Project Documentation

Atari XL/XE A/V-Adapter

Project number: 197

Revision: 1

Date: 15.11.2022

Atari XL/XE A/V-Adapter Rev. 1

Module Description

Introduction

The Atari XL/XE-Adapter serves as a breakout module for the 5-pin A/V jack, which allows using off the shelve cables of desired length and quality for connecting the Atari XL/XE to video/audio equipment.

The adapter is passive, it does not improve the video quality, but it helps to prevent video degradation. The S-Video jack works with Atari XL (that are modified only) and XE. The adapter **does not generate S-Video**!

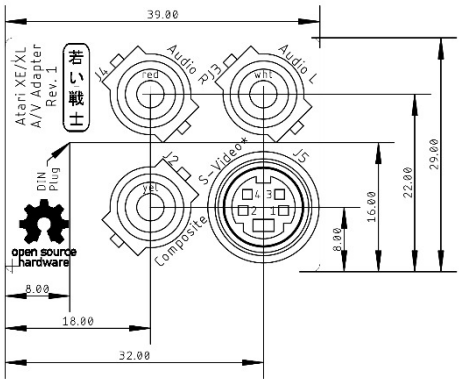


Figure 1: Dimensions of the PCB

The two audio jacks (Audio L and Audio R) are connected to the same signal, the (mono) Audio Out of the Atari.

A 3D printable case can be found in the project folder as well as a label for this case. The case for Rev. 0 is different from the case for Rev. 1.

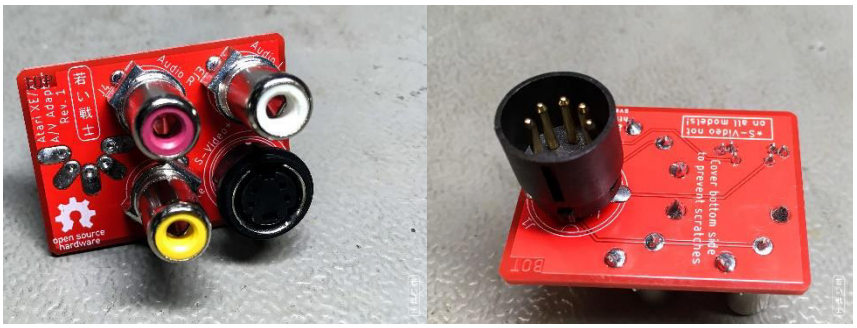


Figure 2: Top and bottom side of the assembled Atari A/V-Adapter

Figure 3: Atari A/V-Adapter installed in the 3D-printed case

Connectors

A/V-Plug – J1

The A/V-Plug for the Atari XE (XL) is the inner part of a Lumberg SV 50 DIN-Plug (180°).

Pin	Signal
1	Luminance*
2	GND
3	Audio Out (mono)
4	Composite Video
5	CHROMA*

*XL (with S-Video mod only) and XE

RCA-Jacks – J2, J3, J4

Connector	Signal
J2	Composite Video
J3	Audio Out L (mono!)
J4	Audio Out R (mono!)

Mini-DIN (S-Video) jack – J5

A vertical PCB mount Mini-DIN jack (4 circuits)

Pin	Signal
1	GND (Luminance)
2	GND (Chrominance)
3	Luminance
4	Chrominance

The DIN-Plug

The DIN-Plug is an **essential part** of this development. It is the inner part of a Lumberg SV 50 connector, which is not cheap, but it is definitely worth the money, since the flange is taking the forces introduced by the weight of the adapter and the cables. This way, the set-up is not hanging

from the contacts, which might even damage those. Do not use a cheap connector without a flange, here.

Assembly

First, the DIN connector has to be soldered. The pins should be aligned flush to the top side of the PCB. This can be accomplished by putting the PCB top down on a heat resistant, flat surface. Then solder one pin from the top (the solder pads are shaped in a way, that allows doing so), check, if it is really flush and the connector is perpendicular to the board, then solder the remaining pins.

