

chapter 6

SPECIFICATIONS

6.1 Physical and Environmental

Table 6-1 Computer		
	U.S.	Metric
Dimensions		
Height	1.6 in	4.06 cm
Depth	9.6 in	24.38 cm
Width	12.5 in	31.75 cm
Weight		
modem installed		
with CD-ROM drive		
without AC adapter	6.8 lb	3.0 kg
with AC adapter (total carrying weight)	7.7 lb	3.5 kg
with diskette drive		
without AC adapter	6.6 lb	3.0 kg
with AC adapter (total carrying weight)	7.5 lb	3.4 kg
with MultiBay weight saver		
without AC adapter	6.3 lb	2.8 kg
with AC adapter (total carrying weight)	7.0 lb	3.2 kg
no modem installed		
with CD-ROM drive		
without AC adapter	6.8 lb	3.0 kg
with AC adapter (total carrying weight)	7.7 lb	3.5 kg
with diskette drive		
without AC adapter	6.5 lb	2.9 kg
with AC adapter (total carrying weight)	7.4 lb	3.4 kg
with MultiBay weight saver		
without AC adapter	6.0 lb	2.7 kg
with AC adapter (total carrying weight)	6.9 lb	3.1 kg

continued

Table 6-1 *continued*

	U.S.	Metric
Standalone (Battery) Power Requirements		
Nominal operating voltage	14.4 VDC	
Average operating power	20 W	
Peak operating power	28 W	
AC Adapter Power Requirements		
Operating voltage	100-120/220-240	
Operating current	1.2/0.6 Amp	
Operating frequency range	50 to 60 Hz AC	
Maximum output voltage	+18.85 volts	
Maximum transient	1kV for 50 ns	
Automobile Adapter DC Input Requirements		
Operating voltage	10.5 to 15.2 VDC	
Temperature		
Operating	50 to 104°F	10 to 40°C
Nonoperating	-4 to 140°F	-20 to 60°C
Relative Humidity (noncondensing)		
Operating	10 to 90%	
Nonoperating ($t_w = 38.7^\circ\text{C}$ max)	5 to 90%	
Altitude (nonpressurized environment)		
Operating	0 to 10,000 ft	0 to 3.05 km
Nonoperating	0 to 30,000 ft	0 to 9.14 km
Shock		
Operating	10 G, 11 ms, half sine	
Nonoperating	240 G, 2 ms, half sine	
Vibration		
Operating	0.25 G, 50-500 Hz sine, 1/2 octave/minute sweep	
Nonoperating	1.00 G, 50-500 Hz sine, 1/2 octave/minute sweep	

NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

6.2 Display

Table 6-2
13.3-inch XGA, CTFT

	U.S.	Metric
Dimensions		
Height	7.98 in	20.28 cm
Width	10.64 in	27.03 cm
Diagonal	13.30 in	33.79 cm
Number of Colors	256, 32K, 64K, 16M	
Contrast Ratio	150:1	
Brightness	125 nits	125 CD/M ²
Pixel Resolution		
Pitch		0.264 × 0.264 mm
Format	1024 × 768	
Configuration	RGB Stripe	
Backlight	Edge Lit, bottom	
Character Display	80 × 25	
Total Power Consumption	4.9 W / Inverter (max) 2.1 W / LCD (max)	

Table 6-3
14.1-inch XGA, CTFT Display

	U.S.	Metric
Dimensions		
Height	11.25 in	28.57 cm
Width	8.44 in	21.43 cm
Diagonal	14.10 in	35.71 cm
Number of Colors	256, 32K, 64K, 16M	
Contrast Ratio	150:1	
Brightness	120 nits	125 CD/M ²
Pixel Resolution		
Pitch		0.279 × 0.279 mm
Format	1024 × 768	
Configuration	RGB Stripe	
Backlight	Edge Lit, bottom	
Character Display	80 × 25	
Total Power Consumption	5.7 W / Inverter (max) 2.4 W / LCD (max)	

