

# Apple® IIe Enhancement Kit

Installation Guide



## **Customer Satisfaction**

The Apple IIe Personal Computer Enhancement Kit comes with a limited lifetime warranty to the original purchaser only.

The word Apple and the Apple Logo are registered trademarks of Apple Inc.

PDF designed by: khaibitgfx@outlook.com

## **Limitation on Warranties and Liability**

Even though ReActiveMicro has tested the hardware described in this manual and reviewed its contents, neither ReActiveMicro nor its affiliates make any warranty or representation, either express or implied, with respect to this manual or to the hardware described in this manual, their quality, performance, merchantability, or fitness for any particular purpose. As a result, this hardware and manual are sold "as is", and you the purchaser are assuming the entire risk as to their quality and performance. In no event will ReActiveMicro or its suppliers be liable for direct, indirect, incidental, or consequential damages resulting from any defect in the hardware or manual, even if they have been advised of the possibility of such damages.

In particular, they shall have no liability for any programs or data stored in or used with ReActiveMicro products, including the costs of recovering or reproducing these programs or data. Some states do not allow the exclusion or limitation of implied warranties or liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you.

## **ReActiveMicro**

Office Toll Free: (800) REACTIVE (732-2848)

Office/Mobile Direct: (856) 779-1900

support@reactivemicro.com



[www.reactivemicro.com](http://www.reactivemicro.com)



<https://m.facebook.com/reactivemicrousa>



@reactivemicro

# apple //e



The Apple™ IIe Enhancement Kit gives the Apple IIe many of the advanced features found in the Apple IIc, including faster processing, MouseText character display, and support of interrupts for applications such as networking.

### **What to Replace**

---

To upgrade an Apple IIe, you will replace these four integrated circuit chips with new chips from the RM Apple IIe Enhancement Kit:

- the microprocessor (replacing the 6502 with a 65C02)
- the CD Monitor ROM
- the EF Monitor ROM
- the Character Generator (Video) ROM

Figure 1 shows the locations and part numbers of the chips to be replaced on a U.S. (NTSC) main logic board; Figure 2 shows the same things on a European (PAL) main logic board.

