ORDER

A COMPUTER PROGRAM FOR THE

ORGANIZATION and

RETRIEVAL of

DATA for

EFFICIENT

RESEARCH

USER'S MANUAL

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ABSTRACT

This user’s manual describes ORDER, a computer program for the management of general information. The program is controlled by commands in English. The data-base or individual data items can be displayed as required. The data-base can be manipulated, increased, or decreased by simple commands from the user. A record of all changes made in the data-base may be displayed when required.
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I. INTRODUCTION

An automated information-management system, based on a changing user requirement, calls for a computer program which is simple to use, but which controls a system complete enough and complex enough that it can accommodate change. ORDER is a general information-management system which takes a major step toward providing such a "user-oriented" computer program.

In the design of ORDER, it was assumed that the user of information knows best how he wants to use, manipulate, organize, and think (and change his mind) about his data base. All too often, it seems, computer-based systems are designed in such a fashion that the computer specialist and the programmer are interposed between the system user and his data. But the source language designed for ORDER is a step away from that philosophy: the ORDER language is short, simple, and straightforward, so that the user can accomplish his tasks accurately, quickly, and without shifting mental gears from the problem viewpoint to the machine viewpoint.

In general, and in brief, ORDER has the following characteristics and capabilities:

1. The program is activated by COMMANDS which are written in stylized, but plain English.

2. New items of data can be added to the data-base with or without significant structural complexity--i.e., data need only minimum editing before they can be added, since the "fine structure" may be built later automatically, upon COMMAND.

3. The data-base and individual data items can be displayed, in whole or in parts, on COMMAND, as the user requires.
4. Manipulation of, changes in, additions to, and deletions from the data-base are all accomplished by the simple COMMANDS from the user.

5. An automatic record is kept of all changes made in the data-base--this history may be displayed upon COMMAND.
II. SYSTEM DESCRIPTION

A. GENERAL DESCRIPTION

The ORDER system places the user in an iterative man-machine process in which he acts as the adaptive mechanism for the system. He (the user) not only uses the machine as a storage and retrieval device, but also as an organizing device.

Figure 1 is a functional flow diagram which shows the iterative loop created in the ORDER system. The user acquires new data and informational requirements. Based upon his knowledge of the current data-base organization and general content, he then formulates commands to the ORDER program to add the new data and/or to change and display existing data to meet new informational requirements. The computer responds with useful information from the data-base and, also, useful information regarding the status and organizational change produced by the user's commands. This computer response is now evaluated by the user, which may prompt him to formulate additional commands to incorporate new data, or to reorganize the existing data-base so as to improve the response.

In summary, ORDER has been designed to encourage the user to avoid a priori and fixed judgments about the organization and interpretation of his data-base. ORDER, thus, minimizes the time and effort necessary to prepare program data for input to the computer, where it can then be manipulated. The ORDER program philosophy is in this regard motivated by the belief that initial organization and editing should be minimized. This is particularly true when the task of the user is one of discovering relations within the data and when the structure of the data today will most likely be unsuited for tomorrow's problem.
B. DATA STRUCTURE

1. General Structure

The data-base consists of a file of items. All items entered by the user are called PROJECT ITEMS, and those created by the system, in its record keeping functions, are called SYSTEM ITEMS. All items in the file, PROJECT ITEMS and SYSTEM ITEMS, have a basic structure which is shown at the top of the figure inside the back cover. Each has: a NAME: an ABSTRACT: and a TEXT.

a. ITEM NAME

The ITEM NAME is a single term or phrase which identifies the particular item. More than one item within a file may have the same ITEM NAME (uniqueness of ITEM NAMES is not necessary to the functioning of ORDER), but it is usually desirable that the names of PROJECT ITEMS be unique.

b. ITEM ABSTRACT

The ABSTRACT is a set of DESCRIPTORS which the user wishes to use in characterizing a particular item. These DESCRIPTORS might be keywords or phrases, as used in conventional library-abstracting procedures. They may be interpreted as--i.e., ORDER treats them as--qualities that a given ITEM either possesses or lacks. In the example shown in Appendix III, the ITEMS have been given DESCRIPTORS like these two:

AVIATION WEEK (name of the source magazine)
MICROELECTRONICS (indicating the ITEMS which relate to this topic)

The total list of DESCRIPTORS is maintained by the system. As a new descriptor term is introduced to the system by its occurrence in a new ITEM, it is added to the DESCRIPTOR POOL. The matching of descriptor terms in individual abstracts with those present within a user COMMAND is used to facilitate retrieval in some cases. The effectiveness of the
system depends, in part, upon the ability of the user to assign an appropriate set of descriptors for each item of data—either initially or after the item is in the data-base.

c. TEXT

The TEXT of the item is the categorized or organized body of data for that item. This body of data is organized into a set of attributes. Each attribute consists of a name-value pair. Within a particular text, all attribute names should be unique terms. The attribute value corresponding to a particular attribute name may consist of a string of permissible symbols of indefinite length. The attribute values within the text usually constitute the bulk of the item.

To summarize, an analogy may be drawn between the item of data and a book. The title of the book corresponds to the item name. The table of contents corresponds roughly to the abstract, the individual descriptors being implied by the topics mentioned there. Each chapter corresponds to an attribute, its title being the attribute name and its text being the attribute value.

2. Project Data

Consistent with the design philosophy of ORDER, the specific content of each structural part of the project item is determined completely by the user. At the time a project item is added to the database, it must have, as a minimum: a name, at least one descriptor in the abstract, and at least one attribute in the text.

3. System Data

In support of the user's role as an evaluator, a second type of item is created and retained by ORDER for the purpose of system optimization, called system items. System items provide:
information about system utilization
information about data configuration
information about configuration change

When ORDER processes a command that results in a modification of the file (this excludes the addition of PROJECT ITEMS) a SYSTEM ITEM is automatically created. SYSTEM ITEMS have the same basic structure as PROJECT ITEMS, i.e., a NAME, ABSTRACT, and TEXT. The contents of these parts, however, are not totally determined by the user.*

Since it is assumed that the ability to account for change is of major importance to the user, SYSTEM ITEMS are then incorporated as a part of the data-base. The SYSTEM ITEM contains the following information:

- The actual COMMAND which produced the file change;
- Narrative information about why the change was instituted;
- The part of the file that was influenced by the change;
- The date the change was made.

With this data available, the user can restore the file to some previous state, if an error in judgment was made or previously-deleted information is now important.

In order to describe system utilization and configuration, ORDER provides reports concerning DESCRIPTOR usage. When the command to (DISPLAY)(DESCRIPTOR POOL) is executed, an alphabetical list is produced, showing all DESCRIPTORS in the file which have been used to date. The SYSTEM ITEM DESCRIPTORS are listed separately from the PROJECT ITEM DESCRIPTORS. Also, a tally of Uses (how many times the DESCRIPTOR appears in the file) and References (how many times the DESCRIPTOR has

* See Appendix I for complete description of SYSTEM ITEM format.
appeared in the CONDITIONS part of previously-processed commands) is printed for each DESCRIPTOR. This data gives the user some measure of how the DESCRIPTOR is being used, its frequency of use, and its occurrence in the file.

C. COMMANDS

1. General Description

The user works with his data by COMMANDs to the ORDER program. The COMMAND consists of two logical functions:

Select certain ITEMS.
Do something to the selected ITEMS.

Each COMMAND is a self-contained and independent statement to the system. It results in action on the data file. Thus a later COMMAND may refer to the results produced by an earlier COMMAND.

While the COMMAND is best considered as having two independent logical functions (SELECT and DO), it is composed by the user and interpreted by the ORDER program in five parts:

$$\text{DO} \quad \text{SELECT}$$
$$\text{(DATE)) (FUNCTION) (OBJECT) (VALUES) (CONDITIONS)}$$

(This COMMAND format is also shown on the foldout inside the back cover.) Here is an example:

$$(1/20/66) \quad (ADD) \quad (DESCRIPTOR) (VENEZUELA) (D(CARACAS))$$

Here is an equivalent example:

$$(1/20/66) (ADD) \quad \text{THE (DESCRIPTOR) (VENEZUELA) TO ALL ITEMS THAT HAVE THE DESCRIPTOR (D(CARACAS)) THIS DESCRIPTOR WAS ADDED BY J. HONES}$$
Notice that the two COMMANDs will produce identical results. However, the second one is easier to interpret by the user and contains more information, namely the narrative information following the CONDITIONs. Since the whole COMMAND will be included as part of a SYSTEM ITEM, this may be an additional source of data for the user in his role as a system evaluator.

2. **FUNCTIONs**

Four different FUNCTIONs are provided to establish and maintain the data base as well as to retrieve selected information from it. Only one of the following four terms may appear within the FUNCTION part of the command:

- ADD
- DELETE
- CHANGE
- DISPLAY

DISPLAY causes the selection and output of certain ITEMs or parts of ITEMs of data, depending upon the content of the remaining three parts of the COMMAND. This FUNCTION also will output the contents of the DESCRIPTOR POOL, as well as the complete data file.