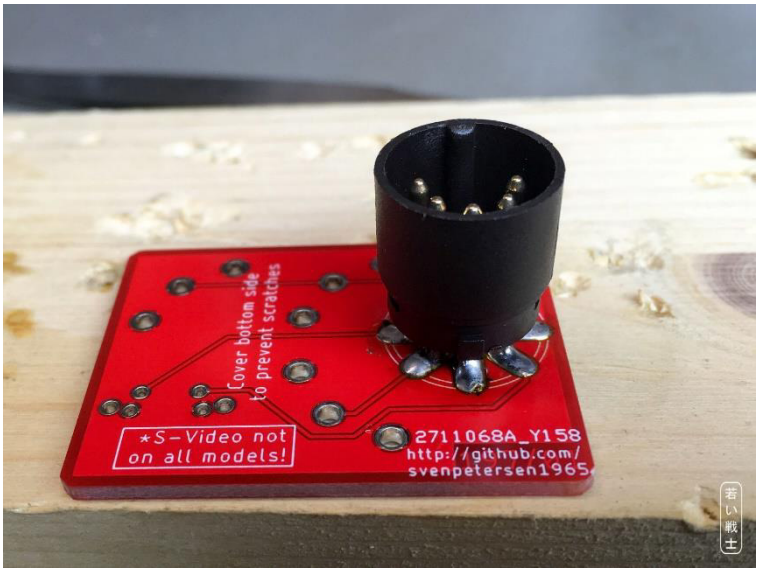


Figure 4: Aligning the DIN-Connector

Now, place and solder the mini-DIN and finally the RCA jacks. They should be well aligned, too. The ground pins might require more energy to be soldered, so the use of a thick solder tip is recommended and may be even a higher temperature (450°C). After soldering, the pins should be trimmed (shorter than 1.5mm), so they fit into the 3D-Printed case. If you do not use a case, cover the pins with something like duct tape or small drops of hot glue to prevent scratching the case of your Atari.

Compatibility

The A/V Adapter is compatible with the Atari 8-bit computers XL (composite only) and XE and modified XL for S-Video.

Acknowledgement

I thank my cooperation partner for this project, Michal Polák. He initiated the project, provided me with the information and tested the A/V Adapter with other computers than the 800XL.

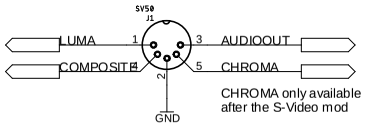
Revision History

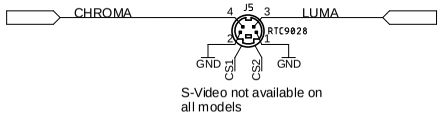
Rev. 0

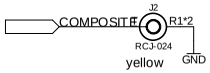
- Fully functional prototype

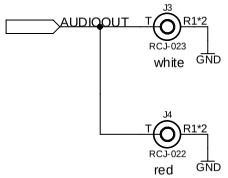
Rev. 0 → Rev. 1

- The device is turned right, the notch of the DIN and mini-DIN connectors points up (again)
- New case (Rev. 1) required









open source hardware

Title:	Atari A/V-Adapter	Doc.-No.:	197-1-01-01
		Draft.:	Sven Petersen
Date:	15.11.2022 11:46	Rev.: 1	Page 1/1
File:	Atari_AV-Adapter		
	http://github.com/svenpetersen1965		A3

Sven Petersen 2022	Doc.-No.: 197-2-01-01	
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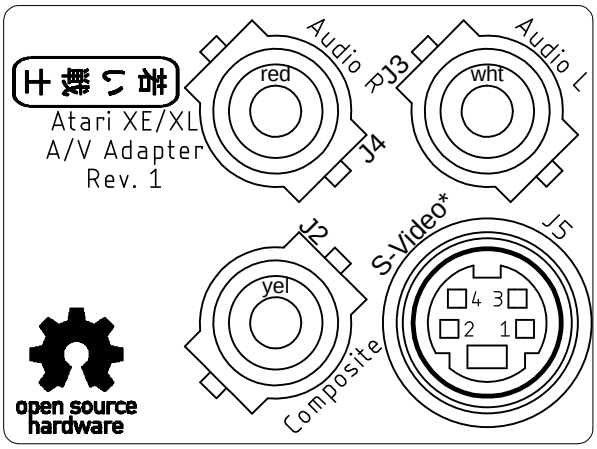
Atari_AV-Adapter		
28.11.2022 15:18		Rev.: 1
placement component side		



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Atari_AV-Adapter		
28.11.2022 15:18		Rev.: 1
placement solder side		

