*Rocket Chip*
**Installation Manual and user's Guide**

**PRELIMINARY**
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## Table of Contents

## 1.0    Introduction

Bits & Pieces Technology is pleased to introduce you to *RocketChip* — the most advanced single—chip accelerator available for the Apple II, II Plus, IIe and IIc computer marketplace. It does not require cables, slots or a complicated installation procedure. *RocketChip* does speed up program execution from all memory locations (64k or 128k), 1.6 Megabytes of auxiliary memory, expansion ROMs, and peripheral board ROMS, while retaining normal game paddle/joystick operation and offering you the choice of normal or unique game play sounds


## 2.0    *RocketChip* Features

*   Operates from 5MHz to 50KHz — 5 times faster than normal Apple speed to 20 times slower than normal Apple speed of lMHz.
*   Requires very little power - Less than l00mA
*   Easy to install and does not require a slot.
*   Standard power—up configuration or can be programmed by the user.
*   Keyboard selectable special features
*   Emulation of AE Transwarp speed setting protocol.
*   Accelerates all memory locations:
        *System memory (64k or 128K)
        *Auxiliary memory up to 1.6 Megabytes
        *Expansion ROMs.
        *Peripheral card ROMs.
*   Accelerates all 80 column operations
*   Non-standard configurations of the *RocketChip* registers are retained until the power is turned off.


## 3.0    *RocketChip* Installation Procedure

The installation of *RocketChip* into your Apple computer is an easy procedure when you follow the steps outlined in this section. If you have an Apple II, II Plus, or IIe the installation steps are detailed in Section 3.1. If you have an Apple IIc, the installation requires disassembly of the computer case, the removal of the 65C02 microprocessor and replacement with the *RocketChip.* The Apple IIc installation steps are detailed in Section 3.2. If you do not feel comfortable disassembling the Apple IIc, please refer to your dealer for additional assistance.

You will need the following tools to install your RocketChip;

    1 IC chip puller tool or a small flatbladed screwdriver
    1 Medium Phillips screwdriver - For Apple IIc installation

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<u>**Warning**</u>
**Turn OFF the AC power switch on your Apple computer. Leave the AC power cord connected to the wall outlet and the computer.**

Attempting to install *RocketChip* with the power applied can cause serious damage to your Apple computer and to *RocketChip.* Bits *&* Pieces Technology, Inc. will not assume responsibility for damage caused by improper installation or handling.
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**3.1 *RocketChip* Installation for the Apple II, II Plus, and IIe**

**MAKE SURE THAT THE COMPUTER POWER IS *"OFF"***


STEP #1: Removing the Apple II Cover
　　Grasp the back edge of the cover. Lift up on the cover until it releases and then pull it straight back and lift it off. Set the cover aside.

STEP #2 : Removing Expansion Boards
　　The easiest way to gain access to the 6502/65C02 microprocessor is to remove any optional expansion boards that you have installed in slots #2, #3, #4, and #5. To remove an expansion board, carefully pull up on the board to free it from the motherboard connector.

STEP #3 : Removing the 6502/65C02 Microprocessor and Installing *RocketChip.*

**Important Note for you to read:** Both your original microprocessor and RocketChip can be damaged by static electricity, 6502/65C02, before touching the 6502/65C02 or removing RocketChip from the anti—static protective package, it is necessary for you to GROUND YOURSELF by touching the power supply housing with your hand to remove any static electricity.

**Touch the power Supply housing.** The location of the 6502 for the Apple II, and II *Plus* is shown in Figure 1. The location of the 6502/65C02 for the Apple IIe is shown in Figure 2. Use an IC chip puller tool or a small flatbladed screwdriver to carefully remove the 6502/65C02 from the socket on the motherboard. To avoid damaging the 6502/65C02, try to work the part straight out of the socket so that pins do not get bent. If pins do get bent, they can be carefully straightened with long nose pliers.

