VBXE 2.1

Electron & Candle'O'Sin, rev 2.1

VideoBoard XE
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Version 2.1 for Lotharek FHU
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DISCLAIMER :

- **Before any soldering inside computer; POWER OFF ATARI**
- **Disconnect all devices**
- **Use professional tools without any risk or possible harm to You**
- **If You are not sure what to do – go to PROF ! Do not solder on Your own.**
- **If You haven`t understood below pinouts – also visit PROF technician !**

Hello Dear VBXE USER ☺

VBXE project was started in 2005 by Tomasz Piórek (Electron/TQA), and first public announcement was made in March of 2006. Since that time, VBXE project has been improved by Candle`o`Sin - Video DAC has been changed, microcontroller responsible for FPGA core management functions was swapped from PIC to ATMega48. Recently, new live was pumped into project - another VideoDac change, few minor changes. Newest version - 2.1 - is 100% compatible with it`s ancestors, is made on automatic assembly lines and it is 100% ROHS and environment friendly.

Device info:

- RGB output providing crisp clear picture using LCD TV or RGB monitor
- up to 1024 colors on screen from 21 bit palette
- graphics resolution up to 640x480i (640x240p) in 64 colours, 320x240p in 1024 colours, and 160x240p in 1024
- true 80 char mode for text display
- blitter with 7 modes of operations capable of zooming displayed data, transparency, collision detection and many other features
- full downward compatible with GTIA chip
- and many, many more

So, let's have a look inside box. There are:

1. Fully tested and assembled VBXE BOARD
2. Adapter for ANTIC (**NOTE**: XL adapter is different than XE)

Here we can learn how to connect Your brand new VBXE upgrade inside ATARI. Before You start, unplug ATARI from power supply or any external devices. It is very easy process and as long You have some soldering skills, we shouldn`t expect any troubles.

So, follow me :

