286 SYSTEM BOARD

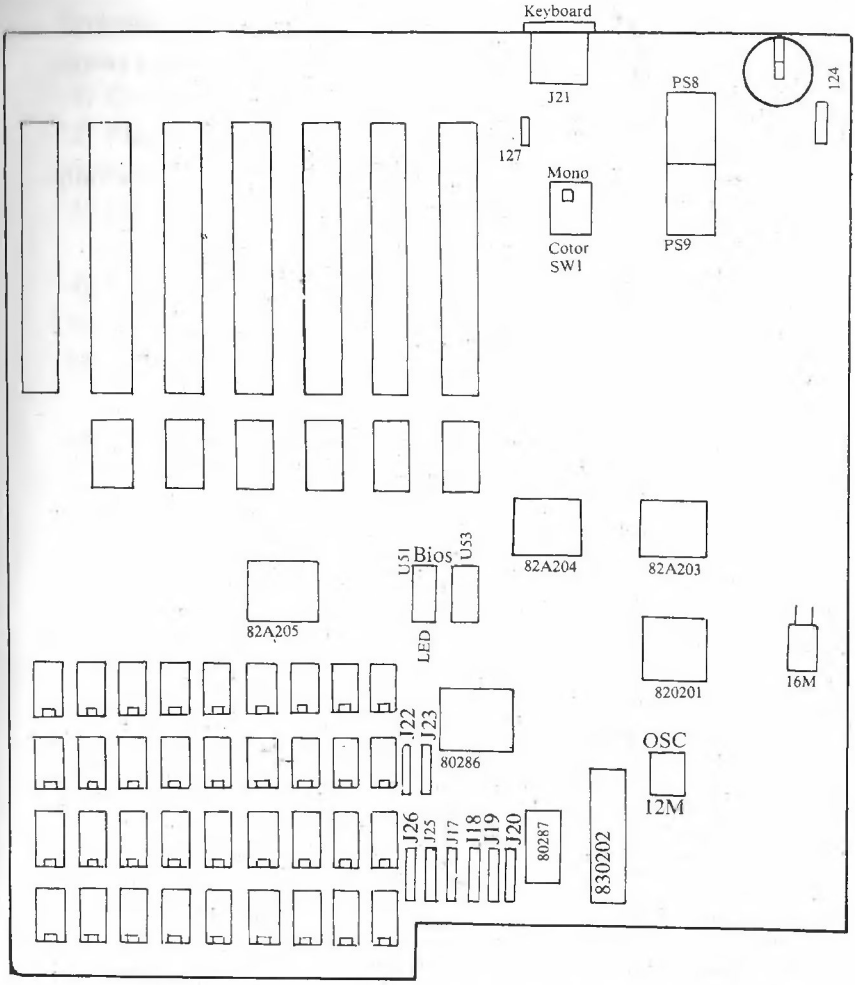
PRODUCT COMPARISIONS

The WL286-5A 1 Mega byte system board has numerous advantages over the Faraday A-Tease, the ATI-1000, and the 80286 Boards board.

	WL286-5A	**FARADAY**	**ATI**	**IBM**
Memory	1 mega byte (standard)	640K (standard)	640K (standard)	512K (standard)
Number of ICs	84	154	130	130
Dual Clock	6/8/10 MHz select (rechargeable)	6MHz only	6MHz only (unserviceable)	6MHz only
Battery	onboard (rechargeable)	external	onboard (unserviceable)	external
PCB layers	4	8	4	6
Custom chips	5	none	none	none
Low cost	yes	no	no	no

BOARD OUTLINE

Dimensions: 12'' (width)x13.8'' (length)



J17- Speaker connector
J18- EXT Lock Connector
J24- EXT Lock Connector
J21- Keyboard connector
J26- 0-wait-state and 1-wait-state switch
J25- Sped switch (1-2 software switch, 2-3 hardware switch,
J27- Hardware reset
PS8- Power supply connector
PS9- Power supply connector
SW1- Monochrome/Color switch
J23
J22- Ram size select
J20- 27128 or 27256 Select
U51- 'LOW BYTE' or 'EVEN BYTE' BIOS 27256.
U53- 'HIGH BYTE' or 'ODD BYTE' BIOS 27256.
J19- EPROM or PROM SELECT

