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AD 409 587

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FOR

SCIENTIFIC AND TECHNICAL INFORMATION

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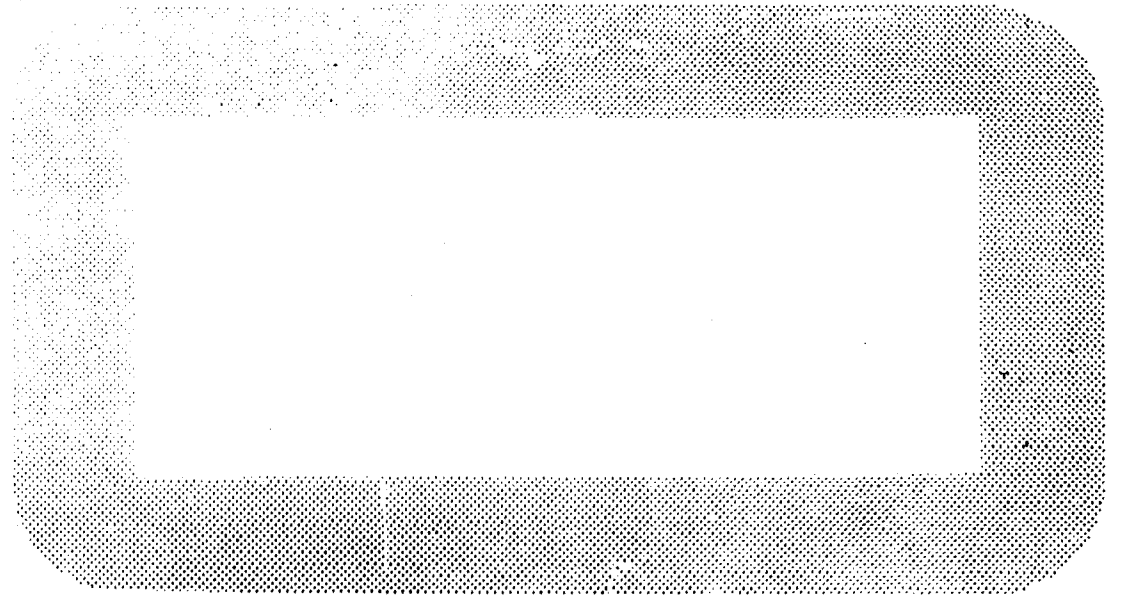


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409 587

TECHNICAL
MEMORANDUM



U. S. NAVAL WEAPONS LABORATORY
DAHLGREN, VIRGINIA

NOTES

U. S. NAVAL WEAPONS LABORATORY

TECHNICAL MEMORANDUM

MAY 1963

No. K-38/63

USER/OPERATOR GUIDE FOR THE NWL TECHNICAL LIBRARY

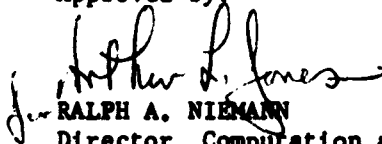
INFORMATION RETRIEVAL SYSTEM

COMPUTER PROGRAMS

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Director, Computation and
Analysis Laboratory

This memorandum is not to be construed as expressing the opinion of the Naval Weapons Laboratory, and while its contents are considered correct, they are subject to modification upon further study.

Copies may be obtained from the Director, Computation and Analysis Laboratory.