Figure 1. Chips on U.S. (NTSC) Main Logic Board

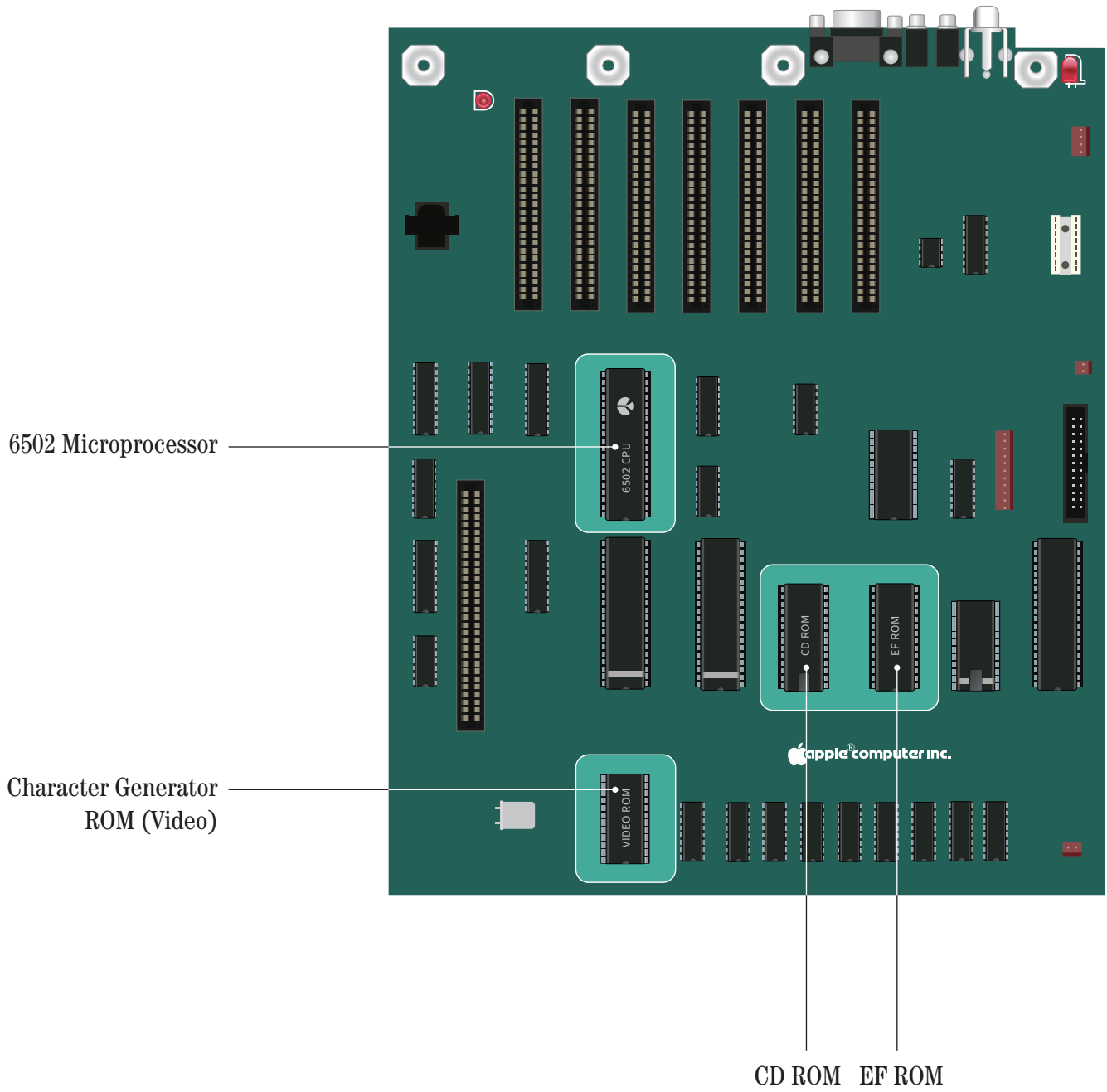
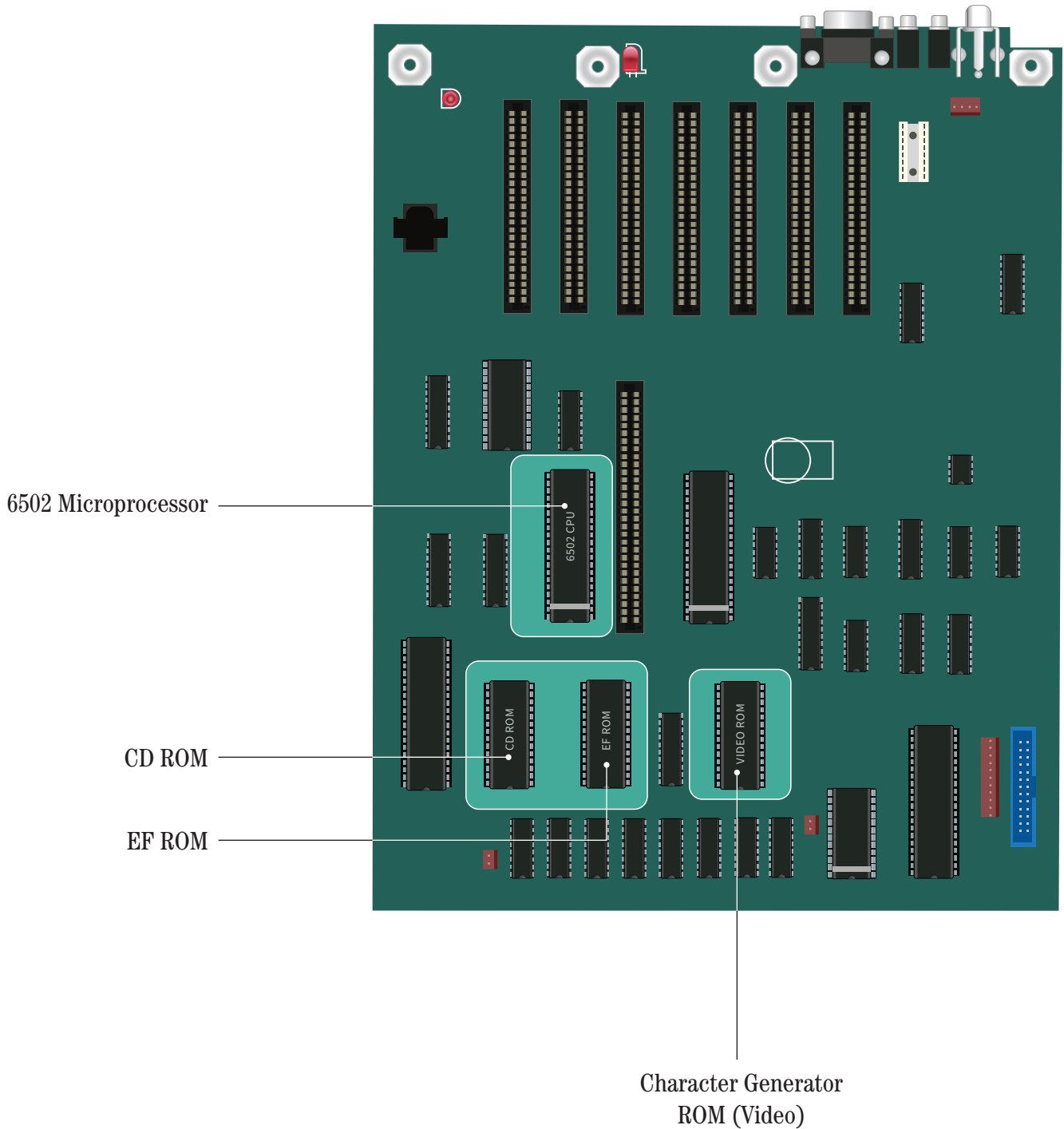


