

NewLife 25

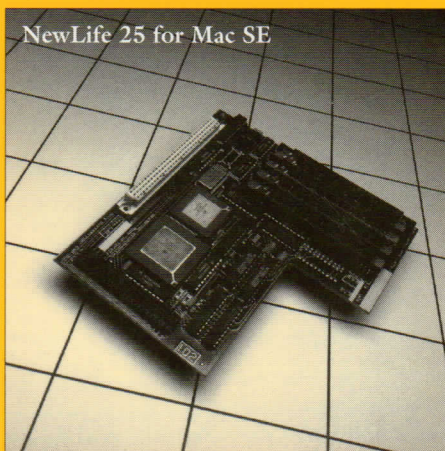
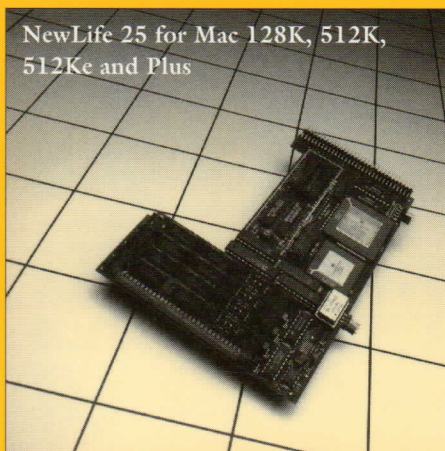
system upgrade

for

Mac 128K Mac Plus

Mac 512K Mac SE

Mac 512Ke



User guide and
installation manual

NewLife™

NewLife 25

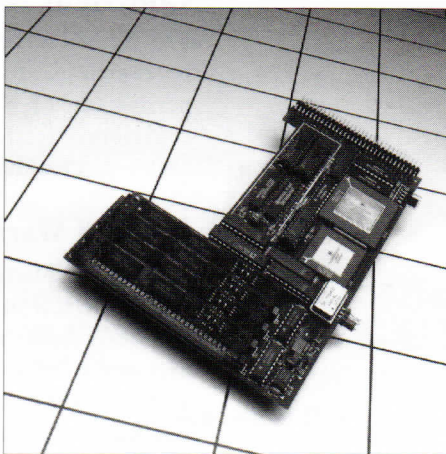
system upgrade

for

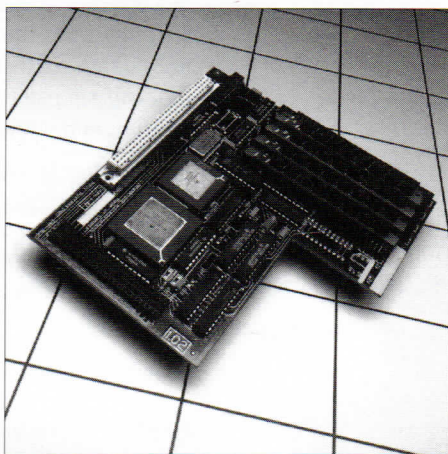
Mac 128K Mac Plus

Mac 512K Mac SE

Mac 512Ke



NewLife 25 for Mac 128K, 512K,
512Ke and Plus



NewLife 25 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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(90 08 29)

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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

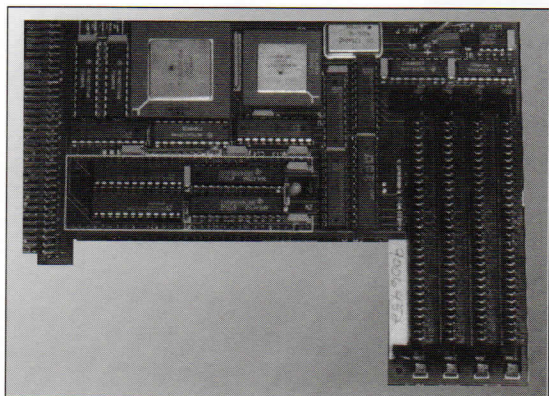
The NewLife 25 system upgrade

Congratulations!

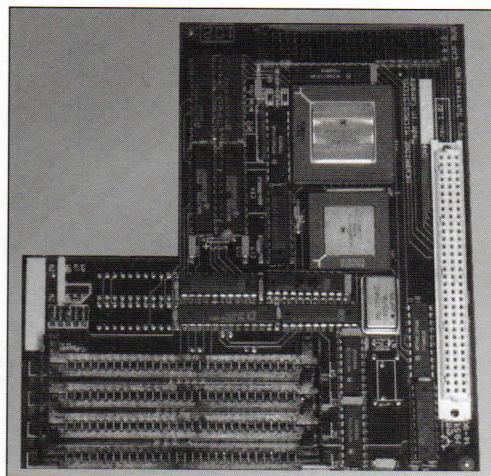
We're glad you've chosen to give **NewLife™** to your Mac with a Newbridge Microsystems **NewLife 25** system upgrade. We're sure you'll be pleased with the improved performance and capabilities of your enhanced Mac.

There are two versions of the **NewLife 25**. One is designed specifically for the Mac 128K, 512K, 512Ke, and Plus. The other is designed for the Mac SE. **NewLife 25** gives your Mac six times the computing power of a standard Mac SE and supports up to 4MB of RAM and virtual memory with up to 12 (additional) Megabytes is supported via the use of Virtual™ by Connectix. **NewLife 25** has an optional SCSI port available which enables the Mac 128K, 512K, and 512Ke to use hard disks and other SCSI devices.

With the **NewLife 25** you can run applications that require more processor speed or memory, and you can use fast SCSI hard disks to quickly access large amounts of data. **NewLife 25** really does **give a new life to your old Mac** and allows you to stay productive in today's rapidly changing software environment.



*Figure 1a: NewLife 25Plus system upgrade
for the Mac 128K, 512K, 512Ke and Plus*



*Figure 1b: NewLife 25SE system upgrade
for the Mac SE*

NewLife 25 features and benefits

- **NewLife 25** is installed using a “pin kit” or the Killy clip on the Macintosh 68000 CPU. This is a simple, reliable, method of attachment.
- **NewLife 25** features a flexible memory expansion structure using SIMM technology. You can use either 256K or 1Mb SIMMs to provide either 1Mb or 4Mb of system memory.
- **NewLife 25** supports virtual now through “Virtual™” by Connectix.
- **NewLife 25** is compatible with Apple’s proposed System 7.
- **NewLife 25** has an optional SCSI port available for Mac 128K, 512K, and 512Ke upgrades.
- **NewLife 25** is powered by a 25 MHz 68030 CPU and 68882 FPU co-processor pair for lightning fast operation.
- **NewLife 25** gives you the performance of a Mac IIci 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 the **NewLife 25 system upgrade**.

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 the **NewLife 25** yourself, *read the safety precautions in part 2.*

part 3 of this manual contains the installation steps for the **NewLife 25Plus** on a Mac 128K, 512K, 512Ke, and Plus.

part 4 contains the installation steps for the **NewLife 25SE** on a Mac SE.

part 5 describes the installation and configuration of the desk accessory and application of the **NewLife 25** control software.

If you follow the steps carefully, you shouldn’t have any problems with your new **NewLife 25 system upgrade** but just in case you do, **part 6** 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 25 board.