1. Locate Your ANTIC CHIP on ATARI BOARD http://en.wikipedia.org/wiki/ANTIC
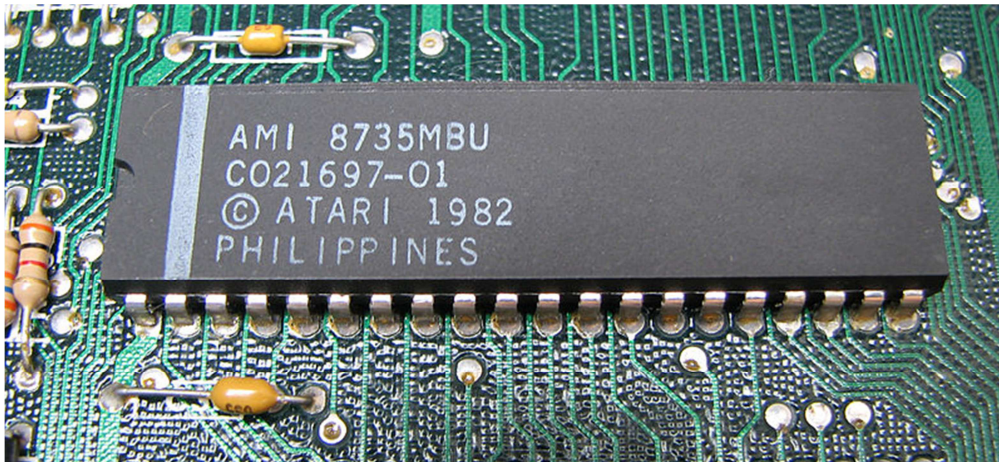

2. If ANTIC CHIP is socketed, remove it from socket and remove socket. If it is not socketed, You have to desolder it. After this operation, space after ANTIC CHIP should be clean from solder – like below. ANTIC CHIP will be needed later so do it carefully !
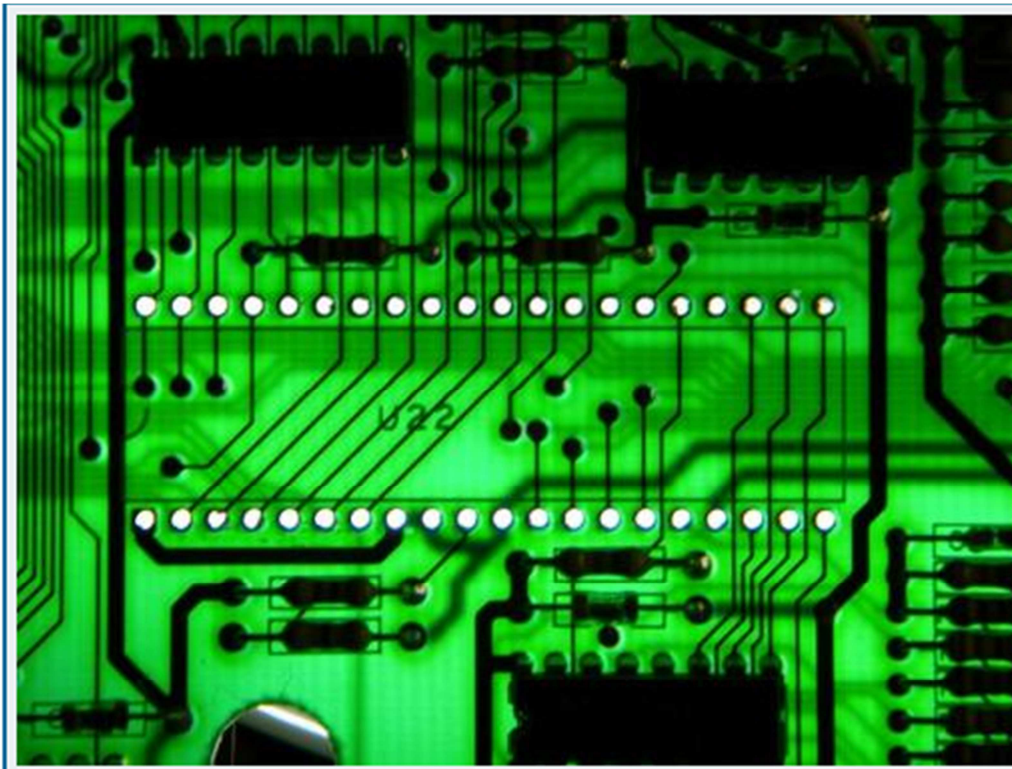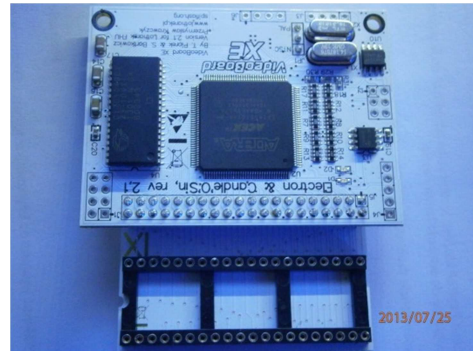
3. Solder into ATARI board VBXE ADAPTER

NOTE: Do not remove bottom precision 40 pin socket from VBXE adapter whilst soldering !

