P800M Programmer's Guide 2
Volume I: DOM

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This is the first of a five-volume set dealing with the Disc Operating System (non-real time and real time) for the P800M series. It describes the Disc Operating Monitor.

The other volumes of this set are:
II: Instruction Set
III: Software Processors
IV: Disc Real Time Monitor
V: Multi-Application Monitor

Other books pertaining to the P800M series are:

P852M System Handbook
P856M/P857M Handbook
P800M Operator's Guide
P800M Interface and Installation Manual
P800M Software Reference Data
P800M Data Communication User Manual

Great care has been taken to ensure that the information contained in this manual is accurate and complete. However, should any errors or omissions be discovered, or should any user wish to make a suggestion for improving this manual, he is invited to send his comments, written on the sheet provided at the end of this book, to:

SSS-DOC.
at the address on the opposite page.

The Disc Operating Monitor (DOM) is used in a non-real time disc system and is intended mainly as a tool for program development. Communication with the system normally takes place via the operator's typewriter by means of a comprehensive set of control commands, more or less as in time sharing, but not only disc storage but also the other peripherals in the configuration may be used without restriction.

This monitor allows the user to process and maintain on disc all kinds of user data, such as programs in source, object and load format as well as various files. This can be done in interactive as well as in batch processing mode.

All system components, including processors, are disc resident. The scheduled label feature allows some form of multiprogramming.

1 Principles of Operation

With the Disc Operating Monitor, there are two modes of operation:
- conversational, working in sessions
- batch processing, working in jobs.

A session is opened when the user types in his user identification, in reply to the message USERID:, which is output after the system has been loaded or after a previous session or job has been closed. The user may then decide on batch processing or conversational mode.

The user identification is an individual code name for each user, through which he gets access to the system and to his own library files. The user identification must have been declared previously and is then stored by the system in a catalogue on the disc. Thus, only those users whose identification is known to the system can access it. The system itself is also considered as a user, with user identification SYSTEM, with an entry in the disc catalogue (the first entry) and with its own library, i.e. the system software components.

The user communicates with the system through control commands which are normally typed in on the operator's typewriter in conversational mode, a card reader or punched tape reader in case of batch processing.
By means of these commands, the user may create files, call processors, handle his library, delete files, etc.

Per user there is one library on disc, pointed to by the user identification entry in the disc catalogue. All his permanent files are stored in this library, which is located on one disc only, i.e. the disc which contains the directory for that user. This implies that one user cannot have his files stored on several discs, unless, of course, he makes use of several user identifications. However, a user can have access to the system library and

to other user libraries by specifying the user identification of the user of those libraries, but he can only read the data in these files, not write in them.

The files contained in a Library may be of several types: source program files, object modules, load files (programs ready for execution) and files not belonging to any of these types, e.g. files created by user programs.

During a session the user will, outside his library, also need temporary storage space on the disc, either for the processors which he activates through his control commands or for his own programs. This storage space is always allocated to him on the same disc on which his library is located.
Files created during a session are always considered temporary. If the user wants to make them permanent, he must give a specific control command (KPF: Keep File) to have the file stored in his library. Temporary files which are not kept in a library with this control command are automatically deleted at the end of a session or by specific other commands, such as SCR (Scratch).

The allocation of disc storage space takes place dynamically, for library files as well as temporary files. A disc is divided into granules, areas of 8 sectors (one sector = 200 words) and the monitor handles the allocation of these granules to the user's files, when he is creating temporary files. For this purpose, the monitor keeps a table of the granules, to which files they belong and which ones are still available for allocation. On each disc, it also maintains a granule table for that disc.
These tables are updated each time a user gives a command to keep or delete a file. By means of the control commands the user can handle his files and library, call processors to update, assemble, compile, link-edit and debug his programs and he may execute them. In his programs the user may ask the monitor to perform certain functions by means of monitor request, which may be coupled to so-called scheduled labels to achieve a form of multi-tasking.

At the end of a session, the user must type in BYE to close his session. After this the system types out USERID: again and waits for the next session or job with the same or another user. In batch processing, the commands are processed sequentially and automatically until a program itself asks for operator intervention or until an error occurs, in which case the monitor looks for a new job or until a command is given to indicate the end of batch processing (BYE).
It is possible to switch from batch to conversational mode or vice versa during processing, the first choice of mode being made at the beginning of a session. If batch processing is chosen, the first command must be JOB.

