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# MATICO

MACHINE APPLICATIONS TO TECHNICAL  
INFORMATION CENTER OPERATIONS

524 000

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(6) **MATICO.**

## MACHINE APPLICATIONS TO TECHNICAL INFORMATION CENTER OPERATIONS

by

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(9) SEP ~~1962~~ 1962

(10) 24 p. incl illus, refs.

(12) NA

(13) NA



*Lockheed*

**MISSILES & SPACE COMPANY**

A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION

SUNNYVALE, CALIFORNIA

  
ABSTRACT

A modular development of a system for application of electronic equipment to various operations of the Technical Information Center is described. MATICO (Machine Applications to TIC Operations), as originally conceived by the LMSC Technical Information Center, is a series of phases, each contributing a real end-product to expedite and expand information services. The system is the result of the joint development efforts of the Technical Information Center and the Information Processing organization.

~~The system has been~~ designed for the IBM 7090/1401 computer complex, *the system* and includes the following major phases: Catalog Card Production, KWIC Index of Reports, Selective Dissemination of Information, Automated Search Program, and Auto-Abstracting.

Each phase, as well as the complete program, has been so designed that it can be readily adapted to serve any information group confronted with the problem of volume processing of report literature; the dissemination of report information; and the storage and retrieval of document information.



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## 1. INTRODUCTION

The basic concept in our approach to the application of electronic equipment to Technical Information Center operations is the development of a modular program. Each of the MATICO phases will achieve a real end-product in minimum time, and will simultaneously expand the information services offered LMSC while achieving more expeditious service at less cost.

The computer complex to be utilized in these programs is the IBM 7090/1401. Each program phase, utilizing this computer complex, is so planned that it can be readily expanded and adapted to succeeding phases in the system while still employing one basic input record.

A continuing surveillance and study of systems now operative, regardless of location and/or hardware, will be maintained to insure a minimum expenditure of time and expense, and to prevent duplication of effort in development of our mechanized handling of document information. Such cognizance of existing information systems will also insure the maximum compatibility of MATICO with other mechanized information systems.

The individual phases, as well as the complete program, are so designed that they can be adapted to any other Lockheed information groups with an expectation of similar savings and expeditious service. With its flexibility MATICO offers a system capable of presenting a unified corporate attack on many problems of dynamic information service. Figure 1-1 presents a schematic flow of MATICO to date.

# SCHEMATIC FLOW CHART

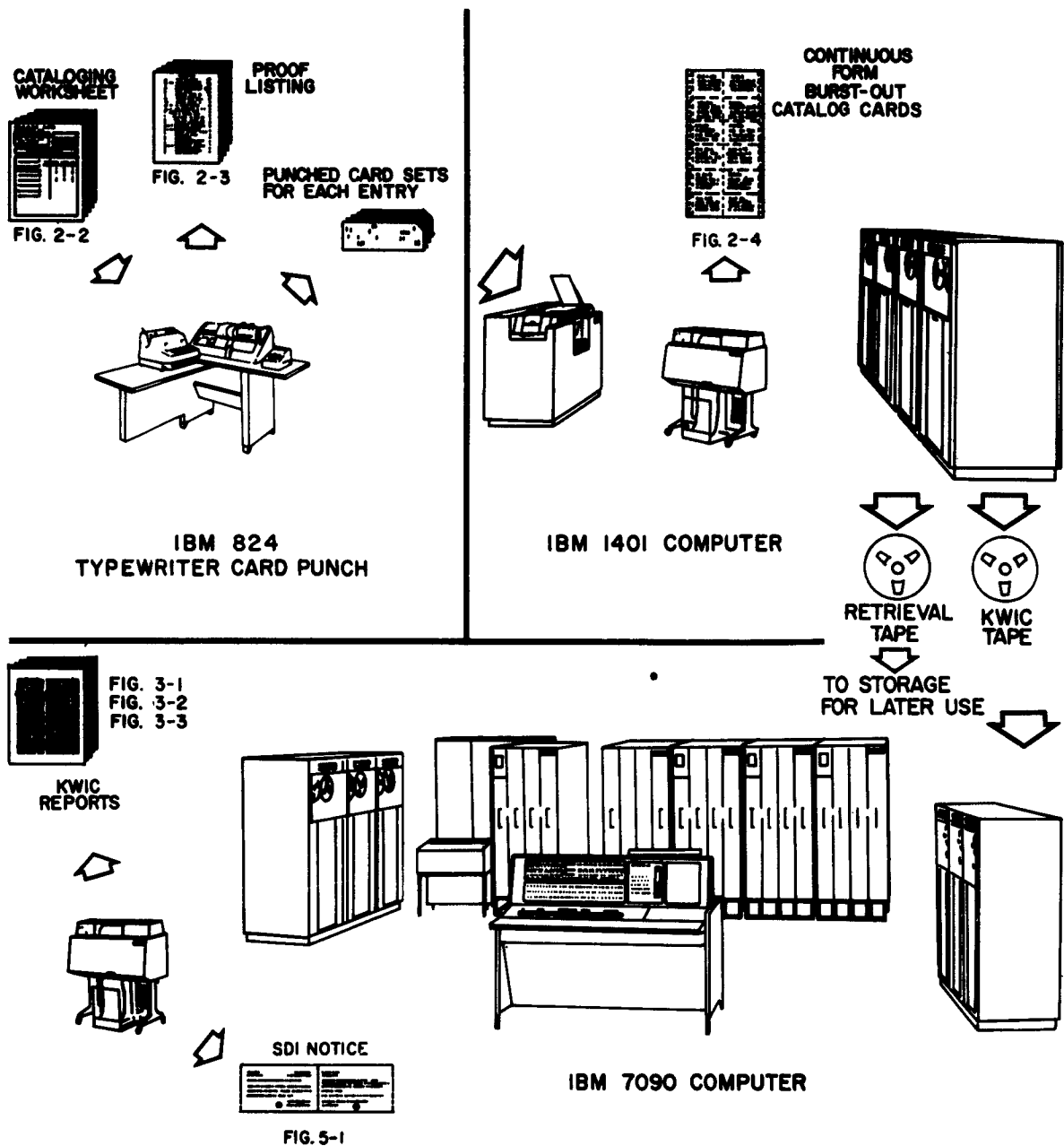


Figure 1-1

## 2. CATALOG CARD PRODUCTION

The preparation and filing of catalog cards have traditionally been necessary library operations that contribute materially to costs. Both the reproduction of cards and manhours in alphabetizing catalog cards are rote functions which the machine can perform more efficiently than the clerical staff.