**Touch the power supply housing.** Remove the Rocket*chip* from the protective package. Look at either Figure 1 (II, II Plus) or Figure 2 (IIe) and install Rocketchip in the motherboard socket as shown. Before pushing *RocketChip* fully into the socket, make sure that Pin #1 is oriented correctly and that all 40 pins of the RocketChip are properly aligned in the socket and that they are not bent.
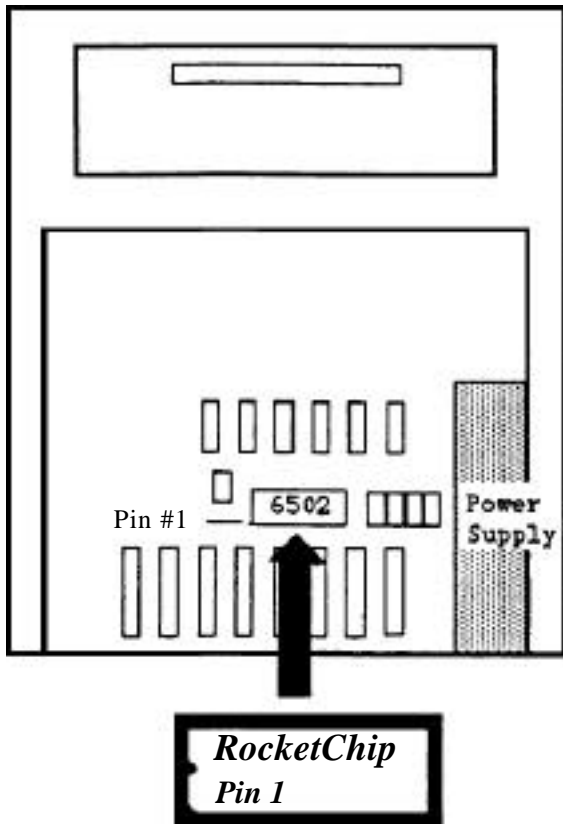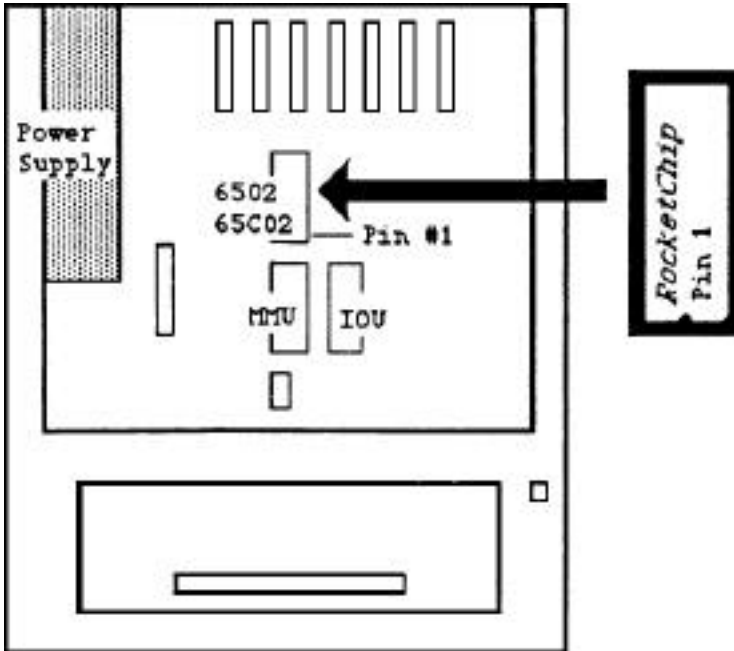
Figure 1 -  Apple II, II Plus Motherboard

Figure 2 - **Apple IIe Motherboard**

STEP #4:    Replacing the Apple II Expansion Boards and the cover.

