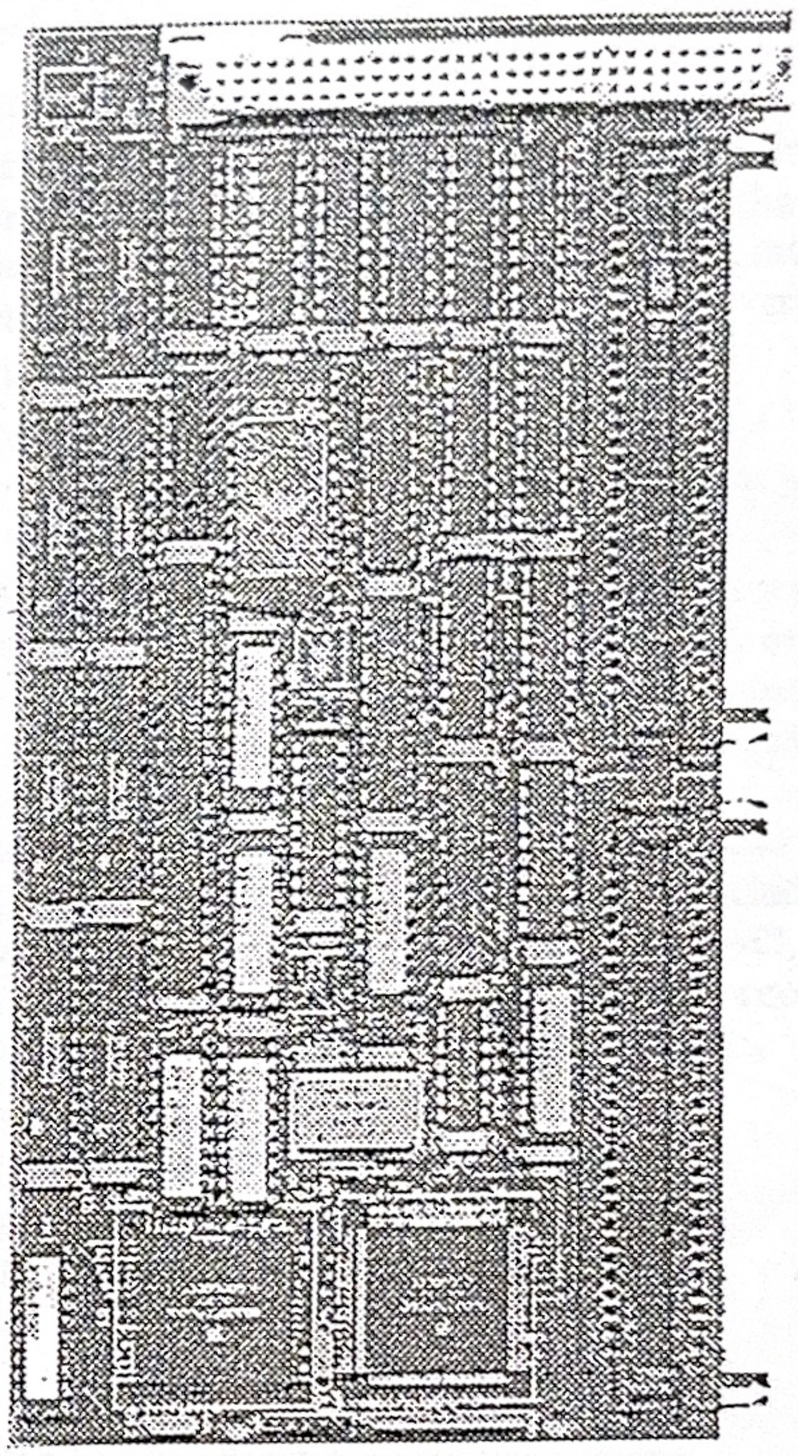
NewLife 33

system upgrade

for
Mac SE



User guide and
installation manual

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This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case, the user, at his own expense, will be required to take whatever measures may be necessary to correct the interference.

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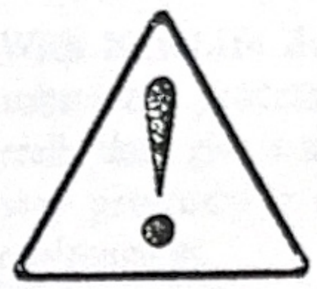
Before You Start!

Please read this manual
before you install your NewLife board.

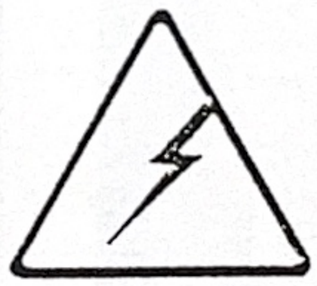
It provides important safety procedures
and describes the recommended
installation steps.

The following symbols are used in this manual to indicate important items:



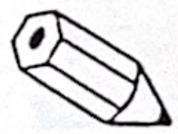
WARNING!

A life-threatening situation. Serious injury or death can result if the hazard is ignored.



CAUTION!

Static discharge can damage equipment.