XE SERIES
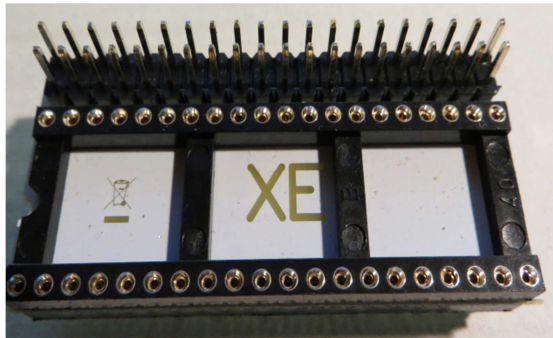
XL SERIES

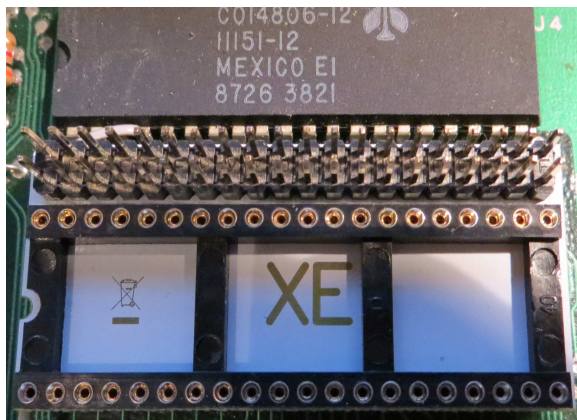
After soldering back VBXE adapter:

- Insert previously desoldered ANTIC CHIP into VBXE precision socket
- Power on ATARI. It must start as usually. If not, check all connections / solders
- Power off atari
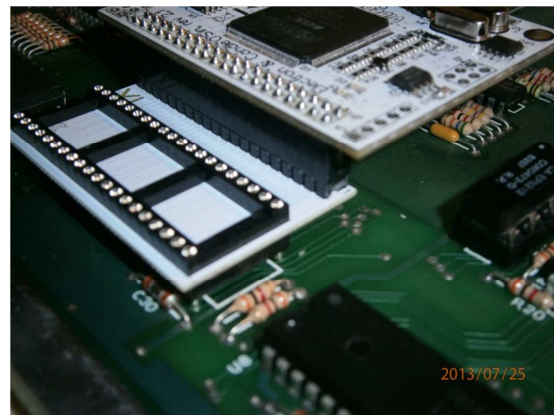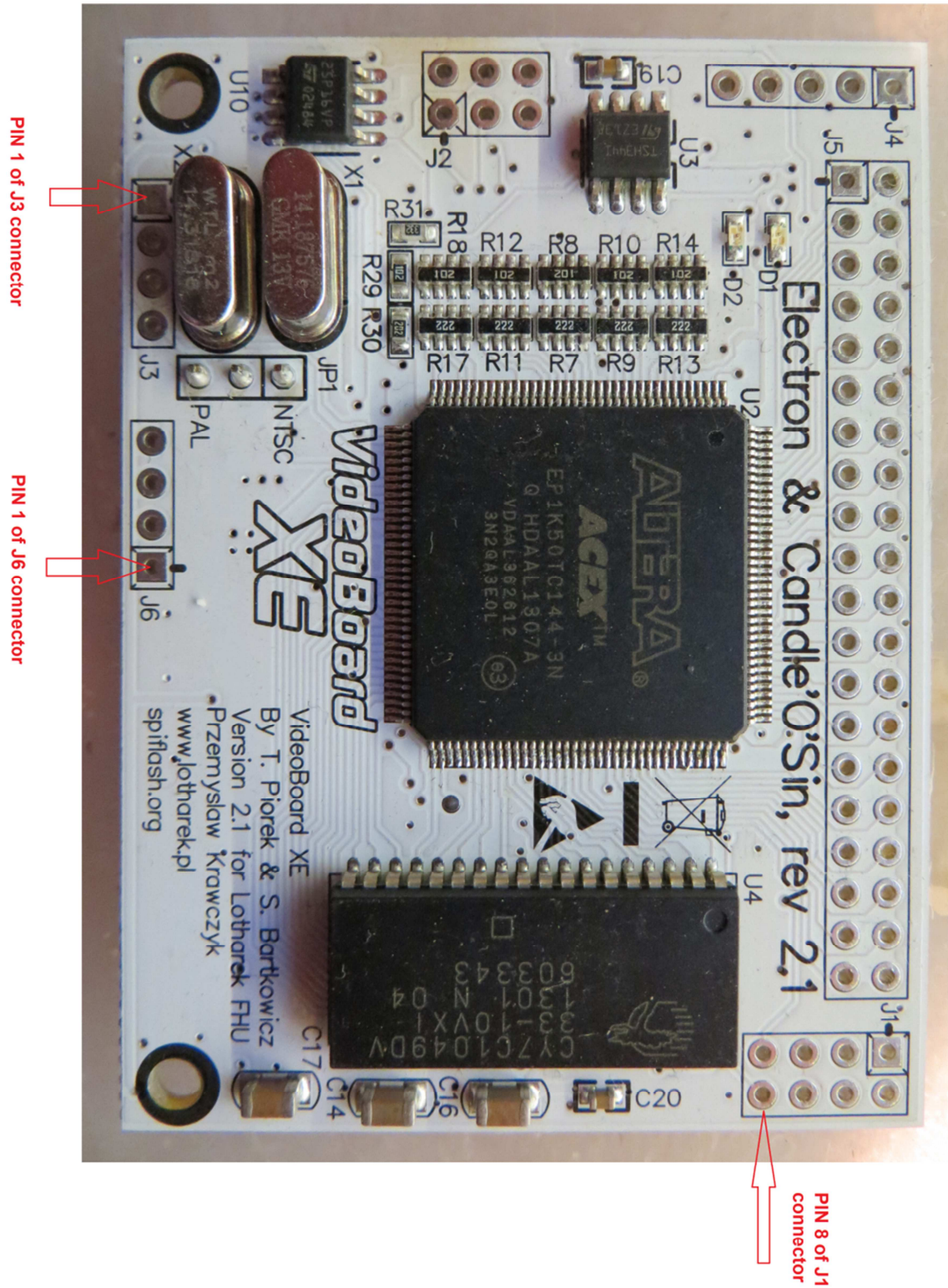- plug VBXE board into adapter.

