

**UNIQUE**

# UX Tubo

(44256 VERSION)

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## 1. Introduction

The UX Turbo mainboard is compatible with the IBM PC/XT. This means that virtually all the softwares that are available for the IBM PC/XT can also be run on a system built with this UX Turbo mainboard.

The main advantages of the UX Turbo mainboard over ordinary PC/XT mainboards are its Wait State Selectability (the wait state of on board I/O, on board memory, on board ROM, slot I/O, slot memory can be programmed), and it can adapt to all IBM PC/XT compatible peripheral cards.

## 2. Features:--

- Ultra-High speed V20 microprocessor.
- Math-Coprocessor 8087 (optional).
- Switchable between (4.77 MHz) Normal mode and (15/12 MHz)\* UX Turbo mode through either a software switch or a hardware switch.
- Normal mode (4.77 MHz) is 100% compatible with IBM PC/XT and UX Turbo mode (15/12 MHz) is 350%\*\* faster than IBM PC/XT.
- 640 KB on board RAM.
- Eight expansion slots.
- Eight interrupt levels.
- 8 KB AWARD BIOS
- $\phi$  - 1 Wait State selectable: on board memory, on board ROM.
- $\phi$  - 3 Wait States selectable: on board I/O, slot I/O, slot memory.
- Parity check enable/disable.
- Four DMA channels for disk and special I/O.
- Three timer channels for sound, time and memory refresh.
- Auto detection for no. of floppy disk drive, type of video display adapter. (Features of AWARD BIOS)

\* UX-15 clock speed at 15 MHz  
UX-12 clock speed at 12 MHz

\*\* The Landmark CPU Speed Test: 3.5X performance relative to 4.77 MHz IBM PC/XT

### 3. Wait State

The factory default settings for wait state are as follows:

- On board RAM access ..... 0 wait state
- On board ROM access ..... 1 wait state
- On board I/O access ..... 1 wait state
- On slot RAM access ..... 3 wait states
- On slot I/O access ..... 3 wait states

As expansion RAM access is treated as 'slot RAM access', 3 wait states are inserted on each access of the expansion RAM card on slot. This is for safe-guarding to accommodate the slowest I/O devices on the system (slot).

However, we provide option of software programming to vary the wait states. For the software programming, please refer to appendix B.

Hardware Option: -

The hardware switch is located at J6\*\* jumper on the mainboard. On board RAM is set to one wait state since the J6 jumper is shorted. when J6 jumper is open, it is in Zero Wait State.

J6

Open	* 0 Wait State (On board RAM)
Close	1 Wait State (On board RAM)

\* Default setting.

\*\* Location of jumper J6, please refer to Appendix G.

### 4. Software Utility

Switching between UX Turbo and Normal mode can be done by hardware or software. Hardware configuration will be mentioned in Section 5.2 (h). The procedures to set up the software switch are as follows:

- (i) Insert Utility Diskette in Drive A, type 'Turbo' then press return key. After the program TURBO.COM is being executed, the UX Turbo mode selection can be done by software.
- (ii) Turn UX Turbo mode on, simply press 'Ctl', 'Alt' and '+' simultaneously.
- (iii) Turn UX Turbo mode off, simply press 'Ctl', 'Alt' and '-' simultaneously.
- (iv) Return to Hardware selection, press 'Ctl', 'Alt' and '\*\*' simultaneously.

In the other way, it also can be used as a functional command, such as:-

#### A: TURBO (SWITCH)

Where (SWITCH) = ON : UX Turbo mode is selected.

OFF: Normal mode is selected.

HARD : Return to Hardware selection.

Note:

The hardware switch can not affect the system speed while the system under software control, but not vise versa.

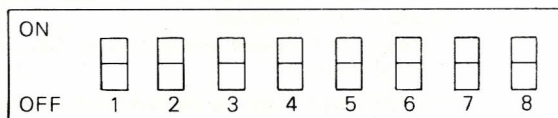
## 5. System Configuration

This section provides information for preparing the UX Turbo mainboard to use. The user should understand all the Information contained in this section before beginning to configure the system.