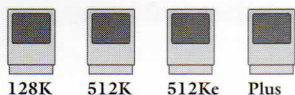
To prevent static damage, take the following precautions:

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

Gather the tools you will need

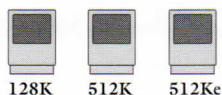
- CRT discharge tool
- Macintosh case opening tool or equivalent (also known as the pull-apart tool)
- 12-inch T-15 Torx screwdriver or equivalent
- Safety goggles
- Regular flat-blade screwdriver
- Phillips screwdriver (for SCSI option)
- Antistatic wrist strap
- Cotton swabs and alcohol
- Utility knife for the **NewLife 25** SCSI port installation
- Soft cloth or foam pad
- Soldering iron and solder (for pin mount only)

Check the package contents



If you have purchased the **NewLife 25Plus** for the Mac 128K, 512K, 512Ke and Plus, the package should contain:

- **NewLife 25Plus** board (Mac 128K, 512K, 512Ke, Plus)
- Killy clip with installation sheet
- Pin kit
- Wiring harness
- Fan kit
- 3.5 inch diskette with control software
- User Guide & Installation Manual (this book)



If you have purchased the optional **NewLife 25 SCSI port** for the Mac 128K, 512K, and 512Ke, the package should also contain:

- NewLife SCSI port board
- Replacement battery cover loosely attached to the DB-25 SCSI connector with 2 screws
- SCSI grounding wire
- Internal SCSI cable



If you have purchased the **NewLife 25SE** for the Mac SE, the package should contain:

- **NewLife 25SE** board (Mac SE)
- 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

Installing the NewLife 25Plus on the Mac 128K, 512K, 512Ke, and Plus

Orienting the NewLife 25Plus



Figure 2 is a simplified top view of **NewLife 25Plus**. It shows the relative locations of the SIMM sockets, the configuration jumpers, the power supply adjustment LEDs, and the header for the optional SCSI port board.

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

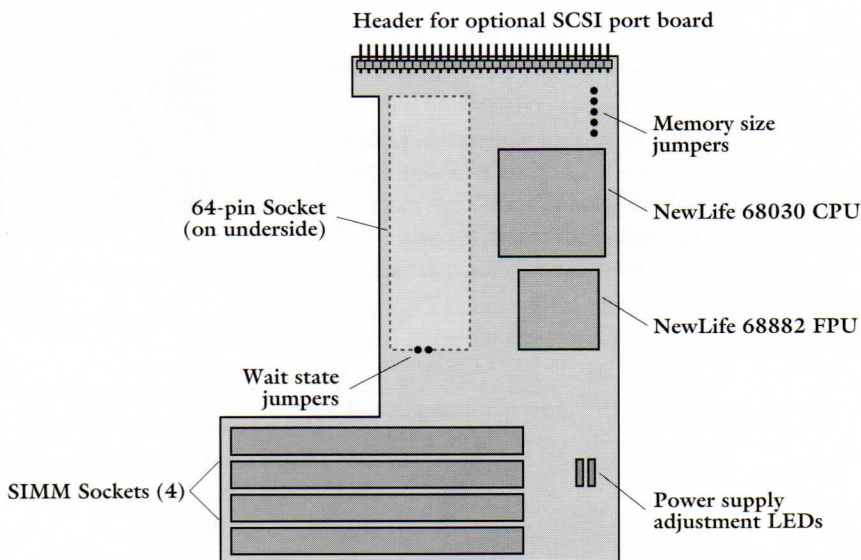


Figure 2 : Simplified top view of NewLife 25Plus

Five easy installation steps

You install the **NewLife 25Plus** in five easy steps:

- Step one: **Open the Macintosh case; remove the motherboard;**
- Step two: **Set the NewLife 25Plus configuration jumpers and install the memory;**
- Step three: **Attach NewLife 25Plus to the Macintosh motherboard;**
- Step four: **Replace the Macintosh motherboard and adjust the power supply, if necessary;**
- Step five: **Attach the SCSI cable 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. Disconnect the keyboard.
3. Remove the reset/interrupt switch (if installed) from the side of the case by prying it off with a small flat-blade screwdriver, as illustrated in Figure 3.

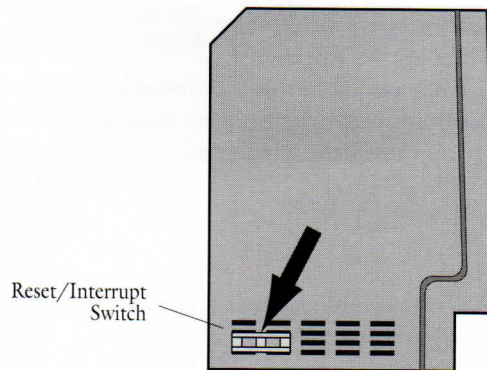


Figure 3 : The reset/interrupt switch

4. Remove the battery compartment cover from the back of the case;
5. To avoid scratching the bezel, place the computer face down on a soft cloth or foam pad;
6. Use a Torx screwdriver to remove the five screws from the back of the Mac. Note that one of the screws is inside the battery compartment.

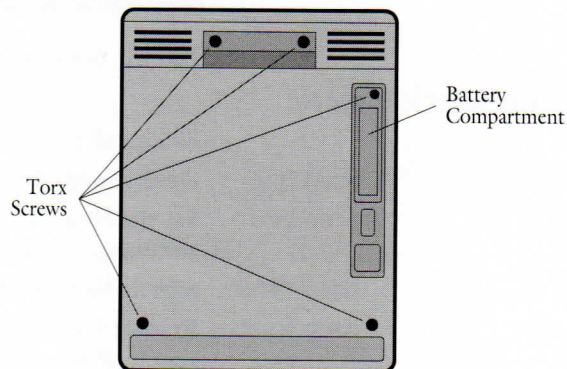


Figure 4 : The back of the Macintosh

7. 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!
8. 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 grounding 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 three, to be sure the CRT is discharged.
5. Remove the alligator clip from the ground lug.

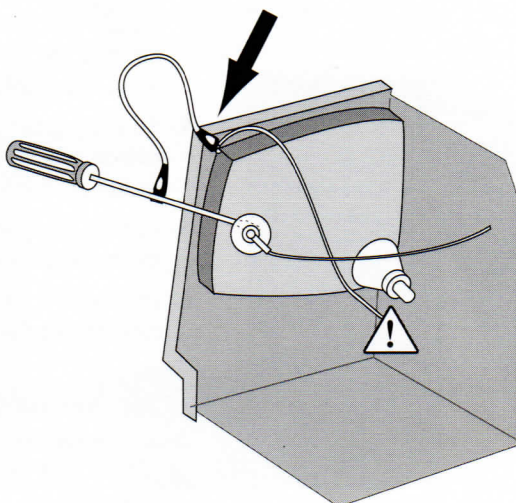


Figure 5 : Discharging the CRT anode



To remove the Macintosh motherboard:

1. To prevent static damage to your Mac or NewLife 25, 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.

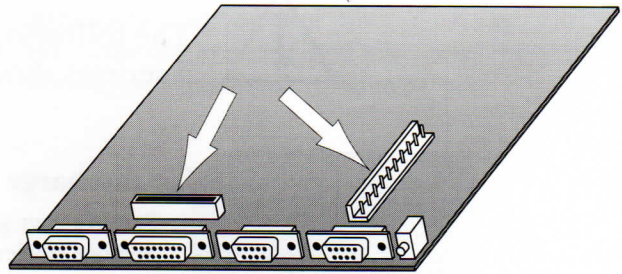


Figure 6 : Motherboard connectors for Mac 128K, 512K and 512Ke

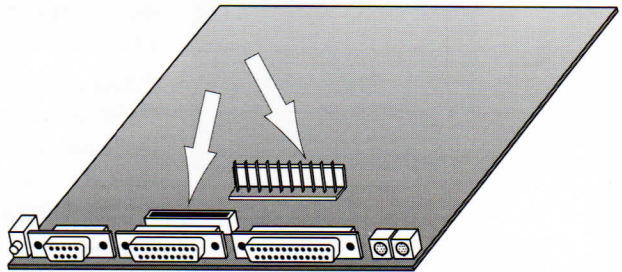


Figure 7 : Motherboard connectors for Mac Plus

3. To unplug the power/video connector, grasp the wire bundle and gently pull it away from the board. Care must be taken as the connection may release suddenly causing your hand to strike the CRT neck, breaking the vacuum seal.
4. To unplug the internal floppy drive connector, grasp the ribbon cable assembly cable and gently pull it out of the socket on the board.
5. Lay the Mac face down (on your foam pad) and slide the motherboard up and out of the case.
6. Put the Mac aside in a safe location, and place the motherboard on your antistatic mat.



