

chapter 6

SPECIFICATIONS

This chapter provides physical and performance specifications for the following standard components:

- Computer
- Displays
- Hard drives
- Diskette drive
- CD-ROM drive
- Battery packs
- External power

The chapter also includes:

- System interrupts
- System DMA
- System I/O address
- System memory map

6.1 Computer

Table 6-1
Computer Specifications

	U.S.	Metric
Dimensions (CPU only)		
Height	1.1 in	3.1 cm
Depth	9.3 in	23.5 cm
Width	11.8 in	30.0 cm
Dimensions (CPU M35EU)		
Height	2.1 in	5.4 cm
Depth	9.3 in	23.6 cm
Width	11.8 in	30.0 cm
Dimensions (M35EU only including tabs)		
Height	0.9 in	2.3 cm
Depth	9.3 in	23.6 cm
Width	11.8 in	30.0 cm
Weight (without M35EU)*		
With 6 cell battery	4.4 lbs.	2.0 kg
Standalone (Battery) Power Requirements		
Nominal Operating Voltage (Li-Ion)	10.8 V	
Maximum Operating Power (CPU only)	35.0 W	
Maximum Operating Power (CPU+M35EU)	45.0 W	
Integrated AC Power Requirements		
Operating Voltage	100 to 240 VAC RMS	
Operating Current	1.1 A RMS	
Operating Frequency Range	47 to 63 Hz AC	
Maximum Transient	4/50 kV	
Temperature **		
Operating	5 to 95°F	10 to 35°C
Non-operating	-4 to 140°F	-20 to 60°C
Relative Humidity (non-condensing)		
Operating	10 to 90%	
Non-operating ($t_W = 38.7^\circ\text{C}$ max)	5 to 90%	
Altitude		
Operating	0 to 10,000 ft	0 to 3.15 km
Non-operating	0 to 30,000 ft	0 to 10.14 km
Shock		
Operating	10 G, 11 ms, half sine	
Non operating	240 G, 2 ms, half sine	
Vibration		
Operating	0.55 G, 0.25 Oct/Min sweep rate	
Non-operating	1.5 G, 0.5 Oct/Min sweep rate	
* Weight is for the computer with 6 cell battery pack and 12.1 inch display panel.		
** Applicable product safety standards specify thermal limits for plastic surfaces. This computer operates well within the temperature ranges specified.		

6.2 Displays

Table 6-2
12.1-Inch CTFT, SVGA Display

	U.S.	Metric
Dimensions		
Height	7.24 in	18.4 cm
Width	9.7 in	24.6 cm
Number of Colors	64K	
Contrast Ratio	100:1 minimum	
Pixel Resolution		
Pitch	0.30 × 0.30 mm	
Format	800 × 600	
Configuration	RGB Stripe	
Backlight	Edge Lit	
Character Display	80 × 25	

Table 6-3
13.3-Inch CTFT, XGA Display

	U.S.	Metric
Dimensions		
Height	7.9 in	20.1 cm
Width	10.6 in	26.9 cm
Number of Colors	64K	
Contrast Ratio	100: 1 minimum	
Pixel Resolution		
Pitch	0.29 x 0.29 mm	
Format	1024 x 768	
Configuration	RGB Stripe	
Backlight	Edge Lit	
Character Display	80 × 25	

6.3 Hard Drives

Table 6-4
Hard Drive Specifications

Standard Model Configurations	4-GB	6-GB
Formatted Capacity per Drive		
Logical	4,099,866,624	6,495,068,160
Drive Type	65	65
Drive Height		
Without frame (mm)	12.5	12.5
With frame (mm)	12.7	12.7
Drive Size		
Inches	2.75 x 3.94	2.75 x 3.94
Millimeters	100.2 x 69.85	100.1 x 69.9
Transfer Rate		
Media (Mb/s)	51.7 to 83.4	67.5 to 111.9
Interface (Mb/s)	16.6	16.6
Sector Interleave	1:1	1:1
Typical Seek Time (Including setting)		
Single Track (ms)	4	3
Average (ms)	13 (READ)	13 (READ)
Full Stroke (ms)	23 (READ)	25 (READ)
Disk Rotational Speed (RPM)	4009	4200
Physical Configuration		
Cylinders	6975	8960
Data Heads	6	6
Sectors/Track	114 to 240	178 to 294
Bytes/Sector	512	512
Logical Configuration		
Cylinders	7944	13,424
Heads	16	15
Sectors per Track	63	63
Bytes per Sector	512	512
Buffer Size (kB)	512	512