NOTE:

Failure to follow instructions can result in equipment damage or malfunction.

part 1 Introduction

The NewLife 33 system upgrade

Congratulations! We're glad you've chosen to give NewLife™ to your Mac with a Newbridge Microsystems NewLife 33 system upgrade. We're sure you'll be pleased with the improved performance and capabilities of your enhanced Mac.

NewLife 33 is designed specifically for the Mac SE. NewLife 33 makes an SE perform in the Mac IIfx class. It gives your Mac 8 times the computing power of a standard Mac SE and supports 16MB of system memory using *Virtual™ 2.0 by Connectix.

With NewLife 33 you can run applications that require substantial processor speed or more memory. NewLife 33 really does give a new life to your old Mac and allows you to stay productive in today's rapidly changing software environment.

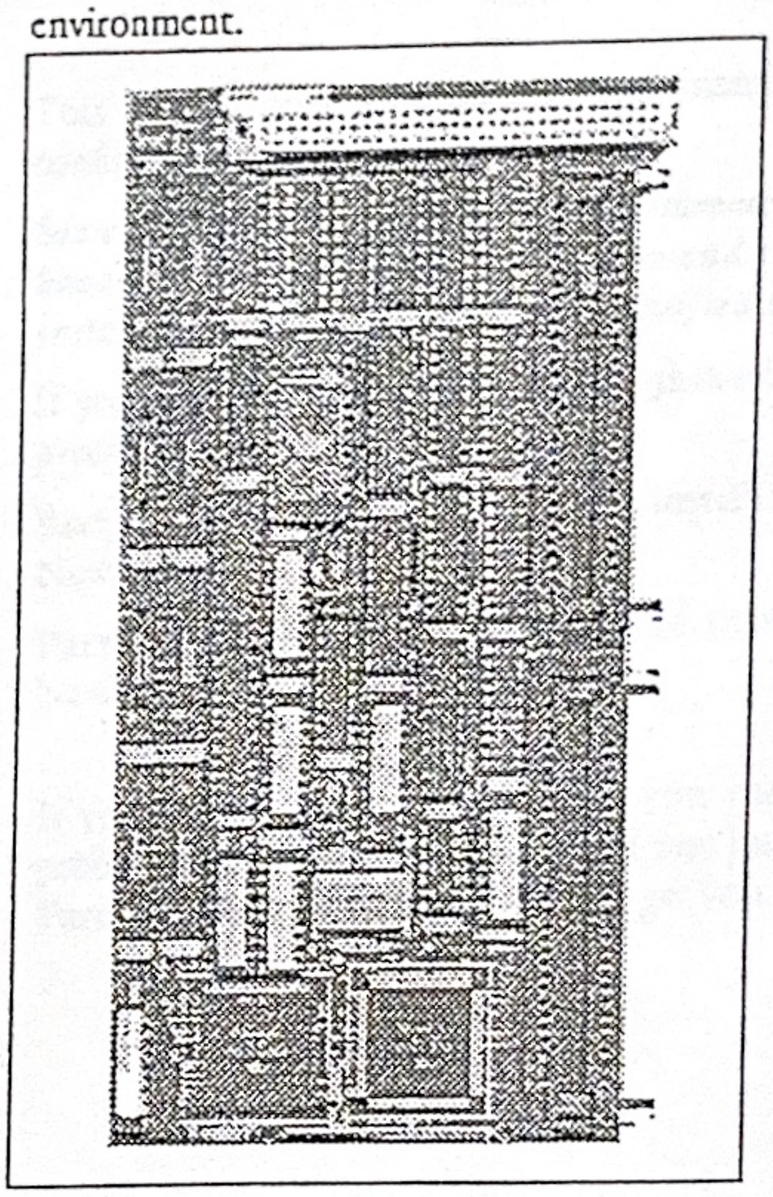


Figure 1: The NewLife 33 upgrade board

NewLife 33 features and benefits

- NewLife 33 is installed directly on the SE expansion bus, and it provides a flow-through SE bus socket.
- NewLife 33 uses standard 1MB 80ns (or faster) SIMMs (Single In-line Memory Modules) to provide 4MB of system memory.
- 256K of 25ns Static RAM
- NewLife 33 has a high speed shadow RAM to improve the performance of RAM access.
- NewLife 33 is compatible with Apple's proposed system 7.
- NewLife 33 is powered by a 33 MHz 68030 CPU and 68882 FPU coprocessor pair for lightning fast operation.
- NewLife 33 gives you the processing speed to run powerful programs like MacDraw, Illustrator, Freehand, Excel, Wingz, Word, WordPerfect, Quark XPress, and PageMaker.

About this manual

This manual gives you step by step instructions to install, configure and use NewLife 33.

Some of the steps are potentially life-threatening to you, and hazardous to your Mac. We recommend that you have the installation done by your dealer's qualified service technician.

If you wish to install NewLife 33 yourself, *read the safety precautions in Part 2.*

Part 3 of this manual contains the installation steps for the NewLife 33.

Part 4 describes the installation and configuration of the NewLife 33 CDEV control software.

If you follow the steps carefully, you shouldn't have any problems with your NewLife board but just in case you do, Part 5 contains some useful hints to get you back on track.

part 2

Preparation and Safety Precautions

Prepare your workplace

Static electricity can severely damage your Macintosh or the NewLife 33 board.