6.3 Hard Drive

Table 6-4 Hard Drive				
	4.0 GB	6.4 GB	8.1 GB	10.0 GB
User capacity per drive (refer to note below)	4.0 GB	6.4 GB	8.1 GB	10.0 GB
Drive type	65	65	65	65
Drive height (with drive frame, in mm)	12.7	12.7	12.7	12.7
2.5-inch form factor	Yes	Yes	Yes	Yes
Sector interleave	1:1	1:1	1:1	1:1
Interface type	ATA-3	ATA-4	ATA-4	ATA-4
Seek times (typical, including settling)				
Single track	4 ms	4 ms	4 ms	4 ms
Average	13 ms	12 ms	12 ms	12 ms
Full stroke	23 ms	23 ms	23 ms	23 ms
Physical configuration				
Cylinders	6975	9279	11968	11968
Heads	6	6	5	6
Sectors per track	144 - 240	168 - 280	190 - 330	190 - 330
Bytes per sector	512	512	512	512
Logical configuration				
Cylinders	7944	13424	15880	16383
Heads	16	15	16	16
Sectors per track	63	63	63	63
Total customer usable data sectors	8,007,552	12,685,680	16,007,040	19,640,880
Bytes per sector	512	512	512	512
Buffer size	512K	512K	512K	512K
Disk rotational speed (rpm)	4000	4200	4200	4200
Transfer rates				
Interface (mbytes/sec)	16.6	16.6	16.6	16.6
Media (mbits/sec)	51.7 - 83.4	61.5 - 102.6	69.0 - 118.0	69.0 - 118.0

6.4 Diskette Drive

Table 6-5
Diskette Drive

Diskette Size	3.5 inch
High Density	1.44 MB/1.2 MB
Low Density	720 KB
Light	None
Height	0.50 in (12.7 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 CD-ROM Drive

Table 6-6
CD-ROM Drive

Applicable Disc	CD-ROM (Mode 1, 2, and 3) CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2 (Form 1 and Form 2) CD-R (read only) CD Plus Photo CD (single/multisession) CD Extra Video CD CD-WO (fixed packets only) CD-Bridge
Center Hole Diameter	.59 in/15 mm
Disc Diameter	12 cm, 8 cm
Disc Thickness	1.2 mm
Track Pitch	1.6 μ m
Laser	
Beam Divergence	53.5 $\pm$ 1.5 degrees
Output Power	0.24 $\pm$ 0.1 mw
Type	Semiconductor Laser GaAlAs
Wave Length	780nm $\pm$ 25nm
Access Time	
Random	< 150 ms
Full Stroke	< 300 ms
Audio Output Level	
Line Out	0.7 V rms
Headphone	none
Cache Buffer	128 KB
Data Transfer Rate	
Sustained, 24X	3.6 MB/sec (outer diameter)1500 MB/sec
Sustained, 1X	150 KB/sec
Burst	8.3 MB/sec
Startup Time	< 10 seconds typical
Capacity	
Mode 1, 12 cm	550 MB
Mode 2, 12 cm	640 MB
8 cm	180 MB

6.6 DVD-ROM Drive

Table 6-7
DVD-ROM Specifications

Applicable Disc	DVD-5, DVD-9, DVD-10 CD-ROM mode 1, mode 2 CD-Digital Audio CD-XA mode 2 (Form 1, Form 2) CD-I mode 2 (Form 1 and Form 2) CD-I Ready CD-Bridge CD-R Photo CD (single/multisession)
Center Hole Diameter	.59 in/15 mm
Disc Diameter	12 cm, 8 cm
Disc Thickness	1.2 mm
Track Pitch	.74 μ m
Capacity	
DVD-5	4.7 GB
DVD-9	8.5 GB
DVD-10	9.4 GB
Mode 1, 12	550 MB
Mode 2, 12 cm	640 MB
8 cm	180 MB
Laser	
Output Power	5 mw
Type	Semiconductor Laser GaAlAs
Wave Length	650 nm $\pm$ 25nm (DVD-ROM mode) 795 nm $\pm$ 25 nm (CD-ROM mode)
Access Time	
Random	< 200 ms
Full Stroke	< 250 ms
Audio Output Level	
Line Out	0.7 V rms
Headphone	none
Cache Buffer	128 KB
Data Transfer Rate	
Sustained, 1x (CD-ROM mode)	150 KB/sec
Sustained, 20x (CD-ROM CAV mode)	1200-1300 KB/sec
Sustained, (DVD-ROM movd)	1352-2705 KB/sec sustained, DVD-ROM mode
Burst	16.6 MB/sec
Startup Time	<3 seconds, typical