ADD is the FUNCTION which permits new data to be added to the file. Complete ITEMs may be added to the file, or new ATTRIBUTEs or DESCRIPTORs may be added to existing ITEMs. This function allows new interpretation and broadening of the data-base.

DELETE is the FUNCTION which allows deletion of unwanted ITEMs or parts of ITEMs from the file.

CHANGE is the FUNCTION which permits the substitution of a new term or value to part of an ITEM in the place of an already existing term or value. This function also permits new interpretation of the data.
3. OBJECTs

The terms which appear in the OBJECT part of the COMMAND identify for the ORDER program the part of the data structure to which the FUNCTION is to be applied. Not every FUNCTION/OBJECT combination is a legal one—or even a sane one. Thus, the user may ADD and DELETE only whole ITEMS, DESCRIPTORS, and ATTRIBUTES; he may CHANGE only ITEM NAME, DESCRIPTOR, ATTRIBUTE NAME, and ATTRIBUTE VALUE; he can DISPLAY almost everything.

The following table shows the permissible FUNCTION/OBJECT combinations (the /s denotes that multiple object terms are allowed):

<table>
<thead>
<tr>
<th>FUNCTIONS</th>
<th>ADD</th>
<th>CHANGE</th>
<th>DELETE</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITEM/S</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ITEM NAME/S</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>ABSTRACT/S</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DESCRIPTOR/S</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEXT/S</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ATTRIBUTE/S</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>ATTRIBUTE NAME/S</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>ATTRIBUTE VALUE/S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DESCRIPTOR POOL</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

4. VALUES

The VALUES part of the COMMAND contains, literally, the VALUES which the user wishes to associate with the OBJECT for purposes of changing the data-base. In the case of the ADD FUNCTION, the VALUES part of the COMMAND will contain, literally, the new ITEM, or the new DESCRIPTOR or ATTRIBUTE. In the case of DELETE or CHANGE FUNCTIONS, the VALUES part of the COMMAND mentions those structural elements of an ITEM (e.g., ITEM NAME, DESCRIPTOR, ATTRIBUTE) which are to be deleted or changed.
Finally, in the case of a DISPLAY FUNCTION, the VALUEs part of the COMMAND mentions the NAMEs of those ATTRIBUTEs to be displayed.

5. CONDITIONS

It is through the interpretation of CONDITIONS that certain ITEMs of data are selected from the file to be operated upon according to the FUNCTION/OBJECT pair. The terms appearing in the CONDITIONS part of the COMMAND serve to define for the program ITEMs of data to which the COMMAND is to be applied. The CONDITIONS, therefore, allow the user to specify that set of data ITEMs having certain common structural elements or data content which are to be selected. Items not having the specified commonality are undisturbed. The elements appearing in the CONDITIONS part of the COMMAND constitute a Boolean expression of terms. These terms may involve ITEM NAMEs, DESCRIPTORs, ATTRIBUTE NAMEs, ATTRIBUTE VALUEs, or STRINGs of CHARACTERS. The Boolean expression which constitutes CONDITIONS is made up of one to five Boolean subexpression types connected by logical "and", represented by the asterisk(*)

All of the sub-expression types except TV demand that the selection of an ITEM be made within the context of ITEM structure e.g., ITEM NAME, DESCRIPTOR, ATTRIBUTE etc. However, TV conditions permit the selection of ITEMs simply on the occurrence of a specified string of characters anywhere within the TEXT part of an ITEM. This feature then allows the user to discover by the complete search of the contents of the TEXT part of an ITEM whether or not specified words or phrases are present. This TV condition is one of the more important aids that ORDER offers to the user for organizing and structuring data which was originally unedited or formless.

* See ORDER LANGUAGE SUMMARY TABLE.
SUBEXPRESSSION TYPES

(BIN) = :IN (®in.₁ ®in.₂ ®... ®in.ₐ)
a Boolean expression of ITEM NAMES.

(BAN) = :AN (®an.₁ ®an.₂ ®... ®an.ₐ)
a Boolean expression of Attribute Names.

(BD) = :D (®d₁ ®d₂ ®... ®dₐ)
a Boolean expression of Descriptors.

(BAV) = :AV (®an. ®.R. val.)₁ ®(an. ®.R. val.)₂ ®... ®(an. ®.R. val.)ₐ)
a Boolean expression of ATTRIBUTE NAMEs and VALUE bounds

(BTV) = :TV (®(str.) ®(str.) ®... ®(str.))
a Boolean expression of TEXT (ATTRIBUTE) VALUE

Where:

(®) = : (=, *) logical "and" and "and not" respectively

(an.) = : (ATTRIBUTE NAME)

(in.) = : (ITEM NAME)

(d) = : (_DESCRIPTOR)

(.R.) = : (one of the relations, .LESS., .GREATER., .EQUAL., .BETWEEN..) Note that if .BETWEEN is used val.₁ and val.₂ will appear separated by a comma: (an. .BETWEEN val.₁, val.₂)

(val.) = : (a term in the conditions which is a value to be compared to the ATTRIBUTE VALUE mentioned, according to the relation .R.)

(str.) = : an arbitrary string of characters.
Boolean subexpressions of type BIN allow selection of ITEMS by ITEM NAME. Subexpressions of type BAN allow selection of ITEMS by the existence of ATTRIBUTE NAMES within the TEXT. Likewise, expressions of type BD permit selection of ITEMS based upon occurrence of certain DESCRIPTOR terms within the ABSTRACT. Finally, subexpressions of type BAV permit selection of ITEMS whose ATTRIBUTES are equal to a certain VALUE, or lie within an open or closed interval. By compounding these five subexpression types into the complete Boolean expression in the CONDITIONS part of the COMMAND, an extremely specific COMMAND may be constructed. The COMMAND then selects ITEMS based upon VALUE considerations as well as NAMES.

Symbolically:

\[(\text{conditions}) = :((\text{BIN}) (\text{BD})(\text{BAN}) (\text{BAV})(\text{BTV}))\]

where any one or more subexpression types may be absent. Empty conditions are interpreted as "all" or the whole file.

6. Summary

The following table summarizes all possible COMMAND forms which the user may execute with ORDER.
ORDER LANGUAGE SUMMARY TABLE
(COMMAND) = : (date|function|object|values|conditions) $$

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>OBJECT</th>
<th>VALUES</th>
<th>CONDITIONS</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADD</td>
<td>ATTRIBUTE/S</td>
<td>(m = av.)</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Add attribute in (values) to texts of items satisfying (conditions).**</td>
</tr>
<tr>
<td></td>
<td>ITEM</td>
<td>(ln./abs./text)</td>
<td>Empty</td>
<td>Add item specified in (values) to the file.</td>
</tr>
<tr>
<td></td>
<td>DESCRIPTOR/S</td>
<td>(descriptors)</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Add descriptors which appear in (values) to the abstracts of items satisfying (conditions).**</td>
</tr>
<tr>
<td></td>
<td>ITEM/S</td>
<td>Empty</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Delete items satisfying (conditions) from the file.</td>
</tr>
<tr>
<td></td>
<td>DESCRIPTOR/S</td>
<td>(descriptors)</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Delete the descriptors in (values) from items satisfying (conditions).**</td>
</tr>
<tr>
<td></td>
<td>ATTRIBUTE/S</td>
<td>(m = av.)</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Delete the attributes named in (values) from items satisfying (conditions).**</td>
</tr>
<tr>
<td>CHANGE</td>
<td>ITEM NAME</td>
<td>(m = av.)</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Change the name of the item satisfying (conditions) to term in (values).</td>
</tr>
<tr>
<td></td>
<td>DESCRIPTOR</td>
<td>(d * TO * d')</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Change the descriptors in items satisfying (conditions) to those specified in (values).</td>
</tr>
<tr>
<td></td>
<td>ATTRIBUTE NAME</td>
<td>(an. * TO * an.')</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Change the attribute names of items satisfying (conditions) to those specified in (values).</td>
</tr>
<tr>
<td></td>
<td>ATTRIBUTE VALUE</td>
<td>(m = av.)</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Change the attribute values of items satisfying (conditions) to those specified in (values).</td>
</tr>
<tr>
<td></td>
<td>ITEM NAME/S</td>
<td>Empty</td>
<td>B(D,AN,AV,TV)</td>
<td>Display the item name of those items satisfying (conditions).</td>
</tr>
<tr>
<td></td>
<td>ITEM/S</td>
<td>Empty</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Display the complete item of those items satisfying (conditions).</td>
</tr>
<tr>
<td></td>
<td>ABSTRACT/S</td>
<td>Empty</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Display the item name and abstract of those items satisfying (conditions).</td>
</tr>
<tr>
<td></td>
<td>TEXT/S</td>
<td>Empty</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Display the item name and text of those items satisfying (conditions).</td>
</tr>
<tr>
<td></td>
<td>ATTRIBUTE/S</td>
<td>(m = av.)</td>
<td>B(IN,D,AN,AV,TV)</td>
<td>Display the item name and attributes named in (values) of items satisfying (conditions).**</td>
</tr>
<tr>
<td></td>
<td>DESCRIPTOR POOL</td>
<td>Empty</td>
<td>Empty</td>
<td>Display the complete list of descriptors in the pool.</td>
</tr>
</tbody>
</table>

** Multiple sets of values may be mentioned by separating each with an asterisk.
APPENDIX I
SYSTEM ITEM FORMAT

Since it is assumed that CHANGE is a major activity, a set of items called SYSTEM ITEMS is generated whenever the file is modified. Each CHANGE or DELETE COMMAND, and certain ADD COMMANDs, will automatically generate a new SYSTEM ITEM and add it to the file.