- Insert previously desoldered ANTIC CHIP into VBXE precision socket
- Power on ATARI. It must start as usually. If not, check all connections / solders

4. Please, make proper connections according to diagram, but do not move any crystal to VBXE board – it has already 2 onboard (NTSC,PAL) – this concerns 2.0 version.

Generally, almost all Atari computers are equipped with Freddie CHIP http://en.wikipedia.org/wiki/Atari_FREDDIE (except XL series – follow picture from page 8) and all are equipped with CPU (CO14806).

For those machines with Freddie chip, after removing crystal (GENERATOR in XEGS and some ATARIs) and others parts from below pictures, please make connections between VBXE and Atari board.

STEP	VBXE	ATARI BOARD	Signal NAME
1.	J3 PIN 1	CPU (CO14806) PIN 4	IRQ
2.	J3 PIN 2	Freddie PIN 3	EXTSEL
3.	J3 PIN 3	GND	GND
4.	J3 PIN 4	Freddie PIN 4	CASINH
5.	J6 PIN 4	GND	GND
6.	J6 PIN 3	Freddie PIN 2	CLK 14 MHZ
7.	J6 PIN 2	Not connected	--
8.	J6 PIN 1	Not connected	--
9.	J1 PIN 8	LS38 pin 8 (VB pin on ULTIMATE BOARD if You have Ultimate upgrade installed)	D6xx

Atari computers not equipped with Freddie CHIP http://en.wikipedia.org/wiki/Atari_FREDDIE (XL series) use different pins on VBXE board. For those machines, after removing crystal and others parts from below pictures, please make connections between VBXE and Atari board.

