



WarpedVision™ Amiga scandoubler / FlickerFixer
by Cizar & Sellen (CS-Lab s.c.)

User Manual

(Firmware v1.1.7)

Contents

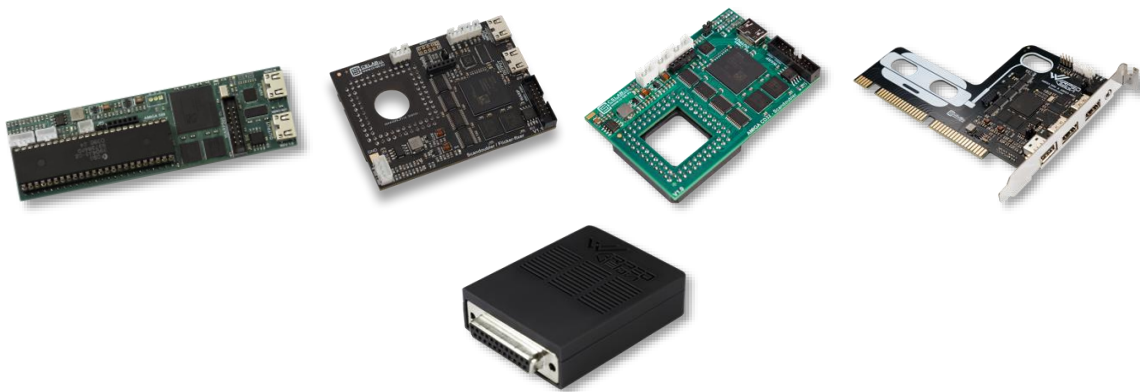
GENERAL INFORMATION	3
TECHNICAL DATA.....	4
AGA KIT CONTENTS	5
CD32 KIT CONTENTS.....	5
ECS KIT CONTENTS.....	5
A3K4K KIT CONTENTS	5
EXT KIT CONTENTS.....	5
CONNECTORS	6
ECS MODEL CONNECTORS	6
AGA MODEL CONNECTORS	6
CD32 MODEL CONNECTORS.....	7
A3K4K MODEL CONNECTORS.....	7
EXT MODEL CONNECTORS	8
CONNECTORS PINOUT	8
INSTALLATION	9
AGA MODEL INSTALLATION	9
ECS MODEL INSTALLATION	13
CD32 MODEL INSTALLATION.....	14
A3K4K MODEL INSTALLATION.....	15
EXT MODEL INSTALLATION	15
POWER UP AND TESTING	16
TROUBLESHOOTING	16
OSD MENU NAVIGATION AND USAGE	17
REMOTE CONTROLLER	17
MAIN OSD SCREEN	17
OSD MENU	18
<i>Main menu</i>	18
<i>Global Settings menu</i>	18
<i>Display Modes menu</i>	18
<i>Audio Settings menu</i>	19
<i>OSD Settings menu</i>	19
<i>Advanced Options menu</i>	19
FINE TUNING	20
PIXEL SAMPLING POINT	20
PICTURE POSITION.....	20
WARPEDVISIONEXT ADDITIONAL SETTINGS	21
VADC CLK PHASE	21
VADC GAIN AND OFFSET.....	21
LPF COMPENSATION	21
FIRMWARE UPGRADE	22
PREPARATION	22
AUTOMATED UPDATE PROCEDURE	22
MANUAL UPDATE	24
DEFINING NEW DISPLAY MODE	25

General Information

WarpedVision is a video signal converter/processor that takes video signal (and audio) from your beloved Amiga and condition it for modern displays. It was designed from ground up, having in mind Amiga computer. Thanks to that it offers superior picture quality and user experience compared to cheap universal devices already existing on the market.

Available models:

- ECS – for Amiga500(+)
 - Lite (work only with Warp Turbo Board)
 - Full
- AGA – for Amiga1200
 - Lite (work only with Warp Turbo Board)
 - Full
- CD32 – for Amiga CD32
- A3K4K – for Amiga 3000 / 4000
- EXT – universal (analog input, external)



ECS, AGA, CD32 and A3K4K versions operate completely in digital domain. They take digital video data directly from Denise/Lisa/Video Slot respectively.

External model is using analog video signal; thus, quality can be a bit lower, but thanks to high performance ADC, drop in quality is usually acceptable for most users.

Full versions have own Digital Video output, while *Lite* variants can only be connected to the Warp Turbo Board and its video output is used (RTG/Amiga switching is automatic).

It is also worth to mention that this device can handle much more than only basic PAL/NTSC. WarpedVision has multisync capabilities, which means that can automatically recognize and properly display also ~31kHz Amiga modes like DbIPAL, DbINTSC, Super72 or Multiscan. This mean that you can easily use e.g., 640x512 resolution without interlace¹.

To maintain compatibility with modern displays original Amiga picture is always upscaled to 1280x1024@60Hz resolution which is one of VESA standard modes. Upscaling is implemented by custom hardware and is done on the fly, so no additional latency is added. Bilinear scaling algorithm reduces artifacts and looks more natural.

¹ While WarpedVision can display PAL/NTSC interlaced modes without flickering, such modes always produce some level of artifacts on non-static content like animations or moving mouse cursor. You can avoid that and use 'progressive' 31kHz mode like DbIPAL, however only AGA chipset gives you all color depths in such modes. ECS can only display 4 colors in DbIPAL because of limited chip memory bandwidth.

Technical Data

Parameter	WarpedVisionAGA	WarpedVisionCD32	WarpedVisionA3K4K	WarpedVisionECS	WarpedVisionEXT
Video Input	24bit digital RGB	24bit digital RGB	24/12bit digital RGB	12bit digital RGB	Analog RGB
AUX Video Input ²	Digital, mini-HDMI style connector (non-certified ³) up to 1920x1080@60Hz (FullHD) resolution	-	Digital, mini-HDMI style connector (non-certified ³) up to 1920x1080@60Hz (FullHD) resolution	-	-
Video Outputs	<ul style="list-style-type: none"> Digital, mini-HDMI style connector (non-certified³) 1280x1024@60Hz with embedded audio stream (should be compatible with most HDMI receivers) Warp QSPI 800Mbit/s stream (proprietary format for Warp Turbo Boards) 				
Power Supply	5V/400mA, using power delivered from Amiga, no external power supply required				
Audio Input ²	2 channels, converted to digital 12bit 44100Hz internally				
IR Receiver input	5V TTL				
Video source switch ² input	5V TTL	-	5V TTL	-	-
Frame buffer RAM ²	16MB/32bit SDRAM @100MHz				
Upscaling	Simple/Bilinear – can be selected in OSD menu				
Preconfigured Amiga display modes	PAL ⁴ , NTSC ⁴ , DbIPAL ⁵ , DbINTSC ⁵ , Multiscan, Super72, SuperPlus, HighGFX, HD720				






² Only Standalone versions

³ Warp products use HDMI-style connectors but are not certified by the HDMI authority. This means that these devices may not be 100% compatible with HDMI standards and while the possibility of damage to any equipment is extremely unlikely - you're using it at your own risk. Warp products are manufactured and sold in very low quantities due to the small target market, and because HDMI certification is expensive, it would make all project economically unviable. This is why it is like it is ☺





⁴ PAL and NTSC have separate mode definitions for SuperHires and all other resolutions. This is because WarpedVision can't currently downscale picture, and SuperHires is 1280 pixels – exactly as output resolution. "PAL-SuperHires" and "NTSC-SuperHires" are defined in such way that horizontal scale is exactly 1:1 (no scaling) and overscan is disabled.

⁵ DbIPAL and DbINTSC have separate mode definitions named "DbIPAL-Boot" and "DbINTSC-Boot". This is done, because on AmigaOS 3.1.4 and 3.2 there is an option in early startup menu to switch to VGA (31kHz) mode, however these aren't "standard" DbIPAL/NTSC modes how you could expect. They use a bit different timing; therefore, additional modes were defined in WarpedVision.

