



# Tech Info Library

## Electrical Specifications: Apple Computers (1 of 2) (2/97)

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TOPIC -----

This article provides the electrical specifications for Apple computers. For information about other Apple hardware, see the Tech Info Library article, "Electrical Specifications: Apple Peripherals (2 of 2)".

NOTE: This article has been revised and combines two previous articles titled, "Electrical Specifications of Most Apple Hardware" and "BTU Ratings for Most Apple Hardware".

DISCUSSION -----

The following Apple products are manufactured for use in the USA. In determining whether a particular product can be used internationally, there are three classes, depending on whether a product accepts a range in voltage, frequency or both (for more specific information, see the article, "Using U.S. Apple Equipment Internationally"):

### 1) Universal

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These products can be used internationally out of the box. Some of Apple's products are self-configuring devices or "universal" within a certain range. They can accept a range in both voltage and frequency, and only require a plug adapter for the specific locale.

Example: The Quadra 800 accepts between 100-125 and 200-240 volts, 47-63 Hz.

### 2) Frequency Independent

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These products can be used internationally with a voltage transformer. Generally they are geared for U.S. 120 volt current, but are flexible as to the frequency they accept (for example, 47-63 Hz), and are known as "frequency independent." These products need a stepdown isolation transformer to adapt the voltage, and will handle the different frequency on their own.

Example: The U.S. Performa 200 accepts 120 volts, 47-63 Hz.

### 3) Frequency Dependent

These products generally cannot be used internationally. These are products that can work only within a narrow range in frequency; they are "frequency dependent." Transformers only transform voltage, so if the product requires a certain frequency, there's no practical way to convert both voltage and frequency.

These products can ONLY be used internationally in countries with the same frequency as the country for which the product was manufactured. Further, a voltage transformer will be required if the destination country has a voltage different from the home country.

Example: The U.S. Apple Color OneScanner accepts 108-132 volts, 58-62 Hz.

NOTE:

Computers with power outlets for peripherals do not condition the current as it passes through. So, for example, a monitor requiring 120v-60Hz current could not be used in a 220v-50Hz environment even if the computer from which it gets its power is able to accept the local current.

The AC output of a Macintosh II is as follows: the monitor receptacle is rated for 3 amps steady state, 40 amps peak power. The power supply is fused for 6 amps to include the Macintosh II and monitor.

The amperage on the back of the computer is what should be used to calculate load on a circuit. Typical circuits in businesses and houses are 15 Amps (some are 20, but rarer, and an electric dryer is usually 30, an electric range may have DUAL 30 Amp circuits wired together). With that capacity, you could have the following configuration (from the back of the CPU):

CPU	5 Amps
Monitor	3 Amps
LaserWriter	7 Amps
Total:	15 Amps

Most of the time, the CPU will draw only 1-1.5 Amps, the Monitor about .5-1 Amp, and the LaserWriter about 2 Amps. The difference is sometimes referred to as Nominal (high) versus Actual draw.

These following values are accurate regardless of peripherals used with each device. For example, a Macintosh II with an EtherTalk NB Card, an 8-bit video card, and HD40 SC draws a maximum of 230 watts and 6 amps from the power outlet it is plugged into.

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|COMPUTERS|
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	Watts*	Amps**	BTU/hr**	Volts	Hertz
Apple II and Apple III					
Apple II	60	.5	205.2	107-132	50-60

Apple II Plus	60	.5	205.2	107-132	50-60
Apple III	100	.83	342	107-132	60
Apple III Plus	100	.83	342	107-132	60
Apple IIe	60	.5	205.2	95-127	60
Apple IIc	25	.2	85.5	105-129	60
Apple IIc Plus	60	.5	205.2	90-130	50-60
Apple IIGS	60	.5	205.2	107-132	50-60

Compact Macintosh & XL	Watts*	Amps**	BTU/hr**	Volts	Hertz
Lisa (Macintosh XL)	150	1.25	513	120	50-60
Macintosh 128K	60	.5	205.2	105-125	50-60
Macintosh 512K, 512Ke	60	.5	205.2	105-125	50-60
Macintosh Plus	60	.5	205.2	105-125	50-60
Macintosh SE	100	.83	342	90-125/   200-240	47-63
Macintosh SE/30	75	.63	256.5	120-125/   200-240	48-62
Macintosh Classic	76	.63	260	120	47-63
Macintosh Classic II	76	.63	260	120	47-63
Macintosh Color Classic	100	.83	342	90-125/   200-240	47-63

Macintosh II Computers	Watts*	Amps**	BTU/hr**	Volts	Hertz
Macintosh II	230	1.9	786.6	90-125/   200-240	48-62
Macintosh IIX	230	1.9	786.6	90-125/   200-240	48-62
Macintosh IICx	159	1.3	543.8	100-125/   200-240	50-60
Macintosh IICi	159	1.3	543.8	100-125/   200-240	50-60