STEP	VBXE	ATARI BOARD	Signal NAME
1.	J3 PIN 1	CPU (CO14806) PIN 4	IRQ
2.	J3 PIN 2	800XL – U18, 74LS08 pin 9	EXTSEL
3.	J3 PIN 3	GND	GND
4.	J3 PIN 4	800XL – U18, 74LS08 pin 10	CASINH
5.	J6 PIN 4	GND	GND
6.	J6 PIN 3	NOT CONNECTED	NOT CONNECTED
7.	J6 PIN 2	NOT CONNECTED	NOT CONNECTED
8.	J6 PIN 1	800 XL – U21, 74LS74 pin 3	CLK 3,5 MHZ
9.	J1 PIN 8	LS38 pin 8 (VB pin on ULTIMATE BOARD if You have Ultimate upgrade installed)	D6xx

VBXE2 Installation Guide connection points - ᴊᴸ ATARI XEGS

Below picture shows install of previous 2.0 version. Present needs only crystal (or generator) and other small parts removal. Then, Please follow above connection table

VBXE2 Installation Guide connection points - 人 ATARI 800XL

Below picture shows install of previous 2.0 version. Present needs only crystal (or generator) and other small parts removal. Then, Please follow above connection table

VBXE2 Installation Guide connection points – ∧ ATARI 65/130XE, 4bit memory chips

Below picture shows install of previous 2.0 version. Present needs only crystal (or generator) and other small parts removal. Then, Please follow above connection table