AGA Kit contents

<p>WarpedVision AGA device</p> 	<p>Remote controller</p> 	<p>Mounting frame</p> 	<p>IR receiver board</p> 	<p>Warp connector ribbon cable</p> 
--	--	---	--	--

CD32 Kit contents

<p>WarpedVision AGA device</p> 	<p>Remote controller</p> 	<p>Mounting frame</p> 	<p>IR receiver board</p> 
--	--	---	--



ECS Kit contents

<p>WarpedVision ECS device</p> 	<p>Remote controller</p> 	<p>IR receiver board</p> 	<p>Warp connector ribbon cable</p> 
--	---	---	--

A3K4K Kit contents

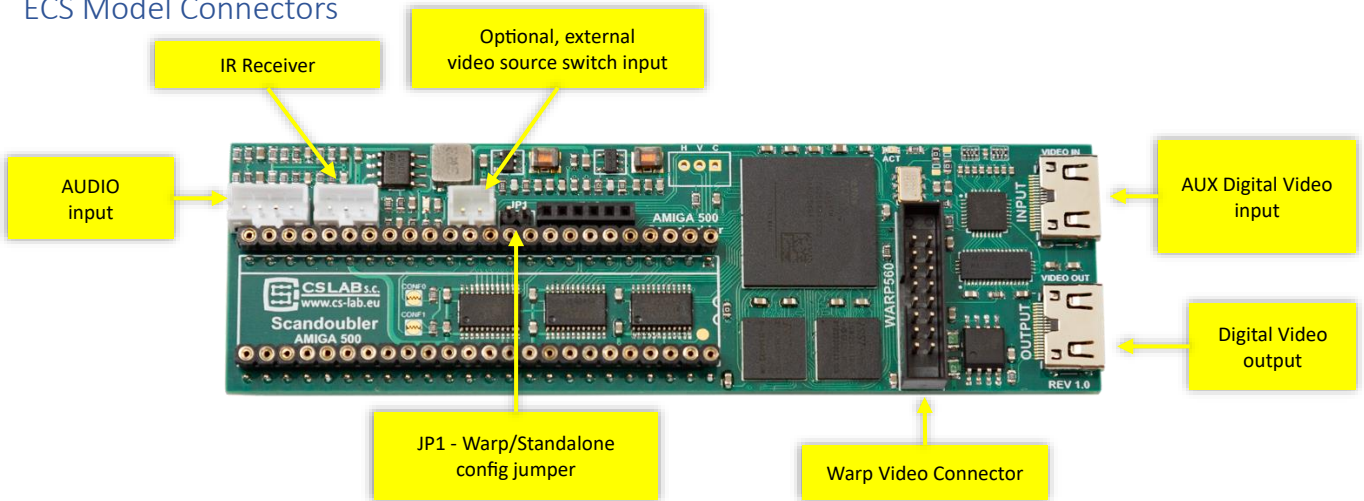
<p>WarpedVision A3K4K device</p> 	<p>Remote controller</p> 	<p>IR receiver board</p> 	<p>Warp connector ribbon cable</p> 
--	--	---	--

EXT Kit contents

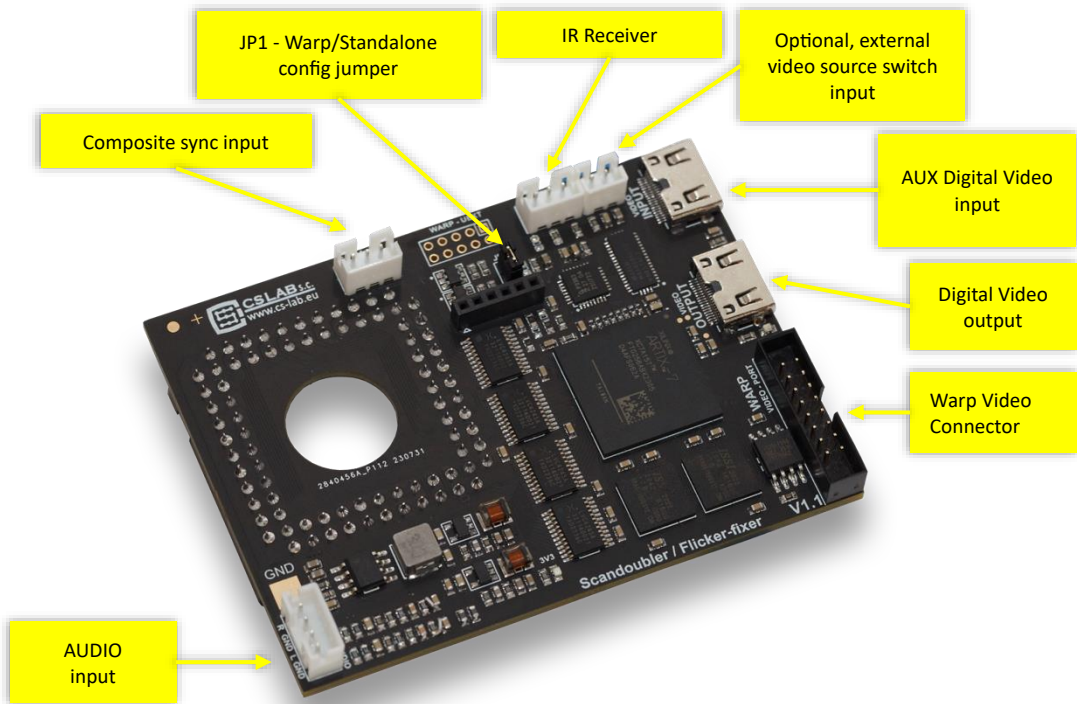
<p>WarpedVision EXT device</p> 	<p>Remote controller</p> 
--	--