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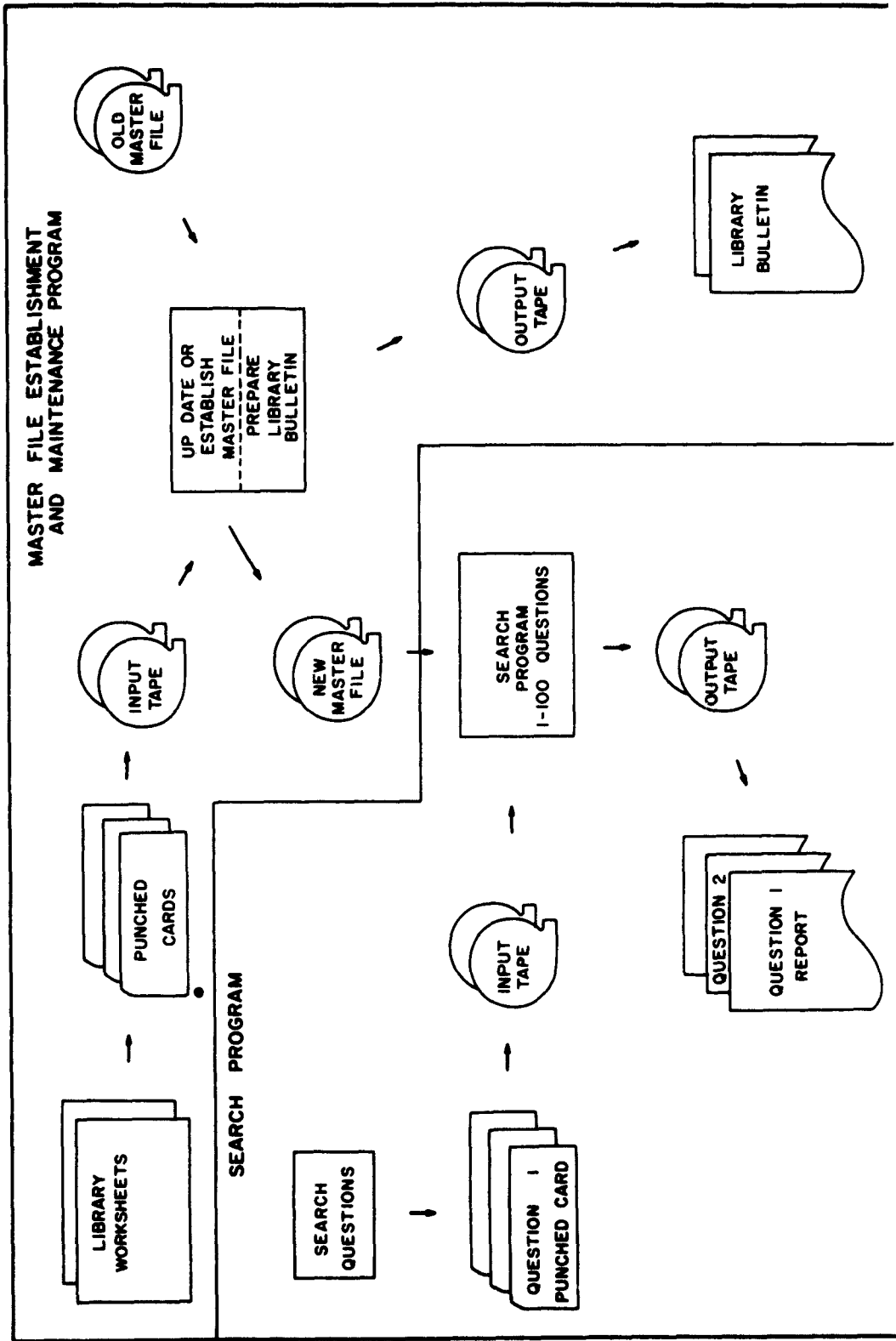
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Distribution

K
K-4
KP
KPO (100)
D
WXO(3)
WD(3)
CMM
TR
ACL(10)
NOL (White Oak) (3)

