

BitWriter Replica 1050

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Author: Juergen van Radecke (tfhh)

Introduction

Hi,

thank you for your purchase of a BitWriter Replica 1050 PCB! I hope you enjoy this fine piece of hardware for our beloved Atari 8-bit computer systems.

Please read the whole manual at least one time completely, even if you're a professional. Some things are very special when using the BitWriter/Super Archiver (in relation to „standard“ enhancements like Happy 1050 or the Speedy 1050).

This document contains „only“ the installation of the BitWriter Replica 1050 into a Atari 1050 disk drive. For using the BitWriter or Super Archiver software, please read the manual for each program. You will find them also in the ZIP archive.

You need some solder skills to built this PCB in your drive. If you've done some easy solder jobs before, this is not a problem. If you don't know, where the hot side of the iron is, it's better to ask a friend ☺

It may sound silly, but believe me, experience with other projects reminds me to tell you this hint... first of all: Check the Atari 1050 disk drive you want to built the BitWriter Replica into! Even if you take one spare drive, maybe not used for years or so. Before you start, take your 1050, power it on, use 2-3 disks, format them, write something on the disks and read them back. Use single and medium density for this tests. The drive should work 30 minutes or more, when it's warm, repeat format, write and read tests. If all is fine, the drive can be used. Otherwise check/repair the issues first or take another drive. This will prevent you from a lot of unnecessary stress ☺