The TIC receives and catalogs approximately 500 report titles per week. The TIC cataloging staff enters full descriptive and subject data on a worksheet (Fig. 2-2). Under MATICO, a set of cards is keypunched from this worksheet (Fig. 2-3). This single machine-readable input serves as the basis for all subsequent listings and reports prepared on the IBM 7090/1401.

The first stage of processing results in the generation of library catalog cards on unique catalog card stock designed by LMSC for this operation (Fig. 2-4). In this 1401 operation all catalog cards are printed two-up, with the option for specified text (titles and subject entries) to be overprinted. For each title there are on the average ten separate cards required for a card set and four sets per title are needed to maintain like manual retrieval points in all LMSC libraries ---in library terms, a "Union Catalog". The speed and accuracy of the 1401 reduces significantly the time required for card production. The need for this high-speed equipment can be appreciated when it is remembered that eight to ten cards are required for each title processed, and these cards are needed by multiple libraries. Card production using the 1401 is now scheduled at 16,000--20,000 cards per week, and the system can readily handle a sizeable increase in volume.

As the 1401 prints library cards, a magnetic tape is simultaneously written. Information contained on the catalog card, as well as added information, is written on a magnetic tape file which will be used for automatic searching, as described later in this report. Another magnetic tape, similarly written except for format, serves as the input to a KWIC (Key-Word-In-Context) program, described in the next section of this report.

Fig. 2-1 below indicates a comparison of the more obvious costs involved in MATICO and the previous paper tape catalog card production methods.

**COMPARATIVE COSTS OF CATALOG CARD PRODUCTION**  
(One-year Period)

| Item                               | Former System |           | MATICO |          |
|------------------------------------|---------------|-----------|--------|----------|
|                                    | Number        | Dollars   | Number | Dollars  |
| Personnel                          | 5             | 21,850    | 2      | 9,000    |
| Card Stock                         |               | 3,300     |        | 3,300    |
| Synchrotape &<br>Slave Typewriters | 2<br>2        | 2,991.66  | 0<br>0 |          |
| Equipment Maintenance              |               | 1,650     |        | 200      |
| 826 Type/Card Punch                |               |           | 1      | 1,440    |
| 1401 Time @ \$40/hr                |               |           | 150    | 6,000    |
| Dollar Total                       |               | 29,791.66 |        | 19,940   |
| Per Title @ 25M                    |               | 1.19      |        | 0.80     |
| Savings Total                      |               |           |        | 9,851.66 |
| Savings Per Title<br>Processed     |               |           |        | 0.39     |

Figure 2-1

In addition to the savings effected in these obvious areas, the return of catalog cards in a "prefiled" order is expected to reduce filing time by 60% in all three libraries.

Other factors to be considered in viewing costs and savings are the added services afforded the TIC with this basic cataloging input:

1. KWIC Indexes as required
2. Selective Dissemination of Information regarding new acquisitions
3. Information retrieval tapes
4. Book catalogs in specialized areas of the collection

The benefits of more rapid card delivery to the catalog, the improved services through both wider and selective dissemination of information of new acquisitions, automated searching---all these also allow greater staff time to examine processing and reader services. MATICO will facilitate the comparison and analysis of terms used by in cataloging and in users' requests. Such analysis will give a sound basis for changes to cataloging authority lists where need is indicated.

Indirectly, non-library organizations will be encouraged to incorporate into the TIC system reports which they receive on direct distribution from originating agencies. With such participation by the various LMSC organizations, there will be fewer unidentified, unknown pockets of literature scattered throughout the various facilities. As organizations become part of the system, the library has not only achieved a major goal, it will also be freed from spending many man-hours in securing stray report publications throughout the company.

# CATALOGING WORKSHEET

## TECHNICAL INFORMATION CENTER

### KEYPUNCH INSTRUCTIONS

1. INSERT ONE (1) BLANK CARD AFTER EACH FIELD (INDICATED BY BLANK LINE ON WORKSHEET).
2. INSERT TWO (2) BLANK CARDS AT END OF EACH WORKSHEET.
3. PUNCH ALL LOWER CASE L'S (1) AS NUMERICAL ONE.

CATALOGED BY

PA

CATALOG DATE

8/30/62

PROOFED

EL

TO KEYPUNCH

8/31/62

CATALOG CARDS REC'D

9/4/62

TYPE IN UPPER CASE. LEAVE NO FIELD BLANK, TYPE NONE IF THERE IS NO DATA FOR ANY FIELD. USE INITIALS ONLY AFTER PERSONAL AUTHORS.