        Install each of your expansion/peripheral boards back into the motherboard slot that it was removed from in Step #2. Replace the cover by inserting the front edge of the cover into the case and pushing it forward and then push down on the back edge of the cover to secure it

STEP #5:   System Check

        Turn on the system power. The monitor screen will be cleared and within 2 seconds you will receive the system prompt and a beep. If you do not get the beep, or if the screen has a checkboard, or if the screen is full of "garbage characters", then RocketChip is not properly installed. IMMEDIATELY TURN THE POWER OFF otherwise *RocketChip* could be damaged. Please review the installation instructions and make sure that all of the pins are OK and that *RocketChip* is installed in the correct socket and that Pin #1 is correctly located.

**3.2** *Rocket.~hip* **Installation for the Apple IIC.**

*MAKE SURE TEAT THE COMPUTER POWER IS* **"OFF"**

STEP #1: Removing the Apple IIc cover.

Turn the computer over so that the bottom side is up and the keyboard side is down, resting on the work surface. Remove the six (6) screws that are shown in Figure 3. Note that two screws (#1 & #2) are larger than the others. Save the screws that you have removed.
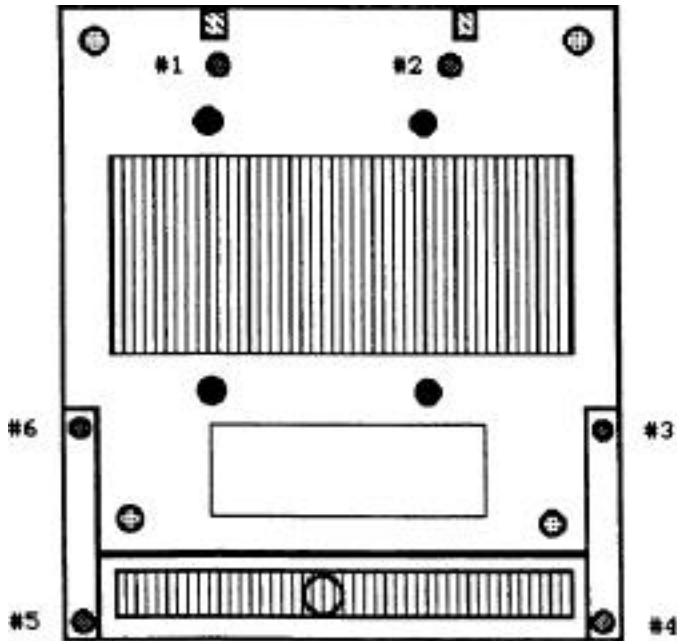


**Figure 3  Apple IIc Bottom Side**

Turn the computer over so that the keyboard side is up. Use a small flatbladed screwdriver to release the plastic latches which hold the top cover in place. Start in the front of the case and work toward the back of the case, being careful not to damage the plastic. Do not use excessive force.

There are two case styles for the Apple IIc. For the two piece case, try to leave the back plate which surrounds the back connectors and the power switch attached to the cover.

When all of the latches are released, pull up on the top cover to remove it and set it aside.

STEP #2:    Folding up the keyboard.

Grasp the Apple IIc keyboard assembly and gently lift the front edge (about 1/4") and then pull it forward Out of the case (about 1/2") to release the tabs on the back of the keyboard from the slots in the disk drive housing. Do not disconnect the flat cable that connects the keyboard to the computer motherboard. Gently fold the keyboard up and rest it on the computer as shown in Figure 4.

STEP #3:   Removing the 65C02 Microprocessor and Installing the *Rocketchip.*


**Important Note for you to read:** Both your original microprocessor and *RocketChip* can be damaged by static electricity, therefore, before touching the 65C02 or removing Rocketchip from the anti—static protective package, it is necessary for you to GROUND YOURSELF by touching the disk drive assembly with your hand to remove any Static electricity. The location of the disk drive is shown in Figure 4