### 5.1 System Configuration DIP Switches (SWA)

The UX Turbo mainboard has an eight way DIP switches to set the system configuration. The switch settings are listed as followings:—

SWA – System Configuration DIP Switches



SW1 – Parity Check Option

SW2 – Must be ON (Reserved for Maths Co-Processor)

SW3, SW4 – Amount of Memory on System Board

SW5, SW6 – Type(s) of Display Adapter(s)

SW7, SW8 – Number of 5¼ inch Diskette Drivers Installed

SW1, SW2

Switch	Function	
SW1	On	Disable Parity Check (DRAM)
	Off	Enable Parity Check (DRAM)
SW2	On	Reserved (Must be On)
	Off	Unused

Note: Parity RAM chip(s) is required to insert to Parity Chip socket(s) if Parity Check is enabled.

SW3, SW4

SW3	SW4	Memory Size
On	On	∅ K
Off	On	512 K
On	Off	640 K
Off	Off	1 M

SW5, SW6

SW5	SW6	Display Adapter
On	On	No Display Adapter
Off	On	Color Graphics Adapter (40x25)
On	Off	Color Graphics Adapter (80x25)
Off	Off	Monochrome Display Adapter

SW7, SW8

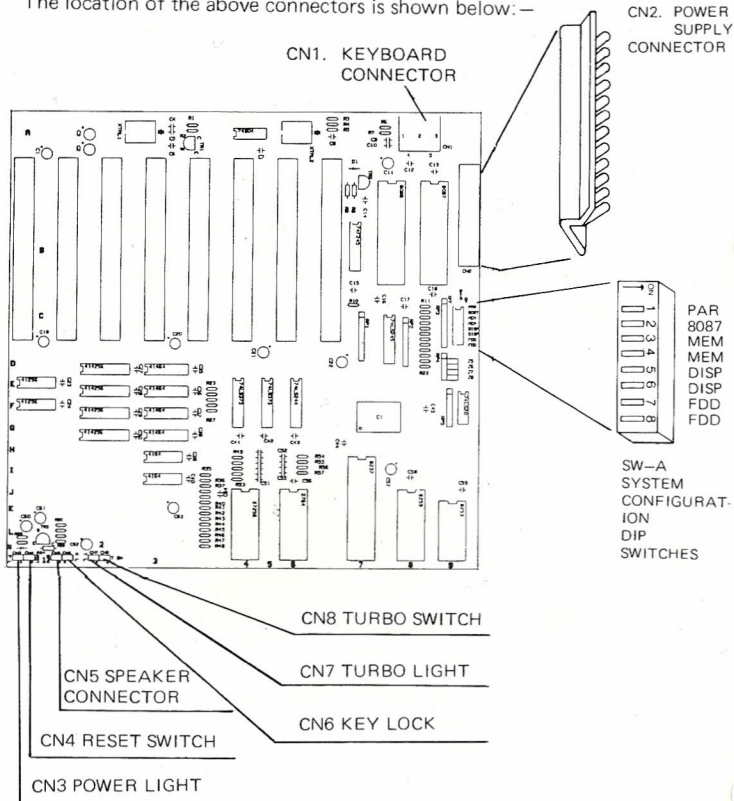
SW7	SW8	Diskette Drives
On	On	1 Drive
Off	On	2 Drives
On	Off	3 Drives
Off	Off	4 Drives

## 5.2 Switch Settings and Connector Descriptions

The UX Turbo mainboard provides the following connectors for your control panel, keyboard and power supply:

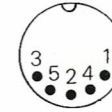
- Keyboard connector
- Power supply connector
- Power light
- Reset switch
- Speaker connector
- Keylock
- Turbo light
- Turbo switch

