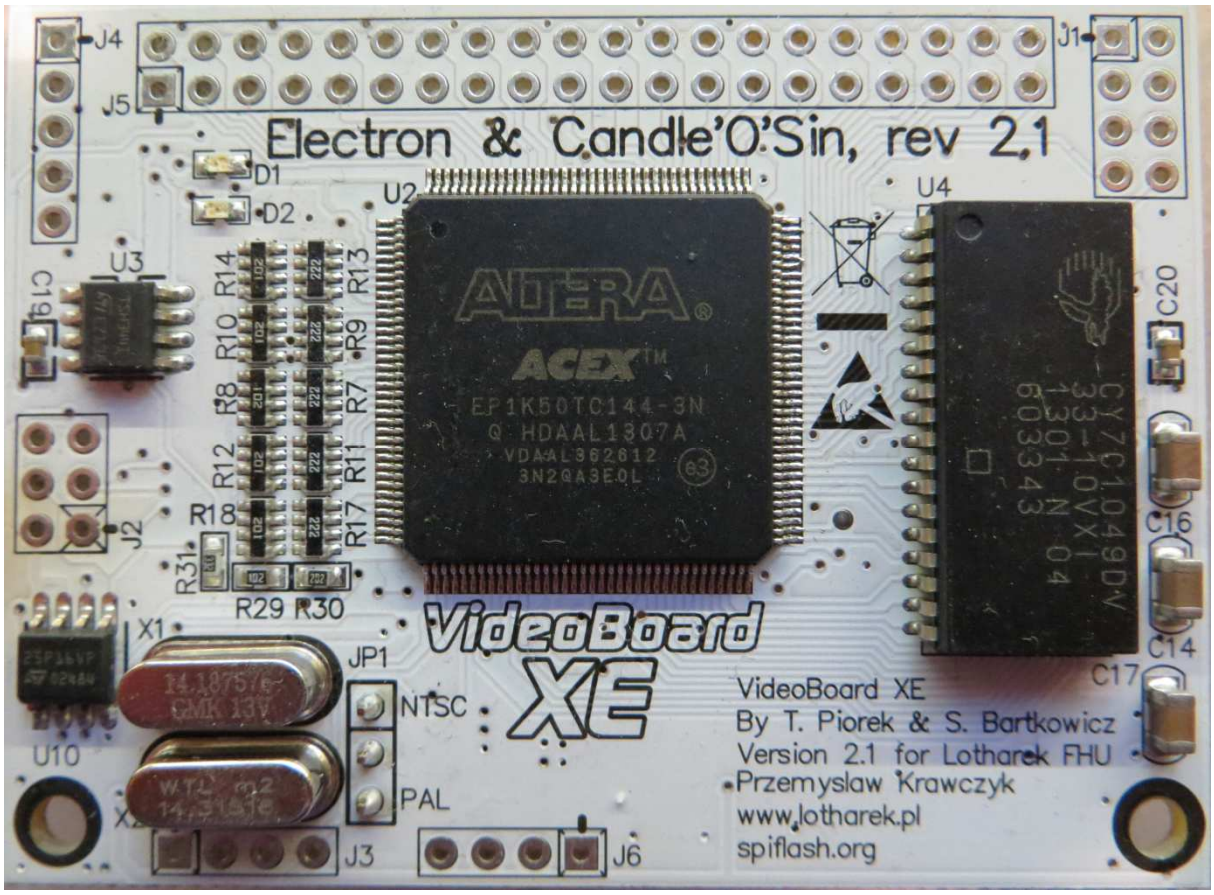
VBXE 2.1



www.lotharek.pl

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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.

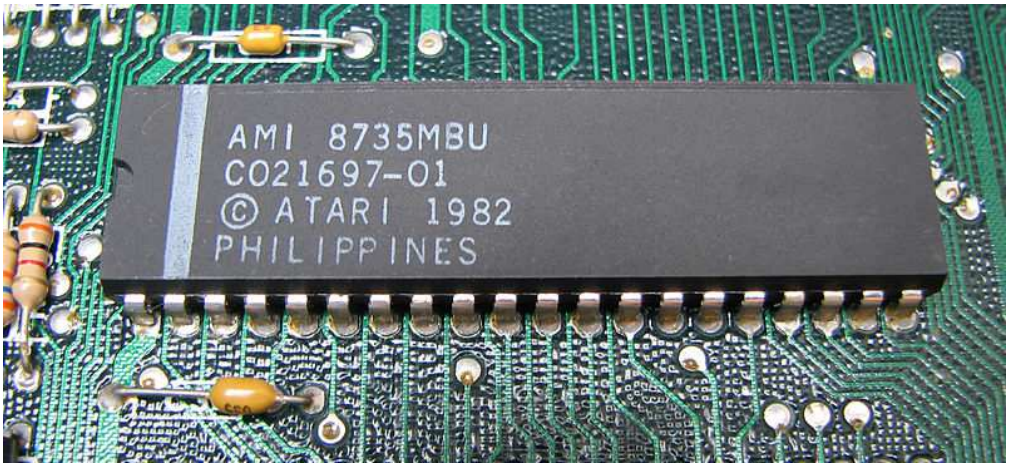
The most important check, prior to installation of VBXE CARD is :