If you are adding NewLife to an unenhanced Mac 128K or Mac 512K, you must install an Apple 128KB ROM kit upgrade first. The Mac 512Ke already has the 128KB ROMs installed.

Step two

Install and configure NewLife memory

The NewLife board can be configured with 1MB of RAM using four 256KB SIMMs or with 4MB of RAM using four 1MB SIMMs. (Although **NewLife 25** can be configured with 0MB of RAM, it is not recommended. The 16-bit data bus in the Mac motherboard provides much poorer performance than the 32-bit data bus on **NewLife 25**) You must set two groups of jumpers to configure NewLife:

- the wait state jumper
- the memory size jumper block

The settings used for these jumpers depends on the amount and type of memory you install.

NewLife 25 is built to accommodate four SIMMs for memory upgrade. You must use low-profile or surface-mount SIMMs which are rated at the following speed:

- for 1 wait state 70ns or faster
- for 2 wait states 110ns or faster

To install the memory:

1. Place the NewLife board on your antistatic mat.
2. Set the wait state jumper to correspond to the type of memory you are installing as shown in Figure 8.
3. Set the memory size jumper to correspond to the amount of memory you are installing as shown in Figure 9.
4. Install the SIMMs. **Because the SIMM sockets are slanted, you must fill them starting at the center of the board, working towards the outer edge.**

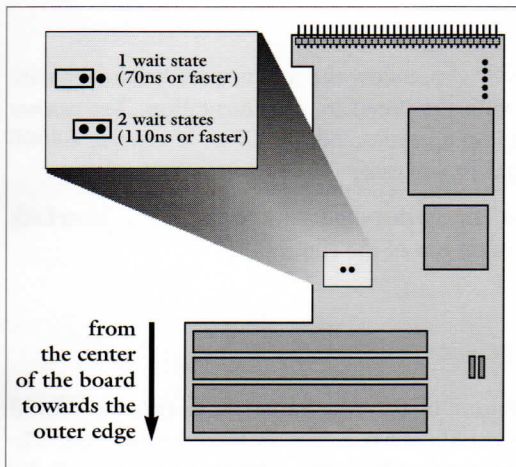


Figure 8 : The wait state jumper

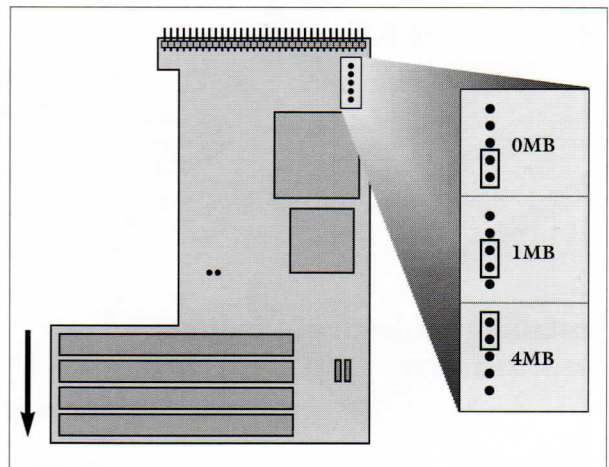


Figure 9 : The memory size jumpers

Step three

Attaching to the Macintosh motherboard

You install the **NewLife 25Plus** board on top of the Macintosh motherboard, as shown in Figure 10. The 64-pin connector on the bottom of the **NewLife 25Plus** board attaches to the Macintosh 68000 CPU. Using alcohol and cotton swabs, clean each pin on the 68000 CPU before proceeding. The installation is done in one of two ways:

1. With a “Killy clip”;
2. With soldered pin mounts (required for a ceramic 68000 CPU).

A ceramic 68000 has a gray or light brown case.

A plastic 68000 has a black case.

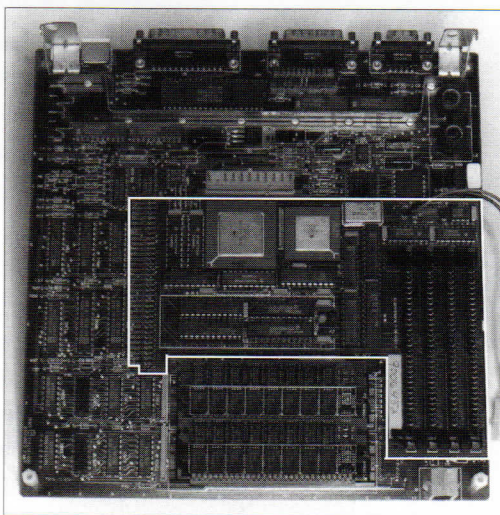


Figure 10 : Positioning the NewLife 25Plus on the Mac motherboard

Installing the Killy clip



To install the Killy clip, follow the instructions on the separate sheet enclosed with the **NewLife** documentation. *You cannot use the Killy clip on a ceramic 68000 CPU.* A ceramic 68000 has a gray or light brown case.

Once the Killy clip is installed you connect the **NewLife** board to the pins on top of the clip.

Installing soldered pin mounts, *an alternative*

Some early versions of the Macintosh have ceramic 68000 CPUs. A ceramic 68000 has a gray or light brown case. *The Killy clip does not work with ceramic 68000s.* You must use the soldered pin mount technique.

DO NOT attempt this procedure unless you are familiar with correct soldering techniques for multilayer boards. Good soldering skills and equipment are required to successfully complete this procedure. You must use a strong soldering iron (we recommend a 40 watt iron) as the 68000 case is an excellent heatsink.

To install the pin mounts:

1. You must solder header-strips onto the pins of the Macintosh CPU. Two 32-pin header strips are supplied, mounted under a 64-pin socket as shown in Figure 11. The 64-pin socket is only used as a carrier for the header strips to simplify the soldering procedure — once you are done, discard the socket.
2. Straddle the header strips and socket assembly over the Macintosh 68000 CPU.
The header strip pins must each slide down the side of one of the 68000s pins. The socket pins must be pointing upwards — away from the board.
3. Carefully solder each of the header strip pins to the Macintosh 68000 CPU. *Remove any flux residue and check for bad solder joints or solder bridges. **Poor soldering can prevent proper operation of the Macintosh — it may not even boot up.***
4. Remove and discard the 64-pin socket. The two header strips are now attached to the 68000 with their pins pointing upwards. You will connect the NewLife board to these pins.

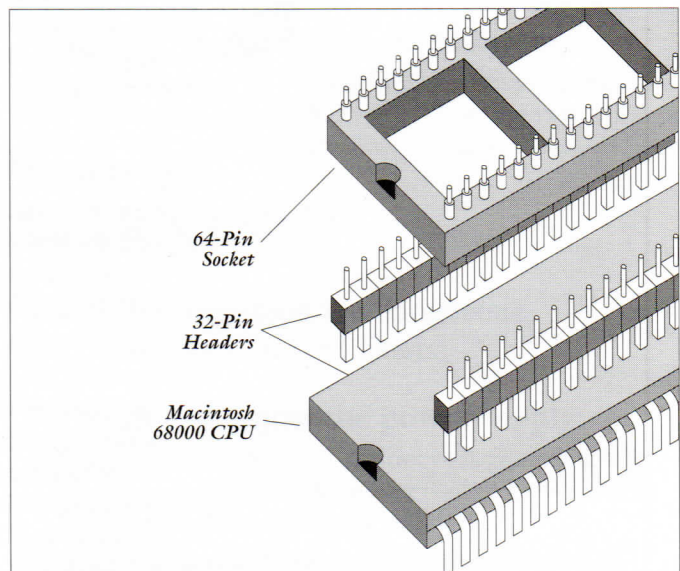


Figure 11 : Exploded view of the pin mount

Attaching the NewLife board



The 64-pin socket on the bottom of the NewLife board connects to the pins on the Killy clip — or to the header strip pins if you used the soldered pin mount procedure.