Connectors

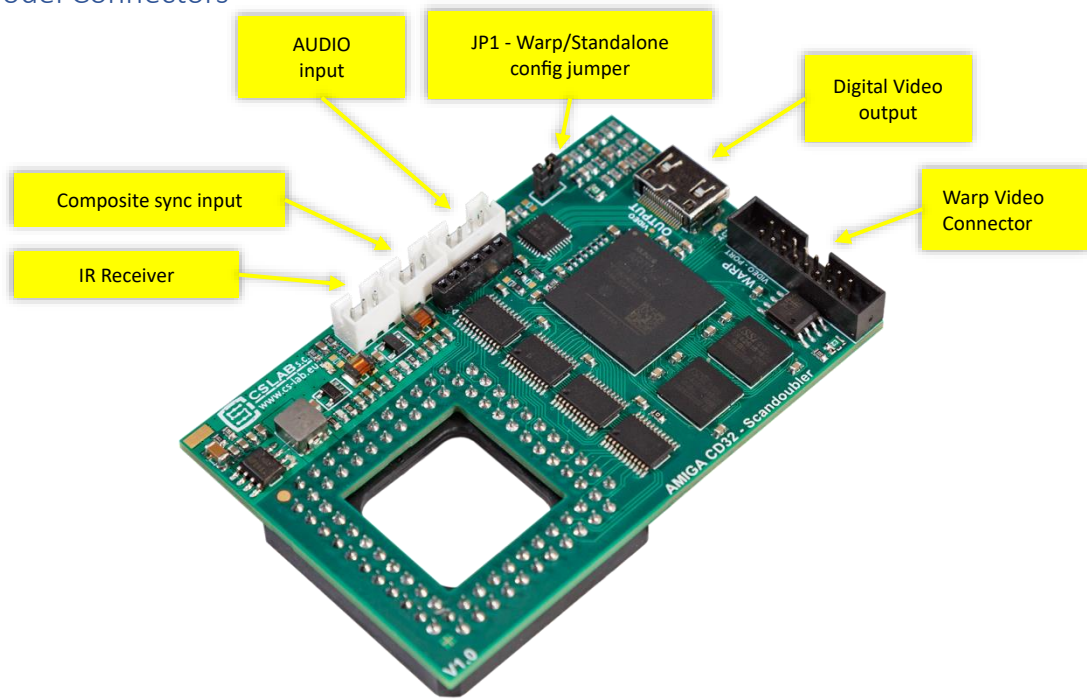
ECS Model Connectors



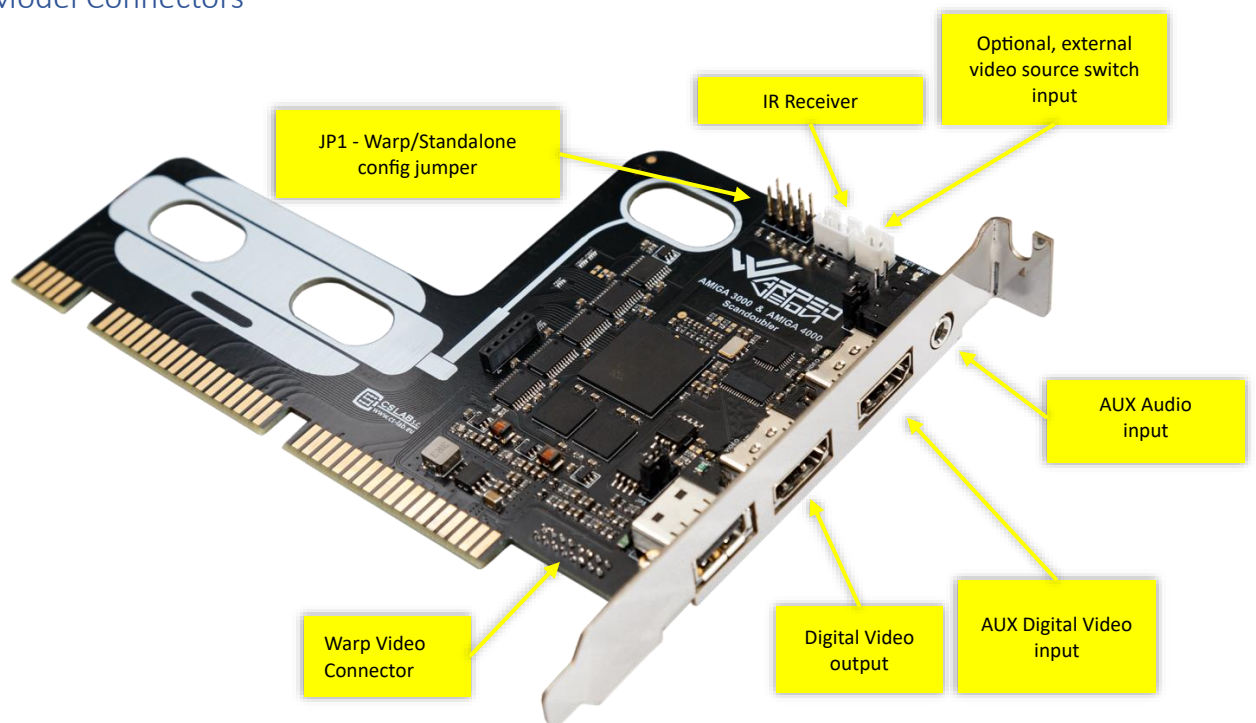
AGA Model Connectors



CD32 Model Connectors



A3K4K Model Connectors



EXT Model Connectors



Connectors Pinout

Audio in	Composite Sync	IR Receiver	Ext. video source switch	JP1 (mode of operation)
1. Audio left channel input 2. GND 3. Audio right channel input 4. GND	1. Composite sync 2. Unused 3. Unused	1. IR signal 2. GND 3. VCC	1. GND 2. Switch	1. GND 2. Mode select ⁶ CLOSED : Standalone OPEN : Warp

⁶ In standalone mode primary video output is active, in *Warp* mode primary video output is inactive, and data is transmitted to the Warp board.

Installation

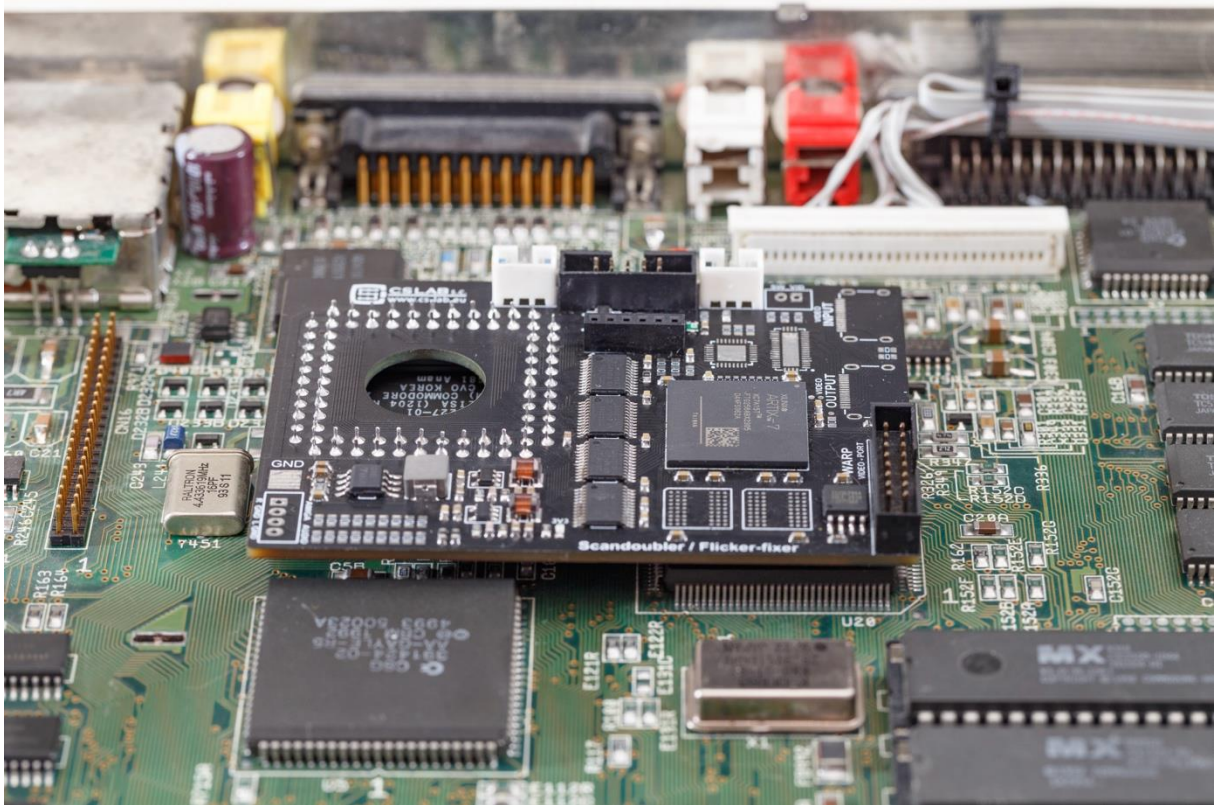
AGA Model Installation

If you have Warp Turbo board, notice that you need at least firmware v1.500 to support WarpedVision.

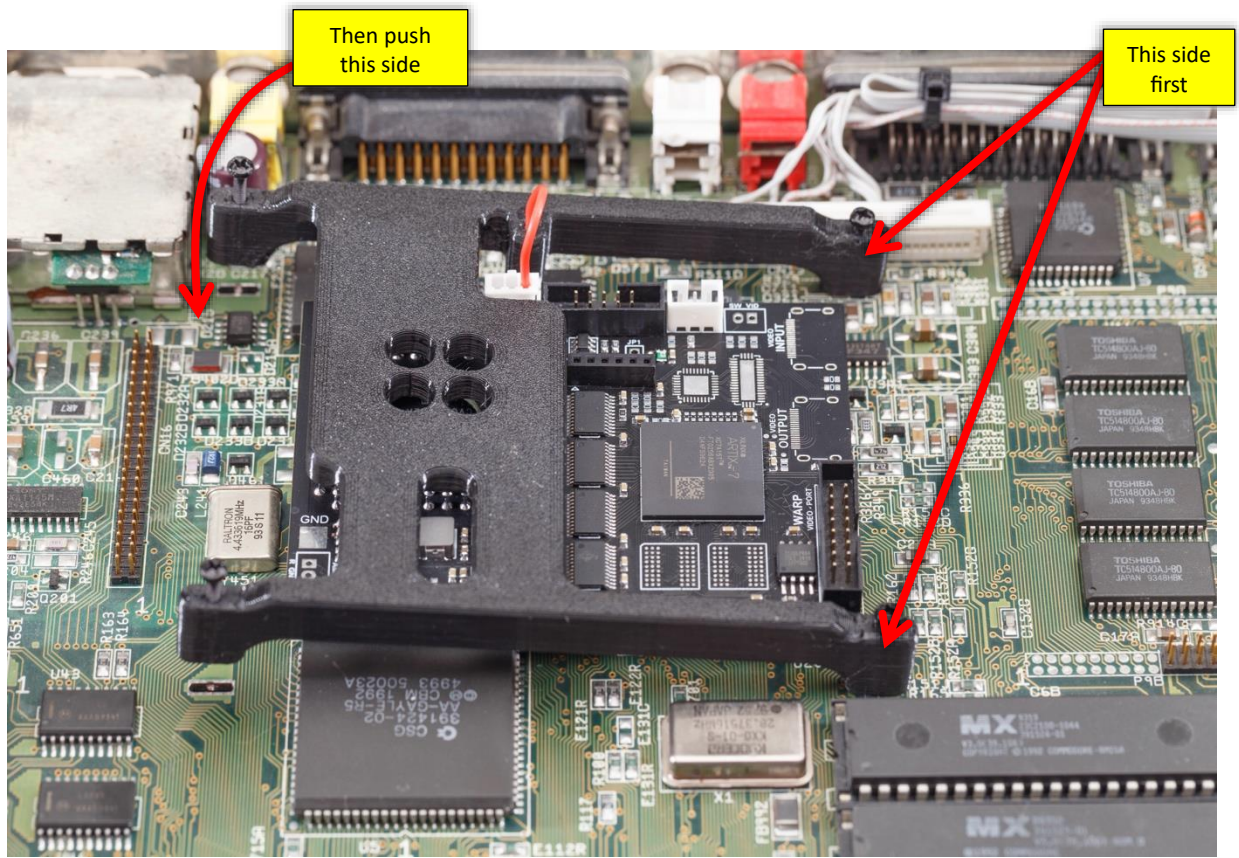
WarpedVision firmware ≥ 1.1 requires at least Warp v1.600 for proper operation.