### BE CONSISTENT--TYPE ADJACENT TO ALL VERTICAL LINES

| DESCRIPTION                            | CARD COLUMNS                                   |   |   |   |   |   |   |   |   |    |
|----------------------------------------|------------------------------------------------|---|---|---|---|---|---|---|---|----|
|                                        | 1                                              | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| ACCESS, NUMBER                         | 5                                              | 5 | 7 | 9 |   |   |   |   |   |    |
| CODE/CALL NUMBER                       | A                                              | I | R | U | 6 | 2 | - | 1 | 8 |    |
| COMPANY/CORPORATION AUTHOR             | A                                              | I | R |   | U | N | I | V | . |    |
| (BLANK LINE)                           |                                                |   |   |   |   |   |   |   |   |    |
| TITLE                                  | STUDIES ON THE PREVENTION OF CONTAMINATION     |   |   |   |   |   |   |   |   |    |
| (DO NOT BREAK WORD AT END OF ANY LINE) | OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC      |   |   |   |   |   |   |   |   |    |
| (BLANK LINE AFTER END OF TITLE)        | EXAMINATION OF HERMETICALLY SEALED ELECTRONIC  |   |   |   |   |   |   |   |   |    |
|                                        | COMPONENTS.                                    |   |   |   |   |   |   |   |   |    |
| AUTHOR: (SURNAME, INITIALS)            | CORDARO, J. T.                                 |   |   |   |   |   |   |   |   |    |
| (USE + FOR "AND"                       |                                                |   |   |   |   |   |   |   |   |    |
| + BEFORE ET AL)                        |                                                |   |   |   |   |   |   |   |   |    |
| (BLANK LINE)                           |                                                |   |   |   |   |   |   |   |   |    |
| PLACE                                  | SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEX. |   |   |   |   |   |   |   |   |    |
| DATE/PAGINATION/HOLDING/COPY NO.       | NOV 61 5 P C-SV                                |   |   |   |   |   |   |   |   |    |
| (LEAVE BLANK LINE)                     |                                                |   |   |   |   |   |   |   |   |    |
| TRACINGS:                              | 1a.T./ 2a.ELECTRONIC EQUIPMENT--STERILIZATION/ |   |   |   |   |   |   |   |   |    |
| 1 = TITLE                              | 2b.SPACECRAFT--STERILIZATION/ 2c.              |   |   |   |   |   |   |   |   |    |
| 2's = SUBJECTS                         | EXTRATERRESTRIAL BASES--CONTAMINATION/ 3a.     |   |   |   |   |   |   |   |   |    |
| 3's = PERSONAL AUTHOR(S)               | CORDARO, J.T./ 4a.AIRU 62-18/ 4b.AD 272 334/   |   |   |   |   |   |   |   |   |    |
| 4's = SERIES NUMBERS, LMSC CONTROL NO. | 6a.EXAMINATION INCLUDES HERMETICALLY SEALED    |   |   |   |   |   |   |   |   |    |
| 5's = CONTRACT NUMBER, LMSC P.O. NO.   | ELECTRONIC COMPONENTS AND THOSE CONSIDERED     |   |   |   |   |   |   |   |   |    |
| 6's = ABSTRACT                         | TYPICAL OF SPACECRAFT ELECTRONIC SYSTEMS. OF   |   |   |   |   |   |   |   |   |    |
|                                        | 166 COMPONENTS EXAMINED, 11 WERE CONTAMINATED. |   |   |   |   |   |   |   |   |    |
|                                        | PAPER AND MYLAR CAPACITORS MORE LIKELY TO BE   |   |   |   |   |   |   |   |   |    |
|                                        | CONTAMINATED DURING FABRICATION THAN OTHER     |   |   |   |   |   |   |   |   |    |
|                                        | CAPACITOR TYPES. APPROACH FOR DEVELOPING       |   |   |   |   |   |   |   |   |    |
|                                        | STERILIZATION PROCEDURES PRESENTED.//          |   |   |   |   |   |   |   |   |    |
| DESCRIPTORS:                           | EXTRATERRESTRIAL BASES/ CONTAMINATION          |   |   |   |   |   |   |   |   |    |
|                                        | INHIBITION/ ELECTRONIC EQUIPMENT/              |   |   |   |   |   |   |   |   |    |
|                                        | MICROORGANISMS/ DECONTAMINATION/               |   |   |   |   |   |   |   |   |    |
|                                        | PURIFICATION/ CAPACITORS-CONTAMINATION/        |   |   |   |   |   |   |   |   |    |

Figure 2-2

# PUNCHED CARD LISTING

5579  
AIRU-62-18 UN  
AIR UNIV.

STUDIES ON THE PREVENTION OF CONTAMINATION  
OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC  
EXAMINATION OF HERMETICALLY SEALED ELECTRONIC  
COMPONENTS.

CORDARO, J.T.

SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS  
NOV 61 6P C-SV

1A.T./2A.ELECTRONIC EQUIPMENT--STERILIZATION/  
2B.SPACECRAFT--STERILIZATION/2C.  
EXTRATERRESTRIAL BASES--CONTAMINATION/3A.  
CORDARO, J.T./4A.AIRU-62-18/4B.AD-272 334//

5580  
GD-CVC-2PH-102 UN  
GENERAL DYNAMICS-CONVAIR

RE-ENTRY RESEARCH. ABSTRACTS OF REPORTS.

NONE

30 JUNE 61 55P C-SV

1A.T./2A.RE-ENTRY AERODYNAMICS/4A.GD-CVC-2PH-  
102/4B.AD-272 274/5A.DA-04-499-ORD-3112//

5581  
ASD-TR-61-142-VOL.1 UN  
BELL AEROSYSTEMS CO.

STUDY AND EXPERIMENTAL RESEARCH INTO FLIGHT  
INSTRUMENTATION FOR VEHICLE OPERATION IN THE  
FRINGE OR OUTSIDE OF THE ATMOSPHERE. VOLUME  
1. SUMMARIES OF THE ANALYSES OF SENSING  
TECHNIQUES.

STEPHAN, S.C.

BUFFALO, N.Y.  
NOV 61 134P C-1-P C-SV

1A.T./2A.CONTROL SYSTEMS/2B.CELESTIAL  
MECHANICS/2C.SUPERAERODYNAMICS/3A.STEPHAN,  
S.C./4A.ASD-TR-61-142-VOL.1/4B.AD-271 602/  
4C.BAC-60003-077-VOL.1/5A.AF-33(616)-7289//

5582  
NOLC-559 UN  
NAVAL ORDNANCE LAB.

FOURTH SYMPOSIUM ON AMMONIA BATTERIES.  
HELD AT THE UNIV. OF CALIFORNIA. 25-26 JAN  
62.

NONE

CORONA, CALIF.  
29 JAN 62 100P C-SV

1A.T./2A.SYMPOSIUM AMMONIA BATTERIES/2B.WET  
CELLS/2C.STORAGE BATTERIES/4A.NOLC-559/4B.272  
289//

5583  
AJEC-413 C  
AEROJET-GENERAL CORP.

MATERIALS PERFORMANCE ANALYSIS OF NOZZLES  
IN FIRST-STAGE POLARIS MODEL A3 MOTOR NO.  
458.

WINTER, R.A.

4 MAY 62 19P C-1-P C-SV ARC-SC  
C-1(INCN)

1A.T./2A.POLARIS A3/2B.ROCKET MOTOR NOZZLES--  
MATERIALS/2C.ROCKET MOTOR NOZZLES--  
METALLURGICAL ANALYSIS/3A.WINTER, R.A./4A.  
AJEC-413/5A.LMSD-P.O.-18-02211//

5584  
UCRL-9903 UN  
CALIFORNIA, UNIV. OF

ON HYDROGEN ION CONCENTRATION EFFECTS IN  
THE RADIOLYSIS OF AQUEOUS-ORGANIC SYSTEMS.