VBXE2 Installation Guide connection points - 人 Atari 65/130XE, 1bit memory chips
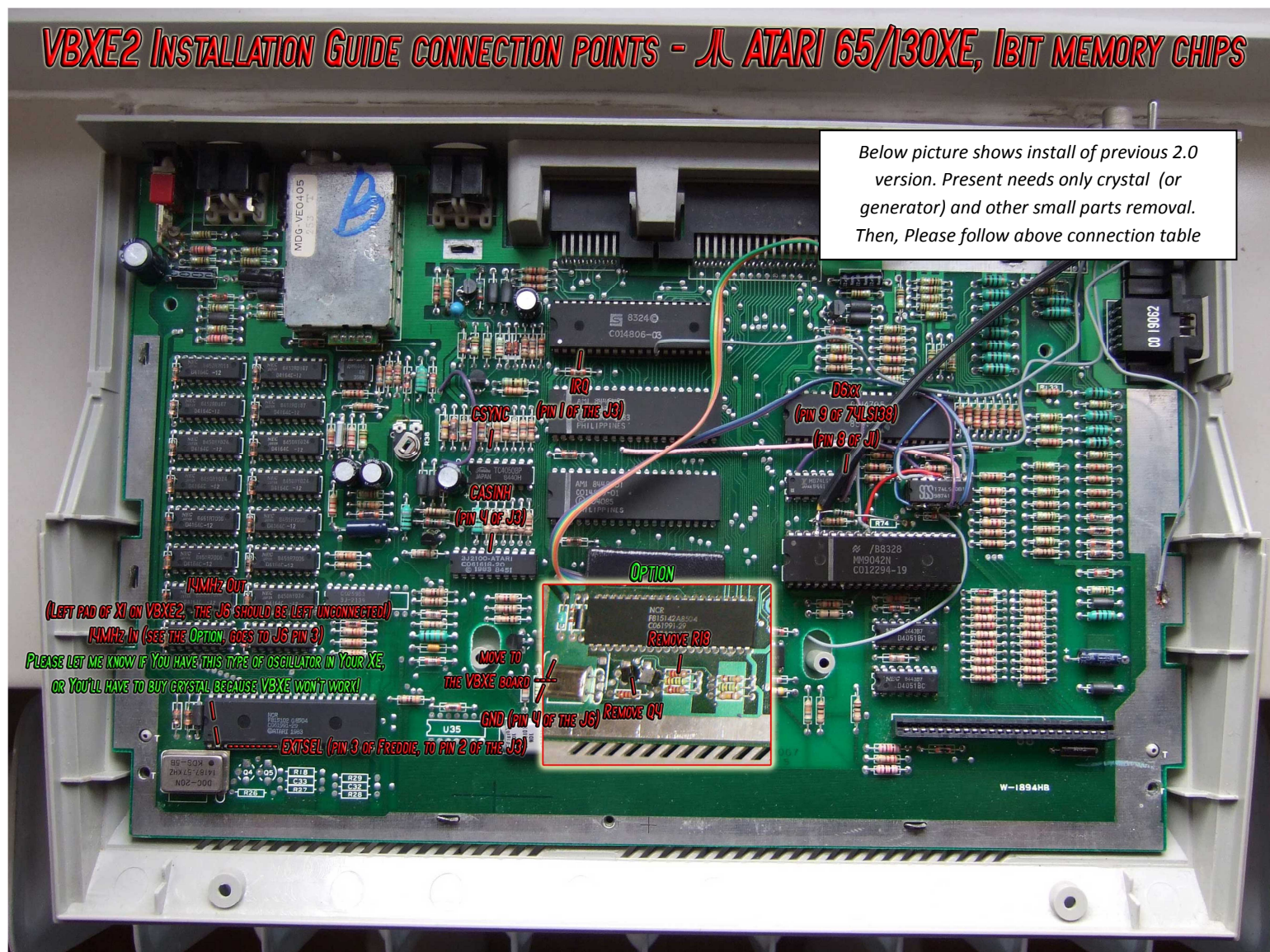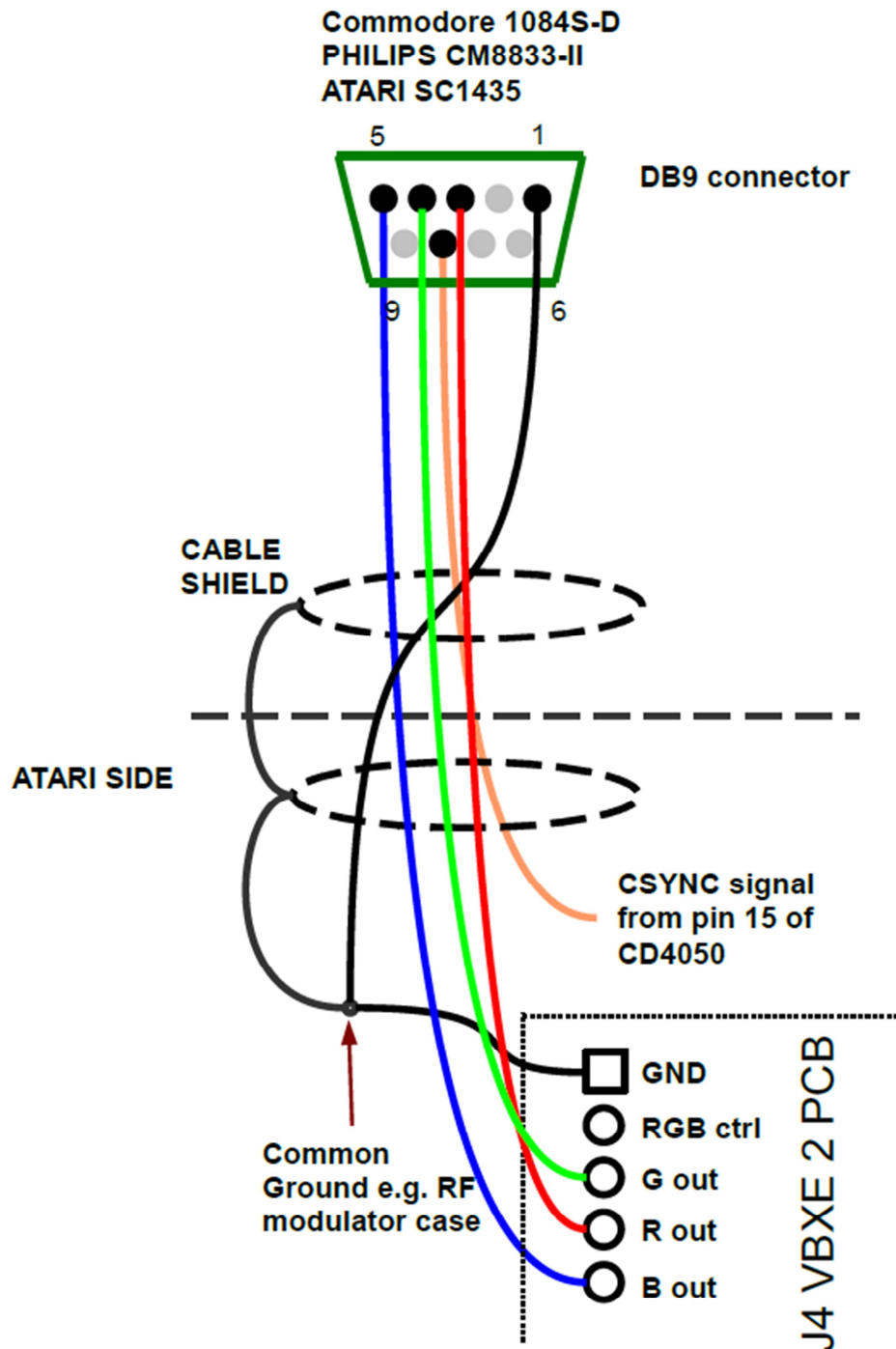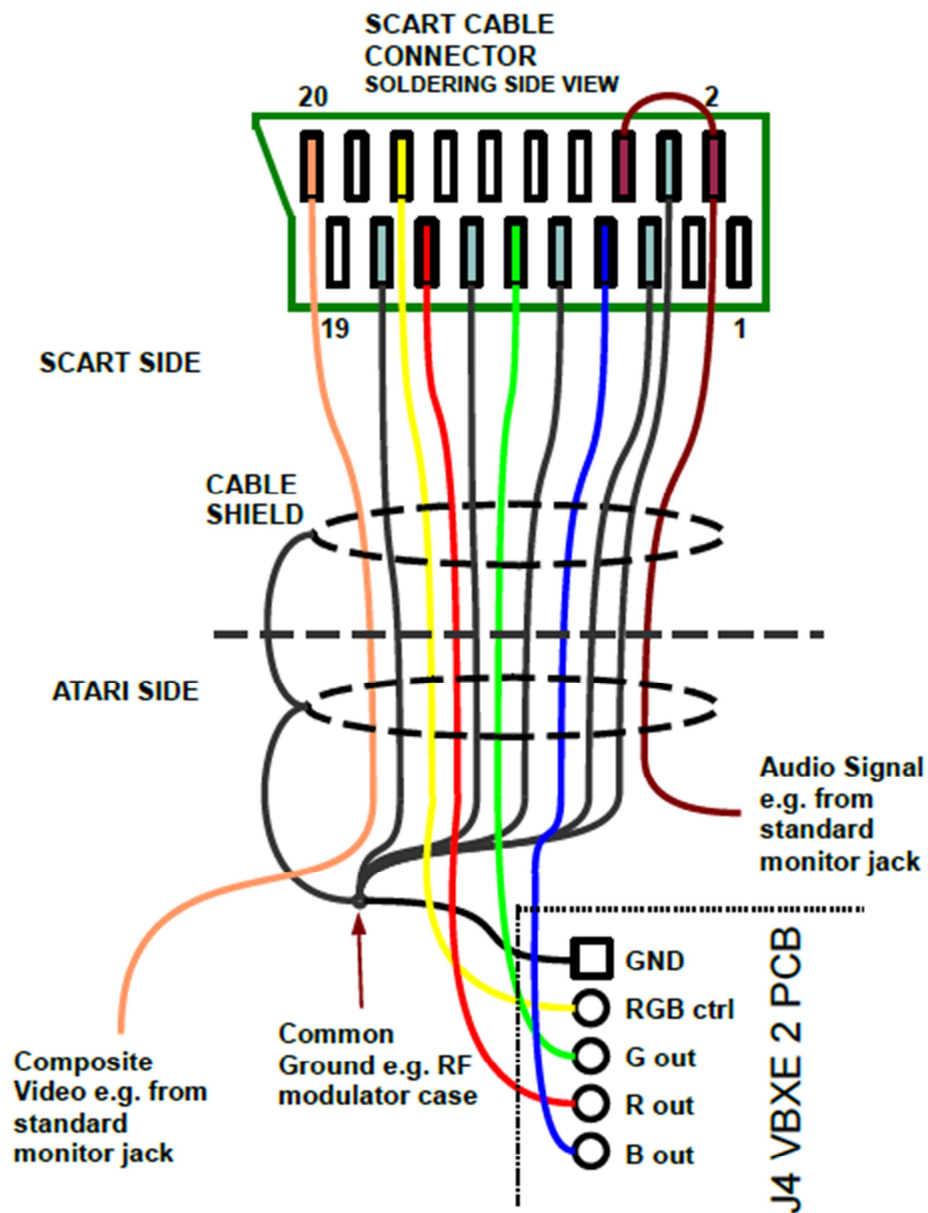
Below picture shows install of previous 2.0 version. Present needs only crystal (or generator) and other small parts removal. Then, Please follow above connection table