Later upgrade is possible, but it is better to do it before installing WarpedVision device.

1. Turn off power and disconnect all cables from the Amiga.
2. Unscrew and remove Amiga top cover.
3. Gently unlock and disconnect keyboard ribbon cable.
4. Remove 2.5" HDD bracket.
5. Remove top RF shield (if present).
6. Clean the mainboard from dust. It is also good idea to wipe Alice and U32 pins with isopropyl alcohol, this will reduce chance of connection problems.
7. Place WarpedVisionAGA on top of Lisa chip, carefully check if socket is properly aligned, and push device towards mainboard. Don't use excessive force, press gently, but firmly. The socket should click on the Lisa chip.

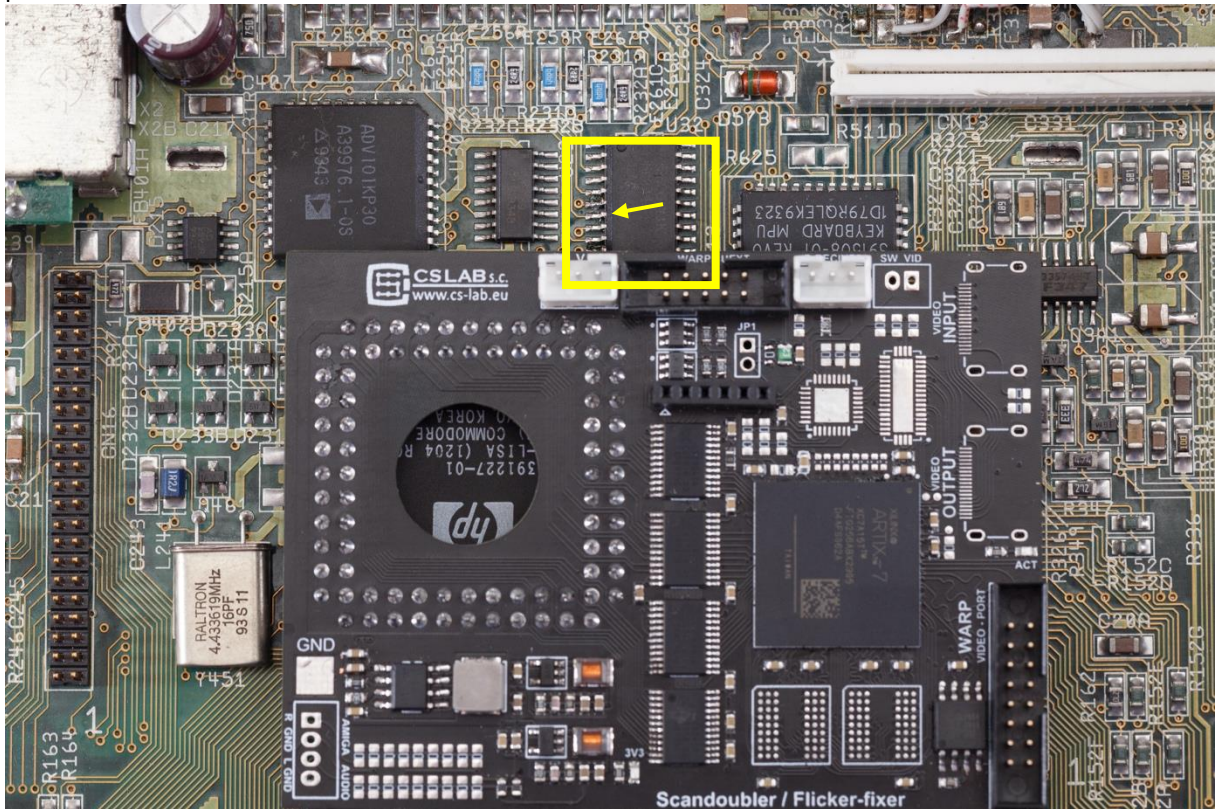


- Place mounting frame on top and press right side first – like shown on the picture below. Then, while holding right side, swing left side and press it also into the slots in the mainboard. From our tests it looks that this ensures best alignment of the pogo pin.

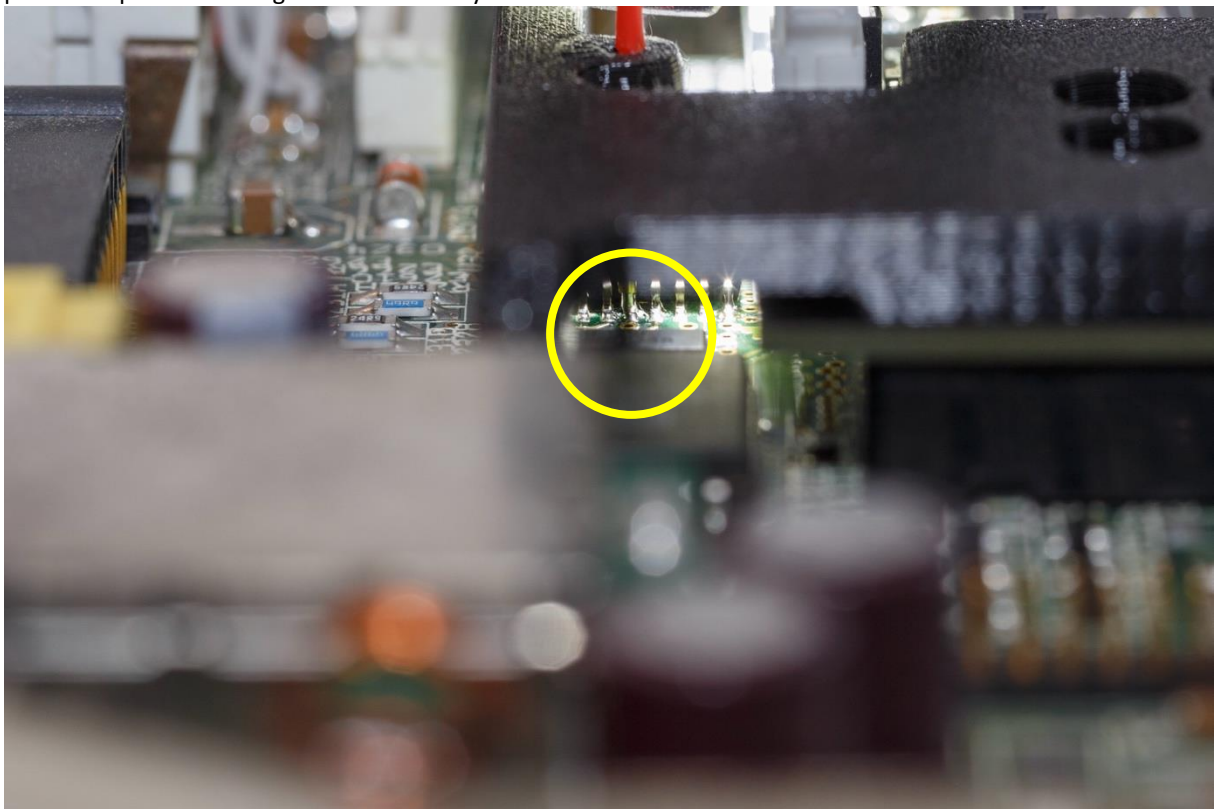


Fasten the screws, don't use excessive force.

9. Check alignment of the pogo pin for composite sync connection. It should touch pin 6 of the U32 chip. Look at picture below for reference.