The ITEM NAME for all SYSTEM ITEMS is the same--namely, SYSTEM ITEM. The ABSTRACT consists of one term which is the change identifier and is a concatenation of the FUNCTION/OBJECT part of the COMMAND which produced the change. For example, ITEM NAME CHANGED would be the ABSTRACT for the SYSTEM ITEM generated as a result of (CHANGE)(ITEM NAME).

The TEXT of SYSTEM ITEMS consists of the COMMAND which caused the change and of the old values that existed prior to the change. In addition, the date of the COMMAND issuing the change is included in the TEXT, as a separate ATTRIBUTE. The construction of this new ITEM is shown in Fig. 2. These pieces of information are generated as a part of the normal COMMAND processing and require no additional action on the part of the user. It will be noted that change records are generated as a result of all COMMANDs which cause changes to either PROJECT data or SYSTEM data in the file. This is true except in the case of (DELETE) (ITEM) where the item selected is a SYSTEM ITEM. The deletion of a SYSTEM ITEM does not generate a SYSTEM ITEM. The DISPLAY function only exposes the stored data and in no way changes its configuration—therefore it does not generate SYSTEM ITEMS. The ADD function also causes a file change and is included as a SYSTEM ITEM generator under the condition of (ADD)(ATTRIBUTE). It may prove useful to include other ADD commands in the category in the future.
Figure 2. System Item Generation
So that the user may take advantage of the information contained in the SYSTEM ITEMS, the details of each type are listed on the following pages.

(CHANGE) SYSTEM ITEMS:

The four SYSTEM ITEMS resulting from the CHANGE function are:

1. (CHANGE)(DESCRIPTOR)

<table>
<thead>
<tr>
<th>(ITEM NAME)</th>
<th>SYSTEM ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ABSTRACT)</td>
<td>DESCRIPTOR CHANGED</td>
</tr>
<tr>
<td>(TEXT)</td>
<td>The following attributes</td>
</tr>
</tbody>
</table>

- **DATE** = (date of command)
- **COMMAND** = (complete command generating the change)
- **ITEM** = (name of first item affected)
- **CHANGE** = *FROM* $d_1$ *TO* $d_2$
- **CHANGE** = *FROM* $d_m$ *TO* $d_n$
- **ITEM** = (name of second item affected)
- **CHANGE** = *FROM* $d_1$ *TO* $d_j$
- **CHANGE** = *FROM* $d_k$ *TO* $d_k$

(etc. for all items affected)
2. (CHANGE) (ITEM NAME)

(ITEM NAME) = SYSTEM ITEM
(ABSTRACT) = ITEM NAME CHANGED
(TEXT) = The following attributes:

  DATE = (date of command)
  COMMAND = (complete command generating the change)
  ITEM = (in_1)
  ITEM = (in_2)
  ITEM = (in_n)
  CHANGE = *FROM* in_1 *TO* in_n
  CHANGE = *FROM* in_2 *TO* in_n
  
  (etc. if more than one item is changed)

3. (CHANGE) (ATTRIBUTE NAME)

(ITEM NAME) = SYSTEM ITEM
(ABSTRACT) = ATTRIBUTE NAME CHANGED
(TEXT) = The following attributes:

  DATE = (date of command)
  COMMAND = (complete command generating the change)
  ITEM = (name of first item changed)
  CHANGE = *FROM* an_1 *TO* an_n
  
  (etc. for all items affected)
4. (CHANGE) (ATTRIBUTE VALUE)

<table>
<thead>
<tr>
<th>ITEM NAME</th>
<th>SYSTEM ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>ATTRIBUTE VALUE CHANGED</td>
</tr>
<tr>
<td>TEXT</td>
<td>The following attributes:</td>
</tr>
</tbody>
</table>

- DATE = (date of command)
- COMMAND = (complete command generating the change)
- ITEM = (name of first item changed)
- ATTRIBUTE NAME = (name of first attribute changed)
- CHANGE = *FROM* av.1 *TO* av.n
- ATTRIBUTE NAME = (name of second attribute changed)
- CHANGE = *FROM* av.1 *TO* av.n

: (etc. for multiple attribute change)
- ITEM = (name of second item changed)
  : (etc.)

etc.
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(DELETE) SYSTEM ITEMS

Three SYSTEM ITEMS are generated by the DELETE function:

1. (DELETE)(DESCRIPTOR)

   (ITEM NAME) = SYSTEM ITEM
   (ABSTRACT) = DESCRIPTOR DELETED
   (TEXT) = : The following attributes:

   DATE = (date of command)
   COMMAND = (complete command generating the deletion)
   ITEM = (the name of first descriptor deleted)
   DESCRIPTOR DELETED = (the first descriptor deleted from first item)

   ...

   (etc. for multiple descriptors)

   ITEM = (name of second descriptor deleted)
   DESCRIPTOR DELETED = (first descriptor deleted from second item)
   DESCRIPTOR DELETED = (etc.)

   ...

   (etc. for multiple items involved)

2. (DELETE)(ITEM)

   (ITEM NAME) = SYSTEM ITEM
   (ABSTRACT) = ITEM DELETED
   (TEXT) = : The following attributes:

   DATE = (date of the command)
   COMMAND = (complete command generating the deletion)
   ITEM = (name of item deleted)
   DELETION = ITEM TOTALLY DELETED

In addition to the above SYSTEM ITEM which is generated as a result of deleting an ITEM, the complete ITEM is automatically displayed. This is for purposes of manual record-keeping, so that the information is not totally lost.

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3. (DELETE)(ATTRIBUTE)

<table>
<thead>
<tr>
<th>(ITEM NAME)</th>
<th>SYSTEM ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ABSTRACT)</td>
<td>ATTRIBUTE DELETED</td>
</tr>
<tr>
<td>(TEXT)</td>
<td>: The following attributes:</td>
</tr>
<tr>
<td>DATE</td>
<td>(date of command)</td>
</tr>
<tr>
<td>COMMAND</td>
<td>(complete command generating the deletion)</td>
</tr>
<tr>
<td>ITEM</td>
<td>(name of first item modified)</td>
</tr>
<tr>
<td>(attribute deleted)</td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>(name of second item modified)</td>
</tr>
<tr>
<td>ITEM</td>
<td>(etc. for multiple items affected)</td>
</tr>
</tbody>
</table>

(ADD) SYSTEM ITEMS

The SYSTEM ITEMS generated by the ADD function are the following:

1. (ADD)(ATTRIBUTE)

<table>
<thead>
<tr>
<th>(ITEM NAME)</th>
<th>SYSTEM ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ABSTRACT)</td>
<td>ATTRIBUTE ADDED</td>
</tr>
<tr>
<td>(TEXT)</td>
<td>: The following attributes:</td>
</tr>
<tr>
<td>DATE</td>
<td>(date of command)</td>
</tr>
<tr>
<td>COMMAND</td>
<td>(complete command specifying the attribute to be added)</td>
</tr>
<tr>
<td>ITEM</td>
<td>(name of item affected)</td>
</tr>
<tr>
<td>(Attribute added)</td>
<td></td>
</tr>
<tr>
<td>(etc. for multiple attribute additions)</td>
<td></td>
</tr>
</tbody>
</table>
2. (ADD) (DESCRIPTOR)

(ITEM NAME) = SYSTEM ITEM
(ABSTRACT) = DESCRIPTOR ADDED
(TEXT) = The following attributes

DATE = (date of command)
COMMAND = (complete command specifying the descriptors to be added)
ITEM = (name of item affected)
ITEM = etc. for multiple affected items
DESCRIPTOR ADDED = (d₁)
DESCRIPTOR ADDED = (d₂)

(etc. for addition of more than one descriptor)
APPENDIX II

INTERNAL DATA ORGANIZATION

So that the user may have a better understanding of the freedom allowed him in structuring data within the organizational bounds of the ITEM, details of the formatting rules within ORDER will be discussed.