Sven Petersen 2022	Doc.-No.: 197-2-01-01	
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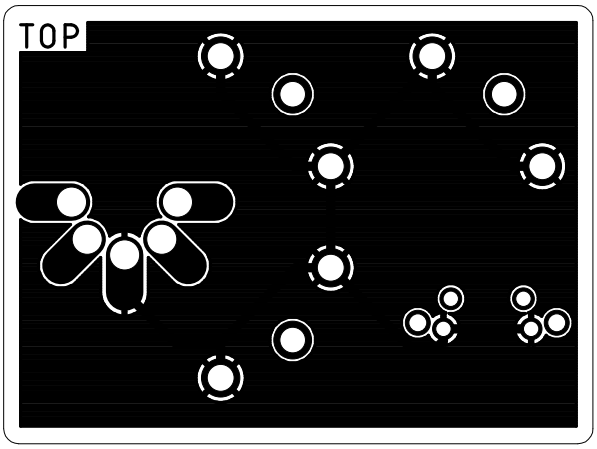
Atari_AV-Adapter		
28.11.2022 15:18		Rev.: 1
top		



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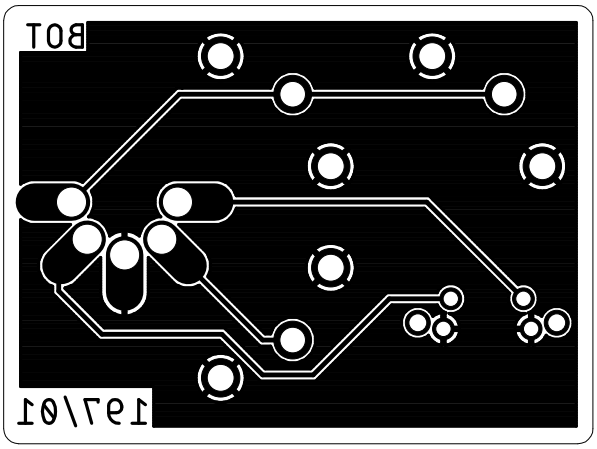

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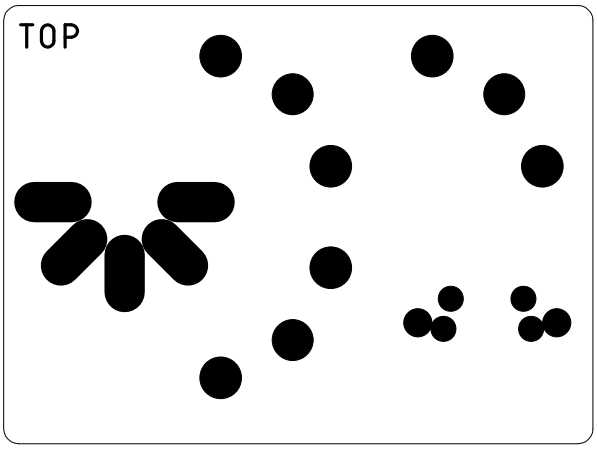
stopmask component side		



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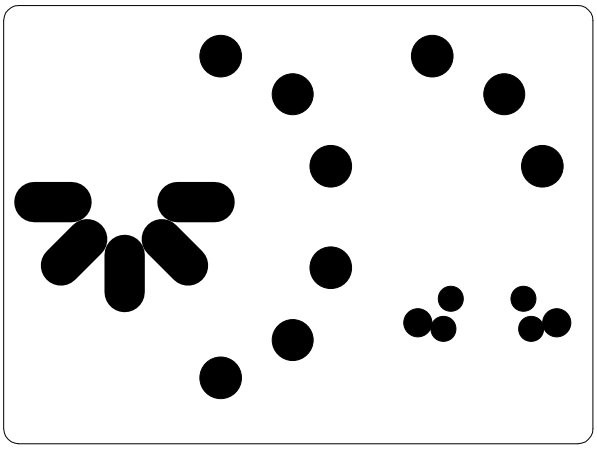
28.11.2022 15:18		Rev.: 1
stopmask solder side		