To prevent static damage, take the following precautions:

- Place a grounded antistatic mat on your workbench.
- Wear a conductive wrist strap connected to the mat.

Gather the tools you will need

- CRT discharge tool
- Macintosh case opening tool or equivalent (also known as the pull-apart tool)
- 12–inch T–15 Torx screwdriver or equivalent
- Safety goggles
- Regular flat-bladed screwdriver
- Soft cloth or foam pad
- Antistatic wrist strap

Check the package contents

- NewLife 33 board
- Mounting hardware
- 3.5 inch diskette with control software
- User Guide & Installation Manual (this book)

Understand the hazards

> **WARNING!**
>
> Macintosh computers contain high voltages and a high vacuum picture tube. Both can cause serious personal injury and property damage. This equipment should only be installed by a qualified technician.

Serious injury or death may result from improper handling of the interior components of the Macintosh.

DO NOT attempt this installation unless you are completely familiar with the methods for preventing electrical discharge and shock.

Always unplug the Macintosh

Make sure that the Macintosh is disconnected from AC power. Working within the Macintosh computer requires skill and expertise to prevent electrical discharge and shock, *even when the Macintosh has been disconnected from its power source.*

Discharge the CRT anode

The CRT anode can have extremely high voltages present (12,000 volts). Follow the steps specified in the Macintosh Technical Procedures manual to discharge the CRT anode. For your convenience, we have summarized the basic instructions in Part 3. Consult the original Macintosh documentation for all of the details.

Handle the CRT with care

The CRT contains a high vacuum — *if it is cracked or broken, it can violently implode causing serious injury. Handle the CRT with care. Always wear safety glasses when the case is open.*

part 3

Orienting NewLife 33

Installing NewLife33

Figure 2 is a simplified top view of NewLife 33. It shows the relative locations of the SIMM sockets and the flow-through connector for the SE bus.

This diagram does not show all of the components on the board — it is supplied to help you orient the board.

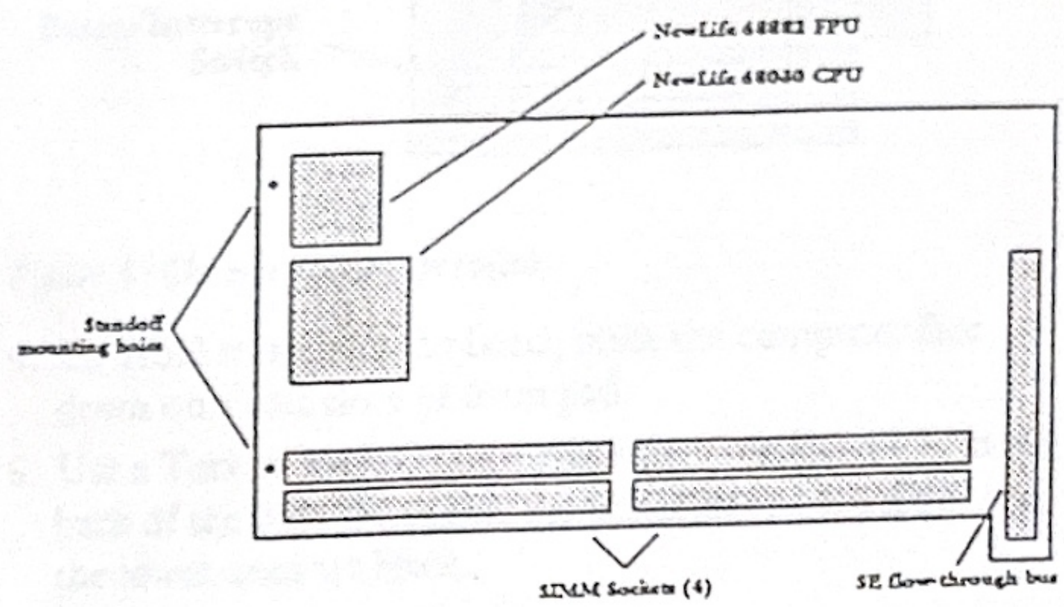


Figure 2 : Simplified top view of NewLife 33

Four easy installation steps

You install NewLife 33 in four easy steps:

Step one: Open the Macintosh case, remove the motherboard;
Step two: Install the memory;
Step three: Attach NewLife 33 to the Macintosh motherboard;
Step four: Replace the Macintosh motherboard and close up the case;

Step one:
Remove the Macintosh motherboard

To open the Macintosh case:

1. Turn off the power and disconnect the AC power cord from the source and from the back of the computer.
2. Disconnect the mouse and all other external cables from the back of the computer.
3. Remove the reset/interrupt switch (if installed) from the side of the case by prying it off with a small flat-blade screwdriver.