**Touch the disk drive housing**. The location of the 65C02 is shown in Figure 4. Use an IC chip puller tool or a small flatbLaded screwdriver to carefully remove the 65002 from the socket on the motherboard. To avoid damaging the 65C02, try to work the part straight out of the socket so that pins do not get bent. If pins do get bent, they can be carefully straightened with long nose pliers.
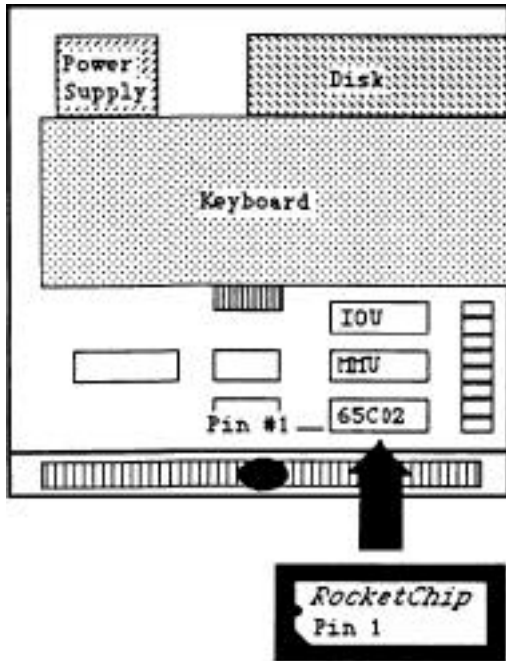
**Figure** 4 – **Apple IIc Motherboard**

      **Touch the disk drive housing.** Remove the Rocket*chip* from the protective package. Look at Figure 4 and install the Rocketchip in the motherboard socket as shown. Please notice that *RocketChip* Pin *1 is marked and that all of the part number markings for devices on the motherboard and the Rocketchip are readable and oriented the same way. Before pushing *RocketChip* fully into the socket, make sure that Pin *1 is oriented correctly and that all 40 pins of the *RocketChip* are properly aligned in the socket and that they are not bent.

STEP #4:   Replacing the Apple IIc Keyboard and Cover.
      Gently unfold the keyboard and place it back into position, making sure that the keyboard tabs are inserted in the slots in the disk drive housing. Replace the top cover and engage the plastic latches. Turn the computer over and replace the six bottom screws that you removed in Step #1.

STEP #5:   System Check
      Turn on the system power. The monitor screen will be cleared and within 2 seconds you will receive the system prompt and a beep. If you do not get the beep, or if the screen has a checkboard, or if the screen is full of "garbage characterS", then RocketChip is not properly installed. IMMEDIATELY TURN THE POWER OFF, otherwise *RocketChip* could be damaged. Please review the installation instructions and make sure that all of the pins are OK and that *RocketChip* is installed in the correct socket and that Pin #1 is correctly located.

## 4.0  *RocketChip* Quick Reference - Operation Guide

**General:**    RocketChip powers up in a standard configuration mode with expansion slots *5 & *6 running at 1MHZ and slots #1, #2, #3, #4 & #7 running at 5MHz. This configuration accommodates most Apple II, II Plus, and IIe systems with a variety of peripheral expansion boards. The RocketChip auto identifies the Apple IIc, so that it operates at its maximum speed potential. The keyboard options offer you a choice of several feature selections. The use of the configuration software allows you to make modifications for non-standard installations of expansion boards or to obtain maximum performance from your system

### System Recommendations and Cautions

a)  If your floppy disk drive controller card is not in either slot *5 or #6, you must use the Configuration Program to set your floppy disk controller card slot to 1MHz by using APPLE.SLOT7—1. Your floppy disk must operate at 1MHz or the diskette could be damaged. If you need to boot from the floppy disk that is not in slot #5 or *6, hold down the ESCape key during power up.

b)  Do not use CACHE.SLOT7-l or CACHE.EXP.ROM7—1 to accelerate an Apple SCSI, AE ramfactor or any card that bank switches ROMs.

c)  AUDIO.MUSIC and AUDIO.HIFI will slow down game play for any game that produces a lot of sound effects.

d)  Any Apple II or II Plus without a paddle/joystick attached will cold boot every time that CTL—RESET is hit. To delete this function, use IIPLUS.NOBOOT or install a paddle/joystick and then CCNTROL—Z will provide a cold boot function for your Apple II or
 II Plus.