- locate Freddie chip (https://en.wikipedia.org/wiki/Atari_FREDDIE)
- measure resistance between pin EXTSEL (pin 3) and Vcc (pin 40)
  - if measured resistance is approx. 3 KOhm, You are ready to install VBXE
  - if measured resistance is approx. 0 Ohm (direct connection) , please do :
    - desolder FREDDIE PIN 3 ONLY
    - lift it up
    - connect it with 1,5-10 KOhm resistor to 5V (Freddie pin 40)
    - power on ATARI – it shall start as usually

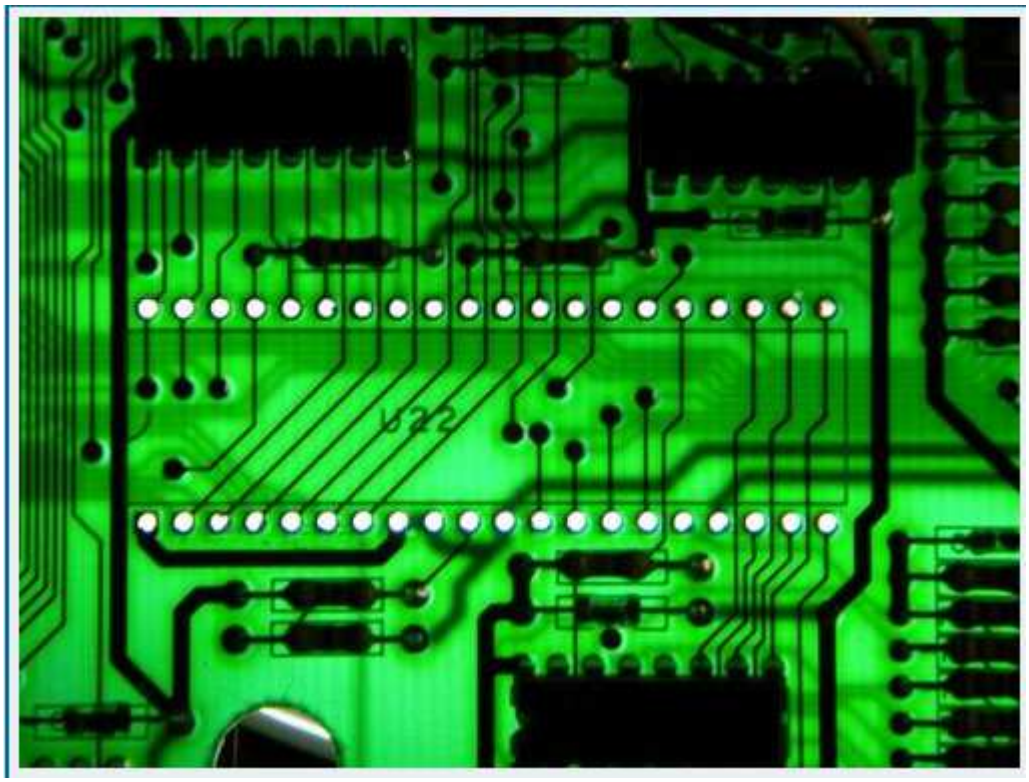
Explanation : in some ATARIs (XEGS, non ECI equipped 65XE) there is permanent connection to 5V, what is BAD. Direct connection of 5V may damage Your VBXE.

STEP BY STEP:

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



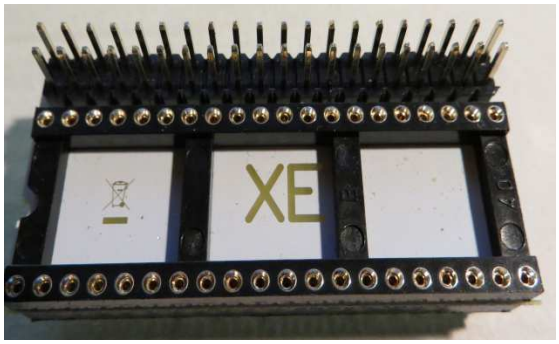
2. If ANTIC CHIP is socketed, remove it from socket and remove socket. If it is not socketed, You have to desolder it. After this operation, space after ANTIC CHIP should be clean from solder – like below. ANTIC CHIP will be needed later so do it carefully !