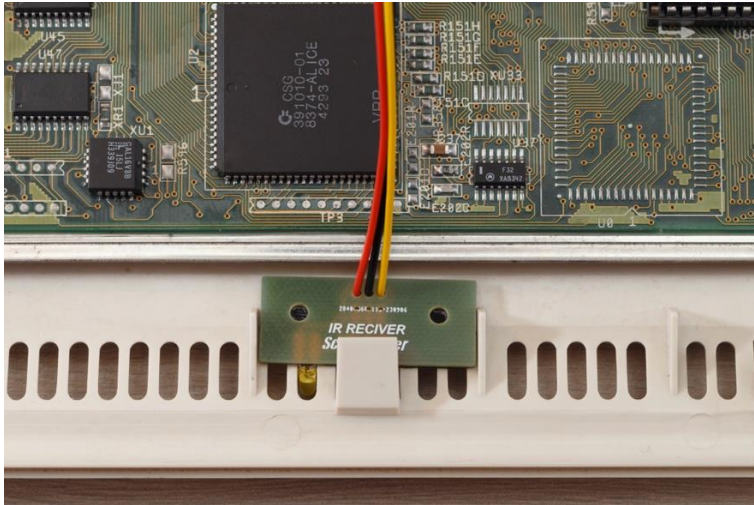


And here is a view at the pogo pin - after frame is mounted and secured. Notice that this pin doesn't have to be centered with absolute perfection. Most important thing is to check if it's not causing short between U32 pins. Pro tip: use a flashlight and don't hurry 😊



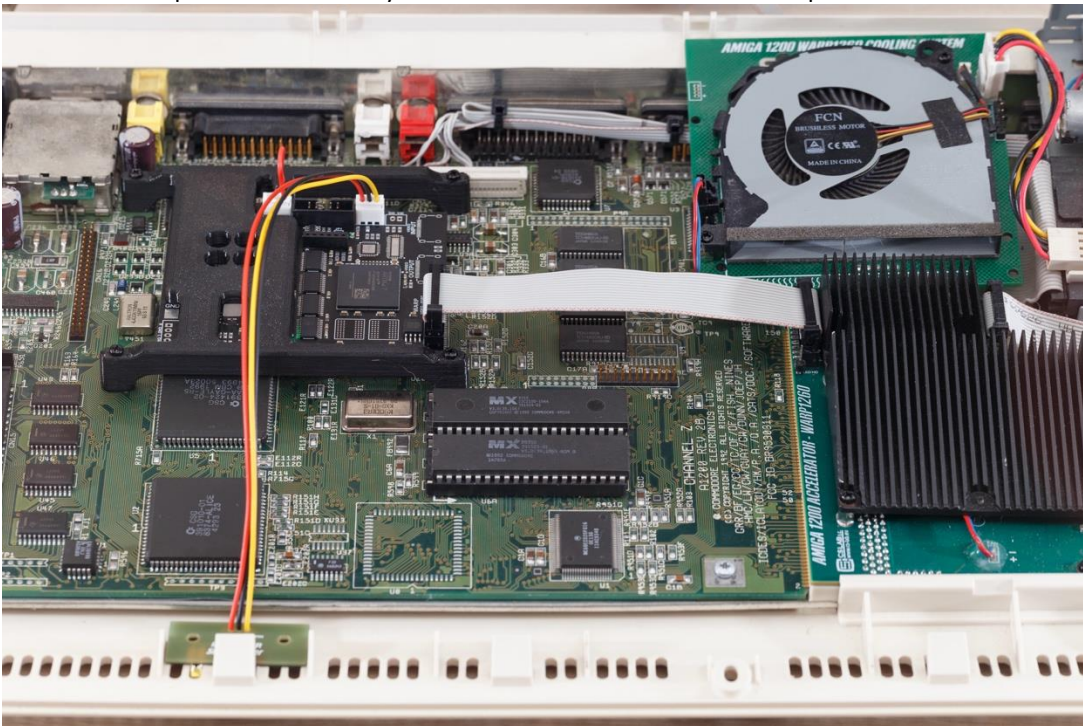
10. Connect composite sync cable from the frame pogo pin to the WarpedVision device.

11. Place and connect IR receiver board



12. Connect audio cable⁷ (optional)
13. Place Digital Video output connector frame and connect HDMI cable to the WarpedVision⁷.
14. If you have 3rd party RTG solution with HDMI output, you can connect it to the WarpedVision AUX Digital Video input for easy switching between RTG/Amiga video sources⁷. Source can be switched by remote control, or by a button connected to "external video source switch" connector.
15. If you have Warp Turbo Board installed, connect ribbon cable between Warp and WarpedVision devices. Thanks to that you can use video output from the Warp and benefit from automatic video source switching when you change display mode between native Amiga and RTG. Try to support WarpedVision with a fingertip from the bottom while connecting cable to reduce downward force on the board's edge.

Here's how WarpedVision looks fully installed and connected with the Warp board:



⁷ Full version only

ECS Model Installation

If you have Warp Turbo board, notice that you need at least firmware v1.500 to support WarpedVision. WarpedVision firmware ≥ 1.1 requires at least Warp v1.600 for proper operation. Later upgrade is possible, but it is better to do it before installing WarpedVision device.

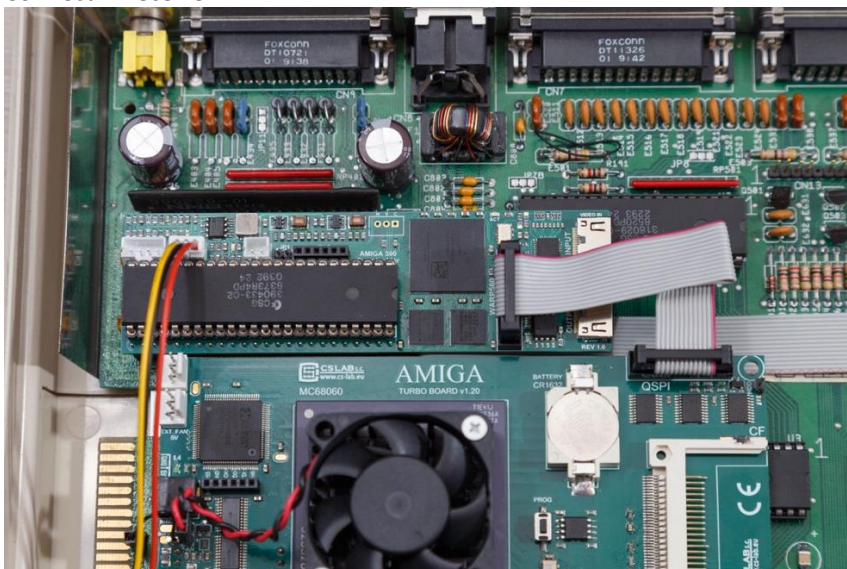
1. Turn off power and disconnect all cables from the Amiga.
2. Unscrew and remove Amiga top cover.
3. Disconnect keyboard.
4. Carefully Remove Denise chip from the socket.



5. Place WarpedVision ECS in the Denise's socket, check pins alignment before press it down.
6. Put Denise chip in the WarpedVision socket (watch out for proper orientation)