e)  RocketChip must run at 1MHz when using some CP/M cards and cards that employ DMA. Use the Configuration Program, boot with ESCape, or CTL-RESET ESCape to set 1MHz

f)  Several configuration programs can be combined to make a pre-boot HELLO or STARTUP file for your unique system configuration if needed

**4.1  Power  Up:** RocketChip runs at the maximum speed of 5MHz with Apple II expansion slots #5 & #6 running at 1MHz and slots #1, #2, #3, #4 & #7 running at 5MHz with all available Auxiliary memory being accelerated.

Holding down the ESCape key during Power Up forces the RocketChip to run at normal Apple speed of 1MHz.

**4.2 Keyboard Selectable Options:** The following modes of operation are activated whenever the CONTROL and RESET (CTL-RESET) keys are pressed at the same time and this key sequence is followed by:

```
ESCape        RocketChip runs at 1MHz (Normal Apple speed)
RETURN        RocketChip returns to 5MBz or previously set RocketSpeed
              of 50KHz to 5MHz.
Space Bar     RocketChip runs immediately without changing speed.
Open-Apple    Cold boot (Key does not need to be held down)
CONTROL-Z     Cold boot for Apple II and II Plus systems.
CONTROL—D     Deletes 2 second pause after CTL-RESET
CONTROL-F     Restores 2 second pause after CTL-RESET (Key sequence is:
              Hold CONTROL—F then hit RESET for Apple IIe & IIc. For
              Apple II & II Plus: CONTROL—RESET F—REPEAT)
```

**4.3 Software Speed Selection:** The RocketChip speed can be also be changed by using software commands in Applesoft BASIC using Applied Engineering's Transwarp protocol.

```
To get RocketSpeed(5MHz)  Type:     POKE 49268,0 <RETURN>
To get Apple speed(lMHz)  Type:     POKE 49268,1 <RETURN>
```

**4.4 Configuration Software:** The configuration disk allows the user to modify the features of the RocketChip. This disk provides ProDOS files (Front side) and DOS 3.3 files (Back side) . The configuration set by the user is retained until the power is turned off. The following files can be run by typing:

```
] BRUN Filename <RETURN> in DOS 3.3 [OR]
] -Filename <RETURN> [OR] -Dir/Filename <RETURN> in PrODOS [OR]
] 10 PRINT CHR$(4), "BRUN Filename" <RETURN> in BASIC
```

**Filenames:**  SPEED.5MHZ/4MHZ/3MHZ/2MHz/1MHz/500KHz/250KHz/l00KHz/50KHz
            AUDIO.NORMAL/SILENT/DiSTORTED/MUSIC/HIFI (Selecting MUSIC
            or HIFI will slow down the RocketChip and game play)
            PAUSE.AT.RESET (Restore 2 second pause after CTL—RESET)
            NOPAUSE.RESET (Delete 2 second pause after CTL-RESET)
            ROCKET.WAIT (Runs Monitor Wait routine at RocketChip
            speed)
            TRANSWARP.CMD (AE TRANSWARP protocol enabled)
            NOTRANSWARP.CMD (AE TRANSWARP protocol disabled)
            STD.LANG.CRD
            NONSTD.LANG.CRD (Titan, Saturn, SwyftCard, etc.)
            IIPLUS.NOBOOT (CTL—Z & paddle/joystick button (Open—Apple)
            ignored after CTL-RESET)
            IIPIUS.BOOT (All CTL—RESETS cause cold boot unless a
            paddle/joystick is installed)

**Filenames (Continued)**

        (1) APPLE.SLOT7—1 (Apple speed of 1MHZ for selected slot)
        (1) ROCKET.SLOT7—1 (RocketChip speed for selected slot)
        (2) CACHE.SLOT7—1 (Accelerate Peripheral card ROM:$Cn00—$CnFF)
        (2) CACHE.EXP.ROM7-l (Accelerate Expansion ROM: $C800-$CFFF)
        (2) NOCACHE.SLOT7—l (NO ROMS or cannot accelerate slot ROMs)