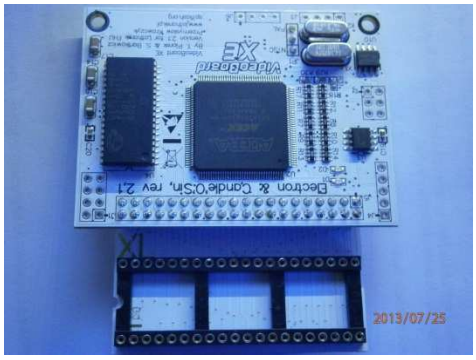
3. Solder into ATARI board VBXE ADAPTER

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

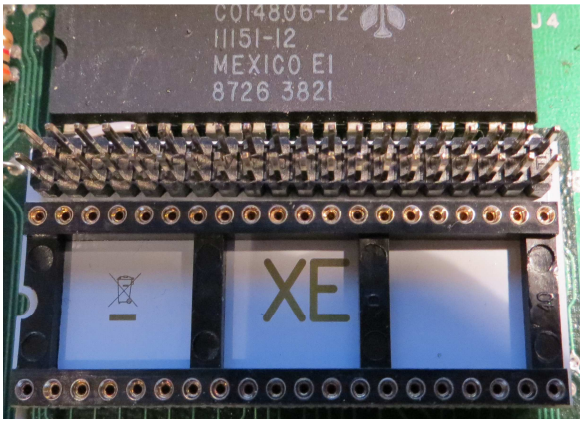
XE SERIES



XL SERIES

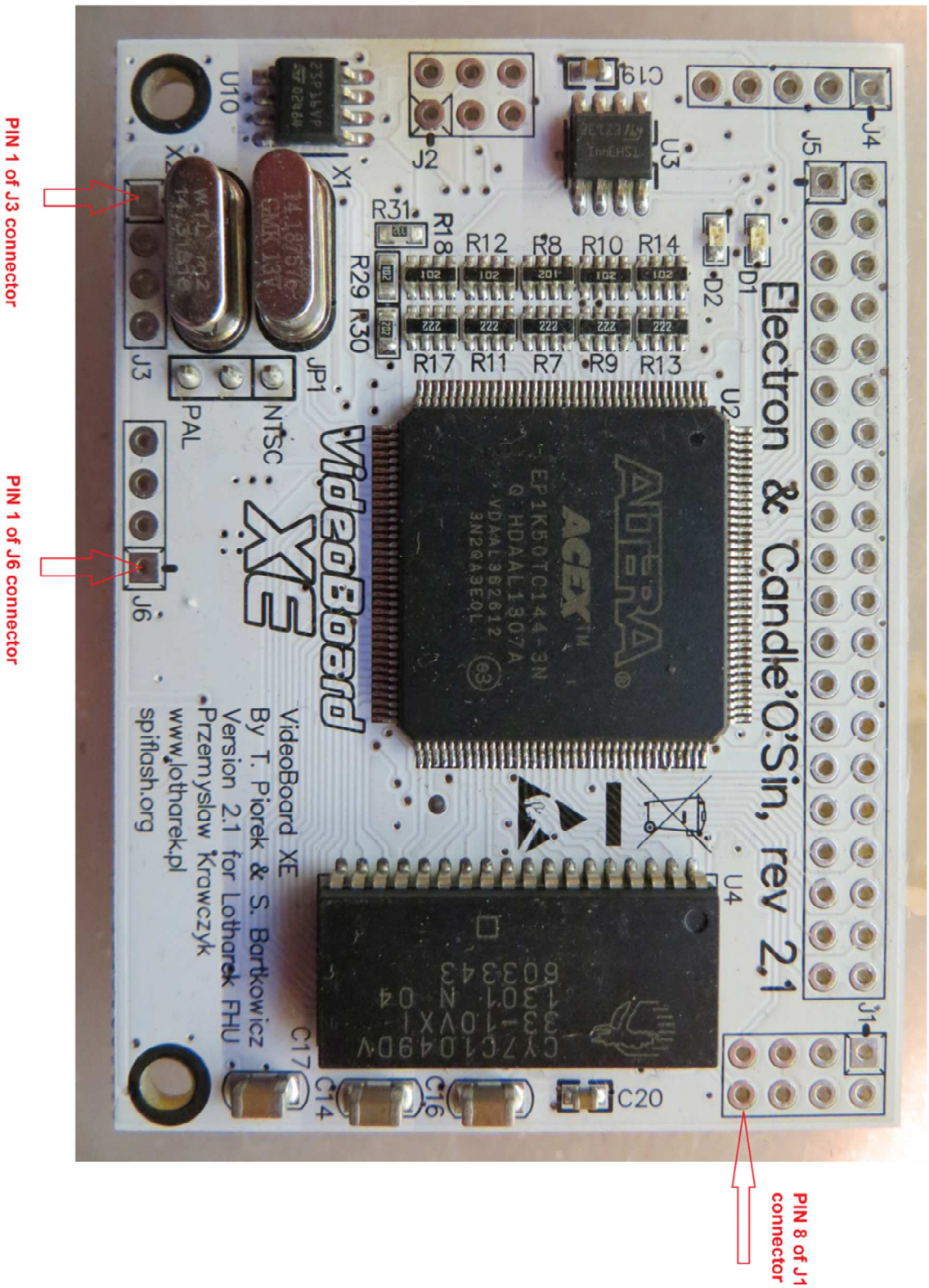


