

**PicoPromSD**

## **User Manual**

Version 1.0

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# 1. Introduction

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This User Manual (UM) provides the information necessary for effective use of PicoPromSD.

## 1.1 Overview

The PicoPromSD was designed as a tool to backup and restore EEPROM data in the original Microsoft Xbox. Upon plugging in the PicoPromSD into the Xbox's LPC port, it will automatically backup the EEPROM data to inserted microSD card in the "EPBACKUP" folder. This only takes a second. If an "eeprom.bin" file is found in the "WRITEEP" folder, you will be given the option to write that file into the EEPROM.

## 2. Getting Started

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### 2.1 Cautions & Warnings

This tool has the potential to damage your Xbox and turn it into a paperweight. If mishandled, it could corrupt your eeprom which could cause the xbox to no longer function. You take all the risks associated with using the PicoPromSD and no guarantees are made. In other words, USE AT YOUR OWN RISK

### 2.2 Set-up Considerations

To use PicoPromSD, you will need a microSD card that is formatted with FAT32 filesystem. FAT16 should also work, but not tested.

You will be required to disassemble your Xbox (not covered in the manual) to access the LPC port on your Xbox.

The easiest way to use PicoPromSD, is to have a 2x8 pin header soldered into the Xbox's LPC port. While this is not necessary, it will allow the safest and easiest connection. The LPC port does not have to be rebuilt for 1.6 versions of motherboards; however, if soldering a pin header onto the motherboard, it's recommended to go ahead with the rebuild for future use.

### 3. Using the System

The following sub-sections provide step-by-step instructions on how to use the various functions or features of the PicoPromSD. Figure 2 at the end of this section will identify the LEDs mentioned in this section.

#### 3.1 Backing up the EEPROM

Backing up the EEPROM is easy and requires very little from the user. This guide will assume your LPC port on your xbox has a pin header installed as recommended in section 2.2.

1. Insert the FAT32/FAT16 formatted microSD card into the PicoPromSD
2. With the Xbox POWERED OFF and Power switch is on USB (to the right), place the PicoPromSD onto the pin header on the LPC port. Place it so that the microSD and button are on the right hand side of the LPC port and are closer to the center of the Xbox's motherboard (see Figure 1).
3. Power on the Xbox.
  - a. After power is stable (if D0/Lframe is grounded, let the Xbox FRAG), Flip the power switch to LPC.
  - b. When power is applied, you will see both the green and red LEDs light up. This means that the backup is in process.
  - c. After a second, the red LED will go out and the green will stay on. This means that the backup was successful. If the green LED goes out and red stays on, then there was an error. Check the microSD card and try again. If problem persists, check the log written to the SD for possible errors. If no log has been written, then the SD card may be the issue.
4. Turn off power to your Xbox and flip the power switch to USB, then remove the PicoPromSD.
  - a. Your backup will be on the microSD card under the epbackup folder. You can backup multiple times. Each backup name is incremented, so you can backup multiple systems without needing to change microSD card. (Backups are named the Xbox's Serial number or eeprom.bin (if serial number cannot be determined), subsequent backups of same system will append a 1,2,3,etc... to the file name.)
5. Backup is complete.

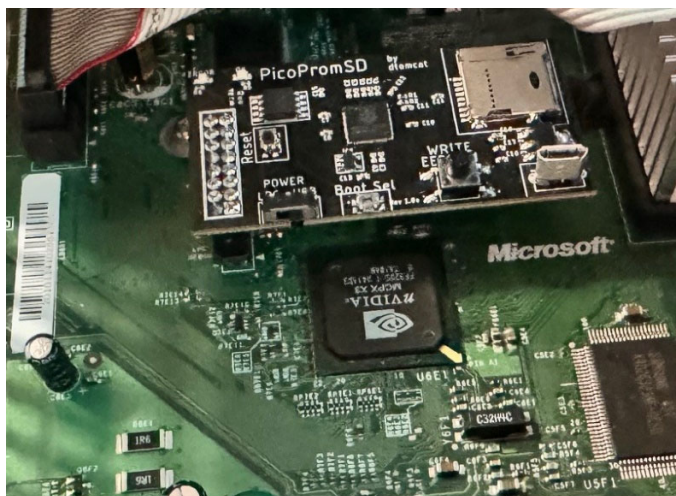


Figure 1.