6.7 LS-120 Drive

Table 6-8
LS-120 Drive

	120 MB	1.7 MB DMF	1.44 MB	1.2 MB	1.2 MB	720.KB	640 KB
Formatted capacity (bytes)	125,958,144	1,720,320	1,474,560	1,261,568	1,228,800	737,280	655,360
Sector size (bytes)	512	512	512	1,024	512	512	512
Sectors	246,527	3,360	2,880	1,232	2,400	1,440	1,280
Magnetic tracks surface	1,736	80	80	77	80	80	80
Optical servo tracks/surface	900	N/A	N/A	N/A	N/A	N/A	N/A
Sectors/track	51-92	21	18	8	15	9	8
Sector interleave	1:1	2:1	1:1	1:1	1:1	1:1	1:1
Spare sectors	170	0	0	0	0	0	0
Zones (each side)	55	1	1	1	1	1	1
Average random seek	70 ms	70 ms	70 ms	70 ms	70 ms	70 ms	70 ms
Track-to-track seek	20 ms	25 ms	25 ms	25 ms	25 ms	25 ms	25 ms
Max single seek	120 ms	170 ms	170 ms	170 ms	170 ms	170 ms	170 ms
Average latency	41.67 ms	41.67 ms	41.67 ms	41.67 ms	41.67 ms	41.67 ms	41.67 ms
Motor RPM	720±0.5%	720±0.5%	720±0.5%	720±0.5%	720±0.5%	720±0.5%	720±0.5%
Motor start time	800 ms	800 ms	800 ms	800 ms	800 ms	800 ms	800 ms
Track density	2,490 TPI	135 TPI	135 TPI	135 TPI	135 TPI	135 TPI	135 TPI
Track width	8 µm	125 µm	125 µm	125 µm	125 µm	125 µm	125 µm
Encoding method	(1,7)RLL	MFM	MFM	MFM	MFM	MFM	MFM
Max flux density	33,660 FCI	17,334 FCI	17,334 FCI	17,334 FCI	17,334 FCI	17,334 FCI	17,334 FCI
Recording density	44,880 BPI	17,334 BPI	17,334 BPI	17,334 BPI	17,334 BPI	17,334 BPI	17,334 BPI
Nominal transfer rate	375-680 KB/sec	150 KB/sec	150 KB/sec	125 KB/sec	125 KB/sec	75 KB/sec	75 KB/sec
Nominal sustained transfer rate across interface	313-565 KB/sec	65 KB/sec read, 32 KB/sec write	55 KB/sec read, 28 KB/sec write	49 KB/sec read, 25 KB/sec write	46 KB/sec read, 23 KB/sec write	28 KB/sec read, 14 KB/sec write	28KB/sec read, 14 KB/sec write
Buffer transfer rate	4.0 MB/sec	4.0 MB/sec	4.0 MB/sec	4.0 MB/sec	4.0 MB/sec	4.0 MB/sec	4.0 MB/sec

6.8 Battery Pack

Table 6-9
Lithium Ion Battery Pack

	U.S.	Metric
Dimensions		
Height	0.79 in	2.00 cm
Length	5.43 in	13.82 cm
Weight	3.46 in	8.80 cm
Weight	0.92 lb	0.40 kg
Recharge times		
while computer is turned on	3-4 hours (depending on system activity during recharging period)	
while computer is turned off		
	2 hours	
Energy		
Voltage	14.4 V	
Capacity	3.0 Ah	
Environmental Requirements		
Operating Temperatures	50°F to 104°F	10°C to 40°C
Charging Temperatures	50°F to 104°F	10°C to 40°C
Recommended Storage Temperatures		
No longer than 1 month	32°F to 140°F	0°C to 60°C
No longer than 3 months	32°F to 113°F	0°C to 45°C
No longer than 1 year	32°F to 68°F	0°C to 20°C

6.9 System DMA

Table 6-10
System DMA

Hardware DMA	System Function
DMA0	Available for audio
DMA1	Entertainment Audio (Default; Alternate = DMA0, DMA3, None)
DMA2	Diskette Drive
DMA3	ECP Parallel Port LPT1 (Default; Alternate = DMA 0, none)
DMA4	DMA Controller Cascading (Not available)
DMA5	Available for PC Card
DMA6	Not Assigned
DMA7	Not Assigned
Note: PC Card controller can use DMA 1, 2, or 5.	