6.4 Diskette Drive

Table 6-5
Diskette Drive Specifications

Diskette size	3.5-inch
High density	1.44-MB/1.2-MB
Low density	720 KB
Light	None
Height	0.43-in (11 mm)
Bytes per sector	512
Sectors per Track	
High density	18 (1.44-MB)/15 (1.2-MB)
Low density	9
Tracks per Side	
High density	80 (1.44-MB)/80 (1.2-MB)
Low density	80
Read/Write heads	2
Average Seek Times	
Track-to-Track (high/low)	3 ms/6 ms
Average (high/low)	94 ms/174 ms
Settling Time	15 ms
Latency Average	100 ms

6.5 Optical Disc Drive

Table 6-6
24X CD-ROM Specifications

Applicable Disc	CD-ROM mode 1, mode 2 CD-Digital Audio CD-XA mode 2 (Form 1, Form 2) CD-I mode 2 (Form1, Form 2) CD-I Ready CD-Bridge CD-WO (fixed/variable packets) Photo CD (single/multisession)
Drive Size (cm)	1.27 x 12.8 x 12.9
Center Hole Diameter	15 mm
Disc Diameter	12 cm, 8 cm
Disc Thickness	1.2 mm
Track Pitch	1.6 μ m
Laser	
Beam Divergence	53.5 ± 1.5 degrees
Output Power	0.24 ± 0.1 mw
Type	Semiconductor Laser GaAlAs
Wave Length	780 nm \pm 25 nm at Ph-4.3 mW
Access time	
Random	<350 ms (150 ms typical)
Full Stroke	<750 ms
Audio output level	
Line Out	0.8 Vrms
Headphone	None
Cache buffer	128 KB
Data transfer rate	
Sustained, 24x	3600 KB/sec (outer diameter)
Sustained, single	150 KB/sec
Burst	8.3 MB/sec
Startup Time	<8 seconds typical
Capacity	
Mode 1, 12 cm	550 MB
Mode 2, 12 cm	640 MB
8 cm	180 MB

6.6 External Power

The external battery charger charges the Li-Ion battery outside the computer. It may also be used to charge spare batteries.

Table 6-7
External Battery Charger with AC Adapter

6-Cell	
Power Supply (Input)	
Nominal Voltage	90 to 264 VAC
Line frequency	47-63 Hz
Power Supply (Output)	
Nominal Voltage	+15.0 +/- 0.5 VDC
Power	35 to 40 W
Temperature	
Operating	32° to 104°F
Nonoperating	-4° to 185°F
Relative Humidity	
Operating	10% to 90%
Nonoperating	10% to 95%

Table 6-8
Lithium-Ion (Li-Ion) Battery Pack

Parameter	6 Cell	9 Cell
Open circuit voltage (Nominal):	10.8 V	10.8 V
Capacity:	38.4 Wh	48.6 Wh
Temperature:		
Charge	10°C to 40°C (50 °F to 104 °F)	
Storage	0°C to 50°C (32 °F to 122 °F)	

6.7 System Interrupts

Table 6-9
Hardware Interrupts

Hardware IRQ	System Function
IRQ0	Timer interrupt
IRQ1	Keyboard
IRQ2	Interrupt controller cascade
IRQ3	COM 2
IRQ4	COM 1
IRQ5	Audio
IRQ6	Diskette Drive controller
IRQ7	EPP Parallel
IRQ8	Real-Time Clock (MSIO)
IRQ9	PCI devices
IRQ10	Unused
IRQ11	Used by PCMCIA
IRQ12	Mouse
IRQ13	Floating point error input
IRQ14	Primary IDE interface
IRQ15	Secondary IDE interface

6.8 System DMA

Table 6-10
DMA Channels

Hardware DMA	System Function
DMA 0	Fast infrared or Audio controller
DMA 1	Audio controller
DMA 2	Diskette drive controller
DMA 3	EPP Parallel Port
DMA 4	Not assigned
DMA 5	Audio Controller
DMA 6	Not assigned
DMA 7	Not assigned