Macintosh IIfx	230	1.9	786.6	100-125/   200-240	48-62
Macintosh IIsi	160	1.33	547.2	100-125/   200-240	50-60
Macintosh IIVx	230	1.9	786.6	100-125/   200-240	50-60
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Macintosh LC Computers	Watts*	Amps**	BTU/hr**	Volts	Hertz
=====					
Macintosh LC	50	.42	171	90-125/   200-240	50-60
Macintosh LC II	50	.42	171	90-125/   200-240	50-60
Macintosh LC III	50	.42	171	100-125/   200-240	47-63
Macintosh LC 475	30	.25	102.6	100-125/   200-240	47-63
Macintosh LC 520	40	.5	136.80	90-125/   200-240	47-63
Macintosh LC 550	40	.5	136.80	90-125/   200-240	47-63
Macintosh LC 575	40	.5	136.80	90-125/   200-240	47-63
Macintosh LC 580	40	.5	136.80	90-125/   200-240	47-63
Macintosh LC 630 family	45	1.25	153.9	100-125/   200-240	50-60
Macintosh TV	60	.5	205.2	90-125/   200-240	47-63
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Macintosh Performa	Watts*	Amps**	BTU/hr**	Volts	Hertz
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Performa 200	76	.63	260	120	47-63
Performa 400,405,430,450	50	.42	171	90-125/   200-240	50-60
Performa 460, 466, 467	50	.42	171	90-125/   200-240	50-60

Performa 475 & 476	50	.25	171	100-125/   200-240	47-63
Performa 550 & 560	40	.5	136.8	90-125/   200-240	47-63
Performa 575,577,578,580	40	.5	136.8	90-125/   200-240	47-63
Performa 600	230	1.9	786.6	100-125/   200-240	50-60
Performa 630 Series	45	1.25	153.9	100-125/   200-240	50-60
Performa 6100 Series	210	1.7	718.2	100-125/   200-240	50-60
Performa 5200 Series	125	4.0	427.5	100-125/   200-240	50-60
Performa 5300 Series	125	4.0	427.5	100-125/   200-240	50-60
Performa 6200 Series	55	1.25	188.1	100-125/   200-240	50-60
Performa 6300 Series	55	1.25	188.1	100-125/   200-240	50-60
Performa 6400 Series	220	3.00	752.40	100-125/   200-240	47-63
Performa 6360 Series	150	5.00	513.00	100-125/   200-240	47-63

Macintosh Quadra	Watts*	Amps**	BTU/hr**	Volts	Hertz
Quadra 605	30	.44	102.6	100-125/   200-240	47-63
Centris 610	86	1.70	294.12	100-125/   200-240	47-63
Quadra 610	210	1.70	718.20	100-125/   200-240	47-63
Quadra 630 family	45	1.25	153.9	100-125/   200-240	50-60

Quadra/Centris 650	230	1.9	787	100-125/	50-60
				200-240	
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Quadra/Centris 660AV	86	1.70	294.12	100-125/	50-60
				200-240	
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Quadra 700	50	1.9	171	100-125/	50-60
				200-240	
-----+-----+-----+-----+-----+-----					
Quadra 800	200	9	684	100-125/	47-63
				200-240	
-----+-----+-----+-----+-----+-----					
Quadra 840AV	200	9	684	100-125/	50-60
				200-240	
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Quadra 900	303	10	1036.26	100-125/	50-60
				200-240	
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Quadra 950	303	10	1036.26	100-125/	50-60
				200-240	

Power Macintosh	Watts*	Amps**	BTU/hr**	Volts	Hertz
-----+-----+-----+-----+-----+-----					
Power Macintosh 4400/200	150	3.0	513	110/220	47-63
-----+-----+-----+-----+-----+-----					
Power Macintosh 5200/75	125	4.0	427.50	100-125	50-60
				200-240	
-----+-----+-----+-----+-----+-----					
Power Macintosh 5260/100	125	4.0	427.50	100-125	50-60
				200-240	
-----+-----+-----+-----+-----+-----					
Power Macintosh 5300/100	125	4.0	427.50	100-125	50-60
				200-240	
-----+-----+-----+-----+-----+-----					
Power Macintosh 5400 Series	220	4.0	752.40	100-125	50-60
				200-240	
-----+-----+-----+-----+-----+-----					
Power Macintosh 5500 Series	220	4.0	752.40	100-125	50-60
				200-240	
-----+-----+-----+-----+-----+-----					
Power Macintosh 6400 Series	220	3.00	752.40	100-125/	47-63
				200-240	
-----+-----+-----+-----+-----+-----					
Power Macintosh 6500 Series	220	3.0	752.40	100-125/	47-63
				200-240	
-----+-----+-----+-----+-----+-----					
Power Macintosh 6100 Series	210	1.7	718.20	100-125/	50-60
				200-240	
-----+-----+-----+-----+-----+-----					
Power Macintosh 7100 Series	230	1.9	786.60	100-125/	50-60
				200-240	
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Power Macintosh 8100 Series	200	9.0	684	100-125/   200-240	50-60
Power Macintosh 7200 Series	150	3.0	513	100-125/   200-240	50-60
Power Macintosh 7300 Series	150	3.0	513	100-130/   200-270	50-60
Power Macintosh 7500 Series	150	3.0	513	100-125/   200-240	50-60
Power Macintosh 7600 Series	150	3.0	513	100-125/   200-240	50-60
Power Macintosh 8500 Series	225	9.0	769.50	100-125/   200-240	50-60
Power Macintosh 8600 Series	560	n/a	1915.2	100-125/   200-240	50-60
Power Macintosh 9500 Series	225	9.0	769.50	100-125/   200-240	50-60
Power Macintosh 9600 Series	560	n/a	1915.2	100-125/   200-240	50-60