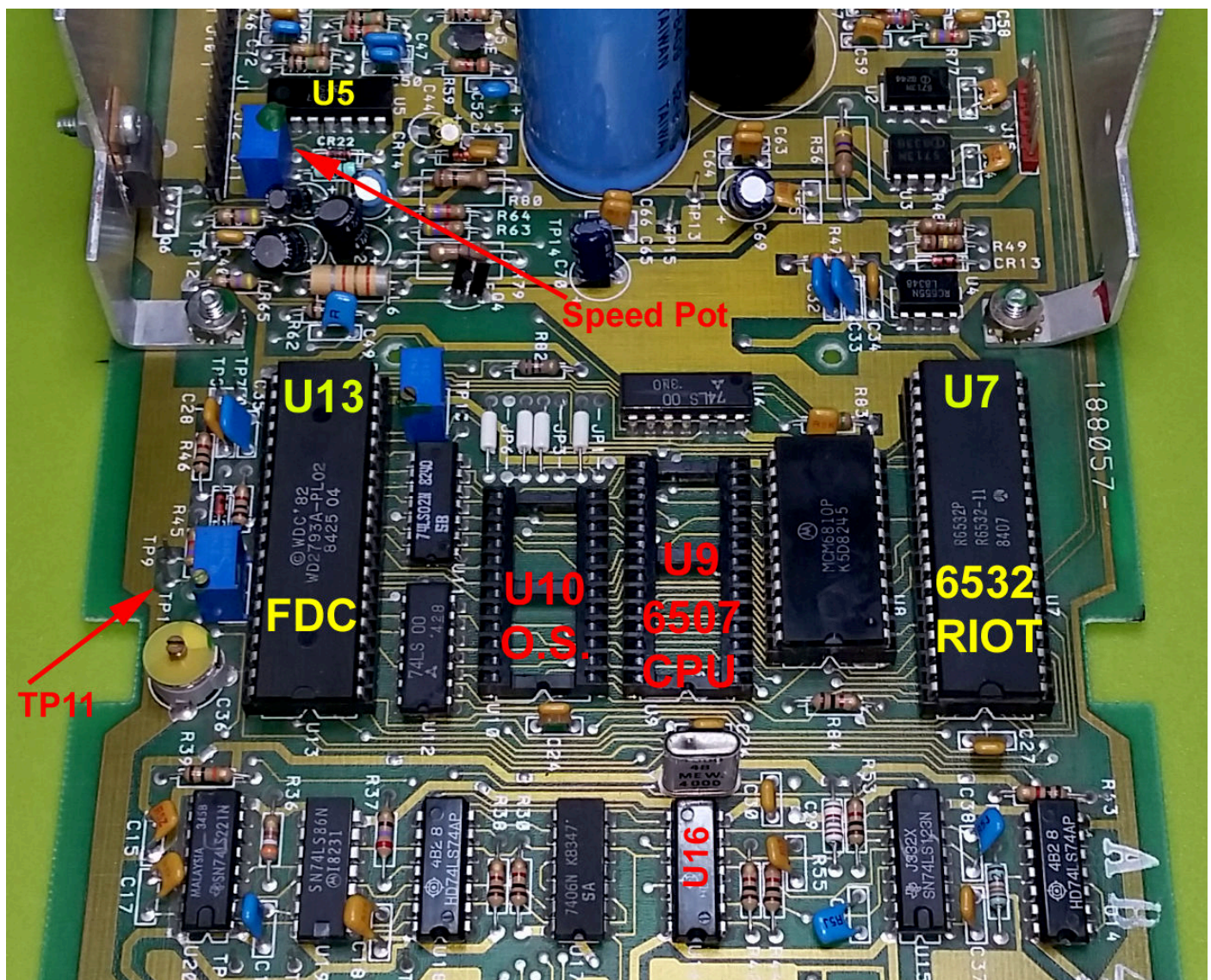
Starting

First, open your 1050 drive. You will find six screws at the bottom side of your drive. Release all screws and remove the top part of the enclosure. Beware of the noses from the brown bezel (front), they break easily. If you haven't often tinkered around with a 1050, make now a photo from **all** the cables coming from the drive mechanic to the main PCB of the 1050. Having some photos of the original state makes it easier to re-assemble the drive after installing the BitWriter Replica.

Detach the drive mechanic and put it to a safe place. For the next steps you wouldn't need it.

Now remove the whole 1050 main PCB from the bottom part of the enclosure. **Even if you have chosen the version „A“ of the BitWriter Replica, please do it also!**

Here's a picture of the 1050 main PCB and the parts or points needed for installation:



(The PCB's part-number, colour and so on of your 1050 PCB may look slightly different, but I.C.s are always the same!)

Remove the O.S. ROM at U10. You didn't need it anymore (but keep it, if you ever want to remove the BitWriter Replica PCB)

Remove the 6507 C.P.U. at U9. On the BitWriter Replica PCB there's an empty 28 pin socket. Insert the 6507 C.P.U. to this place. The notch of the C.P.U. must show to the same direction like the notch of the socket.

When you've purchased the version „B“ of the BitWriter Replica, then first unsolder the socket at U9. If you haven't a unsoldering gun, it's a good idea to use a wire-cutter, cut the old socket in a lot of small pieces until you can remove all plastic. Now take a plier in one hand, the iron in the other and remove pin by pin (or what remains after removing the plastic). Finally you need a unsoldering pump to clean the vias (holes for the pins). Solder one of the machine-head precision sockets coming with the BitWriter Replica into the free place at U9. After doing this, place the second attached machine-head precision socket above the one you've soldered in yet.

Installing the BitWriter Replica

Together with the BitWriter Replica PCB I put a 10-pin IDC cable with different coloured wires into the box. Now it's time to prepare this cable. It's needed to connect the BitWriter Replica PCB with some major points of the 1050 main PCB.

Remove isolation from the end of all 10 wires for 3-5 Millimetres, twist the leads together and tin-coat each end. Cut the tin-coated end of each wire to max. 2 Millimetres.

Remove the FDC (U13) and RIOT (U7) off their sockets.

It's a good idea to take an old toothbrush or something similar and clean the sockets U13, U7 and U9 (for version „A“ of the BitWriter Replica). Also gently cleaning the pins of FDC and RIOT may help to prevent from sporadic issues caused by bad contacts of the 30-years old sockets on the 1050 main PCB.

Bend up the following pins:

Pin 23 of U7 (6532 RIOT)

Pin 30 of U13 (2793/2797 FDC)

Pin 31 of U13 (2793/2797 FDC)

Pin 40 of U13 (**only when FDC 2797 is used!**)

Now let's connect the wires from the IDC cable...

1	black	Pin 2 of U13 (FDC 2793/2797)
2	white	Pin 10 of U7 (RIOT 6532)
3	grey	Pin 31 of U13 (FDC 2793/2797, this pin is bended up!)
4	purple	Pin 10 of U5 (LM/UA-2917)
5	blue	NC (not connected, you may connect it to ground at TP8)
6	green	Pin 23 of U7 (RIOT 6532, this pin is bended up!)
7	yellow	TP-11 (below FDC, see picture on page before)
8	orange	Pin 11 of U16 (74LS04)
9	red	Pin 30 of U13 (FDC 2793/2797, this pin is bended up!)
10	brown	NC (not connected, you may connect it to ground at TP8)

Attention!