GARRISON, W.M. + ET AL

LAWRENCE RADIATION LAB., BERKELEY, CALIF.  
OCT 61 3P C-1-P

1A.T./2A.ORGANIC COMPOUNDS--RADIOGRAPHIC  
ANALYSIS/3A.GARRISON, W.M./3B.WEEKS, B.M./  
3C.COLE, S./4A.UCRL-9903/5A.W-7405-ENG-48//

5585  
ASD-TR-61-327-VOL.5 UN  
KIDDE, WALTER AND CO., INC.

STUDY OF INTEGRATED CRYOGENIC FUELED POWER  
GENERATING AND ENVIRONMENTAL CONTROL SYSTEMS.  
VOL. 5. INTEGRATION AND CONTROL STUDIES.

JENNINGS, A.J. + HALL, G.M.

BELLEVILLE, N.J.  
NOV 61 171P C-SV

1A.T./2A.SPACE CRAFT--POWER SUPPLIES/2B.  
AUXILIARY POWER PLANTS/2C.HEAT EXCHANGERS/3A.  
JENNINGS, A.J./3B.HALL, G.M./4A.ASD-TR-61-  
327-VOL.5/4B.AD-270 473/5A.AF-33(616)-7508//

5586  
AJEC-405 UN  
AEROJET-GENERAL CORP.

PERFORMANCE ANALYSIS SECOND STAGE POLARIS A3  
FILAMENT-WOUND CHAMBER SM-5430 MANUFACTURED  
BY THE AEROJET-GENERAL CORP., AZUSA,  
CALIFORNIA.

CARLTON, W.A.

27 APR 62 VAR.PAGING C-1-P C-SV ARC-SC  
C-1(INCN)

1A.T./2A.POLARIS A3/2B.COMBUSTION CHAMBERS--  
FAILURE/3A.CARLTON, W.A./4B.AJEC-405/5A.  
LMSD-P.O.-18-02211//

5587  
STAN-ANSL-225(37)-TR-21 UN  
STANFORD UNIV.

APPLICATIONS OF LAGUERRE-S METHOD TO THE  
MATRIX EIGENVALUE PROBLEM.

PARLETT, B.

APPLIED MATHEMATICS AND STATISTICS LABS.,  
STANFORD, CALIF.  
17 MAY 62 118P C-1-P

1A.T./2A.EIGENVALUES/2B.MATRIX ALGEBRA/3A.

PARLETT, B./4A.STAN-ANSL-225(37)-TR-21/5A.  
NORR-225(37)//

5588  
STAN-ANSL-225(37)-TR-19 UN  
STANFORD UNIV.

BEST POSSIBLE RATIOS MATRIX NORMS.

STONE, B.J.

APPLIED MATHEMATICS AND STATISTICS LABS.,  
STANFORD, CALIF.  
10 MAY 62 67P C-1-P

1A.T./2A.MATRIX ALGEBRA/3A.STONE, B.J./4A.  
STAN-ANSL-225(37)-TR-19/5A.NORR-225(37)//

5589  
NASA-TR R-113 UN  
NATIONAL AERONAUTICS AND SPACE ADMIN.

A STUDY OF STATISTICAL DATA-ADJUSTMENT AND  
LOGIC TECHNIQUES AS APPLIED TO THE  
INTERPLANETARY MIDCOURSE GUIDANCE PROBLEM.

FRIEDLANDER, A.L. + HARRY, D.P.

LEWIS RES.CTR., CLEVELAND, OHIO  
1961 28P C-1-2-P 3C-SV C-VN

1A.T./2A.CELESTIAL NAVIGATION/2B.MIDCOURSE  
GUIDANCE SYSTEMS/2C.SATELLITE VEHICLE  
TRAJECTORIES--ERRORS/3A.FRIEDLANDER, A.L./  
3B.HARRY, D.P./4A.NASA-TR R-113//

5590  
NASA-TR R-119 UN  
NATIONAL AERONAUTICS AND SPACE ADMIN.

LINEARIZED SUPERSONIC NONEQUILIBRIUM FLOW  
PAST AN ARBITRARY BOUNDARY.

DER, J.J.

AMES RES.CTR., HOFFETT FIELD, CALIF.  
1961 16P C-1-2-P 3C-SV C-VN

1A.T./2A.SUPERSONIC FLOW--MATHEMATICAL  
ANALYSIS/3A.DER, J.J./4A.NASA-TR R-119//

Figure 2-3

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>AIRU-62-18<br/>AIR UNIV.</p> <p>5579 UN</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p> <p>1A.T. 2A. ELECTRONIC EQUIPMENT--STERILIZATION<br/>2B. SPACECRAFT--STERILIZATION 2C.<br/>EXTRATERRESTRIAL BASES--CONTAMINATION 3A.<br/>CORDARO, J.T. 4A. AIRU-62-18 4B. AD-272 334</p> | <p>AIRU-62-18<br/>AIR UNIV.</p> <p>5579 UN</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p> <p>1A.T. 2A. ELECTRONIC EQUIPMENT--STERILIZATION<br/>2B. SPACECRAFT--STERILIZATION 2C.<br/>EXTRATERRESTRIAL BASES--CONTAMINATION 3A.<br/>CORDARO, J.T. 4A. AIRU-62-18 4B. AD-272 334</p> |
| <p>ELECTRONIC EQUIPMENT--STERILIZATION</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>5579 UN</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p>                                                                                                                                               | <p>ELECTRONIC EQUIPMENT--STERILIZATION</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>5579 UN</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p>                                                                                                                                               |
| <p>SPACECRAFT--STERILIZATION</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>5579 UN</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p>                                                                                                                                                         | <p>SPACECRAFT--STERILIZATION</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>5579 UN</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p>                                                                                                                                                         |
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Figure 2-4

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| <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p> | <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p> |
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| <p>AIRU-62-18</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p>                                                                               | <p>AIRU-62-18</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p>                                                                               |
| <p>AD-272 334</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p>                                                                               | <p>AD-272 334</p> <p>AIRU-62-18<br/>AIR UNIV.</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.</p> <p>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P C-SV</p>                                                                               |

Figure 2-4

### 3. KWIC INDEX OF REPORTS RECEIVED

A machine-generated Key-Word-In-Context index to report titles received in the TIC has been specified as one of the early phases since:

1. It provides the solution to TIC responsibility to publish current listings of reports received.
2. KWIC has been elsewhere effectively exploited by technical-scientific library users and has been well received by science-engineering personnel.
3. An IBM 7090/1401 KWIC program which could be adapted to our requirements is available.
4. The KWIC index can be prepared as corollary to the catalog card production without added input or significant manhours.
5. The wider dissemination of availability of newly received research reports is a requirement of TIC as soon as such media is economically practical.