After soldering back VBXE adapter:



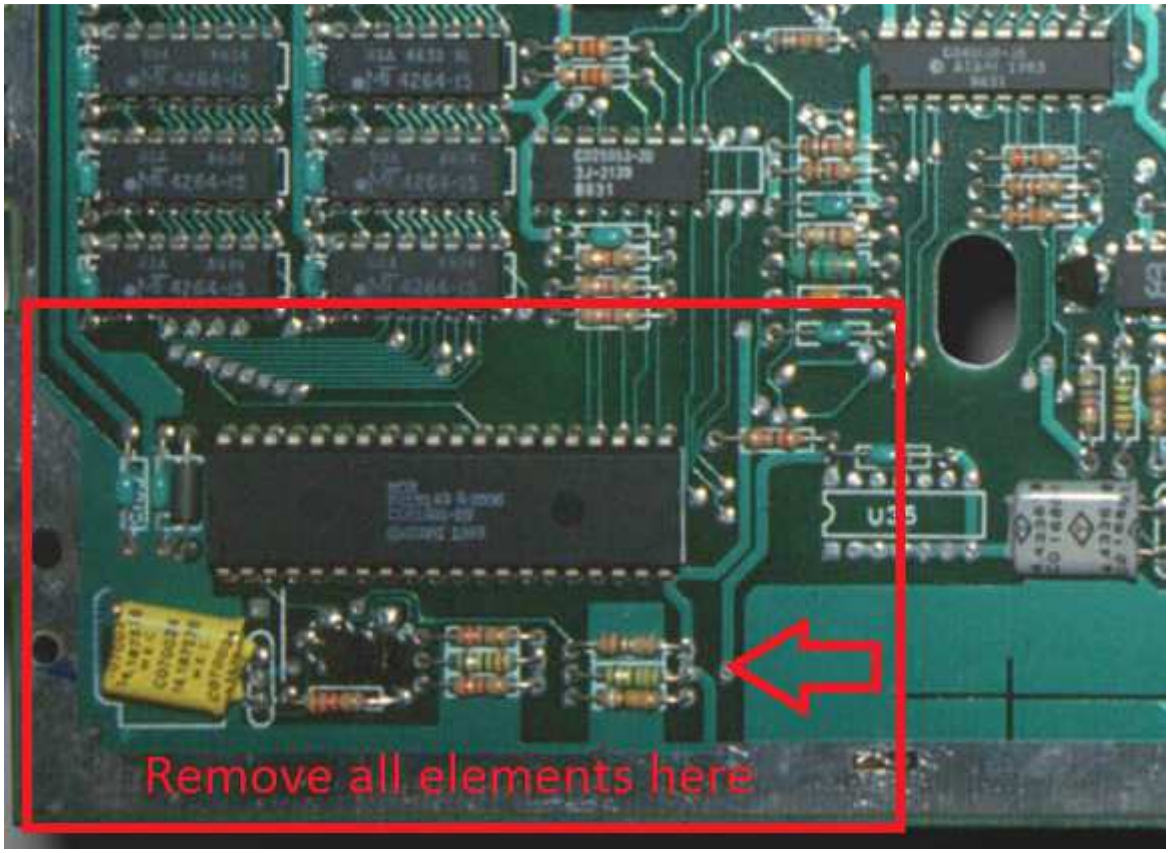
- Insert previously desoldered ANTIC CHIP into VBXE precision socket
- Power on ATARI. It must start as usually. If not, check all connections / solders
- Power off atari
- plug VBXE board into adapter.

