

Quick start for 65C816 Microprocessor kit

1. Memory layout

00000-07FFF	32k RAM	User RAM
08000-0BFFF	I/O	Memory mapped I/O
0C000-0FFFF	ROM	Monitor ROM
10000-1FFFF	64k RAM	User RAM

1. Input/Output layout

8000	GPIO1 LED	Debug LED
8001	PORT0	Input port
8002	PORT1	Digit control
8003	PORT2	Segment control
9000	LCD command write	Text LCD
9001	LCD data write	Text LCD
9002	LCD command read	Text LCD
9003	LCD data read	Text LCD
A000	6850 ACIA	ACIA registers
A001	6850 ACIA+1	ACIA buffer register
B000-BFFF	User expansion	

2. Function keys:

COPY	Copy block of memory: Enter Start, End and Destination used with key + and GO
REL	Find OFFSET byte: Enter Start, and Destination used with key + and GO
DUMP	Display memory contents on 9600 bit/s terminal.
LOAD	Load Hex file.
REG	Set display user registers. Used with hex key 0-F
PC	Set display address to current program counter
ADDR	Set hex entry mode to address
DATA	Set hex entry mode to data
+	Increment display location
-	Decrement display location
INS	Insert one byte and shift 256 bytes down
DEL	Delete one byte and shift 256 bytes up
TEST	Test 10ms tick, SW1 must set to 10ms tick

GO	Jump from monitor program to user code
CLR	Clear zero page memory from 0000 to 007F
REP	Repeat key pressing

3. CPU control keys:

RESET	RESET CPU
IRQ	Trigger IRQ pin to logic 0
NMI	Trigger NMI pin to logic 0, return to monitor

4. Install or Remove the LCD must be done when the kit is POWER OFF!

5. R16 adjusts LCD contrast.

6. Serial port uses CROSS cable RS232.

7. AC adapter should provide minimum +7.5V 500mA. Common AC adapter with +9V 1A is fine. Center pin must be +Positive. Kit power consumption is approx. 0.8W.

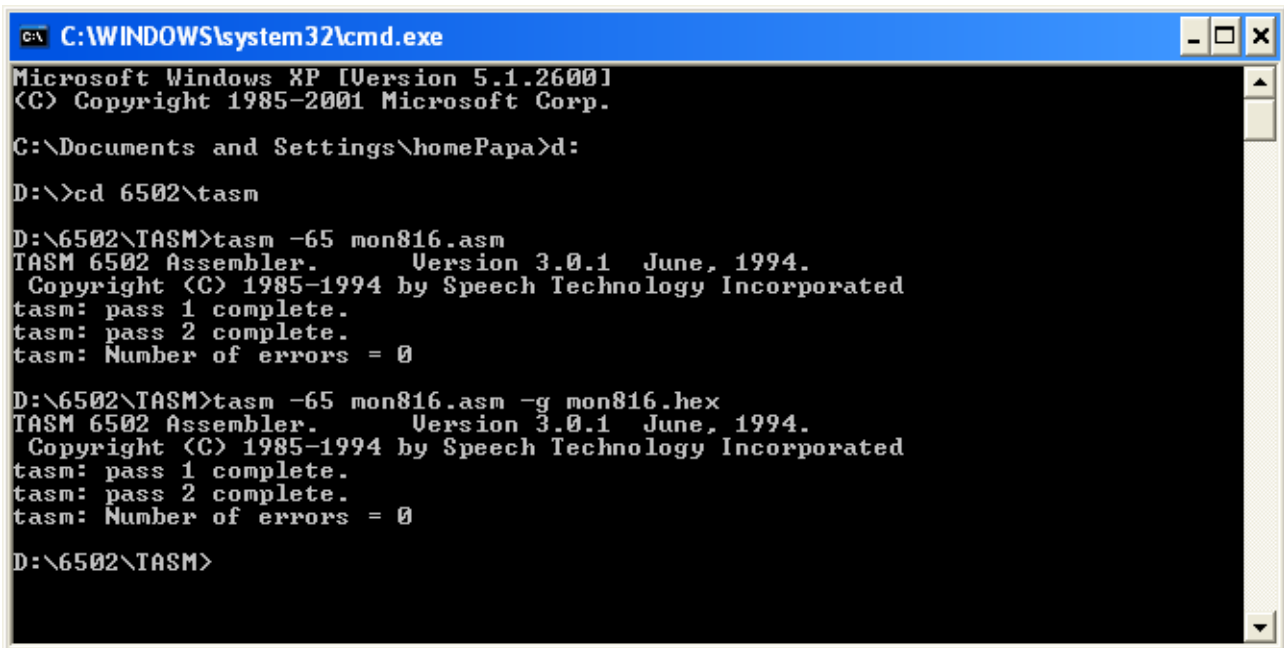
8. The monitor program is operated in emulation mode (6502 8-bit). User code can clear the emulation bit, to enter native mode (65816 16-bit)