SPECIFICATION

* 6 or 8 or 10 MHz 80286 selectable by keyboard or by hardware switch
* 1 mega byte high-speed memory standard
* 16 mega byte expandable in the protected virtual adress mode
* 2 sockets for PHOENIX or WISETEK or ERSO or AMI bios fully compatible with IBM BIOS.
* 8 I/O expansion slots
* Socket for 80287 numberic processor
* CMOS clock and calender circuit
* Rechargeable battery on-board
* 5 custom chips set used to reduce total ICs to 84 pieces
* No selection jumpers for system configuration (no headaches)
* 24-bit addressing and 16-bit data pathing capabilities
* 16-level interrupt
* 7-channel direct memory access (DMA)
* 3-programmable timers
* Speaker/keyboard connector
* Standard AT power supply connector
* Standard 80286 Boards dimension : 12 inches by 13.8 inches with 6 mounting holes that fit AT or compatible chassis
* High temperature burned-in
* O-wait-state or 1-wait-state selectable.
* Hardware reset provided.

INSTALLATION

Peripherals required:

1) WL286-5A 1 Mega Byte system board
2) 80286 power supply or compatible equivalent
3) IBM monochrome/graphic display board or color card or EGA card or compatible equivalent.
4) IBM keyboard or compatible equivaient
5) Monochrome or color monitor or EGA Monitor.

Procedures:

1) Connect power supply connectors to PS8 and PS9 as marked.
2) Plug in keyboard connector to the keyboard receptical (J21) at the back.
3) Install monochrome or color graphic display board in expansion slot 1 or 7.
4) Select monochrome or color at switch (SW1) next to J9.
5) Connect monitor cable to the display board.
6) Make sure "LOW BYTE" or "EVEN BYTE" BIOS is 27256 and is on US51.
7) Make sure "HIGH BYTE" or "ODD BYTE" is 27256 and is on U53.
8) Set the RAM sie as follows by J22 and J23.

J22	J23	RAM BANK0	TYPE BANK1	RAM SIZE
2-3	2-3	4164	4164	256KB
1-2	2-3	41256	NONO	512KB
2-3	1-2	41256	4164	640KB
1-2	1-2	41256	41256	1MB

9) For a board that does not have onboard batteries, plug in the extenal backup power pack (6V) to J9 connector at the back.
10) For those which have the 80286 Boards chasis or compatible equivalent, plug in the speaker connector to J17, and the "Power LED and EXT LOCK" connector to J18 at the front.
11) Turn on the monitor.
12) Turn on the power supply.

Note:
Among the eight slots, Slots J1 and J7 are for the installation of 8-bit option boards, and the remaining six slots - Slots J2 to J6 as well as Slot J8 - are for 16-bit option boards. A 16-bit option board, therefore, is to be installed in one of the expansion slots from Slot J2 to Slot J6 or Slot J8.

Because the Hard Disk Controller Card must be connected with the hard disk, it is recommended that the Hard Disk Controller Card be mounted in Slot J8, which is the closest slot to the hard disk position. Further, installation of the monochrome graphics or color graphics card should be placed in slot J1 or slot J7.

CONNECTORS PINOUT

POWER SUPPLY CONNECTOR (PS8. PS9):

They are both 6-pin (0.156'') male-pin connectors

Pin	Description	Connector
1	Powre good	PS8
2	5V DC	PS8
3	+12V DC	PS8
4	−12V DC	PS8
5	GROUND	PS8
6	GROUND	PS8
1	GROUND	PS9
2	GROUND	PS9
3	−5V DC	PS9
4	+5V DC	PS9
5	+5V DC	PS9

KEYBOARD CONNECTOR (J21):

This is a 5-pin, 90-degree PCB DIN connector

Pin	Description
1	KEYBOARD CLOSK
2	KEYBOARD DATE
3	SPARE
4	GROUND
5	+5V DC

LED and KEYLOCK CONNECTOR (J18):

This is a 5-pin, keyboard, Berg strip (0.1'') male-pin connector

Pin	Description
1	LED power
2	Key
3	Ground
4	Keyboard inhibitor
5	Ground

BATTERY CONNECTOR (J24):

This is a 4-pin, keyed, Berg strip (0.2'') male-pin connector

Pin	Description
1	+6V DC
2	Not used
3	Not used
4	Ground

SWITCH 1 (SW1):

Switch 1 is used to select either monochrome with switch setting 1-2, or color graphies card with switch setting 2-3.