The location of the above connectors is shown below: -



### a) Keyboard Connector (CN1)

The keyboard connector is located at CN1, the pin out of CN1 are as follows:



5-Pin DIN Connector

Pin	Description
1	Keyboard Clock
2	Keyboard Data
3	Spare
4	Keyboard Ground
5	+5V DC

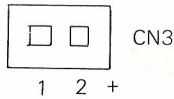
### b) Power Supply Connector (CN2)

Power supply connector CN2 is a single plastic connector. The pin assignments for the power supply connector are as follows:

Pin	Description
1	Power Good
2	+5V DC
3	+12V DC
4	-12V DC
5	Ground
6	Ground
7	Ground
8	Ground
9	-5V DC
10	+5V DC
11	+5V DC
12	+5V DC

c) Power Light (CN3)

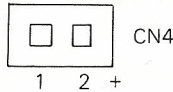
The power light connector is located at CN3. If the LED is connected to CN3, it will be on while the power is switched on. The pinout description is shown below:



Pin	Description
1	- Cathode
2	+ Anode

d) Reset Switch (CN4)

With a switch connected to CN4, the computer will operate normally while the switch is open. If you press and release the switch once, it will cause the system to reset. The switch setting and pinout are as follows:



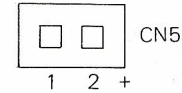
CN4	Function
Open	Executing
Close	Reset CPU

Pin	Description
1	Ground
2	Reset In

**Warning:** If the reset button is pressed accidentally to terminate any process, the data will be lost.

e) Speaker Connector (CN5)

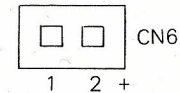
To use the speaker function, connecting a speaker to CN5 on the mainboard. The pinout assignment is shown belows:



Pin	Description
1	Speaker Data Out
2	+5V DC

f) Keylock (CN6)

The keylock connector is located at CN6 on the mainboard. The keyboard is locked while the CN6 is shorted. When the CN6 is open, the keyboard is unlocked. For the switch settings and pinout of keylock connector, refer to the following table:

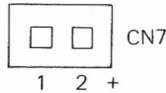


CN6	Function
Open	Enable Key Board
Close	Lock Key Board

Pin	Description
1	Ground
2	Key In

g) Turbo Light (CN7)

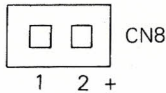
The Turbo LED indicates operation in UX Turbo mode. The Turbo Light Connector is located at CN7 on the mainboard. The pinouts for the connector at CN7 are as follows:



Pin	Description
1	- Cathode
2	+ Anode

h) Turbo Switch (CN8)

The operation of the system can be switched between UX Turbo and Normal mode. The connector of the switch is located at CN8 on the mainboard. The UX Turbo mode is on while the CN8 jumper is shorted. When the jumper is open, the system is in Normal mode. The pinout assignment and switch setting of Turbo Switch is show below:



CN8	CPU Speed
Open	4.77 MHz
Close	15/12 MHz*

CN8. Turbo Switch

Pin	Description
1	Turbo In
2	+5V DC

\* Unique UX-15 clock speed at 15 MHz  
 Unique UX-12 clock speed at 12 MHz

Appendix A Summary of Connectors

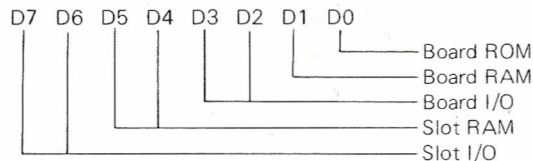
Connector		Pin Out	Function	
Keyboard	CN1	1 Keyboard Clock 2 Keyboard Data 3 Spare 4 Keyboard Ground 5 +5V DC	N/A	
Power Supply	CN2	1 Power Good 2 +5V DC 3 +12V DC 4 -12V DC 5 Ground 6 Ground 7 Ground 8 Ground 9 -5V DC 10 +5V DC 11 +5V DC 12 +5V DC	N/A	
Power Light	CN3	1 - Cathode 2 + Anode	N/A	
Reset Switch	CN4	1 Ground 2 Reset In	Open	Executing Reset CPU
Speaker Connector	CN5	1 Speaker Data Out 2 +5V DC	N/A	
Keylock	CN6	1 Ground 2 Key In	Open	Enable Keyboard
			Close	Disable Keyboard
Turbo Light	CN7	1 - Cathode 2 + Anode	N/A	
Turbo Switch	CN8	1 Turbo In 2 +5V DC	Open	Normal Speed
			Close	Super Turbo Speed
Wait State Switch	J6	1 Wait State In 2 Ground	Open	0 Wait State (On board RAM)
			Close	1 Wait State (On board RAM)