Control Command Interpreter

An interesting feature of the system are the catalogued procedures: it is possible to store a sequence of CCI Control Commands on disc under a procedure name. When it is desired to execute this command sequence or part of it, the procedure is called from the input stream and it is possible at that point to fill in certain parameters or indicate which commands are to be executed and which ones are to be skipped in the catalogued procedure.

CONVENTIONS

Hexadecimal numbers are written preceded by a slash (/), except when used in an operator control message. So:
LDKL A7,/44FE (instruction) but:
DM 44FE 4600 (operator command)
A granule on a disc is defined as an area of 8 consecutive sectors.
Control commands and processor calls are given to the Control Command Interpreter, which types out S: on the typewriter.
Operator control messages are given to the monitor, which types out M: on the typewriter after the INT button on the control panel has been pressed.
Clusters are object code records, the format of which is described in the System Software Manual.

0	0	0000	00
1	1	0001	01
2	2	0010	02
3	3	0011	03
4	4	0100	10
5	5	0101	11
6	6	0110	12
7	7	0111	13
8	8	1000	20
9	9	1001	21
A	10	1010	22
B	11	1011	23
C	12	1100	30
D	13	1101	31
E	14	1110	32
F	15	1111	33

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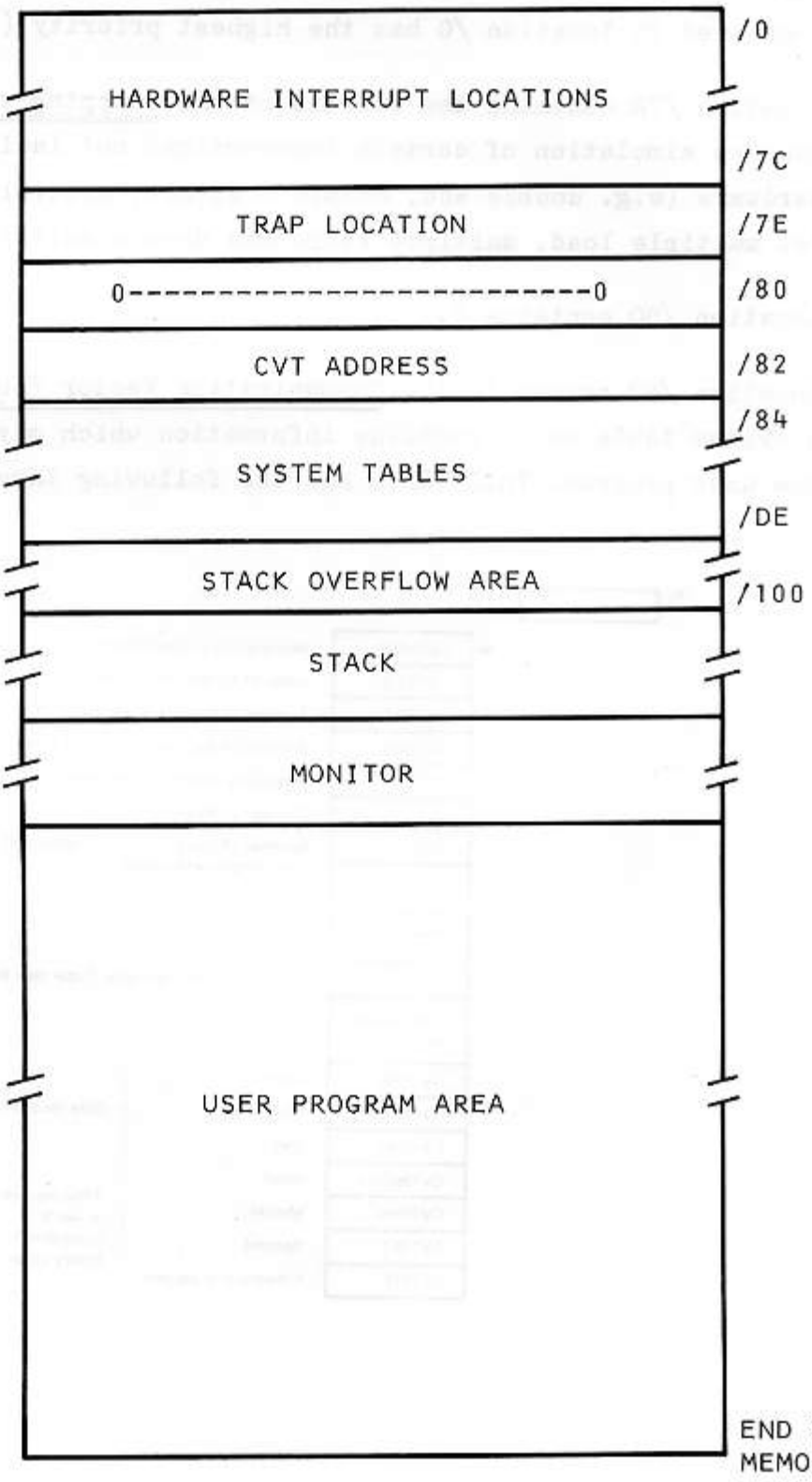
10	16
100	256
1000	4096

