

# Quick start for TMS9995 Microprocessor kit

## 1. Memory layout

0000-6FFF	Monitor ROM
7000	GPIO1 LED
7100	PORT0 input port
7101	PORT1 output port drives digit
7102	PORT2 output port drives segment
7200-7203	LCD registers
7300-7307	UART registers
8000-EFFF	User RAM
F000-F020	User WP for code testing

2. Interrupt vectors: XOP R0,0 is used by monitor program for software break point.

3. User WP, is located at F000. After break with XOP 0, R0-R10 and Status Register will be saved to User Workspace. Key REG will select the registers to see results after code has been tested.

Interrupt level 1 to 4 will use external RAM for Work space and vectors. Study the monitor listings for details.

For example, Interrupt Level 1 will use location E000 for WP and E020 as the RAM vector.

```
0004 E000E020  level1  dwm      wplevel1, level1_service
0008 E024E044  level2  dwm      wplevel2, level2_service
000C E048E068  level3  dwm      wplevel3, level3_service
0010 E06CE08C  level4  dwm      wplevel4, level4_service
```

4. The software interrupts, XOP instruction from XOP 8 to 15 are also using RAM vectors and WP.

```
0060 E090E0B0  xop8_   dwm      wpxop8,  xop8_service
0064 E0B4E0D4  xop9_   dwm      wpxop9,  xop9_service
0068 E0D8E0F8  xop10_  dwm      wpxop10, xop10_service
006C E0FCE11C  xop11_  dwm      wpxop11, xop11_service
0070 E120E140  xop12_  dwm      wpxop12, xop12_service
0074 E144E164  xop13_  dwm      wpxop13, xop13_service
0078 E168E188  xop14_  dwm      wpxop14, xop14_service
007C E18CE1AC  xop15_  dwm      wpxop15, xop15_service
```

## 5. Function keys:

COPY	Enter Start, End and Destination used with key + and GO
CAL	Hex calculator, compute addition (key+) or subtraction (key -) and GO
DUMP	Display memory contents on 9600 bit/s terminal.
LOAD	Load Intel Hex file.

REG	Set display user registers. Used with hex key for R0-R10 and STATUS register
PC	Set display address to 8000
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 words down
DEL	Delete one byte and shift 256 words up
TEST	Test 10ms tick, SW1 must set to 10ms tick
GO	Jump from monitor program to user code
USER	User key, used for divided by 2 after finding the offset byte. To convert byte length to word length
BEEP	Toggle BEEP/NO BEEP

6. CPU control keys:

RESET	RESET CPU
INT1	Trigger INT1 pin to logic 0
NMI	Trigger NMI pin to logic 0
INT4	Trigger INT4 pin to logic 0

7. Install LCD must be done when the kit is POWER OFF!

8. The CPU chip, TMS9995 will be HOT under normal operation.

9. Serial port needs CROSS cable RS232.

10. AC adapter should provide minimum +7.5V 500mA. Common AC adapter with +9V 1A is fine. Center pin must be +Positive.