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### Identification

BOS dump command

Dump

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### Purpose

Using a specified segment as the descriptor segment, the DUMP command provides core and drum dumping of segmented memory on the printer or on tape. It can be used either as a drum-loaded BOS command or as a stand-alone bootloadable deck.

### General Information

The Dumper is entered from the BOS control program by typing the DUMP command. This is the primary means of invoking the Dumper. However, as the Dumper was developed before BOS was, it may still be used independently. This is a useful function, for it permits dumping in the event that BOS has been clobbered, or if BOS is for some reason not in use.

The card deck version of the Dumper may be bootloaded into memory either before or after the job to be dumped has been run. If it is preloaded, it can be left resident and started up at a later time. When the Dumper is bootloaded after the job of interest has been run, the contents of the index registers, the A and Q registers, the instruction counter, and the indicators are lost; the appending registers are preserved.

Regardless of how it is entered, two ways are provided for furnishing instructions to the Dumper: punched cards and the on-line typewriter may be used to specify what is to be dumped, and where. The operating instructions below give the formats for the instructions, as well as a listing of the available instructions in no special order.

When dumping is initiated, the program attempts to find which printer has a ready status, unless output is directed to tape. It loops between trying printer A and printer B until one of them is ready. In the case of any printer error, the program continues to attempt to print the same line until the printer signals ready status. Duplicate line suppression is used throughout the dump.

Operating Instructions

There are three separate ways of invoking the Dumper:

1. To enter the Dumper from the BOS control program:  
type "DUMP"
2. To load the Dumper after a run (a standard Multics configuration is assumed; see BC.1.02, BC.1.04):
  - a. Stop the processor if necessary.
  - b. Set base switches to
    - xxxxx0 processor base
    - xxxxx1 bootload base
    - xxxxx2 GIOC base
    - xxxxx20 drum base (if used)

(Note that the cards/tape switch in the GIOC should be set to cards.)

  - c. Ready Dumper deck in card reader.
  - d. Press Bootload button.
3. To preload the Dumper (before a run):
  - A. Load the Dumper as described above (note that approximately 7000(8) otherwise-unused locations must be provided for the Dumper).
  - B. Change the base switch settings to appropriate values for your own run.
  - C. Press the Bootload button, executing your own run.
  - D. Stop the processor.
  - E. Restore the base switch settings to the values used in step A.
  - F. Set the EXECUTE SWITCHES switch down.
  - G. Press the Execute button once.

After the Dumper has been loaded by BOS or has bootloaded itself, it will read the clock to obtain time and date information for headings, and then perform any instructions contained on cards placed immediately after the Dumper deck (see format below). After reading the last card (if any), encountering a "stop reading cards" instruction, or finding no cards, the Dumper will expect typewriter input. The KEY BD UNLOCKED light will come on.

Further instructions may be given as follows:

from the typewriter: type the instruction in the format described below; hit END OF MSG.

from cards: load the card reader with instruction cards in the format described below; hit END OF MSG.

### Dumper Instructions

All Dumper instructions consist of a keyword and optional arguments separated by spaces. All numbers are octal, and an \* indicates that the rest of the line is a comment. Note that the instructions are the same regardless of how the Dumper was invoked.

<u>command</u>	<u>explanation</u>
TAPE n	directs output to tape n
PRT	directs output to printer
DBR add -bits-	sets the descriptor segment being dumped from to begin at address <u>addy</u> . Field <u>bits</u> represents the bound and size bits of the descriptor segment being dumped; e.g., 774 would describe a paged segment, 64-word pages, bounds 77. (which is a typical descriptor segment).
SEG n	dumps segment <u>n</u> only
CONT -n- -accesswords-	dump all segments selected by <u>accesswords</u> (see below) starting with segment <u>n</u> . If n is omitted, 0 is assumed.
REG	dumps machine conditions and descriptor segment.

<u>command</u>	<u>explanation</u>
STACK n offset	dumps segment <u>n</u> as stack frames starting from <u>offset</u> . That is, <u>n</u> is used as sb, <u>offset</u> as sp.
DUMP -accesswords-	exactly the same as REG CONT 0 accesswords STACK sb sp
ABS loc count	dumps from absolute location <u>loc</u> to <u>loc + count</u>
DRUM sector count	dumps drum sectors <u>sector</u> to <u>sector + count</u>
EOF	writes end-of-file on tape and rewinds; or ejects 8 pages on printer.
QUIT	returns control to BOS
*	comment.
TTY	read instructions from operator's typewriter
(null)	read from card reader

For the instructions CONT and DUMP, the arguments "accesswords" are interpreted as a string of paired fields which select the segments to be dumped according to the SDW access field. The first element of each pair specifies the SDW access bits which must be on for the segment to be dumped, and the second element of the pair specifies the bits which must be off. Each pair selects a set of segments, and the conditions selected by all pairs are OR'ed together to determine whether a segment is to be dumped. Each element of a pair is a string of the following letters:

W	write permit
L	slave access
M	master procedure
S	slave procedure
E	execute-only
D	data
A	all (WMLSD)
X	none

The default second element is X and the default first element is WD.

Example: to dump all data which is not write-permit,  
and all master procedure which is:

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DUMP D W MW
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When a QUIT command is issued, core is restored so that one could continue the run by typing the BOS command "CONTIN."

#### Notes

1. If no printer is ready and output is not directed to tape, program will keep looping.
2. This program will not work when the bootload program in the GIOC diodes is changed.
3. When the system is changed so that different memory controllers send interrupts to different interrupt vectors then the bootload base must be set appropriately.
4. Both the printer, the card reader, the tape channel, and the operator's console must all be on the same GIOC.
5. In the course of several-segment dumps (i.e., not "dump one segment only") only the first block will be dumped of unpaged segments of length greater than 63 blocks. (This is done to avoid dumping all of <memory> in 6.36 runs, and the fictitious "abs\_seg" in initialization runs).
6. If there is trouble with the dump, such as a runaway tape, or if you desire to stop the current operation, hit REQUEST. The dumper should unlock the keyboard and wait.
7. An execute fault should also reset the dumper.