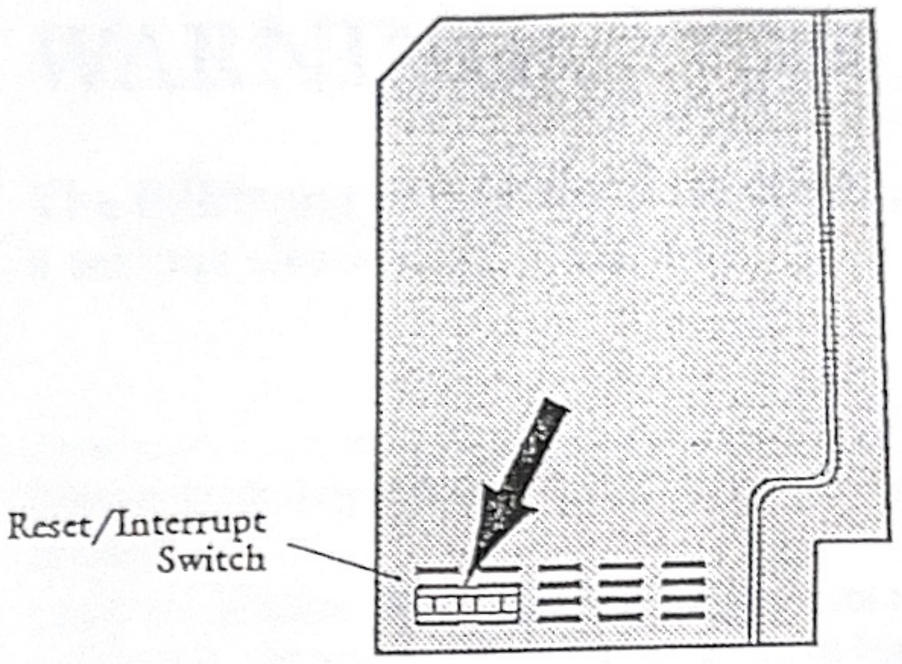


Figure 3 : The reset/interrupt switch

4. To avoid scratching the bezel, place the computer face down on a soft cloth or foam pad.
5. Use a Torx screwdriver to remove the four screws from the back of the Mac. Note that the upper screws are silver and the lower ones are black.

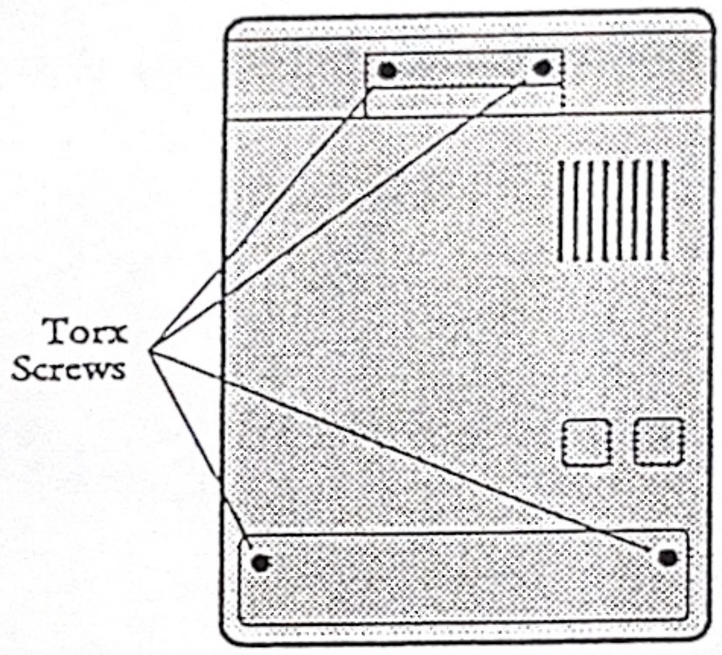


Figure 4 : The back of the Macintosh

6. Use the pull-apart tool to gently pry the cover loose. Carefully lift up the cover and set it aside. *The CRT picture tube is now exposed — be careful!*
7. Stand the Macintosh back up in its normal position.

WARNING!

The following procedure is dangerous, a serious shock hazard exists!

To discharge the CRT anode:

1. Remove your antistatic wrist strap, if you have it on. Remove any jewelry you are wearing. Put on your safety goggles.
2. Attach the alligator clip of the CRT discharge tool to the metal part of the ground lug exactly as shown in Figure 5. Do not clip onto the chassis.
3. Put one hand behind your back or in your pocket. Grasp the insulated handle of the CRT discharge tool with your free hand. Hold the CRT discharge tool against the side of the CRT and insert it under the anode cap, until it touches the anode ring. A crackle or spark may be generated.
4. Remove the CRT discharge tool from under the anode cap. You may wish to repeat step 3, to be sure the CRT is discharged.
5. Remove the alligator clip from the ground lug.