**Notes for PrODOS: (1)** Dir = SLOT.SPEEDS (2) Dir = SLOT.CACHING

## 6.0 *RocketChip* Warranty

### 6.1.Bits £ Pieces Technology, Inc. *RocketChip* Warranty

Bits & Pieces Technology, Inc. (hereafter referred to as EPT Inc.) warrants RocketChip to be free from defects in materials and workmanship for a period of ONE YEAR from the date of original purchase. BPT Inc., at its option, will repair or replace a defective part during the warranty period. BPT Inc. will not assume any responsibility for damage due to improper installation or handling by the purchaser. BPT Inc. makes no warranties, either express or implied, regarding the enclosed product, its merchantability or its fitness for any particular purpose. In no event shall BPT Inc. be liable for any loss of profits, loss of use of facilities or equipment, or other indirect, incidental or consequential damages. The exclusion of implied warranties is not permitted by some states. The above exclusion may not apply to you. This warranty provides you with specific legal rights. There may be other rights that you may have which vary from state to state.

If your RocketChip proves to be defective, please contact your local dealer for a replacement or contact BPT Inc. Any defective product returned to BPT Inc. must be shipped prepaid and accompanied by a Return Materials Authorization (RMA) . To obtain a RMA number, please call our Customer Service Department at: (818) 706—7932 [9am to 5pm PST]

### 6.2 Apple Computer, Inc. Copyrights and Disclaimer of Warranty

ProDOS and DOS 3.3 are copyrighted programs of Apple Computer, Inc. licensed to BPT Inc. to distribute for use only in combination with BPT Inc. Configuration Program. Apple Software shall not be copied onto another diskette (except for archive purposes) or into memory unless as a part of the execution of BPT Inc. Configuration Program. When the software has completed execution, Apple Software shall not be used by any other program

Apple Computer, Inc. makes no warranties, either express or implied, regarding the enclosed computer software package, its merchantability or its fitness for any particular purpose. The exclusion of implied warranties is not permitted by some states. The above exclusion may not apply to you. This warranty provides you with specific legal rights. There may be other rights that you may have which vary from state to state.

Rocketchip is an accelerator-on-a-chip for the Apple® II, II Plus, IIe and IIc. Requiring no slot, the 40-pin DIP package replaces the 6502 or 65C02 microprocessor, consumes less power than existing accelerator products, accesses expanded memory and lets your Apple II run up to five times faster.

**Compatibility**
RocketChip will run virtually all Apple II software, supports all peripheral hardware, works with any standard hard disk and supports all standard operating systems including ProDOS™ GEOS™ DOS 3.3™ UCSD Pascal™ and Digital Research CP/M™

**Features/Specifications**
  Operates at 5 MHz; competitive with IBM®AT,™ faster than
  TransWarp™
faster than the Apple® Mac+™ and nearly twice as fast as the IIGS™
 RocketChip accelerates program execution in *all* memory locations
for 64K or 128K.
    AUX Memory— more than 1.6 Megabytes accelerated;
    any additional memory runs at normal speed.
    Apple memory expansion card and compatibles.
    Peripheral card ROM.
 Low power CMOS technology Typical operating current less
than 100mA.
  One simple keystroke allows return to normal Apple operating
speed of 1 MHz
   Variable speed from 50 kHz up to 5MHz.
  No distortion of program sound effects,
  Accelerates all 80 column display operations. Easy to install,
  Standard power-up configuration or call he user programmed. The ONLY
   accelerator technology that will work in the closed
system Apple IIc.

contents: This package contains one RocketChip, an instruction manual, and a utility diskette.

Minimums system requirements: Apple II, II+, IIe or IIc with 64K RAM.

# BITS & PIECES
## T E C H N 0 L 0 G Y, I NC.

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