6.9 System I/O Address

Table 6-11
System I/O (Port) Addresses

I/O Address (Hex)	System Function (Shipping Configuration)
000 - 00F	Master DMA Controller # 1
010 - 011	Force Software SMI
012 - 01F	Unused
020 - 021	Peripheral Interrupt Controller # 1
022 - 024	Chipset Configuration Registers
025 - 03F	Unused
040 - 043	Counter/Timer Registers
044 - 05F	Unused
060	Keyboard Data
061	Port B
062 - 063	Unused
064	Keyboard Command/Status
065 - 06F	Unused
070	CMOS Index Address
071	CMOS Data
072 - 073	Unused
074	Reserved
075	Unused
076	Reserved
077 - 077F	Unused
080 - 08F	DMA Page Registers
084 - 085	POST Code Output Port
090 - 091	Unused
092	Fast Reset Register
093 - 09F	Unused
0A0 - 0A1	Interrupt Controller # 2
0A2 - 0BF	Unused
0C0 - 0DF	DMA Controller # 2
0E0 - 0E1	ESS Audio Configuration
0E2 - 0E5	Configuration Registers
0E6 - 0EF	Unused
0F0 - 0F1	NCP Numerics Register
0F9	ESS Configuration Lock
0FA	Unused
0FB	ESS Configuration Unlock
0FC - 0FF	Unused
100 - 101	Unused
103 - 16F	Unused

Continued

Table 6-9 *Continued*

I/O Address (Hex)	System Function (Shipping Configuration)
170 - 177	Hard Drive Secondary Registers
178 - 1EF	Unused
1F0 - 1F7	Hard Drive Primary Registers
1F8 - 1FF	Unused
200 - 21F	Unused
220 - 22F	ESS Audio Registers (1st Possible) (Default)
230 - 23F	ESS Audio Registers (2nd Possible)
240 - 24F	ESS Audio Registers (3rd Possible)
250 - 25F	ESS Audio Registers (4th Possible)
260 - 277	Unused
278 - 27A	LPT2 and High Speed Parallel Port Registers
27B - 27F	LPT2 High Speed Printer Port Registers
280 - 2F7	Unused
2F8 - 2FF	Serial Control Register COM2
300 - 36F	Unused
370 - 371	Reserved
372	Diskette Digital Output Register
373	Unused
374	Reserved
375	Diskette Main Status/Data Registers
376	Reserved
377	Diskette Input/Control Registers
378 - 37A	LPT1 and High Speed Parallel Port Registers
37B - 37F	Unused
380 - 387	Unused
388 - 38B	ESS FM Synthesizer
38C - 3AF	Unused
3B0 - 3BB	Unused
3BC - 3BE	LPT3 and High Speed Parallel Port Registers
3BF	LPT1 High Speed Parallel Port Registers
3C0 - 3CD	Unused
3D0 - 3DF	Unused
3F0 - 3F7	Diskette Drive Controller Primary Registers
3F8 - 3FF	COM1 Serial Controller Registers
400 - 4CF	Unused
480 - 48F	Extended DMS Registers
4D0 - CF6	Unused
CF7	Configuration/NVM Data Register
CF8 - CFB	PCI Configuration Index Register
CFC - CFF	PCI Configuration Index Register
D00 - FFF	Unused

6.10 System Memory Map

Table 6-12
Memory Map

Size	Memory Address	System Function
640 K	00000000 - 0009FFFF	Base Memory
128 K	000A0000 - 000BFFFF	Video Memory
48 K	000C0000 - 000CBFFF	Video BIOS
160 K	000C8000 - 000E7FFF	Unused
64 K	000E8000 - 000FFFFF	System BIOS
15 M	00100000 - 00FFFFFF	Extended Memory
58 M	01000000 - 047FFFFF	Super Extended Memory
58 M	04800000 - 07FFFFFF	Unused
2 M	08000000 - 080FFFFF	Video Memory (Direct Access)
4 G	08200000 - FFFFFFFFFF	Unused
64 K	FFFF0000 - FFFFFFFF	System BIOS ("SHADOW")