GENERAL FLOW DIAGRAM LIBRARY COMPUTER PROGRAMS



SECURITY CLASSIFICATION _____

LIBRARY ACCESSION NUMBER
3 B

CARD	TRANS.											
1		SOURCE ABBREVIATION	REPORT NUMBER			SOURCE						
		9	26	27	44	45	60					
2		SOURCE										
		9	60									
3		TITLE										
		9	60									
4		TITLE										
		9	60									
5		TITLE										
		9	60									
6		AUTHOR	DATE		CLASS.	NO.	ROUTING		MISCELLANEOUS			
		9	38	39	44	45	50	51	52	57	62	63
7		AUXILIARY NUMBER	CONTRACT NUMBER									
		9	* 44 45					68				
8		DESCRIPTOR	CODE	DESCRIPTOR	CODE	DESCRIPTOR	CODE					
			9	14		9	14		9	14		
			15	20		15	20		15	20		
			21	26		21	26		21	26		
			27	32		27	32		27	32		
			33	38		33	38		33	38		
			39	44		39	44		39	44		
			45	50		45	50		45	50		
			51	56		51	56		51	56		
			57	62		57	62		57	62		
			63	68		63	68		63	68		
			69	74		69	74		69	74		
			75	80		75	80					

LIBRARY DOCUMENT INDEXING WORKSHEET
PRNC-NAL-5070/13 (REV. 5-63)

SECURITY CLASSIFICATION _____

FIGURE 2
2

Keypunch Instructions for

Library Document Indexing Worksheet

PRNC-NWL - 5070/13 (Rev. 7-62)

GENERAL INSTRUCTIONS: Punch card only if it contains data.
Left Adjust all information in specified fields.
Any Alpha "0" may be punched as zero.

<u>Cols.</u>	<u>Data</u>
1	Card Code - Cards are numbered 1 through 8. Punch number as entered if the card contains other data. . Card 1 - First source card. Punch it full before beginning Card 2. Card 2 - Second source card. Card 3 - First title card. Punch it full before beginning card 4. Card 4 - Second title card. Punch it full before beginning Card 5. Card 5 - Third title card. In cards #2, 4, and 5, space in col. 9 if full word ended in col. 80 of pervious card. Card 6 - Author, date, classification, number of copies, routing, and miscellaneous data. Left adjust all fields. In the date and classification fields, do not punch hyphens. Punch a 4-digit date. Date example: 2-62, keypunch 0262 Classification example: C-4, keypunch C4. If nothing is entered in the classification field. keypunch "U". Card 7 - Auxilary number and contract number. Card 8 - Descriptor card. All descriptor cards have an 8 punched in col. 1, and there may be 3 descriptor cards per document with a maximum of 12 descriptors on the first two cards and 11 descriptors on the third card. Left adjust all fields.
2	"D", 'E' or 'R' for cards 1-7 and "D", 'R", or 'X', 'Y', "Z" for card 8. If nothing is entered on cards 1-7 punch "E". If nothing is entered on the 8 cards, punch 'X' in the first, 'Y' in the second, and "Z" in the third.

3-8 Library Call Number. The Library Call Number is keypunched in all cards.

NOTE: Cols. 3-8 will be the same for all cards punched for each document.

9-80 Keypunch data shown in cols. as indicated in each block.

(CONTINUATION OF)
FIGURE 3

LIBRARY MASTER FILE DESCRIPTION

<u>FIELD DEFINITION</u>	<u>WORD NO.</u>	<u>FIELD SIZE</u>
Library Accession Number	1	6AN
Source	2-25	144AN
Title	26-61	216AN
Author	62-66	30AN
Date	67	6I
Classification	68	6AN
No. of Copies	69	2AN
Routing	70	6AN
Miscellaneous	71-73	18AN
Auxiliary No.	74-79	36AN
Contract No.	80-83	24AN
Descriptors	84	6AN
	.	.
	.	.
	.	.
	.	.
	118	6AN