## 3.2 Writing to the EEPROM

Writing to your EEPROM is a little bit more involved (on purpose). It's important to note that the PicoPromSD does not validate nor verify the eeprom.bin provided by you. If you provide a corrupt eeprom.bin, it will write the corrupt eeprom.bin and therefore... CORRUPT your EEPROM. Caution must be taken to ensure you provide a valid eeprom.bin.

Please note, that eeprom.bin file will be deleted from the "WRITEEEP" folder (discussed later). The eeprom.bin files inside the EPBACKUP folder will not be touched. Please ensure you have a backup of the eeprom.bin file you place in the "WRITEEEP" folder.

To write to your eeprom:

1. On the microSD card you're using
  - a. Create a new folder in the root directory named "WRITEEEP"
  - b. Copy your eeprom.bin (that you validated and verified) into the "WRITEEEP" folder.
  - c. Now follow the instructions in section 3.1 through 3.1.3. Do not turn off the xbox. After 3.1.3, return here.
2. After the backup, if the microSD card was prepared correctly, the PicoPromSD's green LED will flash rapidly. This informs you that it sees the eeprom.bin in the WRITEEEP folder and is ready to write the EEPROM.
  - a. CAUTION: the next part can kill your Xbox. Do not proceed unless you know what you are doing. This will overwrite your eeprom with the data you provided. If that data is corrupt... so will your eeprom. PROCEED AT YOUR OWN RISK.
3. When ready to Write, and the green LED is flashing rapidly, Press the "WRITE EEPROM" button on the PicoPromSD.
  - a. When complete, the green LED is will stay on solid and the write process is complete. NOTE: The eeprom.bin file is now deleted from the "WRITEEEP" folder. This is to ensure you do not accidentally write that file to another Xbox.
4. Write Process is now complete.

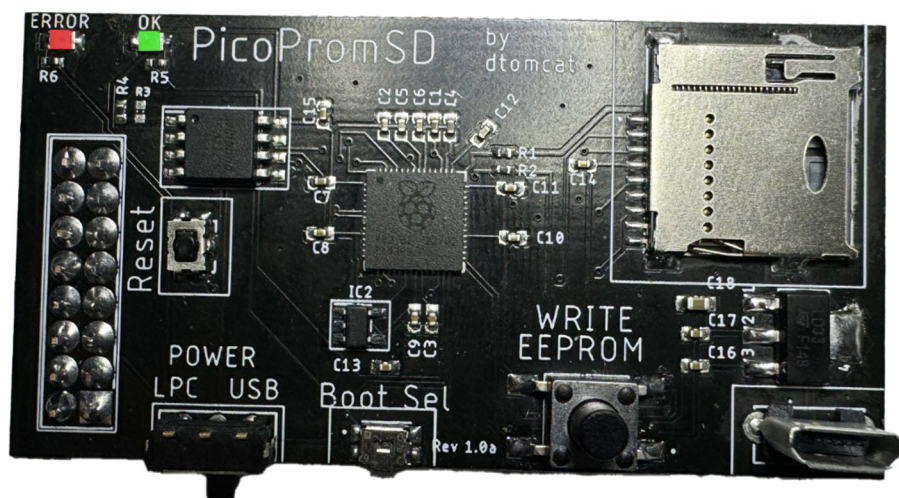


Figure 2.

### 3.3 Reading/Writing the EEPROM without a Pin Header

It is possible to read from and write to your EEPROM without a pin header installed on your Xbox. One example will be given in this section (pogo pins). While reading from your EEPROM with this method is relatively safe, it is not recommended for writing to your EEPROM. This method basically uses pressure as you press the pogo pins into place. The process of reading from your EEPROM is fast and if enough pressure isn't exerted (but not so much you damage the board/pins), you will simply get a corrupted eeprom.bin or the process will fail. If, however, enough pressure isn't exerted while writing, you can corrupt your EEPROM and cause your Xbox not to boot. If enough pressure can be exerted the entire time (while pressing the "write eeprom" button and throughout the entire process) this method can be used for reading and writing. Again... This process isn't recommended for writing... and note the chance of your backup being corrupted as well.

#### 3.3.1 Cautions with pogo pin method

##### CAUTIONS/WARNINGS:

1. If the pogo pins are not placed on the correct LPC port vias/pads, you can damage the PicoPromSD and/or your Xbox motherboard. Ensure proper placement. Damage can occur while the Xbox is powered OFF but plugged into a wall outlet.
2. Take care not to exert too much pressure on the pogo pins as damage to boards/pins can occur. Only enough force to compress the internal springs is needed.
3. Not exerting enough force will result in poor connection. During the reading stage... this can result in corrupted backup files. During the writing stage, this can cause damage to your Xbox resulting in the Xbox not being able to boot.