0200	18	CLC	; CLEAR CARRY FLAG
0201	FB	XCE	; CHANGE TO NATIVE MODE
0202	C230	REP #\$30	; 16-BIT ACC, 16 BIT INDEX
0204	A93412	LDA #\$1234	; LOAD 16 bit data
0207	8500	STA 0	; store it to 0000
0209	8502	STA 2	; store it to 0002
020B	38	SEC	
020C	FB	XCE	; CHANGE TO EMULATION MODE
020D	0000	BRK	

The example shows loading the accumulator with 16-bit constant and store it to location 0000 and 0002. We can enter the hex code, test it and check the result using REG 6 and REG 7 easily.

9. Monitor source code is TASM format. User can modify, add more functions.

The assembler uses -65 for 6502 table. The output file will be HEX file.



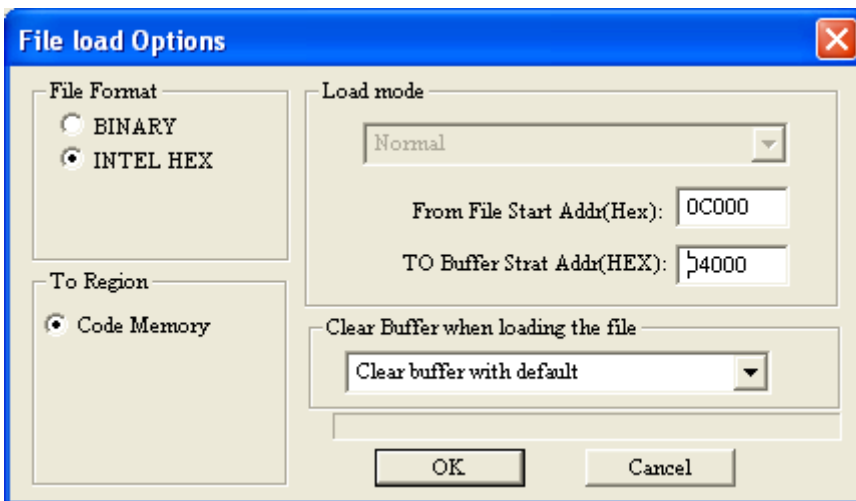
```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\homePapa>d:
D:\>cd 6502\tasm
D:\6502\TASM>tasm -65 mon816.asm
TASM 6502 Assembler.      Version 3.0.1  June, 1994.
Copyright (C) 1985-1994 by Speech Technology Incorporated
tasm: pass 1 complete.
tasm: pass 2 complete.
tasm: Number of errors = 0

D:\6502\TASM>tasm -65 mon816.asm -g mon816.hex
TASM 6502 Assembler.      Version 3.0.1  June, 1994.
Copyright (C) 1985-1994 by Speech Technology Incorporated
tasm: pass 1 complete.
tasm: pass 2 complete.
tasm: Number of errors = 0

D:\6502\TASM>
```

To program the 32kB PROM, the location should be moved from C000 to 4000.



More technical information, please contact wichit.sirichote@gmail.com