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


PIN 1 of J3 connector
PIN 1 of J6 connector
PIN 8 of J1 connector
Electron & Candle'O'Sin, rev 2.1
VideoBoard XE
By T. Piorek & S. Bartkowicz
Version 2.1 for Lotharek FHU
Przemyslaw Krawczyk
www.lotharek.pl
spiflash.org
J1
J2
J3
J4
J5
J6
U2
U3
U4
U10
X1
X2
JP1
PAL
NTSC
C14
C16
C17
C20

ATARI XE SERIES (65XE/130XE/800XE):

- Remove below parts (resistors, oscillator)

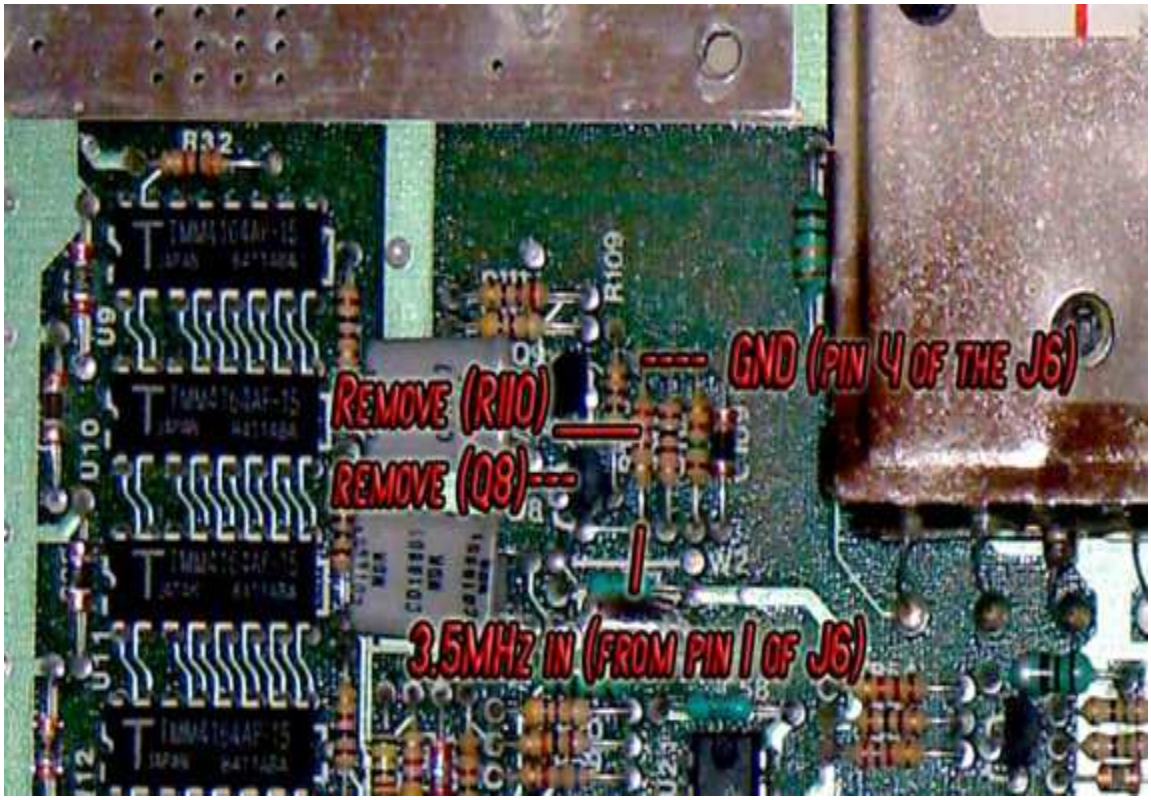


- Make a proper connections

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	LS138 pin 9 (VB pin on ULTIMATE BOARD if You have Ultimate upgrade installed)	D6xx

ATARI 800XL (NOT XLF; computers with delay line chip – first design)

- Remove below parts (1 transistor, 1 resistor)