Position the NewLife board above the Macintosh motherboard as shown in Figure 10. *Before you apply any pressure, look between the two boards and make sure all of the pins are aligned with the socket.*

Place the entire assembly on your antistatic mat and apply pressure to the NewLife board — **but only above the socket location**. After the pins are seated in the socket, inspect the assembly to make sure the NewLife board is completely seated and properly aligned.

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.

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 keyboard connector toward the front of the computer about half an inch behind the plastic front cover. Feed the accelerator power cable up through the large hole in the center of the chassis frame.
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. Push the motherboard down to seat the rear metal brackets. The motherboard should be held securely by the guides.
3. Re-attach the internal floppy drive ribbon cable.

4. Unplug and completely remove the original Macintosh power/video wiring harness from the video board (the vertical board at the side of the Mac).
5. Replace the original Macintosh wiring harness with the NewLife harness. Attach it to the video board and to the motherboard. The end of the harness that has the ferrite cylinder goes into the motherboard.
6. Connect the lead from the NewLife board to the cable on the NewLife harness nearest to the motherboard.

CAUTION:



The power lead connectors were designed to fit only in one configuration. If the connectors don't mate easily, stop and verify what you are doing. Don't force the connectors.

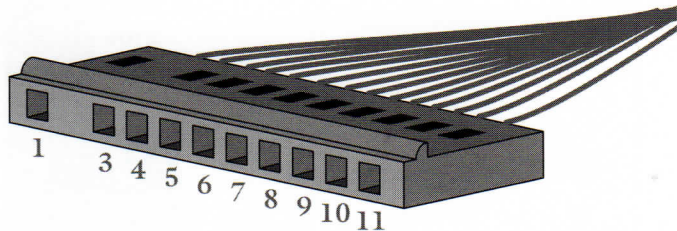


Figure 12 : Power supply plug

Adjust the power supply, if necessary

The Macintosh has an adjustable power supply designed to operate between 4.9 and 5.0 volts. There are two LEDs on NewLife that make power supply adjustment fast and easy (Figure 13).

WARNING!



The following steps are dangerous, a serious shock hazard exists!

To check and adjust the power supply:

1. Noting the warning above, remove your grounding wrist strap and reconnect the AC power cord to the Macintosh.
Keep your hands away from the machine!
2. Observe the red and yellow power supply adjustment LEDs. If neither one is illuminated, no adjustment is necessary (Figure 13).

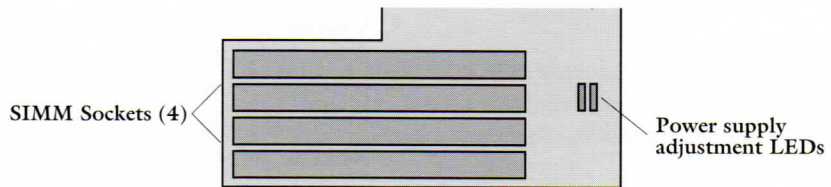


Figure 13 : Power supply adjustment LEDs

3. If adjustment is required, turn the voltage set screw on the side of the power supply until both LEDs go out. The set screw is clearly labelled on the plastic power supply shield.
4. Disconnect the AC power cord. *Hazardous voltages may still be present even after disconnecting the AC power!*

Install the fan assembly

The fan assembly is installed behind the internal disk drive attached to the metal chassis at the back of the Mac.

1. Attach the fan to the bracket with two bolts and nuts. The arrow on the fan showing the direction of air flow, should be pointing up as illustrated in Figure 14.

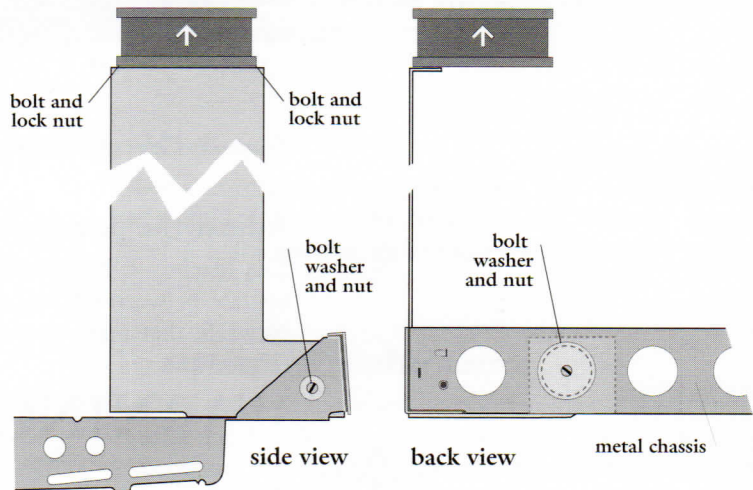


Figure 14 : The fan assembly installation

2. Mount the bracket on the chassis with two bolts, washers and nuts, on the side and at the back, as illustrated.
3. Connect the fan power leads to the NewLife harness.
4. If you have not purchased the optional SCSI port, the installation is complete — you can close up the Mac case. If you did purchase the SCSI port, install it as described on page 17, before you close up the case.

Step five

Install the SCSI port (optional)

The SCSI cable and connector assembly is shipped loosely attached to the battery door connector. Tighten the connector assembly.

The cable is designed to run out of the Macintosh battery door. You must remove a small part of the plastic ridge on the battery compartment opening to make room for the cable. Use a sharp utility knife to trim away 1.25 inches of the ridge as shown in Figure 15. Make sure to remove any rough edges that could damage the cable.

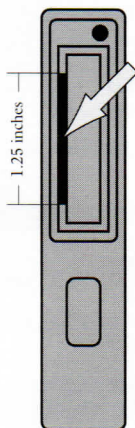


Figure 15 :
Remove 1.25 inches of the battery compartment ridge

The NewLife SCSI option is installed vertically through a cut-out on the chassis. Carefully insert the NewLife SCSI port into the hole and press the 64-pin receptacle on the NewLife SCSI onto the **NewLife 25** 64-pin header.



CAUTION:

Be careful not to lift the NewLife 25 off its mount.

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

Place the 25-pin D connector on top of the battery, laying the cable towards the trimmed edge of the battery compartment. At the back of the Mac there is a wire cable which grounds the analog board to the chassis. It is screwed into the chassis directly above the spot marked with the symbol $\frac{1}{2}$.

Using a Phillips screwdriver, remove this screw. Feed the loose end of the SCSI ground wire down to the chassis. Replace the screw placing both the SCSI ground and analog board ground together onto the screw and re-attach. Attach the rectangular black connector on the end of the SCSI ribbon cable to the header of the NewLife SCSI board. The cable connector is keyed to prevent improper installation. You can now close up the Mac case.

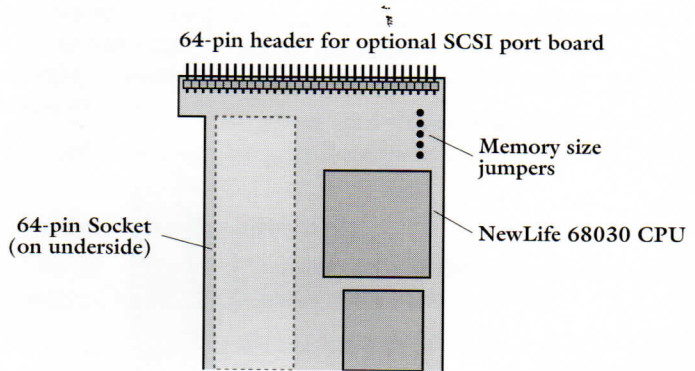


Figure 16 : The SCSI port board header

SCSI configuration

The SCSI port provides optimum performance with SCSI hard disk drives when the hard disk driver is configured in Handshake Mode. Your hard disk driver software may allow you to set this option — refer to your hard disk user manual. You can also use a SCSI manager application program such as Silverlining™ to set this mode.



CAUTION:

Do not configure for Blind Transfer Mode. This mode gives very poor hard disk performance, or no hard disk response at all.