Apple Workgroup Servers	Watts*	Amps**	BTU/hr**	Volts	Hertz
Workgroup Server 60	86	1.70	294.12	100-125/   200-240	50-60
Workgroup Server 80	200	9.00	684	100-125/   200-240	50-60
Workgroup Server 95	303	10.00	1036.26	100-125/   200-240	50-60
Workgroup Server 6150	210	1.7	718.20	100-125/   200-240	50-60
Workgroup Server 8150	200	9.0	684	100-125/   200-240	50-60
Workgroup Server 9150	303	10	1036.26	100-125/   200-240	50-60
Workgroup Server 7250	150	3.0	513	100-125/   200-240	50-60
Workgroup Server 8550	225	9.0	769.50	100-125/   200-240	50-60

				200-240	
Network Server 500	325	7.0	1111.50	100-125/ 200-240	50-60
Network Server 700	425	7.0	1453.50	100-125/ 200-240	50-60
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Portable Macintosh	Watts*	Amps**	BTU/hr**	Volts	Hertz
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Macintosh Portable	5	.125	.3	70-125/ 200-240	48-62
PowerBook 100	17	2	58.14	100-125/ 200-240	50-60
PowerBook 140	17	2	58.14	100-125/ 200-240	50-60
PowerBook 145,145B	17	2	58.14	100-125/ 200-240	50-60
PowerBook 150	17	2	58.14	100-125/ 200-240	50-60
PowerBook 160	17	2	58.14	100-125/ 200-240	50-60
PowerBook 165c	24	3.2	82.1	100-125/ 200-240	50-60
PowerBook 170	17	2	58.14	100-125/ 200-240	50-60
PowerBook 180	17	2	58.14	100-125/ 200-240	50-60
PowerBook 180c	24	3.2	82.1	100-125/ 200-240	50-60
PowerBook 190 Series	45	1.88	153.9	100-125/ 200-240	50-60
PowerBook Duo 210	25	1.04	85.5	100-125/ 200-240	50-60
PowerBook Duo 230	25	1.04	85.5	100-125/ 200-240	50-60
PowerBook Duo 250	25	1.04	85.5	100-125/ 200-240	50-60



PowerBook Duo 270c	25	1.04	85.5	100-125/  200-240	50-60
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PowerBook Duo 280	25	1.04	85.5	100-125/  200-240	50-60
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PowerBook Duo 280c	36	1.5	123.1	100-125/  200-240	50-60
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PowerBook Duo 2300	36	1.5	123.1	100-125/  200-240	50-60
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PowerBook 520/520c	40	VBatt 1.0†	137	100-125/  200-240	50-60
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PowerBook 540/540c	40	VBatt 1.0†	137	100-125/  200-240	50-60
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PowerBook 5300	45	1.88	153.9	100-125/  200-240	50-60
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Duo Dock	87	4.2	297	100-125/  200-240	50-60
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Duo Dock II	87	4.2	297	100-125/  200-240	50-60
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Duo Dock Plus	87	4.2	297	100-125/  200-240	50-60

End\_Table

#### Additional Information

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 "Current leakage" is the amount of current that is passed to earth ground. The current leakage of all Apple equipment meets the following specifications:

- As specified by the UL standard for Apple equipment distributed in the United States, the current leakage will be less than 5.0 milliamperes.
- As specified by the IEC 380 & 950 standards for Apple equipment distributed in France and most of Europe, the current leakage will be less than 3.5 milliamperes.

† The PowerBook 500 series AC adapter has two separate outputs, VBatt and Vmain. The VBatt supply is used for charging the batteries while the VMain supply provides power for the PowerBook. Power from VBatt is automatically diverted to power the PowerBook if additional power is needed.

\* Amps calculated based on efficiency of power supply, except for Macintosh PowerBooks (amps calculated at 7.5 volts) and Macintosh Duos (amps calculated at 24 volts).

\*\* The BTU calculation is Watts X 3.42 = BTU/hour.

The BTU ratings for the Macintosh systems take into account any hard disk or expansion card(s) that may be installed internally.

Article Change History:

24 Feb 1997 - Added new computers.

05 Dec 1996 - Added 6360.

05 Sep 1996 - Updated, re-formated, split into separate articles.

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