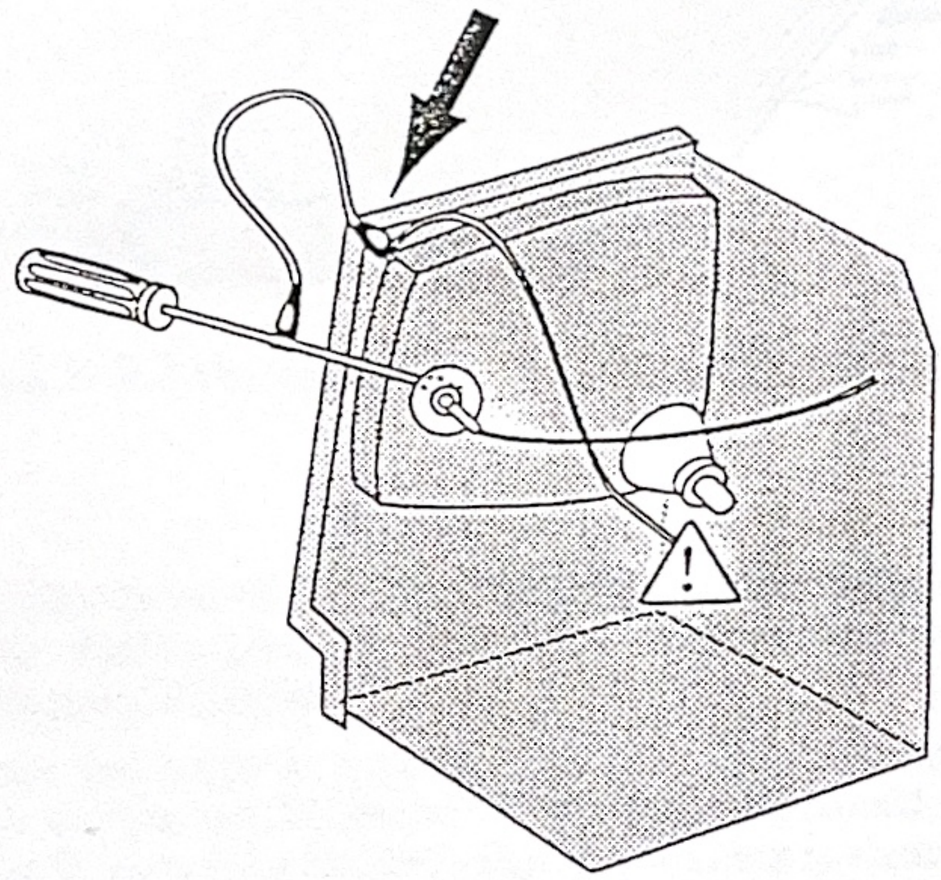


Figure 5 : Discharging the CRT anode

To remove the Macintosh motherboard:

1. *To prevent static damage to your Mac or NewLife 33, put on your antistatic wrist strap and perform this operation on your antistatic mat.*
2. Locate the motherboard. It is on the bottom side of the Mac. You must detach the connectors from the motherboard before it will slide out of the case.
3. To unplug the power/video connector, grasp the wire bundle and gently pull it away from the board.
4. To unplug the SCSI cable and internal floppy drive connector, grasp the ribbon cable assemblies and gently pull them out of their socket on the board, using a rocking motion.
5. If you have any expansion cards installed in the PDS slot, (such as a video or an ethernet card) it must now be removed. See the manufactures' instructions for proper procedure.
6. Lay the Mac face down (on your foam pad) and slide the motherboard up and rotate out of the chasis.
7. Put the Mac aside in a safe location, and place the motherboard on your antistatic mat.

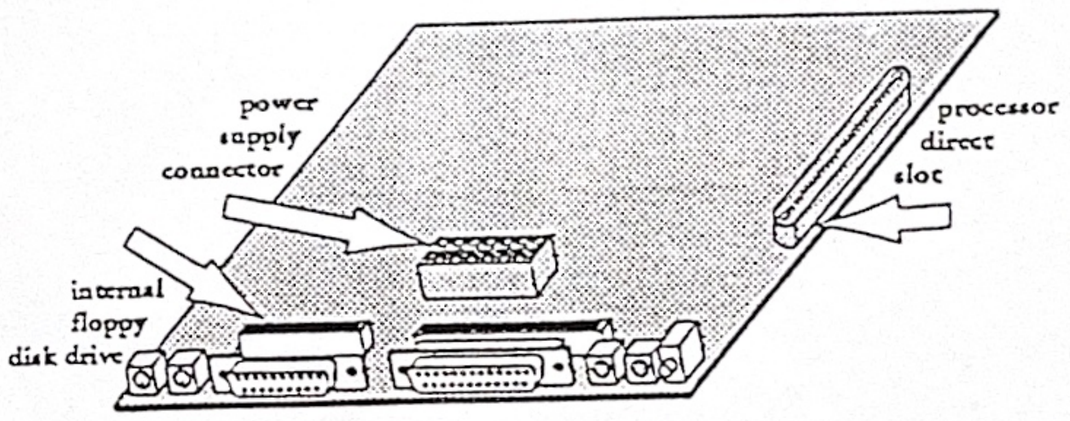


Figure 6 : Motherboard connectors

Step two:
Install NewLife memory

NewLife 33 must be configured with 4MB of RAM using four 1MB SIMMs. You must use 80ns or faster low-profile or surface-mount SIMMs.

Before you install the memory, place the NewLife board on your antistatic mat. Because the SIMM sockets are slanted, you must fill them from the outer edge and working towards the center. You must leave at least 512K on the SE motherboard. If you change the amount of memory on the motherboard see the Apple Technical Procedure Manuals for the correct motherboard jumper/resistor settings.