The last device in the SCSI chain should be equipped with termination resistors. If the terminators are missing, SCSI peripheral behaviour may be unpredictable, or the system may not recognize the peripheral.

There should be only one set of termination resistors in the SCSI chain. More than one set may cause problems. If SCSI problems arise in your system, carefully check for terminating resistors. Refer to the user guides for each SCSI device to determine if the resistors are installed.

part 4

Installing NewLife 25SE on the Mac SE

Orienting the NewLife 25SE for the Mac SE

Figure 16 is a simplified top view of the **NewLife 25** for the Mac SE. It shows the relative locations of the SIMM sockets, the configuration jumpers, 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.

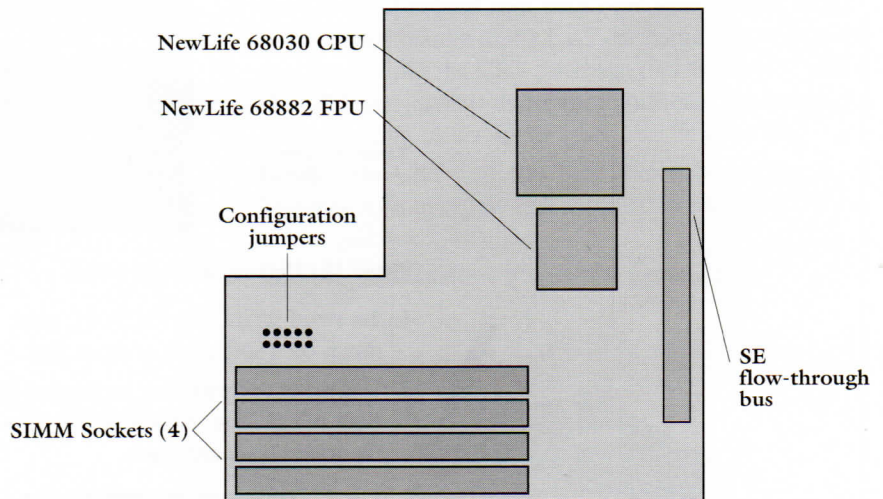


Figure 17 : Simplified top view of NewLife 25 for the SE

Four easy installation steps

You install the NewLife 25SE in four easy steps:

- Step one: Remove the Macintosh motherboard.
- Step two: Set the NewLife 25SE configuration jumpers and install the memory.
- Step three: Attach the NewLife 25SE to the Macintosh motherboard.
- Step four: Replace the Macintosh motherboard and close up the case.

part 4

Installing NewLife 25SE on the Mac SE

Orienting the NewLife 25SE for the Mac SE

Figure 16 is a simplified top view of the **NewLife 25** for the Mac SE. It shows the relative locations of the SIMM sockets, the configuration jumpers, 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.

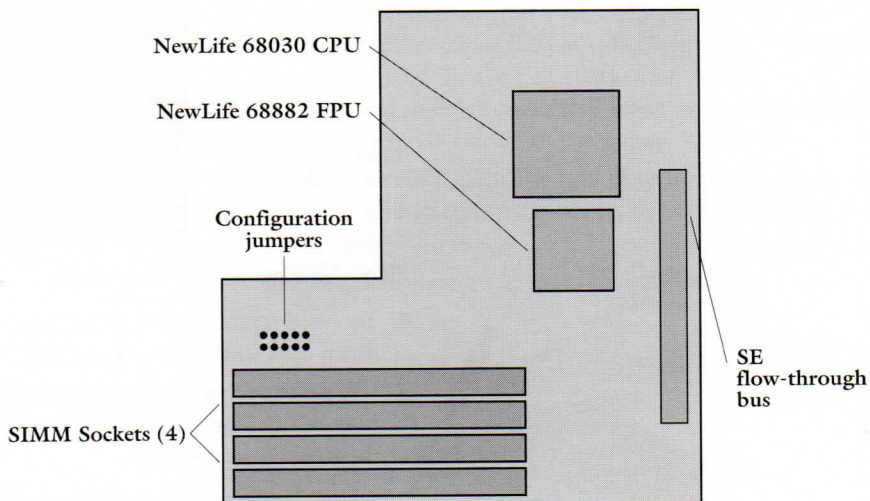


Figure 17 : Simplified top view of NewLife 25 for the SE

Four easy installation steps

You install the NewLife 25SE in four easy steps:

- Step one: Remove the Macintosh motherboard.
- Step two: Set the NewLife 25SE configuration jumpers and install the memory.
- Step three: Attach the NewLife 25SE 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 SE 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.

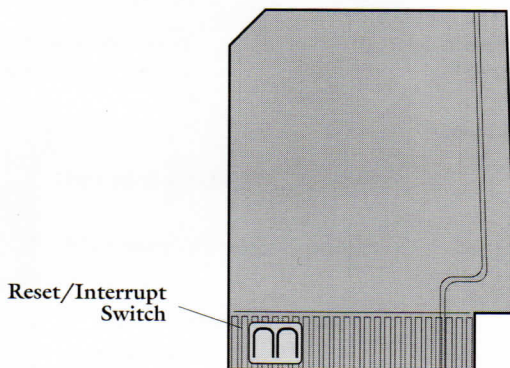


Figure 18 : The reset/interrupt switch

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.

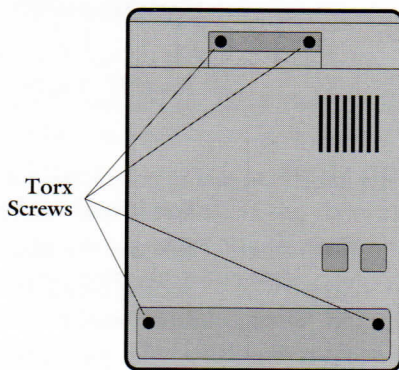


Figure 18 : The back of the Macintosh SE

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 grounding 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 19. *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 three, to be sure the CRT is discharged.
5. Remove the alligator clip from the ground lug.

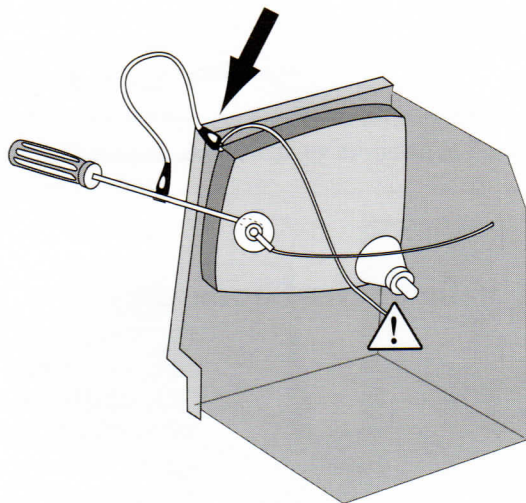


Figure 20 : Discharging the CRT anode



To remove the Macintosh motherboard:

1. To prevent static damage to your Mac or NewLife 25SE, 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.

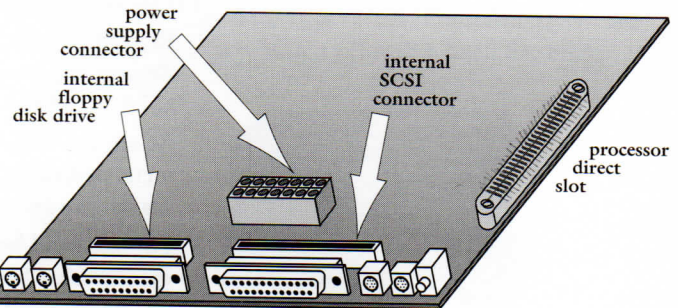


Figure 21 : Motherboard connectors for the Mac SE

3. To unplug the power/video connector, grasp the wire bundle and gently pull it away from the board. Care must be taken as the connection may release suddenly causing your hand to strike the CRT neck, breaking the vacuum seal.
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. Lay the Mac face down (on your foam pad) and slide the motherboard up and out of the case.
6. Put the Mac aside in a safe location, and place the motherboard on your antistatic mat.