The TERM

A TERM is a string of admissible characters, not including any blanks, which the user chooses to concatenate. A sequence of TERMS, each separated by blanks, forms a PHRASE. The admissible characters for a TERM are:

- integers, 0 through 9
- alphabetic characters, A through Z
- special characters include:
  - + plus sign
  - . period
  - $ single dollar sign
  - / single slash
  - , comma
  - - dash or minus sign

The characters which the user may not use as part of his data are those reserved for special meaning to ORDER. They include:

- ) , ( right and left parenthesis for separating parts of the command
- * asterisk used for Boolean "and"
- - dash or minus signs are prohibited within ATTRIBUTE NAMES, DESCRIPTORS, or ITEM NAMES
two or more contiguous dollar signs are reserved to indicate "end of command"

 duas contiguous slashes are used to separate the ITEM NAME, ABSTRACT, and TEXT within the VALUES part of a command to (ADD)(ITEM)

+o, -0,RM the plus and minus zeros as well as the record mark are used for internal formatting purposes

the equal sign is reserved to separate an Attribute Name from its value

Since "+", "." and both "-" signs have meaning with numeric characters, they may not appear as unassociated characters, i.e., preceded and followed by blanks.

Examples of permissible TERMS are:

BEETHOVEN
GERMAN
1770

Examples of a PHRASE are:

LUDWIG VAN BEETHOVEN
LIVED 1770 TO 1827

Examples of nonpermissible TERMS and PHRASES are:

1770 - 1827
LUDWIG *VAN* BEETHOVEN
ITEM NAMEs, DESCRIPTORs and ATTRIBUTE NAMEs are all treated alike in regard to internal formatting. These are considered phrases. ATTRIBUTE VALUEs however are treated as strings of PHRASEs separated by specially formatted numbers or dates. If a PHRASE is keypunched into a card with contiguous blanks between terms, the string of blanks is collapsed into a single blank. This formatting function conserves machine storage and relieves the user of worrying about counting blanks.

As mentioned above, ATTRIBUTE VALUEs are treated in a special way by the formatting routine. This special treatment is for the purpose of providing a selection mechanism for the AV () part of (CONDITIONs). When ATTRIBUTEs are input in the raw state, the VALUEs part of the ATTRIBUTE is scanned for the occurrence of a date or a number. When a date or number is encountered, it is converted to floating-point number and embedded within the ATTRIBUTE VALUE next to its antecedent. The rules of recognition are as follows for dates and numbers:

- **Date: XX/XX/XX.** The occurrence of two slashes separated by either one or two integers. One-or two-digit integers must appear before and after the slash-integer-slash triplet.
- **Numbers:** A string of integers concatenated with or without an algebraic sign (+ or -) or period (for decimal point) is interpreted as an algebraic number provided that it is flanked on each side by at least one blank. The exponent form of a number is also a permissible form: 1.234E + 05.
APPENDIX III

EXAMPLES

The following pages are reproductions of the computer printout from an exercise which was designed to illustrate the operation of ORDER. Many of the COMMANDs shown are ones which would actually be used in building up and editing a data-file; others have been included simply for illustration. The steps shown on the following pages are:

<table>
<thead>
<tr>
<th>Step</th>
<th>COMMAND</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>(ADD)(ITEM)</td>
<td>The text of a magazine article</td>
</tr>
<tr>
<td>2.</td>
<td>(ADD)(ITEM)</td>
<td>Another article</td>
</tr>
<tr>
<td>3.</td>
<td>(ADD)(ITEM)</td>
<td>Another article</td>
</tr>
<tr>
<td>4.</td>
<td>(ADD)(ITEM)</td>
<td>Another article</td>
</tr>
<tr>
<td>5.</td>
<td>(ADD)(ITEM)</td>
<td>Another article</td>
</tr>
<tr>
<td>6.</td>
<td>(ADD)(ITEM)</td>
<td>Another article</td>
</tr>
<tr>
<td>7.</td>
<td>(DISPLAY)(DESCRIPTOR POOL)</td>
<td>These descriptors were defined when the ITEMS were inserted</td>
</tr>
<tr>
<td>8.</td>
<td>(ADD)(ATTRIBUTE)(PAGE = 83)</td>
<td>Every ITEM whose text contains the word &quot;microcircuit&quot; is given MICROELECTRONICS as a DESCRIPTOR</td>
</tr>
<tr>
<td>9.</td>
<td>(ADD)(DESCRIPTOR)</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>(DISPLAY)(ABSTRACTs)</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>(CHANGE)(ATTRIBUTE VALUE) (PAGE = 84)</td>
<td>For three of the magazine articles</td>
</tr>
<tr>
<td>12.</td>
<td>(CHANGE)(ATTRIBUTE NAME)</td>
<td>Abbreviate &quot;date of publication&quot; to &quot;DOP&quot;</td>
</tr>
<tr>
<td>13.</td>
<td>(CHANGE)(ITEM NAME)</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>(DISPLAY)(ITEM NAMES)</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>(CHANGE)(DESCRIPTOR)</td>
<td>Abbreviate &quot;Filter Center&quot; to &quot;F.C.&quot;</td>
</tr>
<tr>
<td>Step</td>
<td>COMMAND</td>
<td>Comments</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>16.</td>
<td>(DELETE)(DESCRIPTOR)</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>(DISPLAY)(DESCRIPTOR POOL)</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>(DELETE)(ITEMS)</td>
<td>Delete all SYSTEM ITEMS</td>
</tr>
<tr>
<td>19.</td>
<td>(DELETE)(ATTRIBUTE)(PAGE)</td>
<td>For all magazine articles whose PAGE value equals 83.</td>
</tr>
<tr>
<td>20.</td>
<td>(DISPLAY)(ATTRIBUTE)(ARTICLE)</td>
<td>For all articles which contain the word &quot;/MOL/&quot;</td>
</tr>
<tr>
<td>21.</td>
<td>(DISPLAY)(DESCRIPTOR POOL)</td>
<td></td>
</tr>
</tbody>
</table>

There are no more COMMANDs at this point, so ORDER does some internal housekeeping and reports on the status of the data-file and the activity during the run just completed.

* There are further comments included in the COMMANDs on the following pages.
COMMAND BEING PROCESSED IS AS FOLLOWS

(2/2/66) (ADU)(ITEM)( MILLIMETER COMMUNICATIONS FROM MOL
// FILTER CENTER AVIATION WEEK// ARTICLE = THE FEASIBILITY OF USING A MILLIMETER WAVE COMMUNICATIONS LINK BETWEEN USAF PROJECTED MANNEDE ORBITING LABORATORY /MOL/ AND A SATELLITE IN EARTH ORBIT IS UNDER STUDY BY MARTIN ORLANDO FOR AIR FORCE RESEARCH AND TECHNOLOGY DIV. MILLIMETER WAVES OFFER A COMBINATION OF POTENTIAL ADVANTAGES OVER LOWER FREQUENCY MICROWAVE COMMUNICATIONS INCLUDING GREATER INFORMATION CAPACITY, LIGHTER WEIGHT AND GREATER SECURITY. SIMULTANEOUSLY, DEFENSE COMMUNICATIONS AGENCY PLANS TO SEEK INDUSTRY PROPOSALS FOR EVALUATION OF A GROUND BASED MILLIMETER WAVE COMMUNICATIONS SYSTEM TO BE USED BETWEEN LOCATIONS IN THE WASHINGTON, D.C. AREA. *DATE OF PUBLICATION= 1/17/66*)

* **ITEM NAME** MILIMETER COMMUNICATIONS FROM MOL

* **ABSTRACT**
  * FILTER CENTER
  * AVIATION WEEK

* **TEXT**
  * ARTICLE = THE FEASIBILITY OF USING A MILLIMETER WAVE COMMUNICATIONS LINK BETWEEN USAF PROJECTED MANNEDE ORBITING LABORATORY /MOL/ AND A SATELLITE IN EARTH ORBIT IS UNDER STUDY BY MARTIN ORLANDO FOR AIR FORCE RESEARCH AND TECHNOLOGY DIV. MILLIMETER WAVES OFFER A COMBINATION OF POTENTIAL ADVANTAGES OVER LOWER FREQUENCY MICROWAVE COMMUNICATIONS INCLUDING GREATER INFORMATION CAPACITY, LIGHTER WEIGHT AND GREATER SECURITY. SIMULTANEOUSLY, DEFENSE COMMUNICATIONS AGENCY PLANS TO SEEK INDUSTRY PROPOSALS FOR EVALUATION OF A GROUND BASED MILLIMETER WAVE COMMUNICATIONS SYSTEM TO BE USED BETWEEN LOCATIONS IN THE WASHINGTON, D.C. AREA.
  * DATE OF PUBLICATION = 1/17/66
COMMAND BEING PROCESSED IS AS FOLLOWS(HUCOM) TIME = 09-37-35
(2/2/66) (ADD) (ITEM) ( MOL CHECKOUT EQUIPMENT// FILTER CEN
TIER* AVIATION WEEK// ARTICLE = DOUGLAS AIRCRAFT CO., US
AF PRIME CONTRACTOR FOR THE MANNEO ORBITING LABORATORY /
MOL/ RECENTLY BRIEFED PROSPECTIVE BIDDERS FOR GROUND CHE
CKOUT EQUIPMENT FOR THE SPACE LABORATORY. PROPOSAL REQUE
STS WILL BE ISSUED SOON. *DATE OF PUBLICATION=1/17/66 )
$$ $$$
THE NEW ITEM HAS BEEN ADDED TO THE FILE*(ADITM)