CHANGING CLOCK SPEED

When powering up the CPU, the 6MHz clock is always active, unless the speed is set at high speed mode by hardware before powering on the CPU. For high speed (8/10MHz or 12MHz), press the "ALT" and "CTRL" keys, then together press "+" key (LED should be on now. If not, try again).
For normal speed (6MHz), press the "ALT" and "CTRL" keys, then together press "+" key again (LED should be off now. If not, try again.)

MICROPROCESSOR

The Intel 80286 microprocessor is a 16-bit data pathing, 24 bit addressing microprocessor. It has four levels of memory protection in memory management. In real address mode (8086 compatible), it has one mega byte of continuous memory by generating 20 bits of physical address. In protected mode, it has one gigabyte of virtual address space per task mapped into a 16 megabyte physical address space. Any virtual address that does not map to a physical memory location will generate a restartable exception.

SYSTEM MEMORY MAP

The system board contains four banks of 256K dynamic RAM with access time of 150ns and 2 banks of 4C1000 dynamic RAM with access time of 120ns. The ram is parity checked and will generate an NMI interrupti if parity error occurs.

Address Range	Start-End	Name	Function
000000-07FFFF	000K-512K	BANK 0	SYSTEM MEMORY (512K)
08000-09FFFF	512K-640-	I/O CHANNEL MEMORY	SYSTEM MEMORY (128K)
0A000-0BFFFF	640K-768-	VIDEO	GRAPHIC BUFFER (128K)
0C0000-0DFFFF	768K-896K	I/O ROM	EXPANSION ROM (128K)
0E0000-0EFFFF	896K-960K	ROM	SYSTEM USAGE (64K)
0F0000-0FFFF	960K-1.024M	ROM	BIOS (64K)
100000-17EFFF	1.024M -1.536M	BANK1	SYSTEM MEMORY (512K)
180000-FDFFFF	1.536M-16.146M	RAM	EXPANSION RAM (14.87M)
FE0000-FEFFFF	16.146M-16.210M	ROM	SYSTEM USAGE (64K)
FF0000-FFFFFF	16.210M-16.274M	ROM	BIOS (64K)

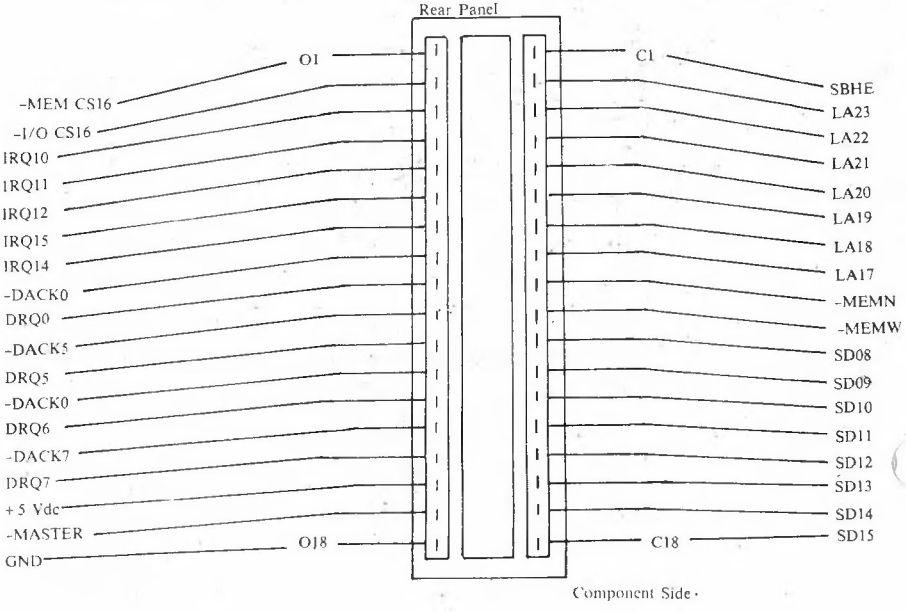
I/O ADDRESS MAP

Hex Range	Devices	Usage
000-01F	DMA controller 1.8237A-5	System
020-03F	Interrupt controller 1.8259A	System
040-05F	Timer, 8254-2	System
060-06F	8042 (Keyboard)	System
070-07F	Real time clock, NMI mask	System
080-09F	DMA page register, 74LS612	System
0A0-0BF	Interrupt controller 2,8259A	
0C0-0DF	DMA controller 2,8237A-5	System
0F0	Clear Math Coprocessor Busy	System
0F1	Reset Math Coprocessor	System
0F8-0FF	Math Coprocessor	System