FIGURE 4

LIBRARY SEARCH QUESTION FORMAT

QUESTION NUMBER	DESCRIPTOR 1	DESCRIPTOR 2	DESCRIPTOR 3	DESCRIPTOR 4	DESCRIPTOR 5	DESCRIPTOR 6	DESCRIPTOR 7	DESCRIPTOR 8	DESCRIPTOR 9	DESCRIPTOR 10 DATE Z	DESCRIPTOR 11 DATE <	DESCRIPTOR 12 CLASS
000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000
12345678	91011121314151617181920212223242526272829303132333435363738394041424344454647484950515253545556575859606162636465666768697071727374757677787980	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000
111111	111111	111111	111111	111111	111111	111111	111111	111111	111111	111111	111111	111111
222222	222222	222222	222222	222222	222222	222222	222222	222222	222222	222222	222222	222222
333333	333333	333333	333333	333333	333333	333333	333333	333333	333333	333333	333333	333333
444444	444444	444444	444444	444444	444444	444444	444444	444444	444444	444444	444444	444444
555555	555555	555555	555555	555555	555555	555555	555555	555555	555555	555555	555555	555555
666666	666666	666666	666666	666666	666666	666666	666666	666666	666666	666666	666666	666666
777777	777777	777777	777777	777777	777777	777777	777777	777777	777777	777777	777777	777777
888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888
999999	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
12345678	91011121314151617181920212223242526272829303132333435363738394041424344454647484950515253545556575859606162636465666768697071727374757677787980	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000

FIGURE 6

I. PURPOSE

The purpose of the Mechanized Information Retrieval System for the NWL Technical Library is three-fold:

1. To permit greater depths of subject matter indexing of publications received by the library. Formerly, because of the manual system, only three or four subject headings were assigned to each publication. In the mechanized system an average of 15 to 20 subject headings (descriptors) is assigned to each document.

2. To permit a more rapid and timely search of the publications contained in the library file. Because of the increased depth of the subject matter indexing, a search may be more specific than was permissible in the past. For instance, an engineer may ask for a listing of all documents pertaining to target detection devices used in the proximity fuse of the Terrier Missile Warhead published since 1961.

3. To prepare a weekly listing (NWL Technical Library Bulletin) of all new publications received by the Technical Library during the previous week. The format of this listing is such that it can be cut into three by five size sheets and used for filing by the Technical Library.

II. GENERAL DESCRIPTION

The IBM 7090 programs for processing the Library data fall into two major divisions (see Figure 1):

- (1) File Establishment and Maintenance (with optional production of the Technical Library Bulletin), which is subdivided into:

- a. a preprocessor sort,
 - b. a program for establishing or updating the master file.
- (2) the Search Program, subdivided into:

- a. a program which scans the master file for documents which satisfy search questions,
- b. a sort program which groups the answers to the questions according to question number (e.g., all answers to question #1 will be grouped together, all answers to #2 will fall together),
- c. a program which lists in the appropriate format the output from the preceding sort. (An alternate output program is available, but is not included as an option in the regular program, which lists the results from a search in a one-line per document report.)

III. MASTER FILE ESTABLISHMENT AND MAINTENANCE

Library Document Indexing Worksheets (see Figure 2) are prepared by the Technical Library staff. The data from these worksheets is keypunched into IBM cards (see Figure 3) and subsequently transcribed onto magnetic tape which is used as input to the file maintenance programs.

A worksheet is prepared for each document to be entered in the master file, and a unique accession number is assigned to each document by which it may be identified. The worksheet was designed to simulate IBM cards, for ease in keypunching, with a maximum of ten cards per worksheet. These cards are numbered by card codes "1" through "8" and contain information as follows:

<u>Card Code</u>	<u>Data</u>
1 and 2	Source Abbreviation, Report Number, and Source

<u>Card Code</u>	<u>Data</u>
3, 4, and 5	Title
6	Author, Date of Publication, Security Classification, Number of Copies, Routine, and Miscellaneous Information
7	Auxiliary Number and Contract Number
8	Descriptor Codes.

There may be up to three "8" cards, a maximum of thirty-five descriptor codes being allowed per document.

The following criteria were established as essential for a document to be accepted by the file maintenance program for entry in the master file: the document must have as a minimum of information,

- a. "1" card - source
- b. "3" card - title
- c. "6" card - author, date, etc.
- d. "8" card - descriptor codes.

A. Use of Transaction Codes

Transaction codes are used to determine the type of processing to be performed on the input data -- entry, deletion, or change. The first -- entry -- denoted by the code "E" for card codes "1" through "7" and by codes "X", "Y", and "Z" used respectively with the three "8" cards, is used only when entering a document in the master file. Deletion (code "D") may be used either to delete an entire document from the file or to delete a descriptor code or codes belonging to a document in the file.