*

* * * ITEM NAME * * *
  * MOL CHECKOUT EQUIPMENT

* * * ABSTRACT * * *
  * FILTER CENTER
  * AVIATION WEEK

* * TEXT * * *
  * ARTICLE = DOUGLAS AIRCRAFT CO., USAF PRIME
CONTRACTOR FOR THE MANNEO ORBITING LABORATORY /MOL/ REC
ENTLY BRIEFED PROSPECTIVE BIDDERS FOR GROUND CHECKOUT EQ
UIPMENT FOR THE SPACE LABORATORY. PROPOSAL REQUESTS WILL
BE ISSUED SOON.
  * DATE OF PUBLICATION = 1/17/66 ........
COMMAND BEING PROCESSED IS AS FOLLOWS (RU COM) TIME: 09-37-37
(2/2/66) (AUD) (ITEM) ARMY SEeks LASER DISPLAY// FILTER
CENTER AVIATION WEEK ARTICLE LATE THIS MONTH ARMY E
LECHONICS COMMAND WILL ASK AVIONICS COMPANIES TO BID ON
A DEVELOPMENT MODEL OF A DISPLAY DEVICE WHICH USES A LA
SER AS A HIGH-INTENSITY SOURCE FOR DATA DISPLAY AND PRIN
TING EARLIER WORK ON LASER DISPLAYS HAS BEEN DONE BY IN
TERNATIONAL BUSINESS MACHINES AND TEXAS INSTRUMENTS UNDE
R MILITARY SPONSORSHIP DATE OF PUBLICATION=1/17/66

THE NEW ITEM HAS BEEN ADDED TO THE FILE (AUD) (TH)

* * * ITEM NAME * * *
* ARMY SEeks LASER DISPLAY

* * * ABSTRACT * * *
* FILTER CENTER
* AVIATION WEEK

* * * TEXT * * *
* ARTICLE = LATE THIS MONTH ARMY ELECTRONICS
COMMAND WILL ASK AVIONICS COMPANIES TO BID ON A DEVELOP
MENT MODEL OF A DISPLAY DEVICE WHICH USES A LASER AS A H
IGH-INTENSITY SOURCE FOR DATA DISPLAY AND PRINTING EARL
IER WORK ON LASER DISPLAYS HAS BEEN DONE BY INTERNATIONAL
BUSINESS MACHINES AND TEXAS INSTRUMENTS UNDER MILITARY
SPONSORSHIP
* DATE OF PUBLICATION = 1/17/66 .........

UNCLASSIFIED
UNCLASSIFIED

COMMAND BEING PROCESSED IS AS FOLLOWS:

ITEM: WIDEBAND MICROCIRCUIT // FILTER CENTER // AVIATION WEEK // ARTICLE = THIN FILM LINEAR AMPLIFIER, WHICH GIVES 15 DB. INSERTION GAIN OVER A 1 GC. BANDWIDTH, FROM 400 TO 1400 MC, USING LUMPED PASSIVE THIN FILM COMPONENTS AND TRANSISTOR CHIPS; HAS BEEN DEVELOPED BY BELL TELEPHONE LABORATORIES. CIRCUIT DESIGN AND LAYOUT WERE DEVELOPED USING A COMPUTER PROGRAM WHICH OPTIMIZED CIRCUIT PERFORMANCE AND ACHIEVES OPERATION ALMOST UP TO THEORETICAL LIMIT OF TRANSISTOR PERFORMANCE. THE MICROCIRCUIT AMPLIFIER, FABRICATED ON A 1.5 X 3 IN. GLASS SUBSTRATE, USES DEPOSITED TANTALUM NITRIDE RESISTORS WITH CAPACITORS AND INDUCTORS FABRICATED FROM A SANDWICH OF NICHROME, COPPER AND PALLADIUM FILM. PASSIVE COMPONENTS CAN BE TRIMMED TO WITHIN 0.02 PERCENT OF DESIRED VALUES.

* DATE OF PUBLICATION = 1/17/66

THE NEW ITEM HAS BEEN ADDED TO THE FILE. (ADITH)
COMMAND BEING PROCESSED IS AS FOLLOWS (RUCOM) TIME: 09-37-45 (2/2/66) (ADU) (ITEM) ( SUN PUMPED LASER PROGRESS// FILTER CENTER// AVIATION WEEK// ARTICLE =SUNPOWERED LASER USING A DOUBLE-DOPED YTTRIUM ALUMINUM GARNET /YAG/ CRYSTAL EXCITED BY 400 W. OF SOLAR ENERGY, HAS PRODUCED A CONTINUOUS US-WAVE OUTPUT OF 0.5 TO 1.0 W. AT RADIO CORP. OF AMERICA AS APPLIED RESEARCH ORGANIZATION. LASER OUTPUT WAS MODULATED TO TRANSMIT A TELEVISION SIGNAL IN RECENT TESTS THAT USED A 3 IN. DIA. MIRROR TO FOCUS SOLAR ENERGY ON THE CRYSTAL. THREE YEARS AGO RCA ANNOUNCED IT HAD FIRST ACHIEVED SOLAR PUMPING USING A CALCIUM-FLUORIDE CRYSTAL. CURRENT PROGRAM IS SPONSORED BY NATIONAL AERONAUTICS AND SPACE ADMINISTRATIONS MANNED SPACECRAFT CENTER. *DATE OF PUBLICATION 1/17/66 *)
ITEM NAME

* IMPROVED FIELD EFFECT DEVICES

ABSTRACT

* FILTER CENTER
* AVIATION WEEK

TEXT

* ARTICLE = USE OF SILICON NITRIDE FILM INSTEAD OF SILICON OXIDE FOR INSULATION IN FIELD-EFFECT TRANSISTORS AND MICROCIRCUITS PROMISES GREATLY IMPROVED STABILITY AND RELIABILITY, ACCORDING TO SPERRY RAND RESEARCH CENTER SCIENTISTS. THE COMPANY PREDICTS THAT SILICON NITRIDE WILL FIND USE AS A DIFFUSION MASK, AS A PASSIVATING LAYER OVER P-N JUNCTIONS AND AS AN INSULATING DIELECTRIC, WHERE SILICON OXIDE NOW IS EMPLOYED. SPERRY REPORTS IT HAS PRODUCED METAL OXIDE SEMICONDUCTOR /MOS/ FIELD-EFFECT TRANSISTORS USING SILICON NITRIDE FOR INSULATION WHICH HAVE SHOWN NO MEASURABLE CHANGE IN PERFORMANCE CHARACTERISTICS AFTER EXTENDED STORAGE AT A TEMPERATURE OF 150 C WITH AN APPLIED BIAS VOLTAGE. CONVENTIONAL MOS TRANSISTORS USING SILICON OXIDE, OFTEN UNDERGO CHANGE DURING SUCH CONDITIONS.

* DATE OF PUBLICATION = 1/17/66

THE NEW ITEM HAS BEEN ADDED TO THE FILE.(ADITM)
UNCLASSIFIED

COMMAND BEING PROCESSED IS AS FOLLOWS (RUCOM) TIME = 09-37-54 (2/2/66) (DISPLAY) THE (DESCRIPTOR POOL) (1) ...........................

************************************************************************** NOTICE THAT BOTH THE VALUES AND THE CONDITIONS PART OF THE COMMAND ARE EMPTY. NO

TICE ALSO THAT THE REFERENCES TO ALL DESCRIPTORS ARE ZERO

**DESCRIPTORS**

CL USES REFERENCES DESCRIPTOR

PROJ 0 0 AVIATION WEEK

**FILTER CENTER**

DESCRIPTOR POOL CONTAINS 2 DESCRIPTORS

-------------

COMMAND BEING PROCESSED IS AS FOLLOWS (RUCOM) TIME = 09-37-55 (2/2/66) (ADD) THE (ATTRIBUTE) (PAGE = 83) TO ALL ITEMS WHICH

MEET THE CONDITIONS THAT (FILTER CENTER)AV((DATE OF

PUBLICATION =)* 1/1/66)) ......................................................