The Bell Laboratories' KWIC has been used as a point of departure. Due to the large number of titles to be announced and the use of the program for reports from all sources, certain modifications have been required. The major deviation from the Bell Lab program is the provision for an option which allows words in the title to be selectively permuted. As the program is generally written, non-selective permuting of key words would result in seven to ten significant words to be permuted for each report title. Permutation to this extent would make our index too voluminous and require excessive machine time. Prototype KWIC readouts have been made (Figs. 3-1 through Fig. 3-3).

## NEW REPORT TITLES

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| <p>/S ON THE PREVENTION OF CONTAMINATION OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC EXAMINATION OF HERMETICALLY SEALED BODIES. BODY OF REVOLUTION IN A NONUNIFORM INCOMING STR/ BODY. SIMULATION STUDIES</p> <p>WS-117L DISCOVERER PROGRAM. FLIGHT TEST REPORT FOR THOR</p> <p>E UP/ NON-SIMILAR SOLUTIONS OF THE COMPRESSIBLE LAMINAR LATE IN HYPERSONIC RAREF/ EFFECT OF SLIP ON THE LAMINAR NEARIZED SUPERSONIC NONEQUILIBRIUM FLOW PAST AN ARBITRARY REGENERATIVELY COOLED THRUST CHAMBER WITH BRAZED RIBS AND A LIGHT-WEIGHT REGENERATIVELY COOLED THRUST CHAMBER WITH PANELS. CREEP</p> <p>CE SYSTEM. MISSILE NO. 332-2301, CALIFORNIA. 25-26 JAN 62.</p> <p>URTH SYMPOSIUM ON AMMONIA BATTERIES. HELD AT THE UNIV. OF CALIFORNIA. / POLARIS A3 FILAMENT-WOUND CHAMBER</p> <p>SN-5430 MANUFACTURED BY THE AEROJET-GENERAL CORP., AZUSA, AN INVESTIGATION OF SOLAR CELL CAPABILITIES FOR SATELLITE APPLICATIONS.</p> <p>SOVIET ELECTRONIC COUNTERMEASURES PRODUCING METAL BONDED CARD SORTER. METHODS OF COMPUTING SIMPLE S</p> <p>TATISTICS BY MEANS OF THE TYPE 026 CARDPUNCH AND TYPE 082 S OF COMPUTING SIMPLE STATISTICS BY MEANS OF THE TYPE 026 /LOGY. I CORRELATION BETWEEN MAGNETIC SUSCEPTIBILITY AND /CMNOLOGY. II. CORRELATION BETWEEN INFRARED SPECTRUM AND /N BETWEEN INFRARED SPECTRUM AND CATALYTIC ACTIVITY/ FUEL CELL AND ITS RELATED TECHNOLOGY. II. CORRELATION BETWEEN MAGNETIC SUSCEPTIBILITY AND CATALYTIC ACT/ FUEL CELL ARRAY OPTIMIZATION.</p> <p>AN INVESTIGATION OF SOLAR PROTON AND ELECTRON DAMAGE TO SOLAR CELLS.</p> <p>O SEPT-31 DEC 1961. RESEARCH RELATING TO FUEL A FIRST- STAGE POLARIS A3 FILAMENT-WOUND CONFIGURATION- F /FORMANCE ANALYSIS SECOND-STAGE POLARIS A3 FILAMENT-WOUND /FORMANCE ANALYSIS SECOND STAGE POLARIS A3 FILAMENT-WOUND /VELOPMENT OF A LIGHT-WEIGHT REGENERATIVELY COOLED THRUST /FORMANCE ANALYSIS OF A SECOND-STAGE GLASS-FILAMENT-WOUND RING-RATE TEST OF A FIRST-STAGE POLARIS A3 FILAMENT-WOUND DESIGN AND PROPOSAL SMALL HIGH-ALTITUDE TEMPERATURE MEASUREMENTS ON TIME-VARIANT COMMUNICATION CHANNELS.</p> <p>RIMENTAL INVESTIGATION OF LIQUID DISTRIBUTION AND SURFACE DEVELOPMENT OF A STUDY OF THE EFFECTS OF WIRE FERRO-AND ANTIFERROMAGNETISM IN A CUBIC A STUDY OF THE FEASIBILITY OF</p> <p>JULY 60. ON THE LATERAL DAMPING LUTION. RESEARCH ON SOLID-PROPELLANT</p> <p>ONS/ THEORETICAL INVESTIGATION OF EFFECTS OF CHANGES IN STANDARD TEST PROCEDURES FOR FM IRIG SYSTEM STANDARDS FOR RADIO</p> <p>MISSILE NO. 332-2301, CABLE SPlice FLIGHT TEST REPORT. MEASUREMENTS ON TIME-VARIANT</p> <p>A CRITERION FOR THE STATISTICAL COMPARISON OF NEKAL PROBLEM OF INFORMATION RECEPTION BY MEANS OF SPEECH XCITED PLASMA LAYER. THE INFLUENCE OF</p> <p>CECRAFT SYSTEM TEST OBJECTIVES (VANDENBERG AIR FORCE BASE ECTIONS IN A LIQUID KCl-LiCl-Zn/ SEPARATION OF VARIOUS CTERIOLOGIC EXAMINATION OF HERMETICALLY SEALED ELECTRONIC ENERGY CONVERTER. SECOND / INVESTIGATION OF INTEGRALLY BORON REINFORCEMENTS FOR STRUCTURAL</p> <p>ROGRESS R/ INSTRUMENTATION FOR THE DETERMINATION OF THE ROGRESS R/ INSTRUMENTATION FOR THE DETERMINATION OF THE TH APPLICATIONS TO THE UP/ NON-SIMILAR SOLUTIONS OF THE CAL AND EXPERIMENTAL INVESTIGATIONS OF INCOMPRESSIBLE AND /EORETICAL INVESTIGATION OF EFFECTS OF CHANGES IN COMMAND FLIGHT 1204, MILESTONE IV. DESCRIPTION OF THE SIX-DEGREE-OF-FREEE FLIGHT-PATH STUDY GENERALIZED FLIGHT 2203 MILESTONE V. DESCRIPTION OF</p> <p>EARTH'S SURFACE. A NUMERICAL METHOD FOR 026 CARDPUNCH AND TYPE 082 CARD SORTER. METHODS OF ORGANIC SYSTEMS. ON HYDROGEN ION MINIMUM ALLOWABLE DIMENSIONS FOR CONTROLS MOUNTED ON INAR FLAME. EFFECTS OF</p> <p>III, VEHICLE 1204. SUPERSEDED BY LMSC-8002 095/ SYSTEM /HT-LOAD TEST OF A FIRST- STAGE POLARIS A3 FILAMENT-WOUND CONSTRUCTION OF CERTAIN EXTREMAL PROPERTIES ON MULTIPLY UPLIPLY CONNECTED DOMAINS BY VARIATIONAL TECHNIQUES.</p> <p>TITANIUM AND TITANIUM ALLO/ THE EFFECTS OF INTERSTITIAL TITANIUM AND TITANIUM ALLO/ THE EFFECTS OF INTERSTITIAL RIOLOGIC EXAMINATION OF H/ STUDIES ON THE PREVENTION OF ATING TARGETS AND EXTENDING CONTROL BY USE OF NON- STEREO E GENERAL PROBLEM OF INFORMATION RECE/ FINAL REPORT FOR /IBILITY OF GEOGRAPHICALLY LOCATING TARGETS AND EXTENDING CONTROL BY USE OF NON- STEREO CONTINUOUS STRIP /</p> | <p>5579</p> <p>5610</p> <p>5551</p> <p>5595</p> <p>5631</p> <p>5527</p> <p>5516</p> <p>5650</p> <p>5607</p> <p>5590</p> <p>5591</p> <p>5591</p> <p>5636</p> <p>5552</p> <p>5582</p> <p>5586</p> <p>5518</p> <p>5524</p> <p>5533</p> <p>5631</p> <p>5562</p> <p>5562</p> <p>5598</p> <p>5614</p> <p>5614</p> <p>5598</p> <p>5552</p> <p>5518</p> <p>5514</p> <p>5640</p> <p>5574</p> <p>5575</p> <p>5586</p> <p>5591</p> <p>5577</p> <p>5573</p> <p>5645</p> <p>5592</p> <p>5599</p> <p>5540</p> <p>5629</p> <p>5510</p> <p>5511</p> <p>5621</p> <p>5553</p> <p>5569</p> <p>5568</p> <p>5543</p> <p>5643</p> <p>5644</p> <p>5552</p> <p>5592</p> <p>5523</p> <p>5535</p> <p>5513</p> <p>5522</p> <p>5554</p> <p>5579</p> <p>5642</p> <p>5516</p> <p>5544</p> <p>5617</p> <p>5650</p> <p>5628</p> <p>5543</p> <p>5547</p> <p>5603</p> <p>5550</p> <p>5611</p> <p>5651</p> <p>5562</p> <p>5584</p> <p>5633</p> <p>5608</p> <p>5596</p> <p>5574</p> <p>5508</p> <p>5508</p> <p>5507</p> <p>5539</p> <p>5579</p> <p>5528</p> <p>5535</p> <p>5528</p> |
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Figure 3-1