Step two Install and configure NewLife memory

The NewLife board can be configured with 1Mb of RAM using four 256KB SIMMs or with 4Mb of RAM using four 1Mb SIMMs. (Although **NewLife 25** can be configured with 0Mb of RAM, it is not recommended. The 16-bit data bus in the Mac motherboard provides much poorer performance than the 32-bit data bus on **NewLife 25**.) You must set two groups of jumpers to configure NewLife:

- the wait state jumper
- the memory size jumper block

The settings used for these jumpers depends on the amount and type of memory you install.

NewLife 25 is built to accommodate four SIMMs for memory upgrade. You must use low-profile or surface-mount SIMMs which are rated at the following speed:

- for 1 wait state 70ns or faster
- for 2 wait states 110ns or faster

To install the memory:

1. Place the NewLife board on your antistatic mat.
2. Set the wait state jumper to correspond to the type of memory you are installing as shown in Figure 22.

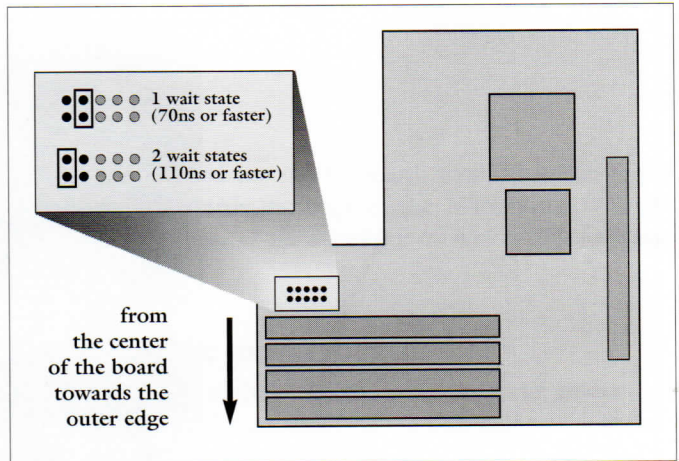


Figure 22 : The wait state jumper

3. Set the memory size jumper to correspond to the amount of memory you are installing as shown in Figure 23.

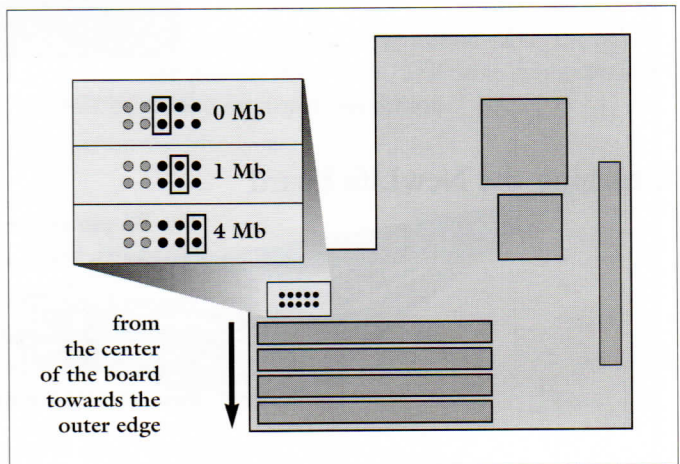


Figure 23 : The memory size jumpers

4. Install the SIMMs. Because the SIMM sockets are slanted, you must fill them starting at the center of the board, working towards the outer edge.

Step three Attaching to the Macintosh motherboard

You install the **NewLife 25SE** board on top of the Macintosh motherboard — as shown in Figure 23. The 96-pin connector on the bottom of the NewLife board attaches to the Mac SE expansion connector.

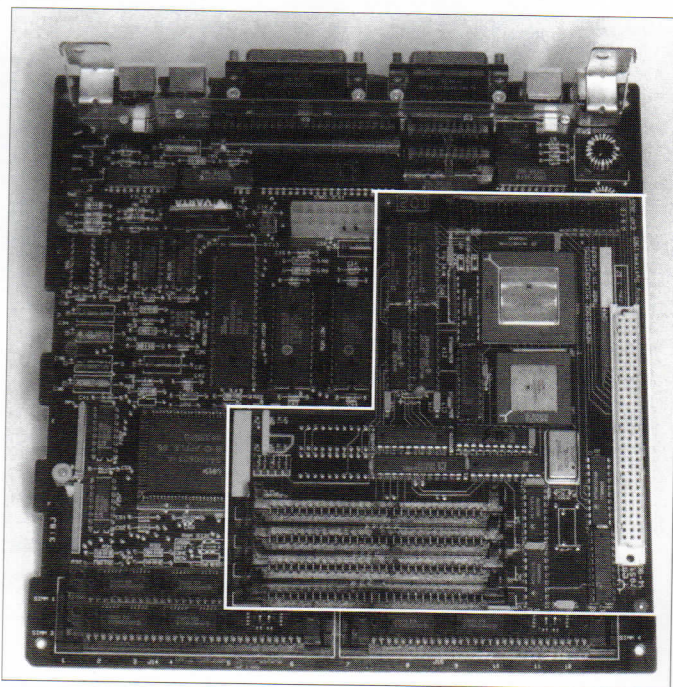


Figure 24: Positioning the NewLife 25SE on the Mac motherboard

Attaching the NewLife board

The 96-pin connector on the bottom of the **NewLife 25SE** board attaches to the Mac SE expansion connector.

Position the **NewLife 25SE** board above the Macintosh motherboard as shown in Figure 24. *Before you apply any pressure, look between the two boards and make sure all of the pins are aligned with the socket.*



Place the entire assembly on your antistatic mat and apply pressure to the NewLife 25SE board — *but only above the socket location*. After the pins are seated in the socket, inspect the assembly to make sure the NewLife 25SE board is completely seated and properly aligned.

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.



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 front 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.

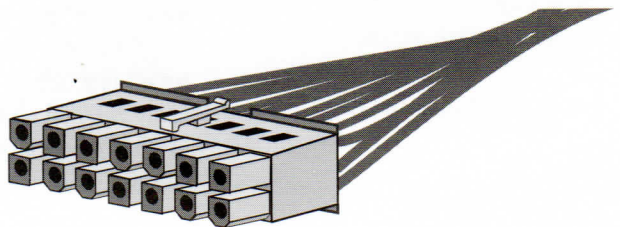


Figure 25 : Power supply plug

part 5

Software Configuration

Booting in 68000 mode

Normally the Mac will boot up using the 68030 microprocessor. If you have a programmer's switch installed on your Mac, you can force the Mac to boot up using its original 68000 microprocessor. This temporarily disables **NewLife 25** and renders any additional memory unusable.

To temporarily disable NewLife 25:

1. Turn on the Mac and simultaneously press the **RESET** and **INTERRUPT** buttons on the programmer's switch.
2. Continue to hold the **INTERRUPT** button down, but release the **RESET** button.
3. When you hear the familiar Mac startup beep sound, release the **INTERRUPT** button. The Mac is now running in native 68000 mode.

To re-enable NewLife 25:

1. Simply restart by selecting the Shutdown or Restart option from the Special menu in the Finder.

NOTE:

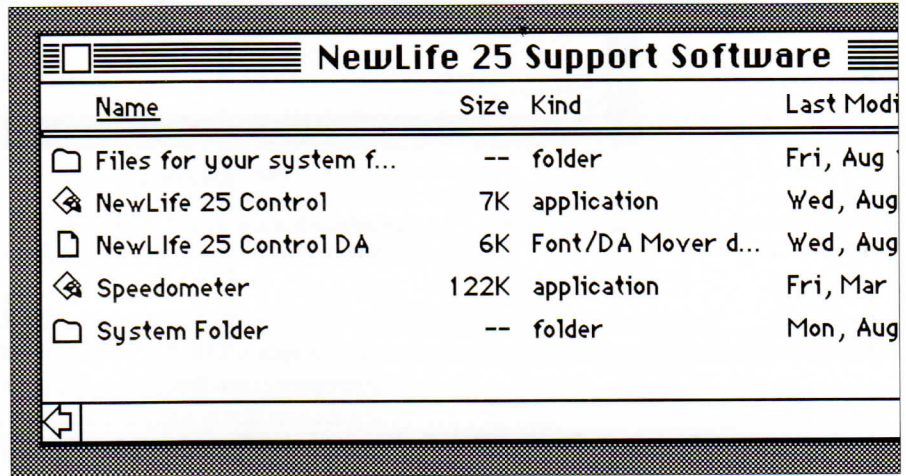
If you have a Mac SE with an Apple Super Drive (FDHD), you cannot write to PC DOS diskettes when the **NewLife 25** is enabled. Switch to native 68000 mode as described above if you need to write to a PC DOS diskette.