6.10 System Interrupts

Table 6-11
System Interrupts

Hardware IRQ	System Function
IRQ1	Timer Interrupt
IRQ2	Cascaded
IRQ3	PCMCIA
IRQ4	Modem (COM1)
IRQ5	Audio (default)*
IRQ6	Diskette drive
IRQ7	Parallel
IRQ8	RTC
IRQ9	Infrared
IRQ10	PCMCIA
IRQ11	Network Interface on ArmadaStation/Armada MiniStation**
IRQ12	Internal Point Stick or External Mouse
IRQ13	Coprocessor (Not available to any peripheral)
IRQ14	IDE Interface (Hard Disk and CD-ROM Drive)
IRQ15	Fixed Disk Drives on the ArmadaStation/Armada MiniStation

Notes:

PCMCIA cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15.

Either the infrared or the serial port may assert IRQ3 or IRQ4.

*Default configuration; audio possible configurations are: IRQ5, IRQ7, IRQ9, IRQ10, or none.

**Default configuration; possible configurations for ArmadaStation or Armada MiniStation network interface adapter are IRQ9, IRQ10, IRQ11, or none.

6.11 System I/O Addresses

Table 6-12
System I/O Addresses

I/O Address (Hex)	System Function (Shipping Configuration)
000 - 00F	DMA Controller no. 1
010 - 01F	Unused
020 - 021	Interrupt Controller no. 1
022 - 024	Opti Chipset Configuration registers
025 - 03F	Unused
02E - 02F	87334 "Super IO" configuration for CPU
040 - 043	Counter/Timer Registers
044 - 05F	Unused
060	Keyboard Controller
061	Port B
062 - 063	Unused
064	Keyboard Controller
065 - 06F	Unused
070 - 071	NMI Enable/Real Time Clock
072 - 07F	Unused
080 - 08F	DMA Page Registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0A1	Interrupt Controller no. 2
0A2 - 0BF	Unused
0C0 - 0DF	DMA Controller no. 2
0E0 - 0EF	Unused
0F0 - 0F1	Coprocessor Busy Clear/Reset
0F2 - 0FF	Unused
100 - 16F	Unused
170 - 177	Secondary Fixed Disk Controller
178 - 1EF	Unused
1F0 - 1F7	Primary Fixed Disk Controller
1F8 - 200	Unused

Continued

Table 6-11 *Continued*

I/O Address (Hex)	System Function (Shipping Configuration)
201	Joystick (Decoded in ESS1688)
202 - 21F	Unused
220 - 22F	Entertainment Audio
230 - 26D	Unused
26E - 26	National 87334 "Super IO" Controller in ArmadaStation/Armada MiniStation
278 - 27F	Unused
280 - 2AB	Unused
2A0 - 2A7	ArmadaStation/Armada MiniStation PC Card DMA Selection, Hard Drive Reset, IDE Select, MultiBay Device Identification
2A8 - 2E7	Unused
2E8 - 2EF	Reserved Serial Port
2F0 - 2F7	Unused
2F8 - 2FF	Infrared port
300 - 31F	Network Interface in ArmadaStation/Armada MiniStation (Default; Alternate is 320, 340, or 360h)
320 - 36F	Unused
370 - 377	Secondary Floppy Controller (In ArmadaStation/Armada MiniStation when a floppy is installed in the CPU)
378 - 37F	Parallel Port (LPT1/Default)
380 - 387	Unused
388 - 38B	FM Synthesizer - OPL3
38C - 3AF	Unused
3B0 - 3BB	VGA
3BC - 3BF	Reserved (Parallel Port/No EPP Support)
3C0 - 3DF	VGA
3E0 - 3E1	PC Card Controller in CPU
3E2 - 3E3	PC Card Controller in ArmadaStation/Armada MiniStation
3E8 - 3EF	Internal Modem
3F0 - 3F7	"A" Diskette Controller
3F8 - 3FF	Serial Port (COM1/Default)
CF8 - CFB	PCI Configuration Index Register (PCIDIV0-1)
CFC - CFF	PCI Configuration Data Register (PCIDIV0-1)

6.12 System Memory Map

Table 6-13
System 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 - FFFFFFFF	Unused
64 K	FFFF0000 - FFFFFFFF	System BIOS

6.13 Modem Chipset

Table 6-14
Modem Chipset

Component	Manufacturer	Part Number
Primary DSP	Lucent	16345T48-AE23-DB
Secondary DSP	Lucent	1635T08-BA23-DB
ASIC	Lucent	VALV34-T-DB
Hybrid	Lucent	D2560BBL-DT
Controller	Motorola	MC68LC302PU