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Figure 3-2

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|      |                   |      |                    |      |                 |
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| 5658 | ABRAMOVICH, G.N.  | 5574 | HEALY, E.J.        | 5632 | ROBINSON, W.    |
| 5534 | ADDISS, R.R.      | 5615 | HIRSCHFELDER, J.O. | 5606 | ROHRBAUGH, J.H. |
| 5514 | AUKERMAN, L.W.    | 5510 | HRITZAY, D.        | 5627 | ROHRBAUGH, J.H. |
| 5562 | AUWOOD, J.A.      | 5564 | HUNTER, P.A.       | 5518 | RUNNELS, R.W.   |
| 5541 | BAIN, B.K.        | 5652 | HUTH, J.H.         | 5505 | SCHNITT, A.     |
| 5503 | BEER, A. C.       | 5569 | HU, P.N.           | 5550 | SEUBERT, F.W.   |
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| 5576 | BIDDLE, M.T.      | 5620 | JANSEN, L.         | 5624 | STICKMEIER, D.  |
| 5611 | BOWYER, A.R.      | 5585 | JENNINGS, A.J.     | 5563 | SIMMONS, B.E.   |
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| 5553 | BROWN, A.M.       | 5592 | KAILATH, T.        | 5541 | SLIVKA, L.P.    |
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| 5575 | CARLTON, W.A.     | 5507 | KLIER, E.P.        | 5560 | STEWART, R.B.   |
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| 5551 | CARSWELL, A.I.    | 5515 | KRINITZ, A.        | 5588 | STONE, B.J.     |
| 5554 | CHIOTTI, P.       | 5610 | KRZYWOBLOCKI, M.Z. | 5607 | STREET, R.E.    |
| 5608 | CHU, BOA-TEH      | 5504 | LAPP, R. R.        | 5512 | STROH, A.N.     |
| 5598 | CHU, J.C.         | 5568 | LEVY, J.B.         | 5633 | STUMP, N.E.     |
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| 5655 | COFFLAND, R.A.    | 5555 | MAFFEI, H.P.       | 5513 | TAMIR, T.       |
| 5579 | CORDARO, J.T.     | 5560 | MANN, D.B.         | 5629 | TEMPLETON, J.G. |
| 5553 | COUCH, D.E.       | 5591 | MASSIER, P.F.      | 5545 | THOMSON, G.     |
| 5517 | COWAN, R.         | 5660 | MCHAN, C.E.        | 5577 | TOMN, G.H.      |
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| 5635 | DEFRANCESCO, A.J. | 5536 | MOELLER, T.        | 5556 | TROZFA, T.A.    |
| 5590 | DER, J.J.         | 5645 | MOREAUX, C.M.      | 5557 | TURNER, D.H.    |
| 5511 | DRESSELHAUS, G.F. | 5657 | MYER, H.G.         | 5538 | TVERBERG, J.C.  |
| 5505 | DUKES, W.H.       | 5559 | NAKATA, M.M.       | 5550 | USHER, N.E.     |
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| 5604 | FLECK, J.J.       | 5609 | PALSULICH, J.M.    | 5572 | WARR, R.E.      |
| 5626 | FORLINI, J.B.     | 5605 | PAO, Y.H.          | 5631 | WELLBORN, W.W.  |
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| 5638 | GAMMON, E.        | 5532 | PEJSA, A.J.        | 5521 | WILMS, E.       |
| 5584 | GARRISON, W.M.    | 5603 | PICKREN, J.I.      | 5583 | WINTER, R.A.    |
| 5519 | GLASS, R.A.       | 5641 | POPINSKI, Z.       | 5614 | YU, W.S.        |
| 5613 | GOLDMANN, J.B.    | 5621 | POWELL, C.F.       | 5632 | ZIMMERMAN, R.H. |
| 5648 | GOULARD, R.       | 5656 | PROSNAK, W.J.      |      |                 |
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| 5547 | GRETHER, G.G.     | 5506 | REDDEN, R.C.       |      |                 |
| 5523 | GRETTERBERG, T.L. | 5594 | RIBEIRO, S.T.      |      |                 |
| 5585 | HALL, G.M.        | 5509 | RICARDI, L.J.      |      |                 |
| 5589 | HARRY, D.P.       | 5659 | ROBERTS, E.J.      |      |                 |
| 5502 | HATFIELD, J.N.    | 5649 | ROBERTS, J.E.      |      |                 |