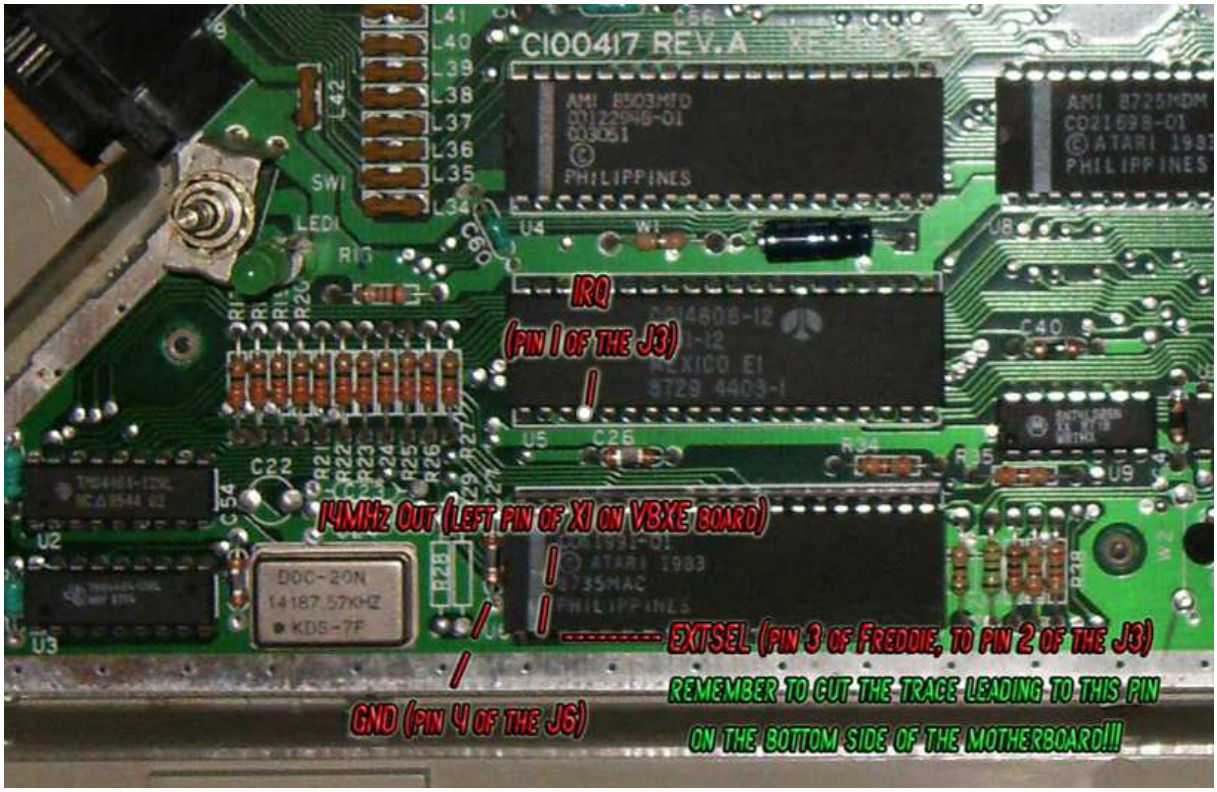


- Make a proper connections

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	LS138 pin 9 (VB pin on ULTIMATE BOARD if You have Ultimate upgrade installed)	D6xx