The Pin 2 of the FDC is not bended and must be fit in the socket after re-insertion. So use just a small drop of solder at the shoulder of that pin. Same for pin 10 of the 6532 RIOT. When you've a 2797 FDC, then nothing will be connected to pin 40, it just have to be bended up.

Now re-insert both I.C.s carefully in their sockets. The bended up pins must stay outside the socket.

Finalizing installation

Now the major part of installation the BitWriter Replica 1050 is already done!

Take the BitWriter Replica PCB and insert it using the pin headers at the bottom side. When you choose version „A“, the BitWriter Replica PCB is equipped with long square male pin headers. **Don't try to insert this one into a machine-head precision socket!** This will destroy the pin headers and maybe the PCB!

The version „B“ has smaller, round precision male pin headers to fit into machine-head precision sockets. You can also plug a version „B“ into the standard socket of a stock 1050, but the BitWriter Replica PCB doesn't fit very well then and could be fall out when moving the drive.

Never continue now when the 1050 main PCB is inserted into the drive's enclosure! The 1050 main PCB should lay on a flat surface!

You may use some force to insert the PCB into the 1050 CPU's socket. Before you start to insert it, be sure to have the right direction (the pot's on the BitWriter Replica CPU shows to the FDC's place) and that the pin header is correct aligned to the socket. Then use some pressure until the pin header are strongly inserted in the socket.

Finally check all connections again. If everything is fine, plug the IDC cable into the jack at the upper left corner from the BitWriter Replica PCB. You did it ☺

Now insert the 1050 main PCB back to the bottom part of the enclosure. Attach the drive mechanic and all cables – you've made the photos to remember which connector is used... if not... bad!

After this, it's a good idea to make a first test. Connect the drive to power only and switch it on. The motor should start spinning for a short time (shorter than a stock 1050!) and also the read/write head should move for- and backward some tracks. If this happens, all looks fine and you can connect it to the computer. Otherwise check all cables, connection and soldering points.

Every BitWriter Replica PCB was tested before shipping out in the following way:

- Installation of the whole PCB in a stock 1050
- Formatting a disk, writing DOS 2.5 to it and listen directory (= read test)
- Starting BitWriter diagnostics, check ROM, RAM and version of Super Archiver/BitWriter
- Adjusting speed pots on the BitWriter Replica PCB
- Copying whole original game „Archon 2: Adept“ (Source is a 2nd drive with original Super Archiver and BitWriter in two splitted PCBs as sold in the Eighties. The destination drive is always the one where your BitWriter Replica PCB(s) were tested)
- Booting the fresh made copy and test if copy protection detection works (= game starts normal)

So in the most cases a failure of the BitWriter Replica PCB is impossible. If you have any issue, please check your installation first. Of course I will assist if further problems appear.

Adjusting drive motor speeds

The last part of installation is absolutely essential. Only a good adjusted drive will make perfect working copies of protected disks.

First you need to format a good working disk in your 1050 equipped with the BitWriter Replica. Take any standard DOS (i.e. DOS 2.5 or so) and format a **single density** disk in your drive. **Don't use medium/enhanced or double density, this will result in wrong measurements for the speed tests!**

In the ZIP archive you will find a file BITWRITER.ATR. This one contains the BitWriter diagnostics and BitWriter copy tool. Boot from that file (using SIO2PC, SIO2SD and so on) and have your 1050 equipped with the BitWriter Replica also connected to the SIO buss. You can switch your 1050 to drive 2, 3 or 4 – the software takes it all.

After booting the BITWRITER.ATR (of course you can copy the image to a real disk and boot it), press „A“ for diagnostics. When the tool is loaded, press 1...4 for the number of the 1050 equipped with the BitWriter Replica.