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28.11.2022 15:18		Rev.: 1
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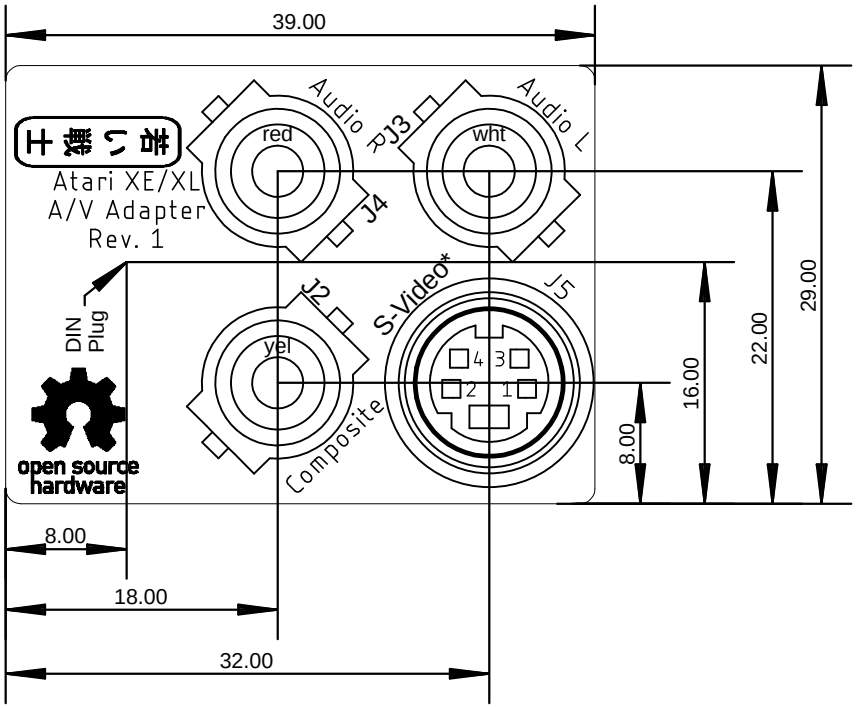

Atari XL/XE A/V-Adapter Rev. 1

Testing

Test Setup

The tests were executed with an Atari XL/XE A/V-Adapter Rev. 0 and Rev. 1. These computers were used for testing:

- Atari 800XL
- Atari 800XE
- Atari 130XE (Rev. 0 only)

The retroTINK 2x (used with the HDMI capture device), the Framemeister (used with the TV) and a Samsung smart TV served as video equipment. A 1.5m RCA A/V cable connected the computer to the video equipment.

Functional Test

The A/V adapter was connected to the computers. The 800XL displayed the composite video signal properly. The 130XE and the 800XE displayed both, the composite and the S-Video signal properly.

Figure 1: Testing with the 800XL

Mechanical Testing

The Atari XL/XE A/V-Adapter Rev. 1did not block any port of the said computers. It fits under the protrusion of the computers' back side.

Figure 2: Test fitting with the 800XL

Figure 3: Test-fitting with the 800XE

Conclusion

The Atari XL/XE A/V-Adapter Rev. 1 works well with different equipment. The video quality depends very much on the used video equipment. The video adapter will not improve the picture of the

computers, since it is passive only, but since it allows to use good, off the shelve cables, it is superior to most hand-made custom cables.

The Atari XL/XE A/V-Adapter Rev. 1 is fully functional.

Atari XL/XE A/V-Adaptor Rev. 1
Bill of Material Rev. 1.0

Pos.	Qty	Value	Footprint	Ref.-No.	Comment
1	1	197-2-01-01	2 Layer	PCB Rev. 1	2 layer, Cu 35μ, HASL, 39.0mm x 29.0mm, 1.6mm FR4
2	1	RCJ-022	RCJ-02X	J4	CUI Inc., RCA jack, vertical, red. Mouser: 490-RCJ-022, Digikey: CP-1407-ND. Alternative part: Keystone 577
3	1	RCJ-023	RCJ-02X	J3	CUI Inc., RCA jack, vertical, white. Mouser: 490-RCJ-023, Digikey: CP-1408-ND. Alternative part: Keystone 584
4	1	RCJ-024	RCJ-02X	J2	CUI Inc., RCA jack, vertical, yellow. Mouser: 490-RCJ-024, Digikey: CP-1409-ND. Alternative part: Keystone 586
5	1	SV50	SV50_INNER	J1	Inner part of Lumberg SV 50 (SV 50-8), e.G. Reichelt: LUM SV 50, Newark: 82AH3339 , Farnell: 3549652, TME.eu: SV50, alliedelec.com: 70151556
6	1	solder bridge		JP1	structure on PCB, close for proper operation
7	1	RTC9028	MINIDIN4_V	J5	Mini-DIN, 4p, vertical. Not required for 5-pin and VIC-20. E.g. AliExpress:
					RTConnector: RTC9028
					ebay.de