Installing the Control Software

The control software consists of three files that are used to control the various features of the **NewLife 25** system upgrade. On the support software disk is an application called **NewLife 25 Control**. This application gives the user control of the features installed by the **NewLife 25 Init** and **NewLife 25 Startup** files. With this application you can easily turn on and off the various features of the **NewLife 25** as well as specify whether or not you want those features automatically invoked each time you reboot your computer.

Note:

Protect yourself against disk driver incompatibility. Backup the files on your mass storage device (hard drive) before continuing. Though the majority of hard disk systems available today are compatible with the **NewLife 25**, it is always important to maintain a current backup of your hard disk.



Name	Size	Kind	Last Modified
Files for your system f...	--	folder	Fri, Aug
NewLife 25 Control	7K	application	Wed, Aug
NewLife 25 Control DA	6K	Font/DA Mover d...	Wed, Aug
Speedometer	122K	application	Fri, Mar
System Folder	--	folder	Mon, Aug

Figure 26 : Support software disk

To install the Newbridge Systems Control software:

1. Remove any earlier versions of the control software from your startup disk. This includes the files **NewLife 25 Init** and **NewLife 25 Startup** in the System folder.
2. Reboot your Mac from the NewLife Systems support software diskette. If the Mac does not boot, refer to the troubleshooting section.
3. Locate the folder called "Files for your System Folder" on the support software diskette. Open this folder and copy the files **NewLife 25 Init**, **NewLife 25 Startup**, and **AppleTalk** into the System folder of your startup disk.
4. Copy the **NewLife 25 Control** application to any location on your startup disk.

Files for your system folder				
Name	Size	Kind	Last Modified	
NewLife 25 Init	12K	Startup document	Wed, Aug	
AppleTalk	11K	System document	Thu, May	
NewLife 25 Startup	5K	application	Wed, Aug	

Figure 27 : Support software disk

5. Locate the file called **NewLife 25 Control DA** on the **NewLife 25 Support Software** diskette. This file contains the desk accessory version of the application **NewLife 25 Control**. Both the **NewLife 25 Control** application and the **NewLife 25 Control DA** may be used interchangeably. Install this file if you wish using a DA installation utility such as **Font/DA Mover**.
6. Remove the support software diskette and reboot your computer from your startup disk. Both **NewLife 25 Init** and **NewLife 25 Startup** will be executed automatically each time your Macintosh reboots. These files install and initialize various resources that support and control different features of **NewLife 25**.

Notes:

1. DO NOT rename the **INIT** and startup files or they will not work.
2. The name of the **NewLife 25 Init** file starts with two blanks.
3. DO NOT update your startup disks with the system on the **NewLife 25 Support Software** diskette. They are present solely to allow the disk to be a bootable/startup disk.

Using the Control Software

Figure 28 shows the **NewLife 25 (Systems)** Control application dialog box. In the left column is a list of features you can turn on and off with the Control application. A description of each feature appears below.

Note : not all options may be available on all NewLife Boards.

NewLife 25 Control		
	Current	Boot
68020/030 Instruction & Data Caches	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off
MC68020/030 Sound Driver	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off
MC68020/030 AppleTalk Driver	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off
SANE Traps to MC68881/882	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No
Copy ROM to 32 bit RAM	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No
Discard 16 bit Memory - OK	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No
Crash Resistant Ram Disk	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No

68030
NewBridge Microsystems
603 March Road, Kanata, Ontario, Canada, K2K 2M5
(613) 592-0714 Copyright 1986-1990 v3.7 68030-25 Mhz With 68882
Memory Setup -4096 k installed - 1024 k on mother board - 992 k of protected memory

OK

Figure 28 : Control dialog box with recommended settings

The column labelled "Current" displays the current state of each feature, while the column labelled "Boot" indicates the state desired after the next reboot. The term "desired" is used here because it may not be possible to set the requested state. If a requested feature is not available, it is ignored during the boot phase.

At the bottom of the dialog box you can see:

- the version number of the NewLife Systems Support Software
- the type of processor being used (68030)
- the type of math coprocessor (68881 or 68882) being used
- the system clock speed(25 MHz)
- the current memory configuration
- the amount of memory, if any, which is protected and available for use as a crash resistant RAM disk

To alter the current state of a feature, click the appropriate radio button in the "Current" column. If a button is grayed out, you cannot change the current state of that feature. However, if you click a button in the "Boot" column, the feature state you select will take effect when the Macintosh is rebooted.

When you press the OK button, the application removes the dialog box and saves your selections to disk. Whenever you reboot the "Boot" column features are enabled.

Description of software features

68030 instruction & data caches

The 68030 microprocessor has internal instruction and data caches. When the internal caches are turned on, the 68030 microprocessor stores recently used instructions and data in them. To save time, the 68030 will fetch cached items rather than using main memory.

To save time and increase performance turn on the instruction and data caches. There are a few applications written with self modifying code that will not run properly with instruction and data caches turned on. Turn this feature off for any such application.

68030 AppleTalk driver

NewLife 25 runs too quickly for standard AppleTalk. Turn on the 68030 AppleTalk Driver to correct the problem.

68030 sound driver

NewLife 25 runs too quickly for four voice sound with Apple's standard sound driver. If you turn on the 68030 sound driver, programs that use the Apple 128K ROM sound driver for multi-voice sounds and music will operate properly. Programs that don't use the ROM sound driver cannot take advantage of this feature.

SANE traps to 68882

SANE (Standard Apple Numeric Environment) is a floating point math software package that is included in the ROM or system file of every Macintosh. Many applications use SANE to perform floating point math. When SANE traps to 68882 is turned on, calls to SANE are directed to the 68882 floating-point math co-processor. This results in much faster floating point operations.

Copy ROM to 32-bit RAM

The 68030 microprocessor accesses memory 32 bits at a time. **NewLife 25** can access both the Macintosh motherboard 16-bit memory (ROM and RAM) as well as any 32-bit memory installed on the **NewLife 25** board. When Copy ROM to 32-bit RAM is turned on, the Macintosh ROMs are copied into the 32-bit RAM on board the **NewLife 25**. This allows almost all memory accesses (RAM and ROM) to use **NewLife 25's** 32-bit high speed RAM, increasing the overall performance.

Discard 16-bit RAM

If high-speed memory is selected and installed, **NewLife 25** automatically hides the motherboard memory from the operating system.

Crash resistant RAM disk

When this feature is turned on, **NewLife 25** creates a crash resistant RAM disk in the 16-bit motherboard memory. The RAM disk uses all of the motherboard memory available to it. While much slower than the 32-bit high speed memory onboard **NewLife 25**, the 16-bit RAM is still much faster than a floppy or hard disk.

NewLife 25 automatically protects the motherboard memory from the operating system. **As long as the power is not turned off, the contents of the RAM disk should remain in memory.** To make sure the RAM disk survives, reboot using the programmer's switch or the Restart menu item. **DO NOT** reboot by turning the Mac off and on.

Control software error messages

There are five error messages that can be displayed by the Newbridge Systems control software. Each error message is discussed below with the probable cause and remedy.