ATARI XEGS

- Remove oscillator

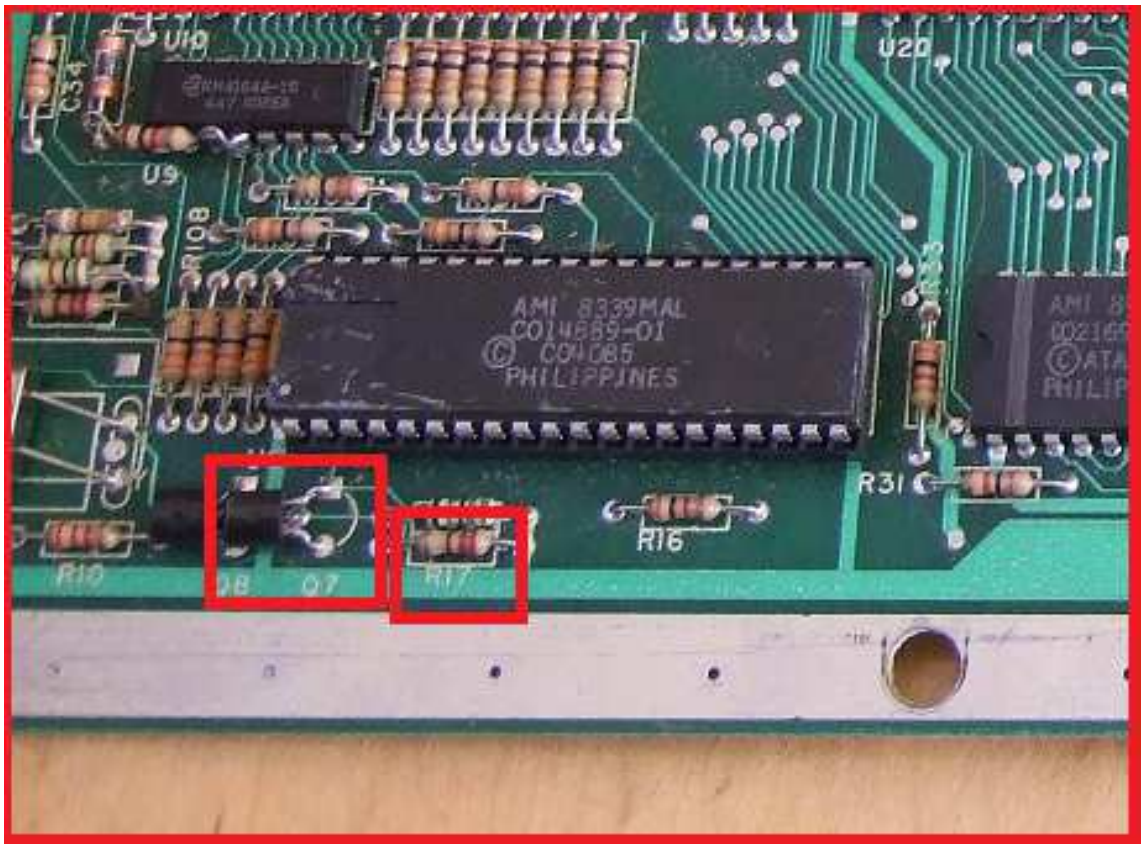


- Make a proper connections

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	LS138 pin 9 (VB pin on ULTIMATE BOARD if You have Ultimate upgrade installed)	D6xx

ATARI 800XL-F – with FREDDY chip

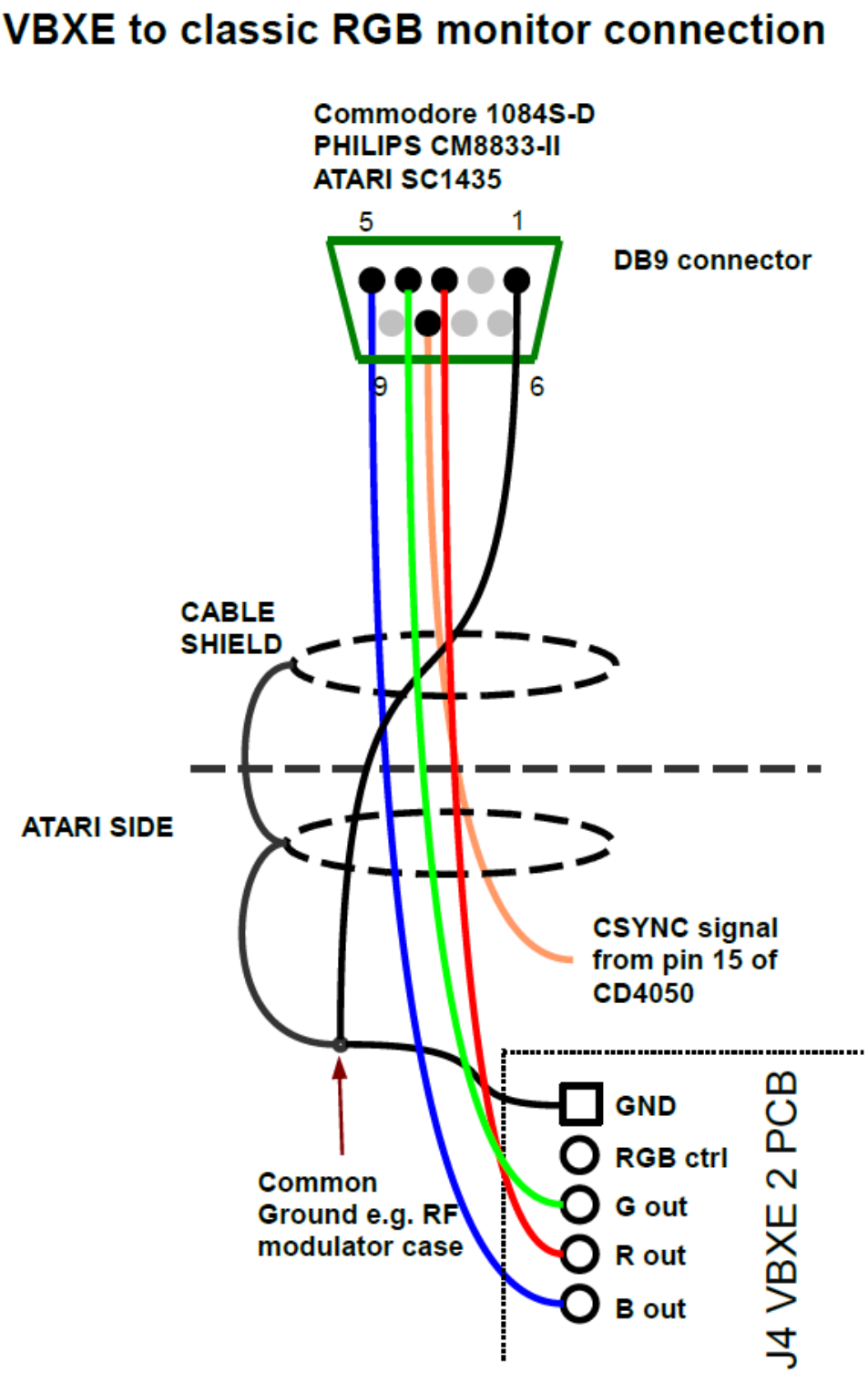
- Remove below parts (1 transistor, 1 resistor)