************************************************************************** THIS COMMAND ILLUSTRATES THE USE OF A

COMPOUND SET OF CONDITIONS AND THAT NARRATIVE INFORMATION MAY BE ADDED TO THE COMMAND FOR CLARIFICATION AND RECORD KEEPING PURPOSES.

**ITEM NAME**

* MILLIMETER COMMUNICATIONS FROM MOL.

ATTRIBUTE(S) BELOW ADDED... (ADATT)

* PAGE = 83

**ITEM NAME**

MOL CHECKOUT EQUIPMENT.

ATTRIBUTE(S) BELOW ADDED... (ADATT)

* PAGE = 83

**ITEM NAME**

ARMY SEeks LASER DISPLAY.

ATTRIBUTE(S) BELOW ADDED... (ADATT)

* PAGE = 83

**ITEM NAME**

WIDEBAND MICROCIRCUIT.

ATTRIBUTE(S) BELOW ADDED... (ADATT)

* PAGE = 83

**ITEM NAME**

SUN PUMPED LASER PROGRESS.

ATTRIBUTE(S) BELOW ADDED... (ADATT)

* PAGE = 83

**ITEM NAME**

IMPROVED FIELD EFFECT DEVICES.

ATTRIBUTE(S) BELOW ADDED... (ADATT)

* PAGE = 83

CURRENT COMMAND HAS BEEN PROCESSED:

6 ITEMS WERE FOUND TO SATISFY COMMAND (MAIN)

UNCLASSIFIED
UNCLASSIFIED

COMMAND BEING PROCESSED IS AS FOLLOWS (NUCOM) TIME = 09-38-02
(2/2/66) (ADU) (DESCRIPTION) (MICROELECTRONICS) (TV) (MICROCIRCUIT))

THIS COMMAND ILLUSTRATES HOW STRUCTURE MAY BE GIVEN TO AN
ITEM DEPENDING UPON ITS CONTENTS

* * * ITEM NAME * *
* WIDEBAND MICROCIRCUIT

DESCRIPTION(S) ADDED TO ITEM AS FOLLOWS (ADUES)
* DESCRIPTION ADDED = MICROELECTRONICS

* * * ITEM NAME * *
* IMPROVED FIELD EFFECT DEVICES

DESCRIPTION(S) ADDED TO ITEM AS FOLLOWS (ADUES)
* DESCRIPTION ADDED = MICROELECTRONICS

* * * ITEM NAME * *
* SYSTEM ITEM

DESCRIPTION(S) ADDED TO ITEM AS FOLLOWS (ADUES)
* DESCRIPTION ADDED = MICROELECTRONICS

CURRENT COMMAND HAS BEEN PROCESSED.
3 ITEMS WERE FOUND TO SATISFY COMMAND (MAIN)

*

COMMAND BEING PROCESSED IS AS FOLLOWS (NUCOM) TIME = 09-38-02
(2/2/66) (DISPLAY) (ABSTRACTS) (TV) (SYSTEM ITEM))

THIS COMMAND ILLUSTRATES THE USE OF THE BOOLEAN OPERATIONS NOT

* * * ITEM NAME * *
* MILLIMETER COMMUNICATIONS FROM MUL

* * * ABSTRACT * *
* FILTER CENTER
* AVIATION WEEK

*

* * * ITEM NAME * *
* MUL CHECKOUT EQUIPMENT

* * * ABSTRACT * *
* FILTER CENTER
* AVIATION WEEK

UNCLASSIFIED
UNCLASSIFIED

**ITEM NAME**

* AMNY SEeks LASER DISPLAY

**ABSTRACT**

* FILTER CENTER
* AVIATION WEEK

*

**ITEM NAME**

* WIDEBAND MICROCIRCUIT

**ABSTRACT**

* FILTER CENTER
* AVIATION WEEK
* MICROELECTRONICS

*

**ITEM NAME**

* SUN PUMPED LASER PROGRESS

**ABSTRACT**

* FILTER CENTER
* AVIATION WEEK

*

**ITEM NAME**

* IMPROVED FIELD EFFECT DEVICES

**ABSTRACT**

* FILTER CENTER
* AVIATION WEEK
* MICROELECTRONICS

CURRENT COMMAND HAS BEEN PROCESSED.
6 ITEMS WERE FOUND TO SATISFY COMMAND. (MAIN)

*
COMMAND BEING PROCESSED IS AS FOLLOWS:(RUNCOM) TIME: 09-38-06 (2/2/66) (CHANGE)(ATTRIBUTE VALUE) (PAGE=84) (IN IMPROVED FIELD EFFECT DEVICES MILLIMETER COMMUNICATIONS FROM MOL (MOL CHECKOUT EQUIPMENT)) $$$$$

* * * ITEM NAME * * *
* MILLIMETER COMMUNICATIONS FROM MOL

ATTRIBUTE VALUE(S) CHANGED AS FOLLOWS:* (CHGAV)
* ATTRIBUTE NAME = PAGE
* CHANGE = * FROM* 83 * TO* 84

* * * ITEM NAME * * *
* CURRENT COMMAND HAS BEEN PROCESSED.
* ITEMS WERE FOUND TO SATISFY COMMAND *(MAIN) *
CURRENT COMMAND HAS BEEN PROCESSED.

6 ITEMS WERE FOUND TO SATISFY COMMAND. (MAIN)
COMMAND BEING PROCESSED IS AS FOLLOWS (NUCOM) TIME = 09-38-20
(2/2/66) (CHANGE) THE (ITEM NAME) TO (COMMUNICATIONS) IN THE
ITEM WHICH NOW HAS THE NAME (IN MILLIMETER COMMUNICATIONS FROM MOL))

ITEM NAME CHANGED AS FOLLOWS (CHG IN)
* CHANGE = FROM MILLIMETER COMMUNICATIONS FROM MOL TO COMMUNICATIONS

CURRENT COMMAND HAS BEEN PROCESSED.
1 ITEMS WERE FOUND TO SATISFY COMMAND (MAIN)

COMMAND BEING PROCESSED IS AS FOLLOWS (NUCOM) TIME = 09-38-23
(2/2/66) (DISPLAY) (ITEM NAMES) ( ) ( )

* * * * ITEM NAME * * *
* SYSTEM ITEM
* SYSTEM ITEM
* SYSTEM ITEM
* ARMY SELLS LASER DISPLAY
* WIDE-BAND MICROCIRCUIT
* SUN PUMPED LASER PROGRESS
* COMMUNICATIONS
* MOL CHECKOUT EQUIPMENT
* IMPROVED FIELD EFFECT DEVICES
* SYSTEM ITEM
* SYSTEM ITEM

CURRENT COMMAND HAS BEEN PROCESSED.
1 ITEMS WERE FOUND TO SATISFY COMMAND (MAIN)
COMMAND BEING PROCESSED IS AS FOLLOWS (RUCOM) TIME= 09-30-26 (12/2/66) (CHANGE) (DESCRIPTOR) (FILTER CENTER) (TO) F.C. (D) (FILTER CENTER))


ITEM NAME

- ARMY SEEKS LASER DISPLAY
  F.C.  ********
  ITEM NAME
  * WIDEBAND MICROCIRCUIT
  DESCRIPTOR(S) CHANGED AS FOLLOWS: (CHGDES)
  * CHANGE = *FROM* FILTER CENTER

ITEM NAME

- WIDEBAND MICROCIRCUIT
  F.C.  ********
  ITEM NAME
  * SUN PUMPED LASER PROGRESS
  DESCRIPTOR(S) CHANGED AS FOLLOWS: (CHGDES)
  * CHANGE = *FROM* FILTER CENTER

ITEM NAME

- COMMUNICATIONS
  F.C.  ********
  ITEM NAME
  * MUL CHECKOUT EQUIPMENT
  DESCRIPTOR(S) CHANGED AS FOLLOWS: (CHGDES)
  * CHANGE = *FROM* FILTER CENTER

ITEM NAME

- IMPROVED FIELD EFFECT DEVICES
  F.C.  ********
  ITEM NAME

CURRENT COMMAND HAS BEEN PROCESSED.