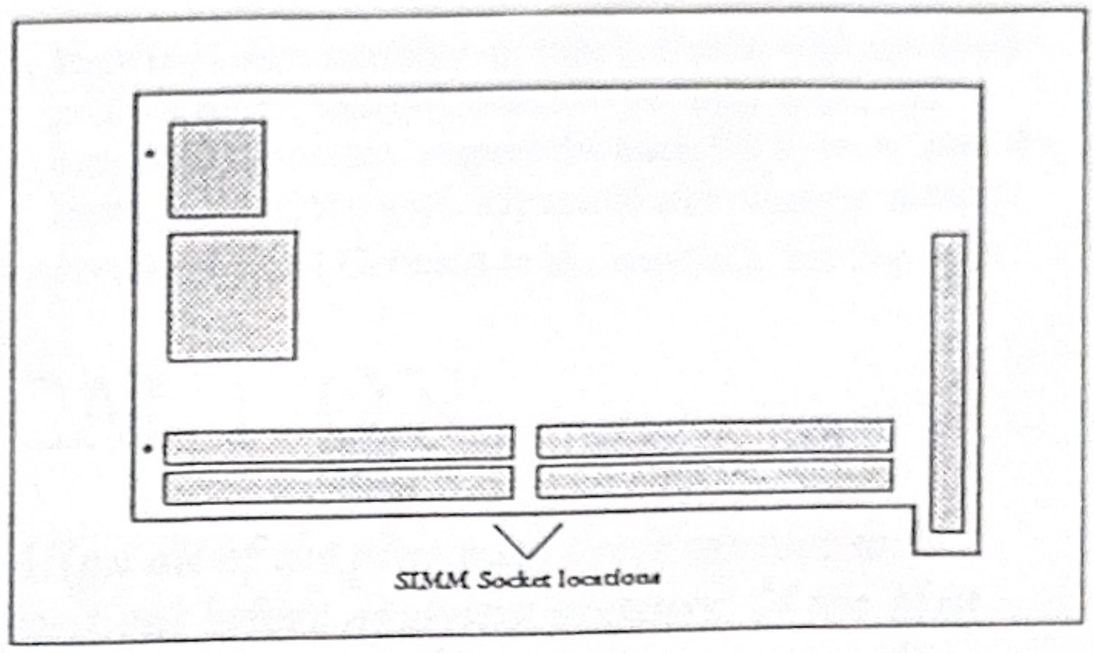


Figure 7 : SIMM socket locations

Step three
Attaching to the Macintosh motherboard

You install the NewLife board on top of the Macintosh motherboard — as shown in Figure 8. The 96-pin connector on the bottom of the NewLife board attaches to the Mac SE expansion connector.

Figure 8 : Positioning NewLife on the Mac

To attach the NewLife board:

1. Locate the holes in the motherboard for the NewLife standoffs. Attach the standoffs to the mother board.
2. Position the NewLife board above the Macintosh motherboard as shown in Figure 8. Before you apply any pressure, look between the two boards and make sure the NewLife connector is aligned with the SE expansion connector.

3. Place the entire assembly on your antistatic mat and apply pressure to the NewLife board — but only above the expansion connector. Inspect the assembly to make sure the NewLife board is completely seated and properly aligned.
4. Attach the NewLife board to the standoffs. See Figure 9.

CAUTION:

Align all of the pins with their correct socket positions before applying pressure. If the pins and socket are misaligned you can severely damage the board and pins and void your NewLife warranty.

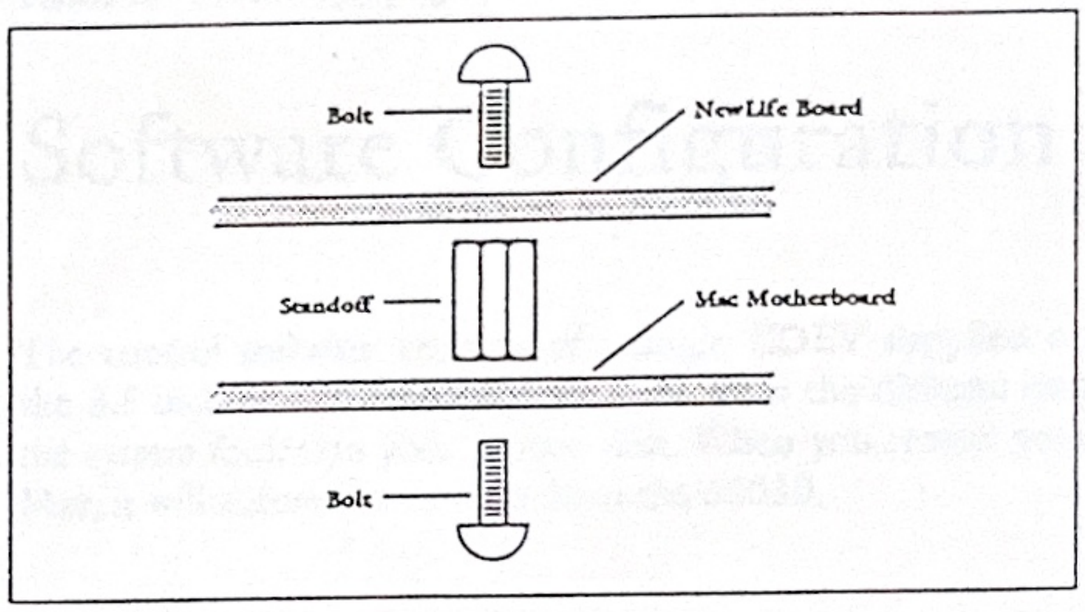


Figure 9 : Standoff installation - edge view

Step four
Replacing the motherboard in the Macintosh

When you removed the motherboard, you slid it out of the metal guides towards the back of the Macintosh. With the NewLife board attached, the assembly is too high to slide back into the Macintosh.