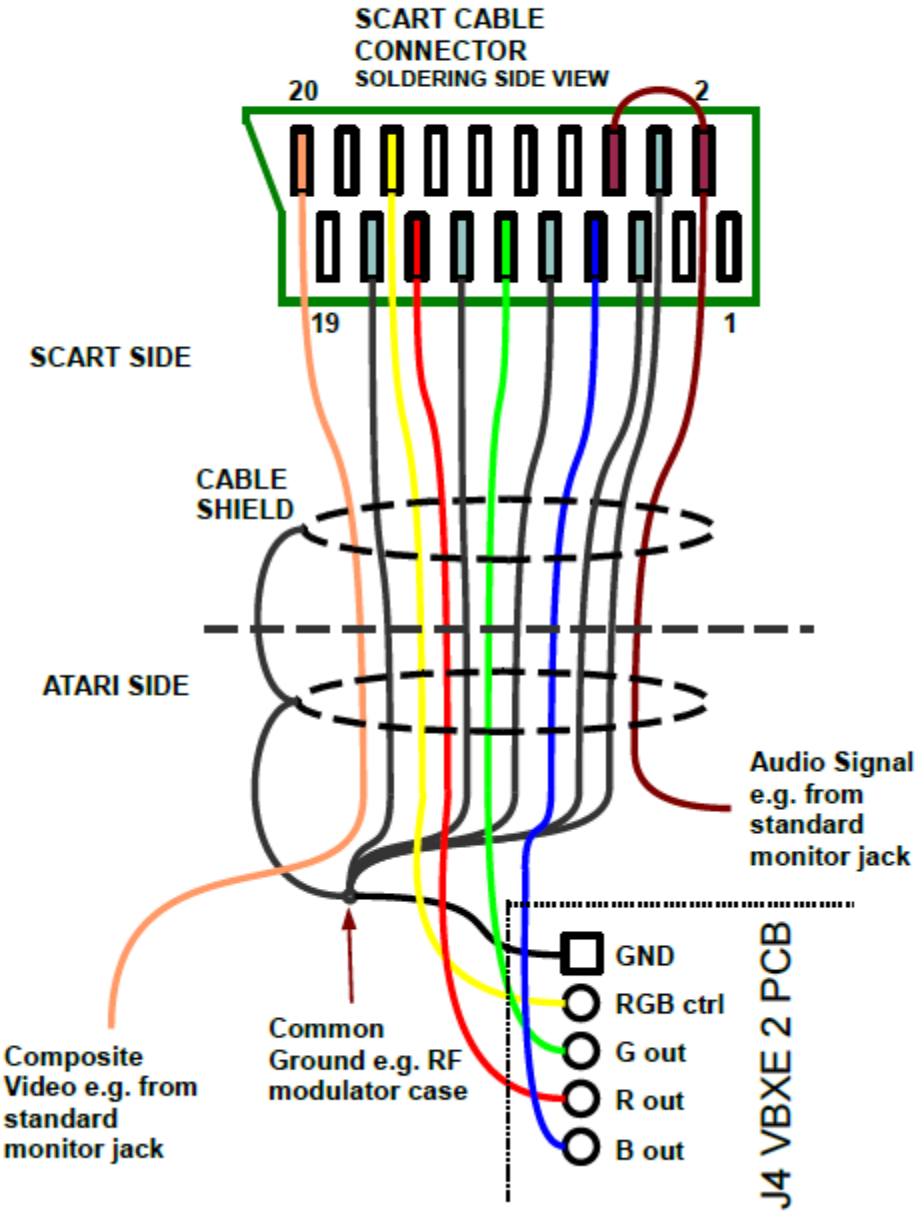
- Make a proper connections

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	LS138 pin 9 (VB pin on ULTIMATE BOARD if You have Ultimate upgrade installed)	D6xx

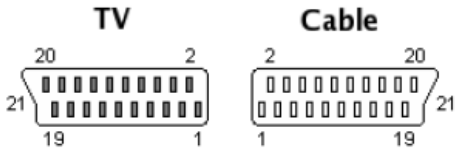
4. After proper installation, VBXE offers high quality RGB output. To test it, make a proper cables.



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.