## Appendix B Wait State Programming

Program Options:—

Wait State Register 070H (I/O) is a 8 bits (Read/Write) register.



D0 : Board ROM

0 : 0 wait state  
1 : 1 wait state

D1 : Board RAM

0 : 0 wait state  
1 : 1 wait state

D3, D2 : Board I/O

D3	D2	Wait State
0	0	0 wait state
0	1	1 wait state
1	0	2 wait states
1	1	3 wait states

D5, D4 : Slot RAM

D5	D4	Wait State
0	0	0 wait state
0	1	1 wait state
1	0	2 wait states
1	1	3 wait states

D7, D6 : Slot I/O

D7	D6	Wait State
0	0	0 wait state
0	1	1 wait state
1	0	2 wait states
1	1	3 wait states

For example, to program the: Slot I/O as 2 wait states  
Slot RAM as 1 wait state  
Board I/O as 1 wait state  
Board RAM as 0 wait state  
Board ROM as 1 wait state

You have to set the value of Wait State Register as 95H

Wait State Register 070H:

D7	D6	D5	D4	D3	D2	D1	D0
1	0	0	1	0	1	0	1

Programming Sequence:—

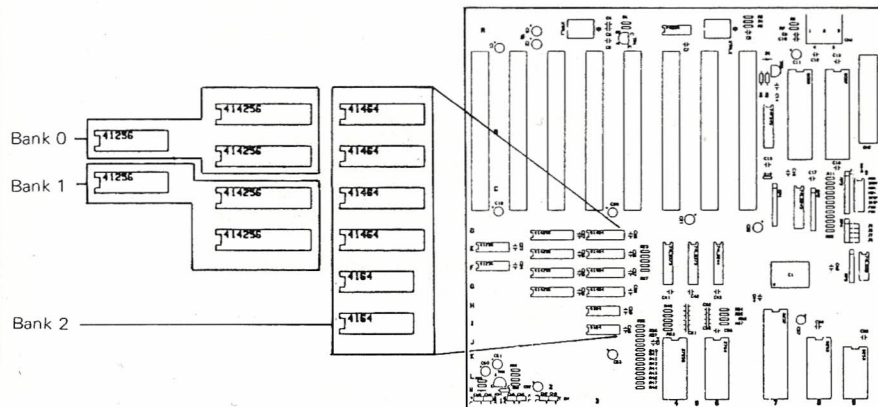
```

CLI
IN      AL, 70H
MOV     AL, #MODE      (#MODE = 95H)
OUT     70H, AL
STI
STI
    
```

Where #MODE is the desired wait state setting for the Wait State Register.

## Appendix C RAM Chip Configuration

To install the RAM chips, first locate the RAM banks on the motherboard as shown below:



Refer to the table below to select and install the appropriate chips for the RAM size you have chosen:

	RAM chip configuration		
	Bank 0	Bank 1	Bank 2
256KB	414256 x 2 *41256 x 1	no chips	no chips
512KB	414256 x 2 *41256 x 1	414256 x 2 *41256 x 1	no chips
640KB	414256 x 2 *41256 x 1	414256 x 2 *41256 x 1	41464 x 4 *4164 x 2

\* Where 41256 and 4164 is Parity RAM Chip(s).  
If Parity Check is disabled on SWA, Parity RAM Chip(s) is not required to insert to Parity Chip socket(s).