Figure 3-3

#### 4. INDEX TO LMSC-GENERATED REPORTS

A KWIC index of LMSC-generated reports which makes such documents accessible through several reference points would be a valuable reference tool in numerous LMSC organizations. This KWIC index, by including all LMSC-generated reports, would serve as exhibit material evidencing the company's technical and scientific scope and competence. In addition, the index would be a valuable reference item throughout the corporate structure.

Newly received LMSC-generated reports are now entering the MATICO program. As soon as the KWIC program is fully operative as a dissemination tool, work will begin to put bibliographic data of LMSC reports issued prior to MATICO into machine-readable form. The index will be issued as soon as such input is completed.

## 5. SELECTIVE DISSEMINATION OF INFORMATION

SDI is a system designed to channel information of newly received reports to those individuals and/or organizations within the company where the probability of the usefulness of the report in conjunction with current work or interests is high. Conversely, SDI might be looked upon as withholding from this individual or organization notification of reports with minor relevancy to current activities.

To implement SDI, and the Automated Search phase of MATICO, an experimental file of reports will be developed to test and measure the effectiveness of varied search and indexing schemes to identify relevant and to ignore irrelevant documents. This experimental file will consist of approximately 500 documents which will be indexed in far greater depth than is presently done. TIC Literature Search staff, familiar with both the documents and the extensive indexing, will serve as the control against which to evaluate any suggested extension or revision of the mechanical search program. This file will be used in conjunction with a pilot group of users for whom interest profiles, stated in descriptors, will be developed and placed in machine storage. The experimental document file will be matched against the pilot interest profiles and notification of relevant documents will be made to individuals indicated. Members of the pilot group will be asked to evaluate the relevance of the document notifications. The evaluations of the SDI participants will serve to determine the effectiveness of various search and indexing systems.

With the selection of a specific storage and retrieval system, a continuing search of current documents will be conducted for the pilot user group, and the service will be extended to additional subscribers. In actual operation SDI will provide abstracts and bibliographic data regarding reports whose indexing has indicated relevance to a subscriber's current interests and activities. Each notice sent to a subscriber will incorporate a return response card so that feedback from the subscribers may be received regularly and an evaluation of the relevancy of the system be made at periodic intervals. The feedback response will indicate the following:

1. The document is of interest and is requested.
2. The document is of interest; however, the abstract was sufficient to keep him informed at present.
3. The document was of interest; however the user already has a copy.

4. The item is of no interest.

5. Comments

In addition to being a means of evaluating SDI, and perhaps an indication as to the suitability of current indexing, responses from the SDI subscribers will serve as a means of modifying the interest profiles of subscribers, thus keeping profiles current. Random notification will also be sent to subscribers with the request for the same response card to be completed. These replies may suggest changes to be considered in interest profiles. Actual implementation of SDI will be related to the progress of other MATICO phases.

The program will employ many of the techniques discussed by H. P. Luhn and T. R. Savage of IBM and full advantage will be taken of the findings of their controlled experiment of SDI. It is expected that the analysis of the effectiveness of SDI will guide in part the development of the Automated Search phase described in the next section.

# SDI NOTICE & RESPONSE CARDS

|                                                                                                                                                                                                                                                                                                                |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <p>AIRU 62-18<br/>JOHN L. JONES<br/>DEPT 52-10<br/>BLDG 201</p> <p>COMPLETE THE FOLLOWING ITEMS...</p> <p>...GRADE DOCUMENT ON RELEVANCE (1-10)<br/>...OF INTEREST, DOCUMENT REQUESTED<br/>...OF INTEREST, DOCUMENT NOT WANTED<br/>...OF INTEREST, HAVE SEEN COPY<br/>...OF NO INTEREST<br/>...COMMENTS...</p> | <p>6 JAN 63<br/>EMP NR 658619<br/>ACC NR 5579<br/>SCORE 963</p> | <p>AIRU-62-18<br/>AIR UNIV.</p> <p>STUDIES ON THE PREVENTION OF CONTAMINATION<br/>OF EXTRATERRESTRIAL BODIES. BACTERIOLOGIC<br/>EXAMINATION OF HERMETICALLY SEALED ELECTRONIC<br/>COMPONENTS.</p> <p>CORDARO, J.T.<br/>SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEXAS<br/>NOV 61 6P</p> <p>1A. I. 2A. ELECTRONIC EQUIPMENT--STERILIZATION<br/>2B. SPACECRAFT--STERILIZATION 2C.<br/>EXTRATERRESTRIAL BASES--CONTAMINATION 3A.<br/>CORDARO, J.T. 4A. AIRU-62-18 4B. AD-272 354</p> | <p>UN 5579</p> |
| <p>RETURN TO<br/>I TIC<br/>I DEPT 50-14<br/>I BLDG 201</p>                                                                                                                                                                                                                                                     |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |

Figure 5-1

## 6. AUTOMATED SEARCH

While both the TIC and Information Processing are well acquainted with numerous mechanized search systems, no system now operative holds the solution to our requirements. Indeed, it is the opinion of the TIC that no truly effective, economical, efficient program for an automated search of literature now exists.