The last transaction -- change -- is signified by the code "R" and is used to alter a portion of the data pertaining to a document which is in the file.

"E" for use with cards
"1" through "7";
"X", "Y" and "Z": for
use with "8" cards

- Used only when entering a document for the first time.

"D"

- For deletions:

(1) To delete a descriptor:

Card code (col. 1) - "8"
Transaction code (col. 2) - "D"
Accession number of document
(col. 3-8)
Enter descriptor(s) to be deleted

(2) To delete an entire document:

Card code (col. 1) - "1"
Transaction code (col. 2) - "D"
Accession number of document
to be deleted (col. 3-8)

"R"

- Replacement:

(1) To replace a descriptor which has been deleted or to add a descriptor if there is space:

Card code (col. 1) - "8"
Transaction code (col. 2) - "R"
Accession number (col. 3-8)
Enter descriptor(s)

(2) To replace or add an item other than a descriptor:

Enter the item to be added or changed in its position on the proper card (e.g., a date goes on a "6" card, contract number on a "7" card), with transaction code "R" and all other previously entered data belonging to that card.

B. Preparation of Input Tape

Input cards followed by a card with "Z" punched in columns 3 through 8 (to denote end of data) and an "end-of-file" card are put onto magnetic tape by means of a special 1401 card-to-tape program which also converts the letter O to a Zero. These cards do not have to be ordered. The tape prepared is the BI tape and must be prepared off line.

C. File Establishment and Maintenance Runs

1. Sort

The documents are sorted with accession number major, transaction code intermediate, and card code minor.

2. Establishment or Update

The sorted input is used either to establish a master file or to update an existent master file. In establishing, a master file is created; in up-dating, a new master file is generated, the old master file is unaltered.

Errors detected by the program in the input data are rejected and an appropriate message is printed out on line so that the error(s) may be corrected and the data re-entered in the next processing.

D. Master File Description

The master file is ordered by accession number and contains one binary record for each document. Each binary record contains one hundred and eighteen 36-bit words. Each word or field of words is defined as shown in Figure 4.

E. Computer Operating Procedures - File Establishment & Maintenance

1. Tape Setup

A1 - Fortran System tape.

A2 - Program tape.

A4 & A5 - Scratch tapes.

B1 - Input tape (data). If updating, replace the input tape with the old master file tape after sorting is completed.

B2 & B3 - Scratch tapes.

B5 - Assigned tape (at end of run will be the new master file tape).

2. Operating Procedures

a. Clear memory and reset all keys to up.

b. Load cards.

After sorting is completed, a halt will occur before file processing is begun. At this time sense switch settings, if any, should be made.

Sense switches are employed to determine what type of file processing is to occur -- establishment or update -- and whether or not the "Bulletin" is to be produced.

Sense switch 1	down	-- Does not produce "Bulletin"
Sense switch 1	up	-- Produces "Bulletin." ("Secret" document descriptors and titles are masked unless sense switches 2 and 5 are set.)
Sense switch 2	down	-- Prints out all "Secret" document descriptor codes in the "Bulletin"
Sense switch 2	up	-- Prints out only the first four descriptor codes of "Secret" documents in the "Bulletin."

Sense switch 3		-- Not used.
Sense switch 4	down	-- Establishes master file.
Sense switch 4	up	-- Updates master file.
Sense switch 5	down	-- Prints out "Secret" titles of "Secret" documents in the "Bulletin."
Sense switch 5	up	-- "SECRET TITLE" is printed in the "Bulletin" instead of the actual classified titles of "SECRET" documents.
Sense switch 6		-- Not used.

To begin file processing, push the "START" button on the computer console.

At the end of the run, the new master file tape and the old master file tape (if updating) will rewind and unload. The two output tapes for the "Bulletin", one with the classified report and one with the unclassified report, will rewind and unload only if the option to produce the "Bulletin" was taken. The "Bulletin" report tape drive numbers will be listed on line.