## Appendix D Error Message of AWARD BIOS

1. 'PARITY ERROR'  
Occurs on system parity error or I/O channel NMI error.  
The system will halt.
2. 'Keyboard error or locked'  
During the system boot up, if the keyboard is not connected or, the keyboard is hardware locked, or the keyboard is bad, the error message will be displayed on the screen.

## Appendix E General Information on Trouble-Shooting.

### Symptoms

1. No video display and no power light during the power up.

Problem:

- a) Power Cord is not connected.

Solution:

Check power cord is properly installed.

Problem:

- b) Power supply does not work.

Solution:

Replace another power supply.

2. No video display and 1 beep is heard, but the floppy disk does work.

Problem:

- a) Video plug is not connected.

Solution:

Connect the video plug to display adapter.

Problem:

- b) Switch settings of the system configuration on the UX Turbo mainboard is not correct.

Solution:

Check the system configuration and change it to correct setting.

3. 1 long 2 short beeps are heard with no video display, but the floppy disk drive does work.

Problem:

- a) Switch settings of display mode on the display card is not correct.

Solution:

Check the switch settings of the display card, and set it to correct setting.

Problem:

- b) Some dirt or bad contact between the card-edge signal tabs of the display card and the I/O slots.

Solution:

Clean the card-edge signal tabs with contact cleaner or insert the display adapter to another slot on the UX Turbo mainboard.

4. Video display and UX Turbo mainboard work property, but the Keyboard is malfunction.

Problem:

- a) Keylock is locked.

Solution:

Unlocked the keylock.

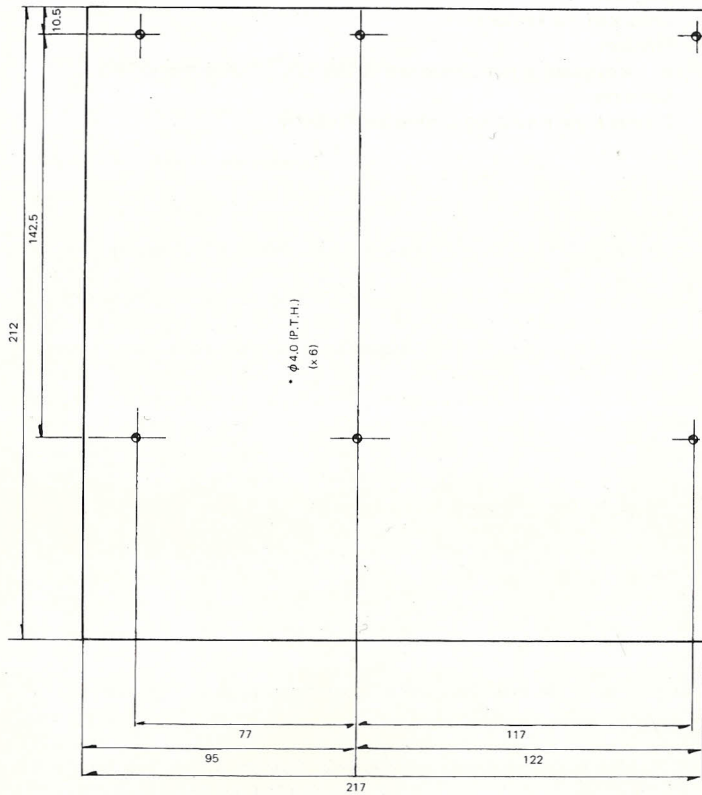
Problem:

- b) Keyboard is not connected to the UX Turbo mainboard.

Solution:

Connect the Keyboard Connector Properly.

## Appendix F Dimension of UX Turbo mainboard



Note: 1. All Dimensions are in MM  
2. Material: 1.6 MM THR FR4

## Appendix G Layout of UX Turbo mainboard