Figure 2. Chips on European (PAL) Main Logic Board



## How to Remove the Chips

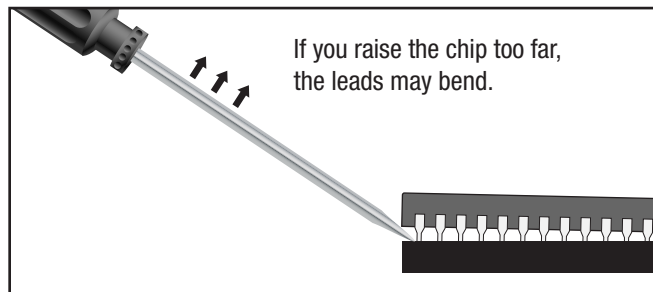
---

Here is the removal procedure.

1. Turn off the power switch but leave the computer plugged in.
2. Remove the cover, then check to be sure the small red light inside the case is off.
3. Touch the power supply case to discharge any electricity that may have built up on your body or clothes.
4. Locate the four chips to be replaced. (Refer to Figure 1 if you're changing the chips in a U.S. Apple IIe; refer to Figure 2 if you're changing the chips in a European Apple IIe.) You may need to remove interface cards to get to the chips.

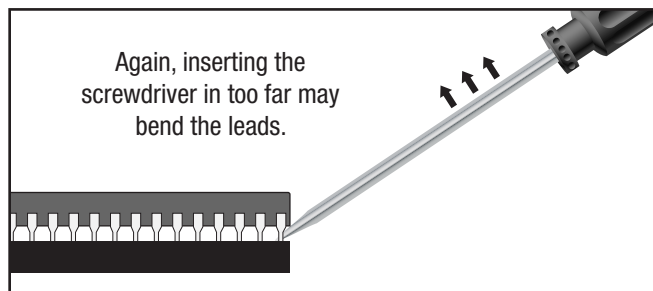
*Figure 3. Inserting Screwdriver*

---



*Figure 4. Raise the chip*

---



5. Using either a small screwdriver with a narrow, flat blade or an integrated circuit extractor, GENTLY rock the chips out of their sockets. It is very easy to accidentally pull up the socket along with the 6502, so be careful. We recommend using the screwdriver for the extraction, removing each end of the chip a little bit at a time as seen in Figure 3 and Figure 4.