#### 3.3.2 Making a Pogo Pin attachment

There are many ways to make a pogo pin attachment for the PicoPromSD. How you do so is up to you. There is a 3D model that can be printed to aid in this step.

You will need the following:

1. 1 3D printed part
2. 1 2x8 pin header
3. 5 Pogo pins (P75-E2 Spring Test Probe, E type conical head)
4. Soldering Iron/Solder

This requires soldering in small places. It is not recommended for those who are not comfortable with soldering. Heat and plastic do not mix! If you are not comfortable or careful, you will melt the plastic and may make the piece unusable.

##### 3.3.2.1 Steps for making

1. Insert pin header (use side with shorter pins) into 3D printed part. Use the side with square holes.
2. Insert pogo pins (end with smallest diameter) into opposite side of 3D printed part. Ensure the ends of pogo pins and pin header touch in the visible voids of 3D printed part.
3. With Pin header fully inserted and touch pogo pins, solder the point where pogo pins/pin header meet (all 5 locations). Take caution not to melt the plastic.



4. Attachment is ready for use. You can use a multimeter to ensure a good connection exists between pin header and pogo pins. (Figure 3 and 4) show a completed pogo pin attachment.
5. You'll insert the pin header side into the PicoPromSD. The side with two parallel pogo pins (right side of Figure 4) goes towards the Open Source Hardware Logo and side with single pin goes towards the programming header (6 pads with holes in them).

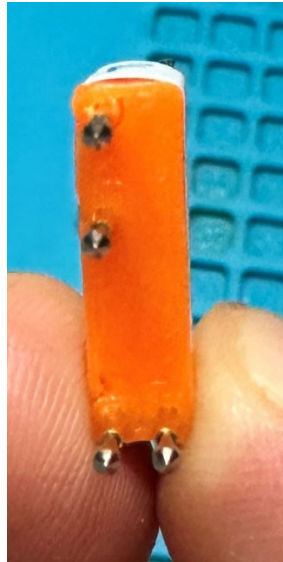


Figure 3

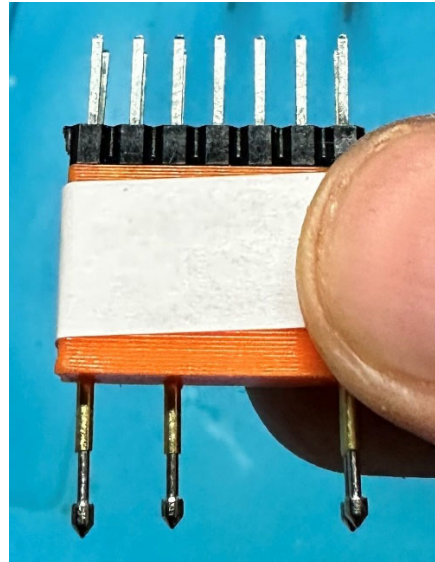


Figure 4

### 3.3.3 Using Pogo Pin attachment

Using the pogo pin attachment takes a little bit of finesse, but not that bad. Refer to figure 5 for pin numbering for the LPC port. This section assumes the pogo pin attachment is already connected to the PicoPromSD (refer to 3.3.2.1.5).

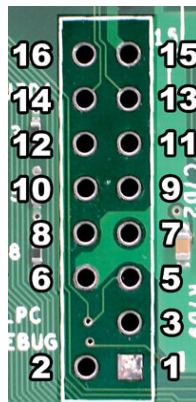


Figure 5



### 3.3.3.1 Steps of use

1. Ensure Xbox is powered off. (This is not necessary, but safest way)
2. Place the 2 parallel pogo pins on LPC pins 14 and 13 keeping the remaining two pins off LPC port.
3. Rotate PicoPromSD to allow remaining pins to contact LPC port pins 6 and 2.
4. Apply slight and even pressure ensure pogo pins compress (but not fully compress). This will ensure a good connection between PicoPromSD and Xbox.
5. Keep slight pressure through the remaining processes.
6. Follow steps for reading/writing as desired (sections 3.1/3.2 respectively).

A video of this in action can be seen here: <https://dtomc.at/PicoPromSDPogoPin>

3D Print files can be found here: <https://github.com/dtomcat/PicoPromSD>