SIX ITEMS WERE FOUND TO SATISFY COMMAND. (MAIN)

*
UNCLASSIFIED

COMMAND BEING PROCESSED IS AS FOLLOWS


ITEM NAME

* AMMY SEERS LASER DISPLAY
DESCRIPTOR(S) BELOW DELETED FROM ABSTRACT (DELETE)
* DESCRIPTOR DELETED = F.C. ******

ITEM NAME

* WIDEBAND MICROCIRCUIT
DESCRIPTOR(S) BELOW DELETED FROM ABSTRACT (DELETE)
* DESCRIPTOR DELETED = F.C. ******

ITEM NAME

* SUN PUMPED LASER PROGRESS
DESCRIPTOR(S) BELOW DELETED FROM ABSTRACT (DELETE)
* DESCRIPTOR DELETED = F.C. ******

ITEM NAME

* COMMUNICATIONS
DESCRIPTOR(S) BELOW DELETED FROM ABSTRACT (DELETE)
* DESCRIPTOR DELETED = F.C. ******

ITEM NAME

* MUL CHECKOUT EQUIPMENT
DESCRIPTOR(S) BELOW DELETED FROM ABSTRACT (DELETE)
* DESCRIPTOR DELETED = F.C. ******

ITEM NAME

* IMPROVED FIELD EFFECT DEVICES
DESCRIPTOR(S) BELOW DELETED FROM ABSTRACT (DELETE)
* DESCRIPTOR DELETED = F.C. ******

CURRENT COMMAND HAS BEEN PROCESSED.
6 ITEMS WERE FOUND TO SATISFY COMMAND (MAIN)

UNCLASSIFIED
COMMAND BEING PROCESSED IS AS FOLLOWS

**COMMAN U**

**$$$$$$$**

- **DESCRIPTION POOL**

<table>
<thead>
<tr>
<th>CL</th>
<th>USES</th>
<th>REFS</th>
<th>DESCRIPTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHUJ</td>
<td>0</td>
<td>0</td>
<td>AVIATION WEEK</td>
</tr>
<tr>
<td>PHUJ</td>
<td>0</td>
<td>2</td>
<td>FILTER CENTER</td>
</tr>
<tr>
<td>PHUJ</td>
<td>0</td>
<td>1</td>
<td>F+C</td>
</tr>
<tr>
<td>PHUJ</td>
<td>3</td>
<td>0</td>
<td>MICROELECTRONICS</td>
</tr>
<tr>
<td>SYST</td>
<td>1</td>
<td>0</td>
<td>ATTRIBUTE ADEED</td>
</tr>
<tr>
<td>SYST</td>
<td>1</td>
<td>0</td>
<td>ATTRIBUTE VALUE CHANGED</td>
</tr>
<tr>
<td>SYST</td>
<td>1</td>
<td>0</td>
<td>ATTRIBUTE NAME CHANGED</td>
</tr>
<tr>
<td>SYST</td>
<td>1</td>
<td>0</td>
<td>DESCRIPTOR ADEED</td>
</tr>
<tr>
<td>SYST</td>
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</tr>
<tr>
<td>SYST</td>
<td>1</td>
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<td>ITEM NAME CHANGED</td>
</tr>
</tbody>
</table>

DESCRIPTOR POOL CONTAINS 11 DESCRIPTORS

* COMMAND BEING PROCESSED IS AS FOLLOWS

**COMMAN U**

**$$$$$$$**

ITEM BELOW DELETED... (DELETED)
ITEM NAME

SYSTEM ITEM

ABSTRACT

ATTRIBUTE ADDED

MICROELECTRONICS

THAT

DATE = 7/2/66

COMMAND = (6/2/66) (ADD) THE (ATTRIBUTE) (PA GE #83) TO ALL ITEMS WHICH MEET THE CONDITIONS THAT ()(FI LIER CENTER) AV((DATE OF PUBLICATION) GT= 1/1/66)) ******

* THIS COMMAND ILLUSTRATES THE USE OF A COMPOUND SET OF CONDITIONS AND THAT NARRATIVE INFORMATION MAY BE ADDED TO THE COMMAND FOR CLARIFICATION AND RECORD KEEPING PURPOSES*

ITEM = MILLIMETER COMMUNICATIONS

UL

PAGE = R3

ITEM = MOL CHECKOUT EQUIPMENT

PAGE = R3

ITEM = ARMY SEEKS LASER DISPLAY

PAGE = R3

ITEM = WIDE BAND MICROCIRCUIT

PAGE = R3

ITEM = SUN PUMPEU LASER PROGRESS

PAGE = R3

ITEM = IMPROVED FIELD EFFECT DEVICES

PAGE = R3 ******

ITEM BELLOW DELETED... (DELITEM)

*

UNCLASSIFIED

UNCLASSIFIED
**ITEM NAME**

SYSTEM ITEM

**ABSTRACT**

DESCRIPTION ADDED

**TEXT**

* DATE = 2/2/66
* COMMAND = (2/2/66) (ADD) (DESCRIPTION) (MICRO ELECTRONICS) (TV((MICRO CIRCUIT))))

This command illustrates how subcune may be given to an item depending upon its content

**ITEM** = WIDEBAND MICROCIRCUIT
* DESCRIPTION ADDED = MICROELECTRONICS
* ITEM = IMPROVED FIELD EFFECT DEVICES
* DESCRIPTION ADDED = MICROELECTRONICS
* ITEM = SYSTEM ITEM
* DESCRIPTION ADDED = MICROELECTRONICS

* * *

ITEM BELOW DELETED... (DELITEM)
ITEM NAME

SYSTEM ITEM

ABSTRACT

ATTRIBUTE VALUE CHANGED

TEAT

DATE = 7/2/66

CMANU = (2/2/66) (CHANGE) (ATTRIBUTE VALUE

E) (PAGE=E4) (IMPLEMENTED FIELD EFFECT DEVICES/MILLIMETER

COMMUNICATIONS FROM MOL* MCL CHECKOUT EQUIPMENT)) $$ $$ $$

ITEM = MILLIMETER COMMUNICATIONS FROM M

OL

ATTRIBUTE NAME = PAGE

CHANGE = *FROM* B3 *T1* M4

ITEM = MOL CHECKOUT EQUIPMENT

ATTRIBUTE NAME = PAGE

CHANGE = *FROM* H3 *TO* M4

ITEM = IMPROVED FIELD EFFECT DEVICES

ATTRIBUTE NAME = PAGE

CHANGE = *FROM* H3 *TO* M4

**********

ITEM BELOW DELETED...(DELET)

*
**UNCLASSIFIED**

<table>
<thead>
<tr>
<th><strong>ITEM NAME</strong></th>
<th><strong>SYSTEM ITEM</strong></th>
</tr>
</thead>
</table>

**ABSTRACT**

ATTRIBUTE NAME CHANGED

**TEXT**

| DATE | 2/2/66 |
| COMMAND | (2/2/66) (CHANGE) (ATTRIBUTE NAME) |
| (DATE OF PUBLICATION) | TO Dop) (AN(DATE OF PUBLICATION) |

| ITEM | AMY SEERS LASER DISPLAY |
| ITEM CHANGE | FROM DATE OF PUBLICATION |
| ITEM Dop | WIDEBAND MICROCIRCUIT |
| ITEM CHANGE | FROM DATE OF PUBLICATION |
| ITEM Dop | SUN PUMPED LASER PROGRESSION |
| ITEM CHANGE | FROM DATE OF PUBLICATION |
| ITEM Dop | MILLIMETER COMMUNICATIONS FROM MOL |
| CHANGE | FROM DATE OF PUBLICATION |
| ITEM Dop | MOL CHECKOUT EQUIPMENT |
| ITEM CHANGE | FROM DATE OF PUBLICATION |
| ITEM Dop | IMPROVED FIELD EFFECT DEVICES |
| ITEM CHANGE | FROM DATE OF PUBLICATION |

ITEM BELOW DELETED... (DELETION)

**UNCLASSIFIED**
ITEM NAME

SYSTEM ITEM

ABSTRACT

ITEM NAME CHANGED

TEXT

DATE = 2/2/66
COMMAND = (2/2/66) (CHANGE) THE (ITEM NAME)

COMMUNICATIONS in that item which now has the name (ITEM NAME) has

MILLIMETER COMMUNICATIONS FROM MOL... SS SS SS

ITEM = MILLIMETER COMMUNICATIONS FROM MOL

COMMUNICATIONS

CHANGE = *FROM* MILLIMETER COMMUNICATIONS FROM MOL TO M MILLIMETER COMMUNICATIONS

ITEM BELOW DELETED... (DELETE)

*
ITEM NAME

SYSTEM ITEM

ABSTRACT

DESCRIPTOR CHANGED

TEXT

DATE = 2/2/66

COMMAND = (2/2/66) (CHANGE) (DESCRIPTOR) (FILTER CENTER) TO* F.C.* (FILTER CENTER)


ITEM = AMMIE SEeks LASER DISPLAY

CHANGE = FROM* FILTER CENTER TO*

F.C.* ITEM = WIDEBAND MICROCIRCUIT

CHANGE = FROM* FILTER CENTER TO*

F.C.* ITEM = SUN PUMPED LASER PROJECTS

CHANGE = FROM* FILTER CENTER TO*

F.C.* ITEM = COMMUNICATIONS

CHANGE = FROM* FILTER CENTER TO*

F.C.* ITEM = MOL CHECKOUT EQUIPMENT

CHANGE = FROM* FILTER CENTER TO*

F.C.* ITEM = IMPROVED FIELD EFFECT DEVICES

CHANGE = FROM* FILTER CENTER TO*

F.C.* ********** ITEM BELOW DELETED... (DELITM)