7. Connect IR receiver.

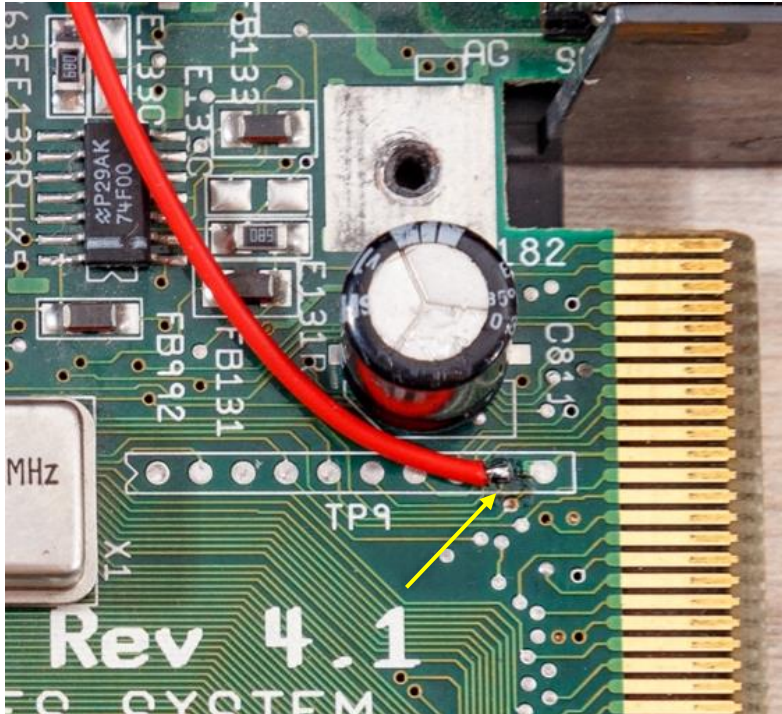


8. Connect audio cable (optional).
9. Place and connect frame with Digital video output (optional).

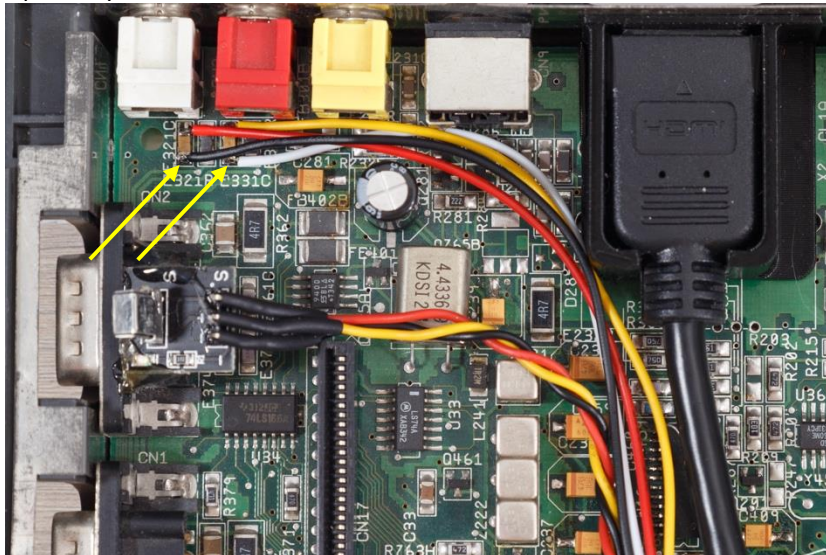
CD32 Model Installation

Installation of WarpedVision in AmigaCD32 requires some soldering skills.

1. Turn off power and disconnect all cables from the Amiga.
2. Unscrew and remove Amiga top cover.
3. Disconnect CDRom and panel cables.
4. Unsolder and remove RF Modulator.
5. Mount Digital Video connector frame in place of RF Modulator.
6. Solder C-Sync cable to TP9, pin 9.

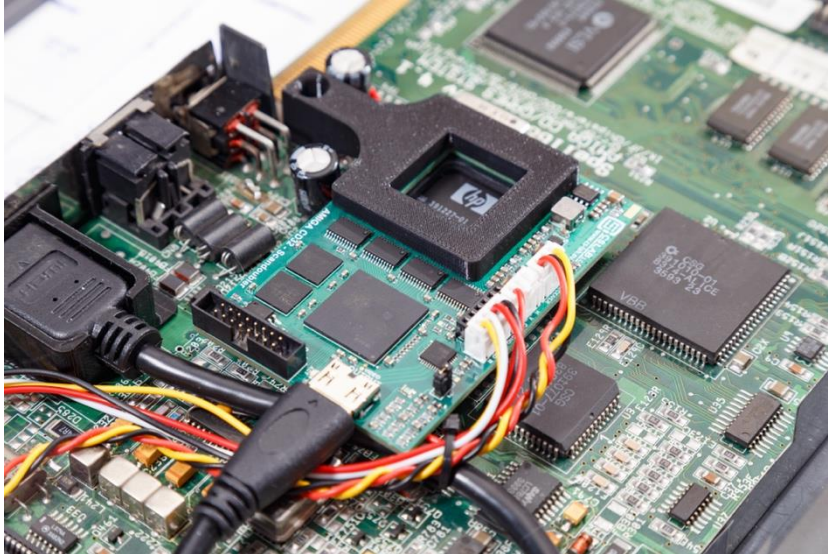


7. Optionally solder audio cable to E321C and E331C



8. Carefully clean Lisa chip pins with isopropyl alcohol.
9. Place WarpedVision device on Lisa chip and gently press it to fit it properly.
10. Secure by screwing provided frame.

11. Connect C-Sync, IR sensor and Digital Video cables to the WarpedVision device.



A3K4K Model Installation

Thanks to big Amigas video expansion slot, installation of WarpedVision device is pretty straight forward.

1. Turn off power and open the case.
2. Insert card into video slot and secure with the screw.
3. Connect and mount IR receiver.
4. Optionally connect Warp4060 with WarpedVision using provided ribbon cable. Remember to check JP1 jumper setting - it should be open if you're using Warp4060 video output or closed if you want to use WarpedVision video output port.



EXT Model Installation

1. Turn off power.
2. Insert WarpedVision to the Amiga's Video Port
3. Optionally connect Audio output from the Amiga RCA, to the 3,5mm WarpedVision socket.



Power up and testing

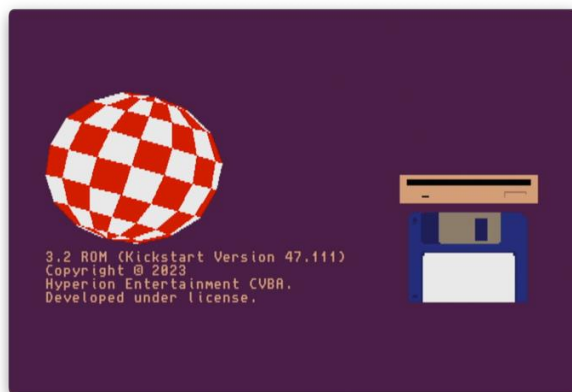
It is in general good idea to not fully assemble Amiga before first test.

Before powering up, please take a minute and check one more time if everything is mounted correctly. Compare with the photos from previous chapter.

If you have standalone model, check **JP1** jumper setting. If this jumper is closed (standalone operation), you should connect HDMI receiver to the WarpedVision board.

If this jumper is open, you should have ribbon cable connected to the Warp board and HDMI receiver should be connected to the Warp's digital video output.

The quickest way to see if scandoubler is working is to remove all bootable media and power up the Amiga⁸. After short while you should see AmigaOS boot screen like below.



If you see a good picture, you can boot normally and test other stuff like remote controller (press *, you should see OSD screen), audio and AUX video input - if you're using those features. AUX video source can be switched pressing # on the remote.

Troubleshooting

Problem	Possible cause	Solution
No picture at all	HDMI cable not connected or connected to wrong device	Check JP1 jumper setting on WarpedVision and HDMI cable connection
	(AGA model) Composite sync signal cable not connected or pogo pin has no proper contact with U32 pin 6.	Check if composite sync cable connector is fitted properly in the socket. Check pogo pin alignment and eventually refit the frame.
	(AGA model) Bad connection of socket on Alice chip.	Try gently press on the frame or refit device. Amigas are quite old now and chip pins can have layer of oxidation. Put device on and off couple of times, then secure it one more time with the frame.
	Using Warp video output, but ribbon cable connecting Warp and WarpedVision is not in place.	Check if cable is properly connected on both sides.
Picture not stable	(AGA model) Intermittent composite sync connection.	Check if composite sync cable connector is fitted properly in the socket. Check pogo pin alignment and eventually refit the frame.
	(AGA model) Bad connection of socket on Alice chip.	Try gently press on the frame or refit device. Amigas are quite old now and chip pins can have layer of oxidation. Put device on and off couple of times, then secure it one more time with the frame.
	Bad configuration of display mode(s)	Reset device to factory settings: menu "Advanced Options/Factory Reset"
Picture stable, but colors are off	(AGA model) Bad connection of socket on Alice chip.	Try gently press on the frame or refit device. Amigas are quite old now and chip pins can have layer of oxidation. Put device on and off couple of times, then secure it one more time with the frame.
	Firmware versions mismatch.	Update Warp and WarpedVision to the latest firmware.
Picture is shifted to the right/left/top/bottom	Display mode settings doesn't match actual picture.	WarpedVision is preconfigured for default picture settings of AmigaOS 3.2. If you have different AmigaOS version or non-default overscan preferences, you should configure it for your system. (check "Picture position" chapter)
Flickering pixels, vertical artifacts	Pixel sampling needs to be fine tuned	Look at the "Fine tuning" and "WarpedVisionEXT additional settings" chapters.