5. After proper installation, VBXE offers high quality RGB output. To test it, make a proper cables.

VBXE to classic RGB monitor connection

Commodore 1084S-D
PHILIPS CM8833-II
ATARI SC1435

DB9 connector

CABLE SHIELD

ATARI SIDE

CSYNC signal from pin 15 of CD4050

Common Ground e.g. RF modulator case

GND
RGB ctrl
G out
R out
B out

J4 VBXE 2 PCB

VBXE to SCART TV connection

SCART PINOUT
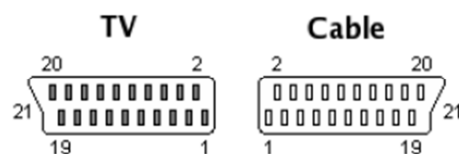
SIGNALS DESCRIPTION

Pin	Name	Description	Signal Level	Impedance	VBXE / ATARI Signal
1	AOR	Audio Out Right	0.5 V rms	<1k ohm	
2	AIR	Audio In Right	0.5 V rms	>10k ohm	Audio
3	AOL	Audio Out Left + Mono	0.5 V rms	<1k ohm	
4	AGND	Audio Ground			GND
5	B GND	RGB Blue Ground			GND
6	AIL	Audio In Left + Mono	0.5 V rms	>10k ohm	Audio
7	B	RGB Blue In	0.7 V	75 ohm	VBXE B
8	SWTCH	Audio/RGB switch / 16:9	0-2 V=TV, 5-8 V=WideScreen, 9.5-12 V=AV Mode	>10 kohm	
9	G GND	RGB Green Ground			GND
10	CLKOUT	Data 2			
11	G	RGB Green In	0.7 V	75 ohm	VBXE G
12	DATA	Data 1			
13	R GND	RGB Red Ground			GND
14	DATAGND	Data Ground			
15	R	RGB Red In / Chrominance	0.7 V (Chrom.: 0.3 V burst)	75 ohm	VBXE R
16	BLNK	Blanking Signal	1-3 V=RGB, 0-0.4 V=Composite	75 ohm	VBXE RGB control
17	VGND	Composite Video Ground			GND
18	BLNKGND	Blanking Signal Ground			
19	VOUT	Composite Video Out		75 ohm	
20	VIN	Composite Video In / Luminance		75 ohm	CVBS
21	SHIELD	Ground/Shield (Chassis)			

Not coloured - not connected

The „SWITCH" Pin may be connected for automatic TV switching to EXTERNAL (SCART) RGB mode - but this feature requires 9-12V DC signal from external source - unfortunately we don't have such voltage available in atari (even on VBXE board). Anyway, every TV can be switched to SCART RGB mode manually by remote or control panel.