The Memory Layout is as follows:

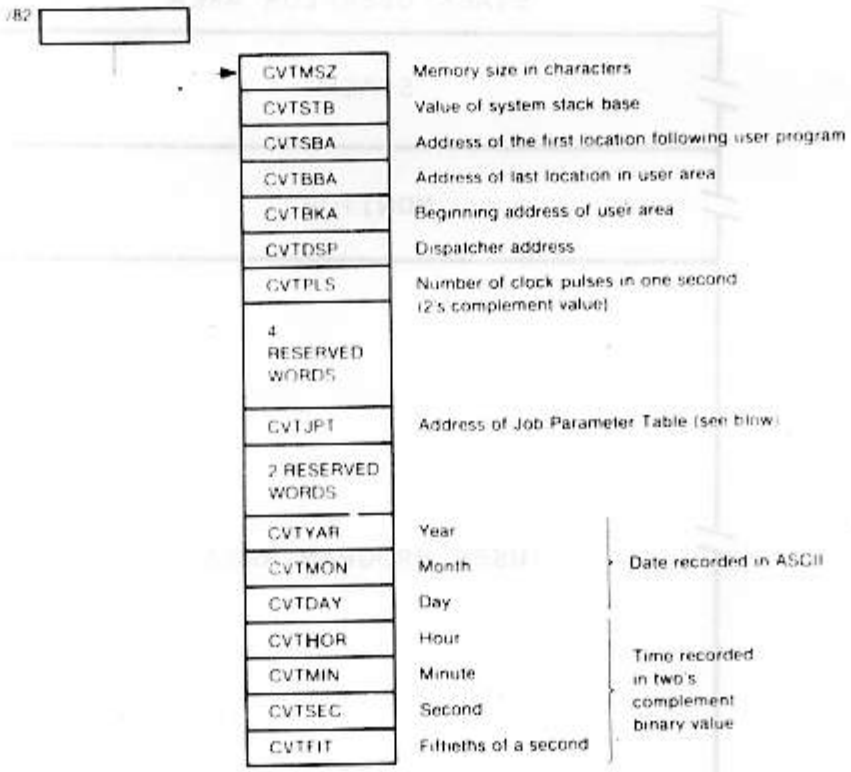


- Location /0 to /7C are hardware interrupt locations. They are hard-wired to internal and external interrupt lines. Each location contains the address of the interrupt routine required to service the interrupt connected to that location. The interrupt connected to location /0 has the highest priority (level 0).

- Location /7E contains the address of the trapping routine which handles simulation of certain instructions not included in the hardware (e.g. double add, double subtract, multiply, divide, multiple load, multiple store and double shift).

- Location /80 contains 0.

- Location /82 points to the Communication Vector Table. This is a system table which contains information which may be of use to the user program. This table has the following layout:



- Locations /84 to /DE are used for other system tables.

- The area occupied by the stack is defined at system generation time. When an interrupt occurs, P- register and PSW are stored here by hardware and a number of registers by software. The number of registers stored depends on whether the interrupt routine servicing the interrupt runs in inhibit mode (anywhere from 0 to 15 registers) or in enable mode or branches to the dispatcher (always 8 registers). The A15 register always points to the next free location in the stack (where all information is stored towards the lower memory addresses). When A15 reaches the value /100 or becomes lower a stack overflow interrupt is given.

- The area after the monitor area is the user area.
  In the user area, one program can be run at a time.
  The area remaining after the program area is reserved for dynamic memory allocation. From this area, blocks of memory space can be requested by the system or by the user. For this purpose the user must send a 'Get Buffer' monitor request. When he does no longer need the buffer, he must send a 'Release Buffer' request.