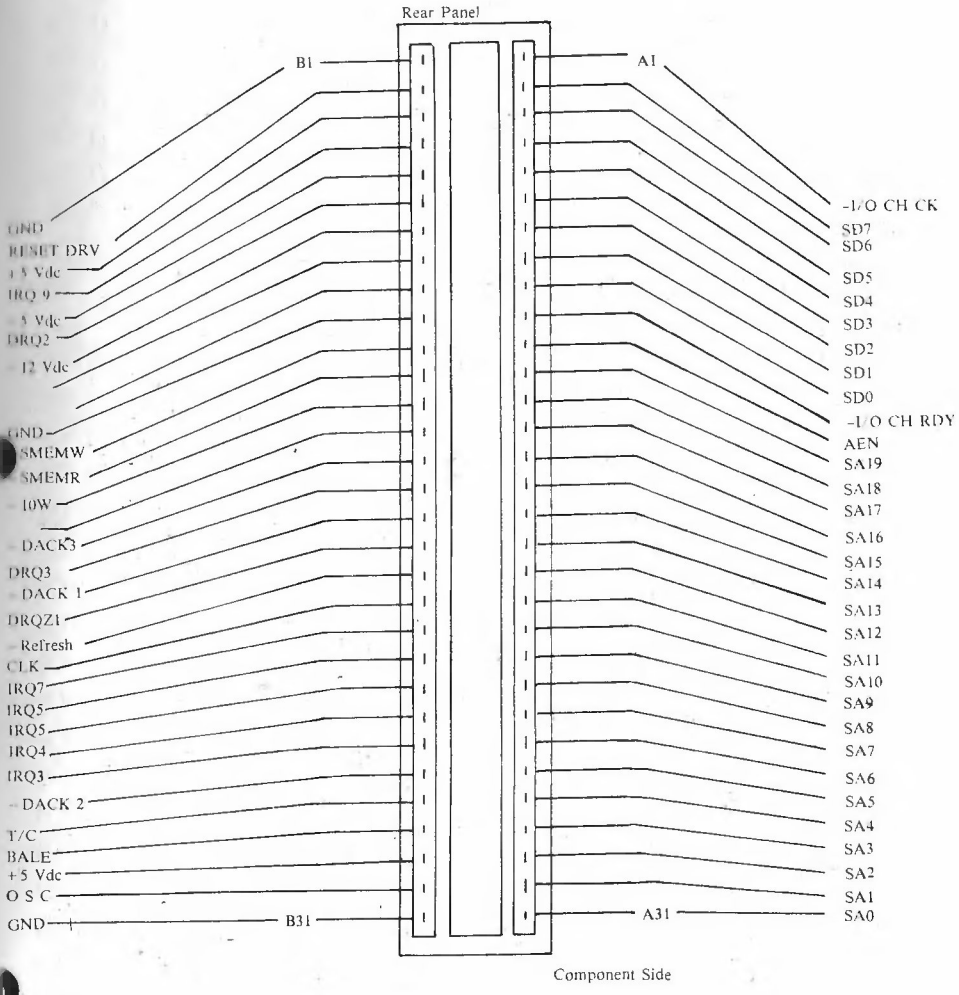
Hex Range	Devices	Usage
1F0 – 1F8	Fixed Disk	I/O
200 – 207	Game I/O	I/O
278 – 27F	Parallel printer port 2	I/O
2F8 – 2FF	Serial port 2	I/O
300 – 31F	Prototype card	I/O
360 – 36F	Reserved	I/O
378 – 37F	Parallel printer port 1	I/O
380 – 38F	SDLC, bisynchronus 2	I/O
3A0 – 3AF	Bisynchronus 1	I/O
3B0 – 3BF	Monochrome display, printer adapter	I/O
3C0 – 3CF	Reserved	I/O
3D0 – 3DF	Color/Graphic monitor adapter	I/O
3F0 – 3F7	Floppy diskette controller	I/O
3F8 – 3FF	Serial port 1	I/O

I/O CHANNEL MAP

36-PIN SLOT PIN-OUT:



62-PIN SLOT PIN-OUT:



WL286-5A
SYSTEM BOARD
TECHNICAL
REFERENCE MANUAL