

TurboForth V1.1

CPU and VDP Memory Maps

CPU Memory Map

TurboForth SCRATCH-PAD RAM Utilisation			
Start Addr		End Addr	Description
Decimal	Hex		
33536	8300	831F	CPU Register Workspace
33568	8320	8327	DOCOL routine
33576	8328	832D	NEXT routine
33582	832E	8335	EXIT routine
33590	8336	833F	Bank switch routine (includes a spare NOP)
33600	8340	8347	Bank return routine (includes a spare NOP)
33608	8348	8351	Speech Synthesizer Status routine
33618	8352	8353	Speech Synthesizer read byte payload
33620	8354	8359	Unused (console appears to use them for something)
33626	835A	8361	Branch to TF ISR routine
33634	8362	8369	Return from TF ISR routine

Note: The disk DSR uses some of the above memory locations, so the routines are copied back to RAM after each disk access.

TurboForth Memory Expansion Utilisation – Lower 8K			
Start Addr		Size	Description
Decimal	Hex		
8192	2000	8192	Free space for general purpose use. Tracked by FFAILM
8192	2000	4096	1 st 4KB of banked SAMS memory if SAMS in use*
12288	3000	4096	2 nd 4KB of banked SAMS memory if SAMS in use*

* Note: When using SAMS, one can use both banks, or just one bank at either >2000 or >3000.

When using only one bank, Forth code may be compiled into the other bank by adjusting FFAILM and H accordingly.

TurboForth Memory Expansion Utilisation – Upper 24K			
Start Addr		Size	Description
Decimal	Hex		
40960	A000	2	Vector for INTERPRET
40962	A002	2	Vector for BLOCK
40964	A004	2	Vector for NUMBER
40966	A006	2	Vector for FIND
40968	A008	2	Vector for sprite movement engine
40970	A00A	2	Vector for music player engine
40972	A00C	2	Spare vector
40974	A00E	2	Holds the CFA of latest word created with CREATE in case DOES> needs to patch it
40976	A010	2	Keyboard device to use for KSCAN routine in console ROM
40978	A012	2	Used for temporary storage
40980	A014	2	Used for temporary storage
40982	A016	2	Used for temporary storage. Also used as random number seed. The seed is set at startup from the value at >83C0
40984	A018	2	Holds io error number of last error
40986	A01A	2	Cursor delay used in KEY and the editor
40988	A01C	2	Determine if screen scrolling should be suppressed. >0=suppress
40990	A01E	2	X co-ordinate of next character to be displayed on screen
40992	A020	2	Y co-ordinate of next character to be displayed on screen
40994	A022	2	Screen width – 32, 40 or 80
40996	A024	2	Screen height - always 24
40998	A026	2	Used to determine if wrap-around is used by SCROLL
41000	A028	2	Used by PANEL & SCROLL. X in high byte, Y in low byte

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41002	A02A	2	Used by PANEL & SCROLL. XL in high byte, YL in low byte
41004	A02C	2	Flag for NTS routine. If >0, then NTS will treat numbers as unsigned, set by U. and .
41006	A02E	2	Points to the most recently defined word in the dictionary
41008	A030	2	Points to the next free byte of memory
41010	A032	2	FORTH variable S0 - holds the address of the start of the data stack (r4)
41012	A034	2	Address of start of return stack (r5)
41014	A036	2	The current base for printing and reading numbers
41016	A038	2	Last number base, used by Number to String routine
41018	A03A	2	Exponent count, used by Number to String routine
41020	A03C	2	Leading zero indicator, used by Number to String routine to determine if leading 0's are ignored
41022	A03E	2	Interpreter interpreting (0) or compiling a word (!=0)
41024	A040	2	Tolds the current index into the terminal input buffer (TIB) - used by variable >IN
41026	A042	2	Copy of VDP register 1 (stored at 83D4)
41028	A044	2	Interrupt routine counter
41030	A046	2	Number of bytes remaining in speech buffer
41032	A048	2	Address of next byte in speech buffer
41034	A04A	2	Speech service: address of the speech service which should be called by the ISR is placed here. (either the routine to stream raw speech data, or the routine to feed speech ROM addresses)
41036	A04C	2	0=speech synth not fitted. >FFFF=speech synth detected
41038	A04E	2	Holds bank number to return to as a memory address (>6000 or >6002)
41040	A050	2	Characters per line: 80 on command line, 64 in blocks
41042	A052	2	The number of characters received by EXPECT. See variable SPAN
41044	A054	2	"We're booting" flag (>0=booting)
41046	A056	2	Stores the end of string marker (normally ") for S" - the word .(sets it temporarily to a) character
41048	A058	2	Flag to indicate if NUMBER pushed a double (>0=yes)
41050	A05A	2	Holds block editor page
41052	A05C	2	Cursor x for editor
41054	A05E	2	Cursor y for editor
41056	A060	2	Cursor blink flag for editor
41058	A062	2	Keyboard auto repeat counter
41060	A064	2	Keyboard auto repeat re-load value
41062	A066	2	Block number of the block currently being edited
41052	A05C	2	Reference counter: incremented by IF, decremented by THEN
41054	A05E	2	Reference counter: incremented by DO, decremented by LOOP & +LOOP
41056	A060	2	Reference counter: incremented by FOR, decremented by NEXT
41058	A062	2	Reference counter: incremented by CASE, decremented by ENDCASE
41060	A064	2	Reference counter: incremented by OF, decremented by END OF
41062	A066	2	Reference counter: incremented by BEGIN, decremented by UNTIL, REPEAT & AGAIN
41064	A068	128	Sprite attribute list
41192	A0E8	64	Sprite movement list. 2 bytes per sprite. Y direction and X direction each as a signed byte
41256	A128	2	Save data following blwp @dsrlnk (8 or >a)
41258	A12A	2	CRU address of the peripheral
41260	A12C	2	Entry address of dsr or subprogram
41262	A12E	2	Device or subprogram name length
41264	A130	2	Pointer to device or subprogram in the pab
41266	A132	2	Version # of dsr
41268	A134	2	Pointer to flag in pab (byte 1 in pab)
41270	A136	10	Data 0,0,0,0,0 in dsrlnk workspace