To replace the motherboard:

1. Place one edge of the motherboard in the metal guides with the motherboard about half an inch behind the plastic fron cover.
2. Use a flat tool – such as a small screwdriver – to carefully spread the metal guide frame away from the opposite edge of the motherboard. Push the motherboard into position and release the metal guide frame. The motherboard should be held securely by the guides.

3. Re-attach the internal floppy drive ribbon cable, the SCSI cable and the power/video cable. The cable connectors are keyed to prevent improper installation.
4. Close up the Mac case.

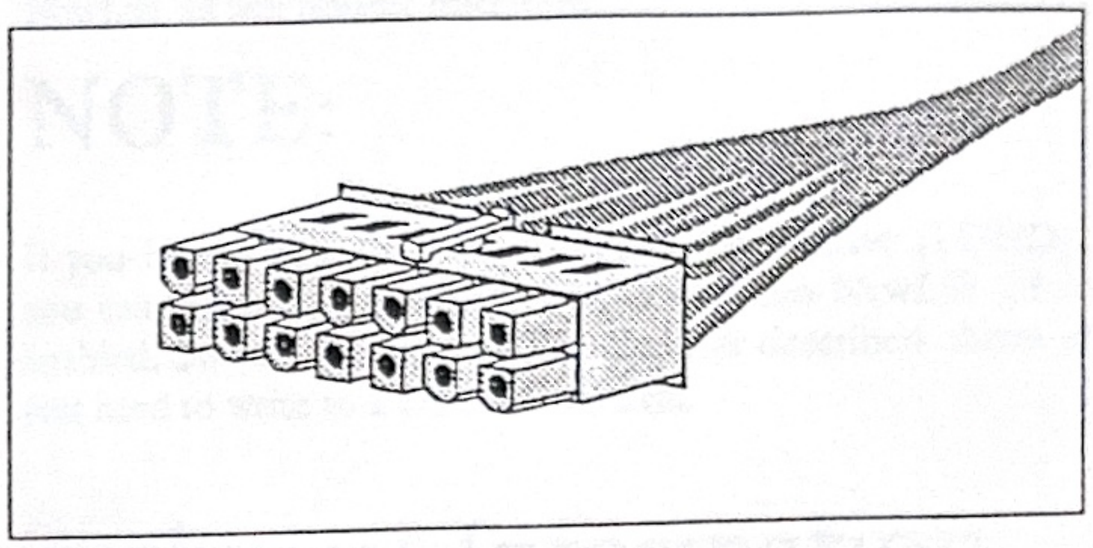


Figure 10 : Power supply plug

part 4

Software Configuration

Installing the Control Software

The control software consists of a single CDEV supplied on the 3.5 inch diskette. Copy the CDEV from the diskette into the system folder on your startup disk. When you restart your Mac, it will automatically boot from the 68030.

Booting in 68000 mode

Normally the Mac will boot up using the 68030 microprocessor. You can force the Mac to boot up using its original 68000 microprocessor. This temporarily disables NewLife 33 and renders any additional memory unusable.

To temporarily disable NewLife 33:

1. Select the Control Panel from the menu.
2. Select the NewLife 33 icon from the Control Panel.
3. Click in the box labelled "Turn off NewLife 33 on next restart".
4. Restart your Mac — it will boot from the original 68000.

NOTE:

As soon as you shut off your Mac and start up again the NewLife 33 will resume operation.

NOTE:

If you have a Mac SE with an Apple Super Drive (FDHD), you can not write to PC DOS diskettes when NewLife 33 is enabled. Switch to native 68000 mode as described above if you need to write to a PC DOS diskette.

part 5

Troubleshooting

Technical Information

Although NewLife is a complex piece of electronic hardware, it has been manufactured with great skill and care. In the unlikely event that you encounter a problem, follow these steps:

1. Note that some INITs can conflict with application programs and produce intermittent system failures. Verify that this type of software conflict is not the problem before you open up the Mac to check the hardware connections inside.
2. Scan the symptoms decribed in Table 3 (on the following pages) to identify the problem.
3. Follow the steps in Table 3 to remedy the problem and then test your system. If the remedy requires you to open the Mac case, observe the safety precautions described in Part 2 of this manual.
4. If you are still experiencing problems, or if the instructions in Table 3 tell you to do so, contact the Newbridge Microsystems factory technical support group for assistance.

Before you call for Technical Support, please fill in the form on this page.

For technical support call:

1 (800)267–7231
Monday to Friday,
from 09:00 to 5:00 Eastern Time
Fax: (613) 592-1320

Before you call:

Please fill in the form on this page. You must have the following information available to allow us to provide you with the best possible service if you call or address an enquiry to our office.