UNCLASSIFIED
UNCLASSIFIED

*** ITEM NAME ***
* SYSTEM ITEM

*** ABSTRACT ***
* DESCRIPTOR DELETED

*** TEXT ***
* DATE = 2/2/66
* COMMAND = (2/2/66) (DELETE) (DESCRIPTION) (F.C.) (U(F.C.))$S
  * ITEM = ARMY SEEKS LASER DISPLAY
  * DESCRIPTION DELETED = F.C.
  * ITEM = WIDEBAND MICROCIRCUIT
  * DESCRIPTION DELETED = F.C.
  * ITEM = SUN PUMPED LASER PROGRESS
  * DESCRIPTION DELETED = F.C.
  * ITEM = COMMUNICATIONS
  * DESCRIPTION DELETED = F.C.
  * ITEM = MOL CHECKOUT EQUIPMENT
  * DESCRIPTION DELETED = F.C.
  * ITEM = IMPROVED FIELD EFFECT DEVICES
  * DESCRIPTION DELETED = F.C. ********

CURRENT COMMAND HAS BEEN PROCESSED.
7 ITEMS WERE FOUND TO SATISFY COMMAND.(MAIN)

*

COMMAND BEING PROCESSED IS AS FOLLOWS (HUCOM) TIME= 09-3A-38
(2/2/66) (DELETE) (ATTRIBUTE) (PAGE) (AV(1 PAGE=EQ#83))$S

*** ITEM NAME ***
* ARMY SEEKS LASER DISPLAY
ATTRIBUTE(S) BELOW DELETED: (DELATR)
  * PAGE = 83 ********

*** ITEM NAME ***
* WIDEBAND MICROCIRCUIT
ATTRIBUTE(S) BELOW DELETED: (DELATR)
  * PAGE = 83 ********

*** ITEM NAME ***
* SUN PUMPED LASER PROGRESS
ATTRIBUTE(S) BELOW DELETED: (DELATR)
  * PAGE = 83 ********

CURRENT COMMAND HAS BEEN PROCESSED.
3 ITEMS WERE FOUND TO SATISFY COMMAND.(MAIN)

UNCLASSIFIED
The feasibility of using a millimeter wave communications link between USAF projected Manned Orbiting Laboratory (MOL) and a satellite in Earth orbit is under study by Martin Orlando for Air Force Research and Technology Div. Millimeter waves offer a combination of potential advantages over lower frequency microwave communications including greater information capacity, lighter weight and greater security. Meanwhile, Defense Communications Agency plans to seek industry proposals for evaluation of a ground based millimeter wave communications system to be used between locations in the Washington, D.C. area.
*** ITEM NAME ***

MOL CHECKOUT EQUIPMENT

*** ATTRIBUTE ***

ARTICLE = DOUGLAS AIRCRAFT CO., USAF PRIME CONTRACTOR FOR THE MANNED ORBITING LABORATORY /MOL/ RELATION BRIEFLY PROSPECTIVE BIDDERS FOR GROUND CHECKOUT EQUIPMENT FOR THE SPACE LABORATORY. PROPOSAL REQUESTS WILL BE ISSUED SOON.

CURRENT COMMAND HAS BEEN PROCESSED.
ITEMS WERE FOUND TO SATISFY COMMAND (MAIN)

* COMMAND BEING PROCESSED IS AS FOLLOWS(MUCOM) TIME= 09-38-49
(2/2/66) DISPLAY (DESCRIPTION POOL) (1) ***************

NOTICE THAT THE DESCRIPTIONS DISPLAYED HERE WHICH HAVE A ZERO USE WILL BE REMOVED FROM THE POOL AS A RESULT OF FILE CLOSING AND CLEANUP AS SHOWN ON THE NEXT PAGE

** ** DESCRIPTION POOL ***

<table>
<thead>
<tr>
<th>CL</th>
<th>PROJ</th>
<th>N</th>
<th>FILTER CENTER</th>
</tr>
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<tbody>
<tr>
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<td>0</td>
<td>P.C.</td>
</tr>
<tr>
<td>PROJ</td>
<td>0</td>
<td>2</td>
<td>MICHELECTRONICS</td>
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<td>ATTRIBUTE ADDED</td>
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<td>ATTRIBUTE VALUE CHANGED</td>
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<td>ATTRIBUTE NAME CHANGED</td>
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</table>

DESCRIPTION POOL CONTAINS 12 DESCRIPTIONS

END OF COMMAND PROCESSING, TIME= 09-38-50

UNCLASSIFIED
INACTIVE TEXT WITH NAME BELOW REMOVED FROM FILE. (CLNTXT)
- MILLIMETER COMMUNICATIONS FROM MUL
- MUL CHECKOUT EQUIPMENT
- ARMY SEeks LASER DISPLAY
- WIDEBAND MICROCIRCUIT
- SUN PUMPEd LASER PROGRESS
- IMPROVED FIELD EFFECT DEVICES
- MILLIMETER COMMUNICATIONS FROM MUL
- MUL CHECKOUT EQUIPMENT
- ARMY SEeks LASER DISPLAY
- WIDEBAND MICROCIRCUIT
- SUN PUMPEd LASER PROGRESS
- IMPROVED FIELD EFFECT DEVICES
- SYSTEM ITEM
- SYSTEM ITEM
- MILLIMETER COMMUNICATIONS FROM MUL
- MUL CHECKOUT EQUIPMENT
- IMPROVED FIELD EFFECT DEVICES
- SYSTEM ITEM
- ARMY SEeks LASER DISPLAY
- WIDEBAND MICROCIRCUIT
- SUN PUMPEd LASER PROGRESS
- SYSTEM ITEM
- SYSTEM ITEM
- SYSTEM ITEM
- SYSTEM ITEM
- SYSTEM ITEM
- SYSTEM ITEM
- SYSTEM ITEM

OF 4000 CELLS IN THE ITEM NAME TABLE 37 HAVE BEEN USED, LEAVING 3963 AVAILABLE

THE FILE CONTAINS 666 WORDS.

FILE NOW CONTAINS 7 ITEMS. (CLNTXT) TUEG 09-3R-50 TEND 09-3R-54

UNUSED DESCRIPTOR/S BELOW REMOVED FROM DESCRIPTOR POOL. (CLNDES)
- FILTER CENTER
- ATTRIBUTE ADDED
- DESCRIPTOR ADDED
- ATTRIBUTE VALUE CHANGED
- ATTRIBUTE NAME CHANGED
- ITEM NAME CHANGED
- FOC
- DESCRIPTOR CHANGED
- DESCRIPTOR DELETED
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<thead>
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<tr>
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<td>AVIATION WEEK</td>
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<tr>
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<td>MICROMECHANICS</td>
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<tr>
<td>SYS</td>
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<td>0</td>
<td>ATTRIBUTE DELETED</td>
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</tbody>
</table>

DESCRIPTION POOL CONTAINS 3 DESCRIPTORS.
OF 1000 CELLS IN THE DESCRIPTION POOL 45 HAVE BEEN USED LEAVING 1585 AVAILABLE.

DPOOL CONTAINS 3 DESCRIPTORS (CLNUES) THEG= 09-38-54 TEND= 09-38-54
ITEM STRUCTURE

ITEM NAME

COMMUNICATIONS

FROM MOL

DESCRIPTORS

FILTER CENTER

AVIATION WEEK

ATTRIBUTES

ARTICLE = THE

FEASIBILITY OF

USING (..etc)

DATE OF PUBLICATION

= 1/17/66  PAGE = 84

COMMAND FORMAT

(Command) = (DATE) (FUNCTION) (OBJECT) (VALUES) (CONDITIONS) $$

ADD  ITEM  VALUE  BIN

CHANGE  ITEM NAME  OF  BD

DELETE  ABSTRACT  'OBJECT'  BAN

DISPLAY  DESCRIPTOR  BAV

TEXT  ATTRIBUTES

NAME  ATTRIBUTE

VALUE  NAME

DESCRIPTION  POOL

UNCLASSIFIED
ORDER - A Computer Program for the Organization and Retrieval of Data for Efficient Research

This user's manual describes ORDER, a computer program for the management of general information. The program is controlled by commands in English. The data-base or individual data items can be displayed as required. The data-base can be manipulated, increased, or decreased by simple commands from the user. A record of all changes made in the data-base may be displayed when required.
<table>
<thead>
<tr>
<th>KEY WORDS</th>
<th>LINK A</th>
<th>LINK B</th>
<th>LINK C</th>
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<tr>
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<tr>
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