The B5 tape is the new master file tape and should be "file protected" for later use with the Search Program and for the next updating.

F. Technical Library Bulletin

The Technical Library Bulletin is produced as an optional by-product by a subroutine of the file maintenance program and is divided into (1) a classified report which contains all new documents which have a security classification of "CONFIDENTIAL" or greater and (2) an unclassified report of new documents which are not classified. The format of the report is such that, in addition to the regular distribution of the "Bulletin", heavy paper copies can be printed and cut to provide 3 X 5 indexing cards for filing purposes in the library. (See Figure 5)

IV. SEARCH PROGRAM

The Search Program scans the master file for documents which satisfy search questions prepared by the Technical Library staff from requests made by station personnel. These questions are punched into IBM cards (see Figure 6) and transcribed onto magnetic tape which is used as input to the computer runs. The program is set up to allow for a maximum of ninety-nine questions for any one search run.

A question may have a maximum of nine "descriptor" codes and three special codes which are used to select documents according to the year of publication and on the basis of security classification. A search is made by matching the descriptor codes of each question against the documents' descriptor codes, by matching the first two special codes of the questions against the year portion of the documents' dates of publication, and by selecting only unclassified documents if the last special code of a question is used. When a document record is found which satisfies a question, the record is reserved for later listing.

A. Use of the Library Search Question

Questions are identified by a "Question Number" which occupies columns 1 through 6 of the input card. The number of descriptor codes used in a question is punched in column 7 and 8. The remainder of the input card is divided into six-digit fields to provide for the nine descriptor codes and the three special codes.

<u>COLUMNS</u>	<u>DATA</u>
1 - 6	Question Number - Should be right-adjusted and filled in with zeroes at left.
7 - 8	Number of Descriptors in the question - must be right-adjusted.
9 - 14	Descriptors - must be left-adjusted
15 - 20	Example: if the first descriptor is "WARF"
21 - 26	then WARF go in columns 9-12 respectively,
27 - 32	and columns 13 and 14 will be blank. The
33 - 38	second descriptor will begin in column 15.
39 - 44	
45 - 50	
51 - 56	
57 - 62	
63 - 68	To be used to select documents according to the <u>year</u> of publication. To select all documents published <u>during and after</u> a certain year, enter that year in columns 65-66 and leave 63, 64, 67, and 68 blank.
69 - 74	To select documents published <u>before</u> a certain year, enter that year in columns 71-72 and leave columns 69, 70, 73, 74 blank.
75 - 80	To be used to select only unclassified documents - enter "UNCLAS" in columns 75 - 80. If all information (i.e., classified and unclassified) is desired, leave these columns blank.

B. Input Preparation

Input cards are put onto magnetic tape in ascending order by "Question Number", followed by a card with "Z" punched in columns 1-6 (to denote end of question) and an "end-of-file" card. The tape prepared is the B1 tape and must be prepared off-line.

C. Search Runs

1. Search

This program scans the master file for documents which satisfy the search questions. Each document record which meets the

requirements is put onto an output tape along with the "Question Number" of the question it satisfies.

2. Sort

The output tape from the "Search" run is sorted on Question Number, i.e. the document records are ordered according to the question they answered.

3. Print

The document records along with their question numbers and the questions' descriptor codes are put into a format similar to that of the "Bulletin" (see Figure 7).

D. Computer Operating Procedures - Search

1. Tape Setup

A1 - Fortran System tape.

A2 - Program tape.

A3 & A4 - Scratch tapes.

A5 - Master File tape.

B1 - Input tape (questions),

B2 & B3 - Scratch tapes.

B5 - Scratch tape (final output will be on this tape).

2. Operating Procedures

a. Clear memory and reset all keys to up.

b. Load cards.

After sorting is completed, a halt will occur so that the master file tape can be replaced by a scratch tape. Resume operations by pushing the "START" button on the computer console.

At the end of the run, the output tape - B5 - will re-wind and unload.