NewLife Problem Report

name of registered user		name of dealer
phone and/or fax no.		
NewLife product name	serial no.	
system version no.	finder version no.	multifinder version no.
applications in which problem occurs		
INITs in use when problem occurs		
description (include screen messages or numbers)		

Troubleshooting Guide

Symptom — On power up, nothing happens or screen is blank

Possible Problem and Suggested Remedy

- No power. Plug computer into a live outlet and turn it on.
- Memory problem. Ensure that NewLife has 4MB of memory installed and that the SE motherboardhas at least 512K of memory correctly installed and confirmed.
- Defective Mac. Remove NewLife board, reassemble Mac and restart. If Mac does not restart properly, it is defective – contact your Mac dealer or repair center.

Symptom — Sad Mac on power up

Possible Problem and Suggested Remedy

- Defective SIMM module(s). One or more of the SIMMs is defective. Contact your dealer for replacements.
- Mac with flashing '?'. Start up disk is not a system disk, or is defective. Restart with a functioning system disk.

Symptom — Intermittent Sad Mac or system bomb during operation

Possible Problem and Suggested Remedy

- See INIT warning at the beginning of this section.
- Excessive ambient operating temperature (temperature is above +40°C). Shut Mac off and let cool down, or move to a cooler operating environment.
- Intermittent connection between NewLife 33 and Mac Se motherboard. Carefully reseat the expansion connector.
- Excessive power supply loading. If you are driving too many peripherals with your power supply, you could be overloading the supply. Remove some peripherals or add a secondary supply.

Symptom

SCSI peripheral is not recognized or does not mount

Possible Problem and Suggested Remedy

- Peripheral software is incorrectly loaded or configured. Reload or reconfigure
- SCSI address on peripheral is incorrect. Refer to peripheral user manual for correct SCSI address.
- Improper SCSI chain termination. Check for missing terminating resistors on the last SCSI device in the chain. A set of terminating resistors should be installed on the last device in the chain.
- Too many terminating resistors. Remove any terminating resistors on SCSI devices which are not at the end of the SCSI chain. Only the final device in the chain should be equipped with termination resistors.
- Bad connection in SCSI cable between Mac and peripheral. Replace SCSI cable.

NewLife 33
Technical Specifications

System Requirements

- Mac SE

Hardware

- CMOS 68030 CPU, 33.333 MHz
- CMOS 68882 numeric co-processor, 33.333 MHz
- 64-pin expansion connector

Wait states

- 0 wait states on SE bus with 80ns or faster SIMMs

Power

- Mac internal power supply
- Voltage Required: 5 V
- Power Consumption:
  Typical 17 Watts with four 1MB SIMMs
  Max 25 Watts with four 1MB SIMMs

Software controls

- CDEV to select processor

Environmental

- Operating temperature: 10° to 35°C, 50° to 95°F
- Storage temperature: –40° to 50°C, –40° to 122°F
- Humidity: 5% to 90% RH non-condensing

Compatibility

Compatible with Apple HD20/SC, SCSI disk drives, LaserWriter, AppleTalk and standard Macintosh software. For supplementary information, contact your dealer or Newbridge Microsytems technical support group.

The NewLife product family

Whether you need a SCSI port, more memory, a larger monitor or massive computing power, Newbridge Microsystems has a NewLife product for your Mac. Brief descriptions of the NewLife products are provided below. If you require more information, please see your local dealer or contact us directly.

NewLife 1

Designed for the 128K, 512K and 512Ke Macs, NewLife 1 provides a SCSI port, a flexible memory upgrade to 4MB using 256KB or 1MB SIMMs (or both) with the overall performance of a Mac SE.

NewLife 2

NewLife 2 includes all the features and capabilities of NewLife 1 and adds a versatile video adapter. It uses a configurable DB-9 TTL PC compatible video connector, so you can attach a variety of large monochrome monitors (including multiscanning types) to increase your viewing window size.

NewLife 25

There are two versions of NewLife 25 available. One is designed for the 128K, 512K, 512Ke, and Mac Plus. The second is designed for the Mac SE. NewLife 25 accelerates your Mac with the power of the 68030 microprocessor and the 68882 floating point math co-processor, both running at 25MHz. Four SIMM sockets allow memory expansion in 1MB or 4MB increments.

NewLife 25 for the 128K, 512K, and Plus models provides a 64-pin expansion connector to accommodate additional boards. An optional SCSI port is available for 128K, 512K and 512Ke Macs which attaches to this connector.

NewLife 25 for the Mac SE attaches to the 96-pin SE bus. It provides a flow-through SE bus expansion connector, which accepts the NewLife Video board.

NewLife Video

NewLife Video for the Mac SE provides a flexible, low-cost solution that allows you to add a larger monitor to your SE system. NewLife Video incorporates a custom video controller ASIC. It can use many of the inexpensive third party monochrome monitors available today, including multiscanning monitors. NewLife Video connects directly to the SE bus and comes complete with software that lets you configure the monitor and screen attributes. Of course, NewLife Video is completely compatible with NewLife 33, and the two make a powerful, productive team.