⁸ WarpedVision itself doesn't require additional software for operation, but if you're using it with the Warp board, you should have at least Warp firmware v1.500. You should upgrade now if you haven't done this already.

OSD Menu navigation and usage

WarpedVision device is factory preconfigured for default display settings of AmigaOS 3.2.

Unfortunately, different versions of AmigaOS have differences in default display modes, so it may be necessary to tune some settings for your system.

Remote controller

Only ▲, ▼, ◀, ▶, OK, * and # buttons are used. The rest has currently no function assigned.

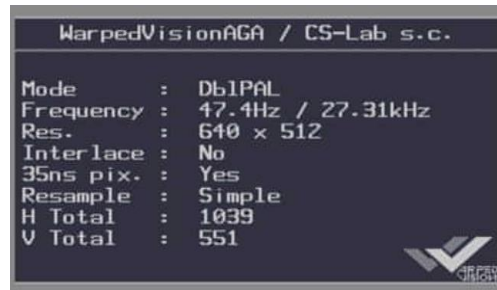


Button	Function
▲, ▼, ◀, ▶	Menu navigation and value setting
OK	Option selection, confirmation, etc. 😊
*	“Back” function. Go to the parent menu, etc.
#	Switching between scandoubler picture and AUX video input.

Main OSD screen

Main screen is displaying following information:

- Device model name
- Analog audio channel input levels (only when operating in standalone mode)
- Current display mode name
- Horizontal / Vertical frequency
- Picture sampling resolution
- Interlace status
- 35ns pixel detection status⁹
- Resample (upscaling) mode
- Total horizontal size in pixels
- Total vertical size in lines



⁹ 35ns pixels are present in PAL-SuperHires and VGA modes.

OSD menu

You can enter menu from the main screen, pressing **OK** button.

Main menu

Global Settings	Global display settings which are affecting all display modes
Display Modes	Display modes parameters editing and management
Audio Settings ¹⁰	Audio settings like volume and stereo level
OSD Settings	OSD personalization settings
Advanced Options	Advanced options like factory reset or firmware upgrade

Global Settings menu

Overscan	You can set percentage of overscan. Some games and demos are using more screen space, and if you notice that content doesn't fit, you can try increase overscan level here.
Upscaling	Upscaling mode selection. Default : use setting defined in video mode configuration Auto : use simple scaling if scaling factor is integer or bilinear otherwise Simple : always use simple scaling Bilinear : always use bilinear scaling
Disable 35ns det.	Super-Hires detection is not perfect, and some demos or games may trigger switching between Hires and Super-Hires. If you experience such behavior, turning on this option can be helpful. It disables 35ns pixels detection. Remember to turn this off if you want use Super-Hires modes.

Display Modes menu

Mode Nr	WarpedVision can handle multiple display modes. Here, you can choose which mode you're about to configure.
Enable	Enable/disable selected display mode. When mode is disabled, WarpedVision will not recognize it and apply settings from closest best match.
Name	Mode name that will be displayed on the main screen if this mode is detected as current. it is only for you. It doesn't affect display in any way.
Copy From Other	Mode copy submenu. It is useful when you're creating new mode, but you want to initialize its settings first from other "similar" mode.
Detection	Mode detection submenu. Here you can configure parameters for display mode recognition.
H-Start, H-End	Begin and end of active display area (horizontal)
V-Start, V-End	Begin and end of active display area (vertical)
Positioning	Adjust active display area position.
H-Scale, V-Scale	Horizontal and vertical scale correction (usually "0").
Overscan range	Active picture area for maximum overscan configuration.
Pixel time	Select if pixel time is detected automatically, or fixed.
Upscaling	Default upscaling algorithm selection for this display mode
Swap fields	Swap fields for interlace
VADC Cl. Start ¹¹	Video ADC clamping start
VADC Cl. Duration ¹¹	Video ADC clamping duration

¹⁰ Audio Settings menu is present only when device is operating in standalone mode (JP1 closed or EXT model, WarpedVision video output is used)

¹¹ EXT model only. For more information about this parameter investigate AD9884 datasheet.

Audio Settings menu

These settings apply only if WarpedVision is used in standalone mode (JP1 closed or EXT model, WarpedVision video output is used)

Volume	Audio volume
Stereo Level	Amiga has by design no cross talk between stereo audio channels. This sounds bad, especially when using headphones. Lowering this value, you decrease stereo channels separation. 0% produce mono sound.

OSD Settings menu

Auto Show	By default, OSD is visible for couple of seconds every time display mode is changing. This may be undesirable e.g., when you are recording some game or demo. Set to Off to OSD be always hidden unless you press some remote controller button.
Alpha (vis.)	OSD transparency when it is in <i>visible</i> state.
Alpha (hidden)	OSD transparency when it is in <i>hidden</i> state. Notice that setting this to non-zero value will cause that OSD will never disappear completely.
Hide delay	How long OSD is shown before hiding automatically. Notice that if you're in the menu, OSD will not be hidden. Exit to the main screen first.
Background	Background color
Foreground	Foreground color
Position	OSD position on the screen

Advanced Options menu

Video Sampling	<p>WarpedVision is factory pre-tuned to match Amiga video signals timing. However, there can be cases when default settings will not match exactly. Here you can fine tune these settings if you find e.g. some pixels are flickering. Look at the "Fine tuning" and "WarpedVisionEXT additional settings" chapters for further information.</p> <p>Pixel Clk Phase : Digital video signal sampling point VADC Clk Phase¹² : Analog video signal sampling point VADC Gain¹² : Analog video signal gain VADC Offset¹² : Analog video signal offset (black level) LPF Compensation¹² : Analog video low-pass filter compensation</p>
Video Sw. mode	<p>External video source switch mode selection (applicable only for models with AUX video input):</p> <p>Pulse : every pulse toggles between inputs Level-L : Change to <i>low</i> level activates AUX input Level-H : Change to <i>high</i> level activates AUX input</p> <p>Notice that input can always be toggled by pressing # on the remote.</p>
Factory Reset	<p>Reset all settings and display modes to default values.</p> <p>Defaults for AGA¹³ : Load default settings for AGA chipset Defaults for ECS¹³ : Load default settings for ECS chipset</p>
Firmware update	Start firmware update process. You'll also need uploader application and firmware file. Press and hold ► button until value reaches 100% and device will enter update mode.
Firmware version	Firmware version information.

¹² Setting available only in WarpedVision EXT model

¹³ Some models (like WarpedVisionAGA or WarpedVisionECS) have only one option, because they can be fitted only in machine with particular chipset. Other models (like WarpedVisionEXT or WarpedVisionA3K4K) have both options, and correct settings should be loaded, depending on machine in which device is used.

Fine tuning

EXT model users should rather follow to the “WarpedVisionEXT additional settings” chapter.

In most cases WarpedVision should work fine out-of-the-box with factory settings. However, not every Amiga is the same, especially these days. If you notice things like flickering pixels, shifted content or permanent Super-Hires mode detection, you should try fine tune settings to your machine.

Pixel sampling point

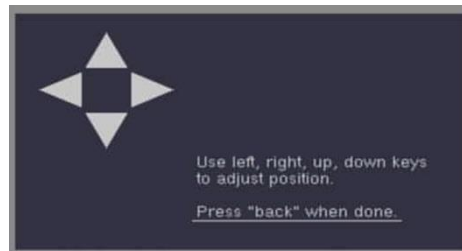
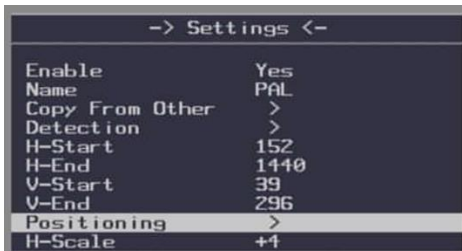
If you see pixel flickering, or “noise” on vertical contrasting elements, go to the **Advanced Options / Video Sampling** and find such value for **Pixel Clk Phase** that picture will be stable.

Notice that changing this parameter can shift entire picture horizontally by 1 pixel. In such case position should be adjusted for every used display mode (see “Picture position” below).



Picture position

Picture position is set by entering **Display Modes** submenu (check if selected mode is the same as currently displayed) and select **Positioning** option. Use arrow keys on the remote to adjust picture position. Press * when done.