Processor is not a MC68030

The Macintosh is not currently running a 68030 on **NewLife 25**. Either the Macintosh doesn't have a **NewLife 25** installed, the Macintosh was rebooted while the interrupt switch was held down (full 68000 compatibility mode), or there is a software problem. To remedy the problem, reboot the Macintosh.

NewLife resources have not been installed

The **Newlife 25 Init** file was not executed automatically at boot time. Make sure that the **Newlife 25 Init** file and the **NewLife 25 Startup** file are in the system folder of your startup disk and no other inits conflict with them.

Initialization file version mismatch

The **NewLife Systems Control** application or desk accessory is incompatible with the **Newlife 25 Init** and **NewLife 25 Startup** files used to start up the Macintosh. Make sure all the support software currently installed came from the same distribution release disk, or is of the same version.

Initialization sequence not properly completed

Although the **Newlife 25 Init** file was executed automatically at boot time, the **NewLife 25 Startup** file could not be found. Make sure that both the **Newlife 25 Init** file and the **NewLife 25 Startup** file are in the system folder of your startup disk, and that their names have not been changed. Note that the name of the file **Newlife 25 Init** begins with two blank spaces. Since the Macintosh executes **INIT** files in alphabetical order, this causes **Newlife 25 Init** to execute before other **INITs**.

Init-Startup file version mismatch.

The **Newlife 25 Init** and **NewLife 25 Startup** file have different version numbers. The version numbers must be the same. **Restore them from the same distribution support software disk.**

part 6

Troubleshooting

Technical Information

Although the **NewLife 25** 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 described in the **Troubleshooting Guide** (on the following pages) to identify the problem.
3. Follow the steps in the **Troubleshooting Guide** 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 the **Troubleshooting Guide** tell you to do so, contact your dealer or the Newbridge Microsystems 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 photocopy and 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, send a Fax 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.
- **Power/video cable not attached.** Open the Mac and connect the cables.

Symptom

Checkerboard pattern or vertical lines observed on powerup

Possible Problem and Suggested Remedy

- **Improperly installed Killy clip.** Inspect clip for pins which are either too high or too low. Reseat offending pin and remount Killy clip. Verify pin continuity with an ohmmeter.
- **Bent pin.** Remove board and check for bent pins. Straighten bent pins and carefully reseat socket.
- **Cold solder joint on pin mount.** Remove board and check each pin with an ohmmeter to verify continuity. If a discontinuity is found, carefully resolder the offending pin.
- **Loose Killy clip.** If the Mac has been operating successfully, the Killy clip may have worked loose due to rough handling. Remove and firmly reseat the Killy clip.

Symptom

Wavering vertical lines observed after powerup

Possible Problem and Suggested Remedy

- **Power supply is not properly connected.** Verify that power supply harness connectors are firmly seated.
- **Power supply is not adjusted to correct voltage** (LEDs are on or flickering). This does not apply to Mac SE models. Re-adjust power supply output voltage following instructions in Part 3.

Troubleshooting Guide

Symptom

Sad Mac on powerup

Possible Problem and Suggested Remedy

- **Incorrect SIMM jumper placement on NewLife board.** Verify that memory size jumpers and wait state jumpers have been correctly set for your memory configuration (see Part 3 or 4).
- **Incorrect SIMM memory size on NewLife board.** All SIMMS are **either 256KB or 1Mb** SIMMs have been used. They cannot be mixed. Note that the SIMM capacity and jumper settings must match.
- **Defective SIMM module(s).** Check the two items above. If Sad Mac still appears on powerup, one or more of the SIMMs are defective. Contact your dealer for replacements.

Symptom

Intermittent Sad Mac or system bomb during operation

Possible Problem and Suggested Remedy

- **See INIT warning at the beginning of this section.**
- **Intermittent connection between NewLife 25 and Mac CPU.** See remedies under 'Checkerboard pattern' symptom.
- **Intermittent power connection.** Reseat power supply harness connectors.
- **Power supply is not adjusted to correct voltage.** See remedies under 'Wavering vertical lines' symptom.
- **Incorrect wait state jumper placement.** Verify wait state jumper settings (see Part 3 or 4).

Symptom

Hangs while booting

Possible Problem and Suggested Remedy

- **Conflicting INITs.** Remove all INITs except the NewLife INIT from the system folder. If using PYRO™ with NewLife 25Plus, rename PYRO™ so that it is installed first. You can accomplish this by inserting 4 spaces before typing PYRO™.

Troubleshooting Guide

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.
- **Bad connection on internal SCSI cable between NewLife board and battery door connector.** Disconnect and reseat cable to ensure a solid connection. If problem persists, contact technical support for assistance.

Symptom

Hard disk does not work or seems very slow

Possible Problem and Suggested Remedy

- **Wrong mode.** Ensure that disk drive software has been configured for Handshake Mode by the disk driver or by a SCSI manager application such as Silverlining™. Note that SCSI hard drives must not be configured for Blind Transfer mode. This is not applicable to the Mac SE.
- **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. If problem persists, contact technical support for assistance.

NewLife 25 Technical Specifications

System Requirements

- Mac 128K, Mac 512K, Mac 512Ke, Mac Plus or Mac SE
- Mac 128K and 512K require 128KB ROM set (available with 800KB floppy disk drive kit)
- 800KB floppy disk drive recommended

Hardware

- CHMOS 68030 CPU, 25.175 MHz
- CHMOS 68882 numeric co-processor, 25.175 MHz
- 64-pin expansion connector

Wait states

- 1 or 2 selectable, depending on speed of SIMMs

Power

- Mac internal power supply
- Voltage Required: 5 V
- Power Consumption (Mac 128K, 512K, 512Ke, Plus): Max 9.1 Watts with four 1MB SIMMs
- Power Consumption (Mac SE): Max 8.0 Watts with four 1MB SIMMs

Optional SCSI port (Mac 128K, 512K and 512Ke only)

- High speed CMOS SCSI Controller
- Power Consumption: Max xx Watts
- Attaches to 64-pin expansion connector on **NewLife 25** board

Software controls

- CDEV to select processor options

Environmental

- Operating temperature: 10° to 40°C, 50° to 104°F
- Storage temperature: -40° to 50°C, -40° to 122°F
- Humidity: 5% to 90% RH non-condensing

Compatibility

Compatible with SCSI peripherals, LaserWriter, AppleTalk and with standard Macintosh software. For supplementary information, contact your dealer or Newbridge Microsystems 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



128K



512K



512Ke

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



128K



512K



512Ke

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 33



SE

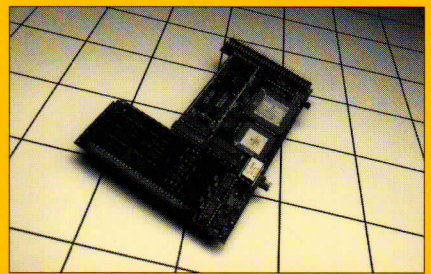
Designed for the Mac SE, NewLife 33 is the upgrade for those who need workstation level computing power. This board features a 68030 CPU and a 68882 FPU running burst mode at 33 MHz. Four SIMM sockets allow up to 4Mb of memory expansion and 12Mb additional virtual memory with Virtual™ by Connectix. NewLife 33 is easy to install, it attaches directly to the SE bus connector. NewLife 33 also offers a flow-through bus expansion connector should you wish to add the NewLife Video board or some other third party board.

NewLife video display interface card

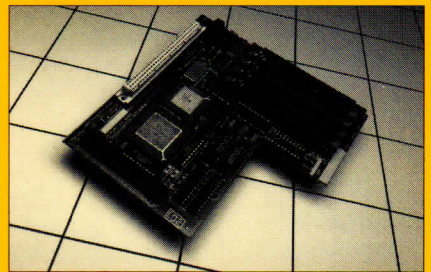


SE

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.



*The NewLife 25 system upgrade board
for Mac 128K, 512K, 512Ke and Plus*



*The NewLife 25 system upgrade board
for Mac SE*

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