Reports containing scientific-technical information may be identified by means of subject headings, descriptors and/or descriptive phrases. MATICO will provide two forms of search capability:

1. An Inverted File - which the requester may approach through a dictionary of descriptors. File order is report numbers within descriptor.

2. A "Unit Record" File - which stores in one location all bibliographic data as well as excerpted information from reports. File order is descriptors by title.

Requesters will state their search parameters in natural language which the TIC personnel will edit. The first phase of the search program will further edit requests and develop a list of descriptors based on the associative characteristics of terms initially used by the requester, i. e., each initial descriptor may generate several synonymic or similar secondary terms which will be used in the search. Logical comparison will be made between requester terms and document descriptors. A score will be computed, indicating the degree of relevance of each document so tested. After searching all documents, the program will generate 3 x 5" output cards giving full bibliographic information and abstracts when these are available. These cards will be reviewed by Literature Search, TIC, and forwarded to the requester for his personal file. The requester will be asked to evaluate the relevance of the documents so selected. These evaluations by the TIC and the requester will serve as a basis for improving the relative effectiveness of the search system, provide input to the synonym dictionary used in the initial editing pass and provide areas for syntactic analysis and/or change in terms used.

Printed output from the search program will include the generation of (1) a synonym and near-synonym dictionary, (2) a list of documents by descriptor, (3) frequency of usage statistics for both descriptors and documents, and (4) a measure of the success for each in satisfying requests. In addition, it is planned to record

descriptors used and successful documents identified by requester. The potential of this record is to allow the identification of personnel and organizations having similar information interests.

Citation Indexing, the inclusion of bibliographic references within the report on the retrieval tape, is being considered. Citation Indexing enables identification of related reports and publications and would provide the basis for associating similar reports. A careful appraisal of the value of citation indexing to LMSC will be made prior to incorporation in MATICO.

## 7. AUTO-ABSTRACTING

Auto-Abstracting is a technique for machine generation of an abstract. The technique has been discussed extensively in the literature and has proved feasible at various installations. The major problem has been the economical preparation of text for input. MATICO will maintain a surveillance of auto-abstracting techniques and applications so that when such machine applications would benefit the LMSC scientists and engineers, the program can be activated as a part of MATICO.

The preparation of text for auto-abstracting may involve LMSC technical publications groups since one attack on this problem of preparing text to be scanned and analyzed by the machine is the coupling of a slave equipment to prepare paper tape simultaneous with the typing of LMSC reports.

This is one of the last phases of MATICO scheduled for concerted attention.

## 8. POTENTIAL ADDITIONAL APPLICATIONS OF MATICO

### 8.1 Introduction

A central problem of information storage and retrieval is the provision of access to a single physical document from many interest or retrieval paths. Stated another way, a single physical document may be relevant in many subject areas. The cataloger or indexer, at best, must identify all such relevant areas, and refer the document to these areas. MATICO provides a variety of techniques for cross-referencing document and subject areas, including:

1. Catalog cards by subjects and descriptors
2. KWIC index by Key-word-in-title
3. Title/descriptor index (descriptor or subject by title)
4. Descriptor/report number index (report numbers by descriptor/subject).

Each technique has the purpose of identifying or classifying documents by descriptors or subject headings. At LMSC there are many responsibility areas other than the TIC which face problems relating to information storage and retrieval, as discussed herein, and which could benefit from various elements of MATICO. This section will suggest some of these areas for extended application.

### 8.2 Dissemination of Corporate Manufacturing Research Investigations

The dissemination of information about Manufacturing Research Investigations is presently accomplished by an accumulative title index that is prepared from punched cards. However, due to the few subjects encoded on the punched card, and the abbreviation of report titles, the usefulness of this title index is limited.

MATICO can, from the normal cataloging input of the TIC, prepare for the corporate Manufacturing Research Organizations a more useful index to MRI reports. By employing the services of MATICO the MRI organizations will eliminate the time and work involved in preparing the punched cards now used in printing the MRI report index, and at the same time provide interested organizations with a more comprehensive index to MRI reports. Through the use of MATICO services MRI organizations can obtain:

1. 3 x 5 catalog cards to be used in compiling manual indexes wherever such files are required throughout the corporate body

2. A cumulative KWIC listing of permuted MRI report titles
3. A combination KWIC index of titles and a subject index which would list report numbers under related subjects

The Manufacturing Research Investigations have been used as an example. Similar service and advantages are available to any Lockheed group that can benefit from a continued reporting of corporate activities in their program areas.

### 8.3 DITYFS

A "Do-It-Yourself-Filing-System" would have many applications within LMSC. In general, classification of information gathered for personal and departmental files would be indexed by the subject organization in a format similar to that used with MATICO. After submission for processing, the user would receive:

1. A file of 3 x 5 cards, one each for title with various subject headings/descriptors assigned
2. KWIC listing of titles

In summary, DITYFS would enable an organization to establish a file of important information, using the tools and procedures along the lines prescribed in professional information handling.

### 8.4 Procedure Manual Writing

In the writing of an operating procedure for any new piece of equipment, a major portion of the effort is involved in a search for and identification of information written for similar equipment in the past. If standard paragraphs of the operating procedures manual were treated as individual documents it would be possible, utilizing MATICO techniques, to identify and store these paragraphs with subject retrieval tags such that relevant paragraphs could be readily located and similar instructions written for the new manual.

Using an approach similar to that employed in the MATICO search scheme, the technical writer about to develop a new procedures manual, would interrogate the MATICO files, listing components and substructures in the equipment to be described. The paragraphs thus obtained could frequently be used as retrieved, or with minor changes, in describing new equipment and operation procedures. A similar technique could be used in the development of other reports where the text may be repetitive, or very closely related, to earlier writing.

### 8.5 Personnel Applications

The MATICO system can be readily adapted to many storage and retrieval problems. Personnel applications can be treated as new document accessions. Applications can be coded in a manner similar to newly received reports. The output of this program would be a set of cards for each applicant, which would be filed under the various subject categories, such as job type, educational background, salary requirement, experience, age, etc. The KWIC announcement could serve as the basis for various historical analyses or selecting applications to be reactivated.

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