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41280	A140	22	Data 0,0,0,0,0,0,0,0,0,0 in dsrlnk workspace
41302	A156	2	Used to store AA pattern for DSR ROM detection
41304	A158	8	DSRLNK 8 bytes device name buffer
41312	A160	1	Op-code: open, read, etc
41313	A161	1	Error code & file type
41314	A162	2	VDP address of data
41316	A164	1	Logical record length
41317	A165	1	Output character count
41318	A166	2	Record number
41320	A168	1	Screen offset for char
41321	A169	1	Name length
41322	A16A	20	File name starts here
41342	A17E	6	Allocation table for file IO. at run time, these 3 words are filled with addresses f1pab, f2pab & f3pab. The MSB is set when a file is in use (i.e. when opened with #OPEN). The MSB is reset when #CLOSE is executed, and thus the file 'slot' can be re-used.
41348	A184	2	Number of block buffers available
41350	A186	2	Holds the block currently being compiled by INTERPRET
41352	A188	2	Holds the block currently being worked on
41354	A18A	2	Block slot 0
41356	A18C	2	VDP address for slot 0
41358	A18E	2	Block slot 1
41360	A190	2	VDP address for slot 1
41362	A192	2	Block slot 2
41364	A194	2	VDP address for slot 2
41366	A196	2	Block slot 3
41368	A198	2	VDP address for slot 3
41370	A19A	2	Block slot 4
41372	A19C	2	VDP address for slot 4
41374	A19E	2	Block slot 5
41376	A1A0	2	VDP address for slot 5
41378	A1A2	2	Address of the terminal input buffer
41380	A1A4	82	Terminal input buffer - holds input from input device
41462	A1F6	82	Screen buffer: enough for one line of 80 chars
41544	A248	32	Work buffer for Number to String routine (holds exponents)
41576	A268	18	String buffer for Number to String routine to construct a string in
41594	A27A	40	Data (parameter) stack
41634	A2A2	60	Return stack
41694	A2DE	2	Pointer to first free address in low memory
41696	A2E0	2	Pointer to first free address in high memory
41698	A2E2	63	Start of free memory. Pointed to by FFAIHM

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Name	
INTVEC	
BLKVEC	
NUMVEC	
FNDVEC	
MOVISR	
MUSISR	
VEC2	
PATCH	
KEYDEV	
TEMP	
TEMP2	
TEMP3 & RAND16	
ERRNUM	
CURSRD	
NOSCRL	
SCRX	
SCRY	
XMAX	
YMAX	
WRAP	
PAN1	

CPU Memory Map

PAN2
DOSIGN
LATEST
HERE
S0
RS0
BASE
LBASE
EXPCNT
LZI
_STATE
IN
VDPR1
ISRCTR
SPCNT
SPADR
SPCSVC
SYNYES
RETBK
_CPL
_SPAN
DOBOOT
SDELIM
ISDBL
EPAGE
CSRX
CSRY
CSRFLG
AUTORP
AUTORL
EDBLK
IFCNT
DOCNT
FORCNT
CASCNT
OFCNT
BEGCNT
SAL
SMLIST
SAV8A
SAVCRU
SAVENT
SAVLEN
SAVPAB
SAVVER
FLGPTR
DSRLWS

CPU Memory Map

DSTYPE
HAA
NAMSTO
PABOPC
PABFLG
PABBUF
PABLRL
PABCC
PABREC
PABSCO
PAPNLN
PABFIL
FALLOC
TOTBLK
BLKNUM
LSTBLK
BLK0
BLK1
BLK2
BLK3
BLK4
BLK5
TIBADR
TIBADR
SCNBUF
WRKBUF
STRBUF
DSTACK
RSTACK
FFAILM
FFAIHM
PRGTOP

VDP Memory Map

TurboForth VDP Memory Utilisation			
Start Addr		End Addr	Description
Decimal	Hex		
0	0	2FF	Screen Image table
768	300	37F	Sprite Attribute List (32 column mode only)
896	380	7FF	Colour table (32 column mode only)
2048	800	FFF	Pattern Descriptor Table
4096	1000	17FF	Sprite Pattern Descriptor Table
6144	1800	1827	40 byte buffer for File 1 PAB
6184	1828	1927	256 byte record buffer for File 1
6440	1928	194F	40 byte buffer for File 2 PAB
6480	1950	1A4F	256 byte record buffer for File 2
6736	1A50	1A77	40 byte buffer for File 3 PAB
6776	1A78	1B77	256 byte record buffer for File 3
7032	1B78	1B9F	40 byte buffer for BLOCK PAB
7072	1BA0	1C1F	128 byte buffer for storing BLOCK contents to/from disk
7200	1C20	201F	BLOCK buffer 5 (1024 bytes)
8224	2020	241F	BLOCK buffer 4 (1024 bytes)
9248	2420	281F	BLOCK buffer 3 (1024 bytes)
10272	2820	2C1F	BLOCK buffer 2 (1024 bytes)
11296	2C20	301F	BLOCK buffer 1 (1024 bytes)
12320	3020	341F	BLOCK buffer 0 (1024 bytes)
13344	3420	37D7	951 bytes free space
14296	37D8	3FFF	Reserved for disk DSR use