## How to Install the Enhancement Chips

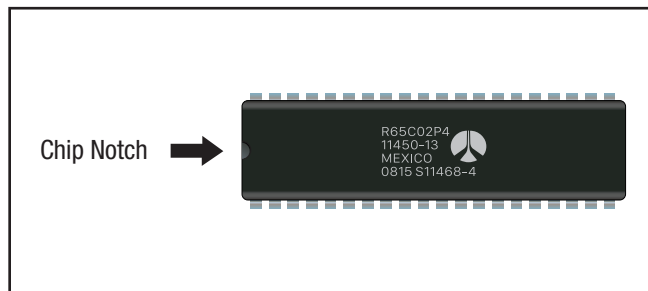
---

Here is the installation procedure.

1. The Enhancement Kit as shown in Table 1. Notice that you install the same monitor ROM CD, monitor ROM EF, and 65C02 microprocessor.
2. Notice that there is a small notch on one end of each chip as seen in Figure 5. This notch should face the keyboard when the chip is in place. Align all of the pins of a chip so that they will enter the sockets without bending. Press down evenly on the chip until it is in place.

*Figure 5. Chip Notch*

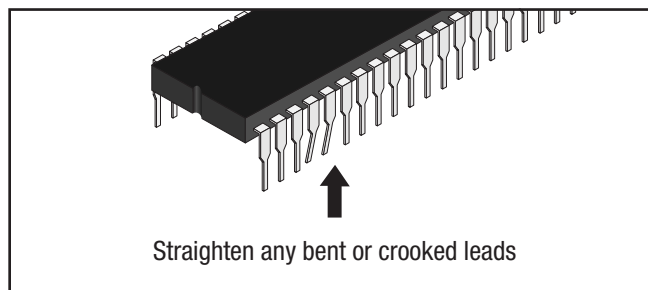
---



3. Before installing each chip check for any bent leads as seen in image Figure 6.

*Figure 6. Chip Leads*

---

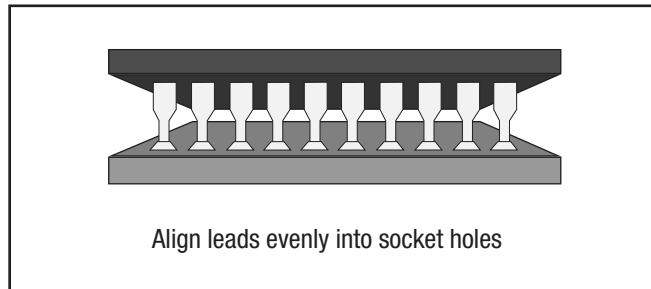


4. When installing each chip make sure all the leads go in correctly as seen in Figure 7. Once you've installed all of the new chips, double check them all one more time to make sure everything is installed correctly.



*Figure 7. Lead Alignment*

---



5. Replace any interface cards you may have removed and close the computer cover.
6. Turn on the computer and run a program to make sure the computer works properly.

Table 1. Enhancement Kit

---

One Monitor ROM (CD)  
One Monitor ROM (EF)  
One 65C02 Microprocessor  
One Character Generator ROM (Video)  
Keyboard Enhanced Label

## Enhancement Changes

---

With an Enhanced Apple IIe when you start up the system. An original Apple IIe will display Apple ][ at the top of the monitor screen, while an enhanced Apple IIe will display Apple //e.

The enhanced Apple //e includes the following changes from the original Apple IIe:

- The 65C02 microprocessor, which is a new version of the 6502 uses less power, has 27 new opcodes, and runs at the same speed as the 6502. *"Opcode is short for operation code and is used to describe the basic instructions performed by the central processing unit of a computer"*.
- The Apple //e Enhanced can take advantage of software developed for the Apple //c software that runs faster and has better graphics than was possible on the unenhanced Apple IIe.
- A new video ROM containing the same MouseText characters found in the Apple //c.
- New Monitor ROMs (the CD and EF ROMs) containing the enhanced Apple //e firmware.
- The identification byte at \$FBC0 has been changed. In the original Apple IIe it was \$EA (decimal 234), in the enhanced Apple //e it is \$E0 (decimal 224).

## **Final Note!**

---

Make sure to keep your original chips in a safe, static free bag and don't hesitate to contact ReActiveMicro if you have any questions or need to resolve any technical issues.

Thanks again for purchasing the Apple IIe Enhancement Kit.



[www.reactivemicro.com](http://www.reactivemicro.com)