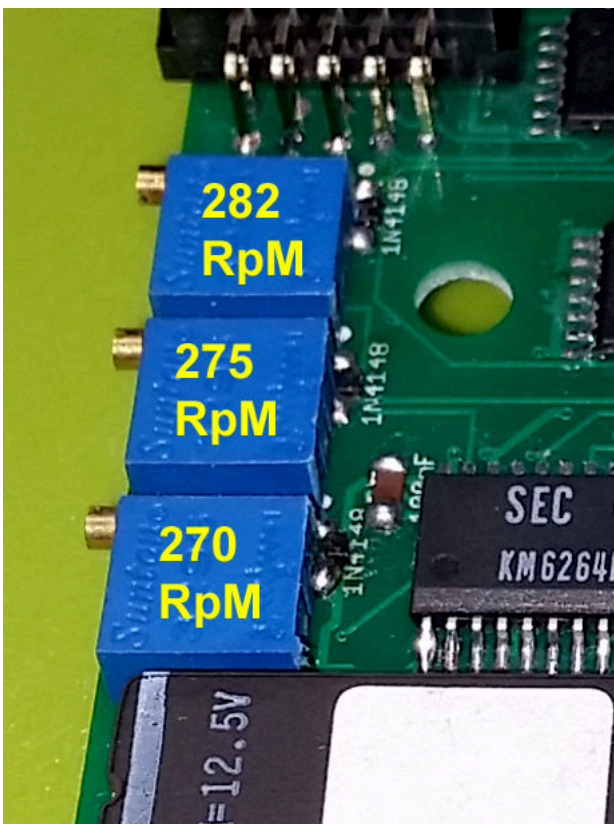
Now you can start with „1“ – speed tests. Insert the freshly formatted single density disk in your 1050 equipped with the BitWriter Replica and press „1“. The BitWriter diagnostics starts with the standard speed, 288 RpM (rounds per minute).

At page 2 I show you the position of the speed pot at the 1050 main PCB. Sometimes there's some wax on the adjustment screw, remove it carefully. Then take a small screwdriver and adjust this pot until the software shows „in range“ at 288 RpM. You should mostly hit the 288 RpM exactly. Of course sometimes it's only 287.7 or 288.3, but the range should never go below 287.5 or over 288.5.

All following settings are depending on the initial standard speed. So it's very important to have a mostly exact setting for the standard of 288 RpM!

Now press START. You always have to hold START down until the software stops beeping, then the next setting for „SLOW1“ should appear. The speed for „SLOW1“ is 282 RpM. To adjust this, use the speed pot on the BitWriter Replica PCB labeled with „282“. See picture below!

The next two settings are similar to that. Press START again, then the setting for SLOW2 (275 RpM) must be done. Use the second speed pot on the BitWriter Replica PCB. Finally do that all again for the third setting, SLOW3 (270 RpM) using the third speed pot on the BitWriter Replica PCB.



Attention:

When setting up the speed pot for 282 RpM, the software sometimes shows a value above 300 RpM with „too high“. This is not a fault of the BitWriter Replica and happens with the original board also (see original BitWriter manual). Just ignore this much-too-high value!

Finish!

When the drive motor speeds are adjusted, the your BitWriter Replica is ready for work!

Hint (for those who reads first a manual, then start working...): Because I already adjusted the BitWriter Replica's speed pots, in the most cases you have nothing to do. When your standard speed of 288 RpM is adjusted good, the other speeds should be fine, too.

Now it's time to read the Super Archiver and BitWriter software manuals.

Have fun!

Regards, Jurgen (tfhh on AtariAge)

List of files in the ZIP archive:

- Installation Instructions BitWriter Replica 1050.pdf - You're reading it ☺
- BITWRITER.ATR – Diagnostic and copy software for the Bitwriter
- Bitwriter Manual.pdf – Manual and installation instructions for the original Bitwriter. Of course you can miss the installation instructions, because you have already done that ☺
- Super Archiver Manual.pdf – Manual and installation instructions for the original Super Archiver. Also miss the installation part...
- The Super Archiver 3.2.atr – Software for the Super Archiver incl. Skew Sector version. Works for the most protected games
- The Super Archiver Enhanced Density 3.03.atr – Special version of the Super Archiver software only for medium density protected disks
- Notes on the Enhanced Density Super Archiver 3.03.pdf – Addendum for the medium density software for Super Archiver
- Notes on the Super Archiver 3.2x.pdf – Addendum for the V3.2 version of Super Archiver software