

APPLICATION NOTE NO. 28

Memory map information.

The memory maps of most microprocessors are 'static'. For example, the video RAM might ALWAYS reside at locations A000h to BFE0h inclusive, therefore restricting the displays you can have and chopping that amount of memory off the maximum you can use for your program. As you may be aware, a processor such as the Z80 can usually only access 64K. This means that if a computer has 32K ROM and 64K RAM only 32K of RAM would be available for use. However, the Enterprise is different. By use of a special custom chip called DAVE a colossal 3900K can be accessed. This is achieved by using 'DYNAMIC memory management'. EXOS handles this in such a way as to make the best use of RAM, ROM and the Z80 CPU.

The DAVE chip works in conjunction with EXOS (Enterprise eXpandable Operating System) shifting memory about to the best advantage of all the devices (video, sound, etc.).

This, of course, means that a 'standard' memory map cannot be drawn for the Enterprise because it is constantly changing. To keep track of where everything is, there are 'defined address variables' which NEVER move about in memory. A list of these is included as part of this Application Note. On the last page is an example memory map which is of a 64K Enterprise with just 1 cartridge ROM (i.e. BASIC) at the point just after the sign-on flashing 'ENTERPRISE' message is displayed.

Even though the field sizes will differ according to circumstances within the machine, the order in which they appear will always be correct barring deliberate re-arranging by the programmer.

EXAMPLE MEMORY MAP
(64k machine with 1 ROM cartridge at switch-on)

Address	Contents	Size

* BFFh: *		* * *
* ... *	* Defined address variables (see list).	* 0017 *
* BFEFh: *		* * *

* * *		* * *
* * *	* Internal EXOS system variables.	* 0267 *
* BEE4h: *		* * *

* * *		* * *
* * *	* Device RAM areas (for built in devices).	* 3212 *
* B258h: *		* * *

* * *		* * *
* * *	* Space for EXOS RAM resident code.	* 0060 *
* B21Ch: *		* * *

* * *		* * *
* * *	* The system stack.	* 1604 *
* ABD6h: *		* * *

* * *		* * *
* * *	* RAM segment list, 1 byte per segment.	* 0004 *
* ABD2h: *		* * *

* * *		* * *
* * *	* Extension ROM list, 4 extra bytes per ROM.	* 0012 *
* ABC6h: *		* * *

* * *		* * *
* * *	* RAM areas for extension ROMs.	* 0000 *
* * *		* * *

* * *		* * *
* * *	* Device descriptors for built in devices.	* 0132 *
* AB42h: *		* * *

* * *		* * *
* * *	* Start of channel descriptor chain.	* * *
* * *		* * *

DEFINED ADDRESS VARIABLES

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Address	variable	use
A) 0BFFFh	USR_P3	These variables hold the contents of the four DAVE chip paging registers when EXOS was last called. Needed by devices when given user addresses.
B) 0BFFEh	USR_P2	
C) 0BFFDh	USR_P1	
D) 0BFFCh	USR_P0	
E) 0BFFA/Bh	STACK_LIMIT	Used for stack checking by devices which need to use more than the default amount of stack space.
F) 0BFF8/9h	RST_ADDR	User's warm reset address.
G) 0BFF6/7h	ST_POINTER	This holds the Z80 address of the status line memory. The 42 bytes from this address onwards make up the status line.
H) 0BFF4/5h	LP_POINTER	This holds the Z80 address of the start of the line parameter table. The line parameter table contains the bytes to be displayed on the screen by the NICK chip.
I) 0BFF3h	PORTB5	Holds the current value of general output port 0B5h. Used by various devices which access this port.
J) 0BFF2h	FLAG_SOFT_IRQ	Triggers software interrupts.
K) 0BFF0h	SECOND_COUNTER	16-bit 1Hz incremental counter. This is reduced modulo 65535.
L) 0BFEFh	CRDISP_FLAG	Flag for suppressing the flashing 'ENTERPRISE' sign-on message when the computer is powered up or reset. Can only be used by a ROM.
M) 0BFED/Eh	USR_ISR	Address of user's interrupt service routine. This must be in page-0 and can be set to zero for no routine.

A) 255,16383
 B) 255,16382
 C) 255,16381
 D) 255,16380

E) 255,16378/9
 F) 255,16376/7
 G) 255,16374/5
 H) 255,16372/3

I) 255,16371
 J) 255,16370
 K) 255,16368
 L) 255,16367
 M) 255,16365/6