WarpedVisionEXT additional settings

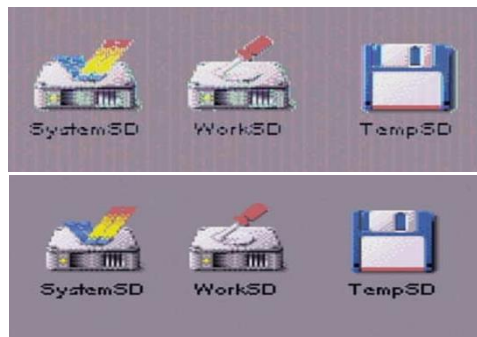
Device's factory settings should be ok for most users, but due to analog signal nature, some additional tuning may be required on some Amigas to achieve best picture quality.

VADC Clk Phase

Usually, the first parameter to focus on is **VADC Clk Phase** in **Advanced Options / Video Sampling** menu. It is responsible for setting sampling point of analog signal. If you see flickering pixels and some vertical artifacts or if Super-Hires mode is detected constantly, you almost certainly need to tune this parameter.

On the right you have two examples, showing the same content with different VADC Clk Phase adjustments.

Also, you can try different settings if you see excessive noise or vertical banding.



VADC Gain and offset

These two options are also placed in **Advanced Options / Video Sampling** menu. They are responsible for adjusting analog signal DC offset and gain. I doubt that adjusting these parameters will be ever necessary, but they are added just in case. Tuning procedure is following:

1. Prepare test picture with 16 shades of gray from complete black to white.



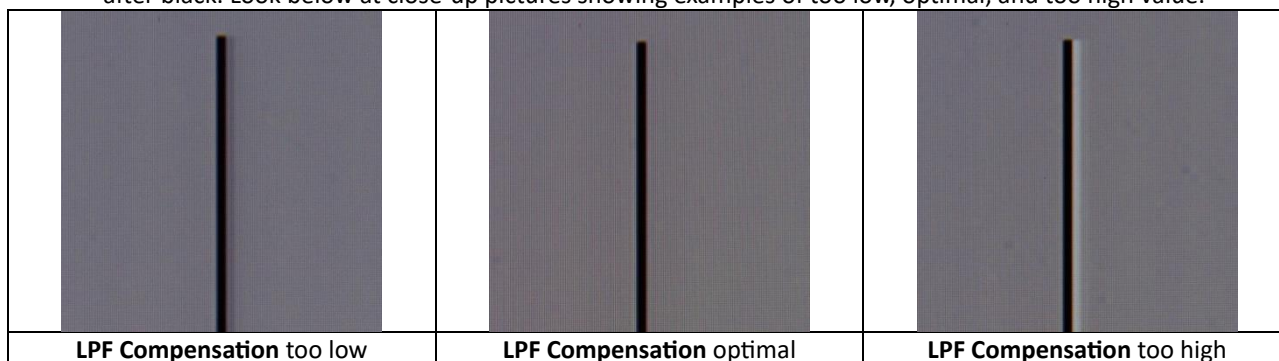
2. Find **VADC Offset** setting that black will be true black but watch out for next shade to not be clipped.
3. Find **VADC Gain** setting for brightest white but watch out for previous shade to not be clipped.

LPF Compensation

Amiga video circuit and WarpedVisionEXT analog RGB inputs have embedded low-pass filters to minimize noise. However, this can introduce light smudging on the picture. WarpedVision can compensate for this. Like with previously mentioned parameters, default setting should be ok for most users, but it can be adjusted if needed.

Tunning procedure is following:

1. You can tune on standard workbench screen, but smudging mentioned before will be best visible if you prepare simple test picture: half gray (#808080) background and vertical black line. Also, best screen mode for this is DbIPAL.
2. Set **Upscaling** to **Simple** and **Overscan** to **0%** in **Global Settings**.
3. Observe change of color from black to gray. If it is sharp, with no grading, then there's no need for tuning.
4. Set **LPF Compensation** to 0.
5. Increase **LPF Compensation** until the change from black to gray is sharp, without additional grading, but watch out not to overset. When the value is too high, you'll see an increased noise level and a brighter pixel after black. Look below at close-up pictures showing examples of too low, optimal, and too high value.



Firmware Upgrade

Firmware upgrade is a simple procedure, but must be done with care, otherwise you'll have to send device to CS-Lab for factory reprogramming.

Firmware upload will clear all the memory and reset to factory settings. If you previously had to tune some settings to your computer, it is good idea to note them down before starting upgrade. Same thing with display modes you may have added or changed. Unfortunately, there is no way to download them to file.

Preparation

Firmware archive can be downloaded from:

<https://amigawarp.eu/download/download-warpedvision-firmware/>

It contains firmware for all models, uploader app, and script which mostly automate upgrade process.

WarpedVision device firmware transmission is done using picture, so device must be properly configured prior to update. Picture must be stable, without flickering, etc.

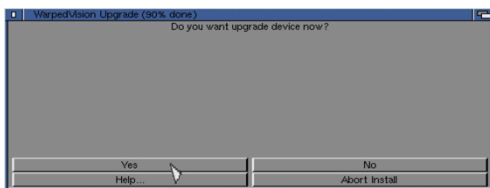
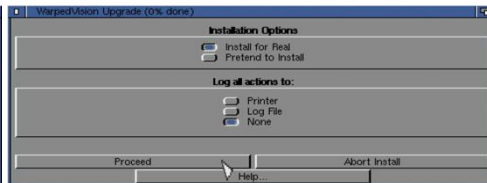
Your Amiga system should be stable and have at least 8MB of Fast-RAM. If you experience frequent, random crashes starting update process is not a good idea. You can first start uploader app without initializing firmware update in OSD menu, in this way firmware is not actually updated, but you can test if uploader starts and finishes without any issues, without risking bricking of the device.

Automated update procedure

1. Unpack downloaded firmware archive.
2. Close all applications.
3. Run **WarpedVision Upgrade** installer script.



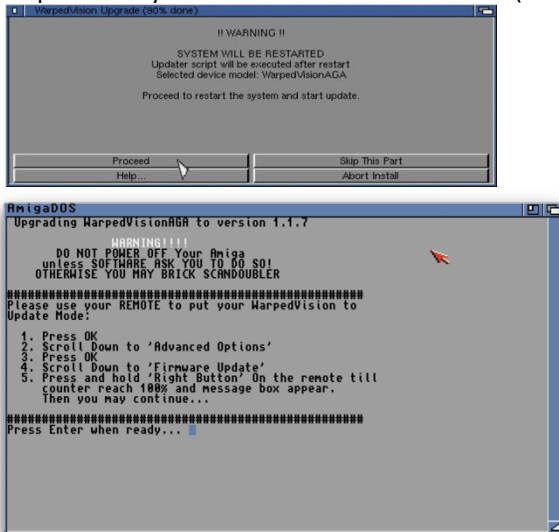
4. Proceed through initial steps.



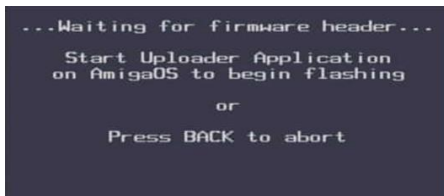
5. Select your WarpedVision model and proceed.



- Click proceed. System will be restarted from RAD (bootable ram disk) device.



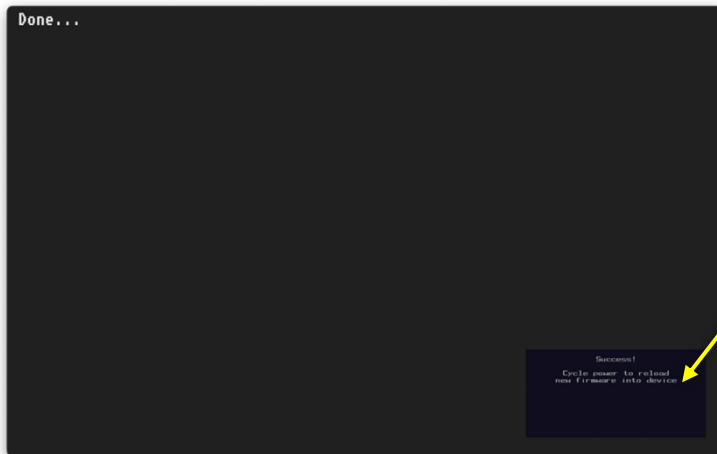
- Use the remote and navigate to **Advanced options / Firmware update** and hold ► key until you see following message on the OSD.
(you can skip this step if you want to perform a “dry run”, i.e. just test uploader app without actual flashing of the device)



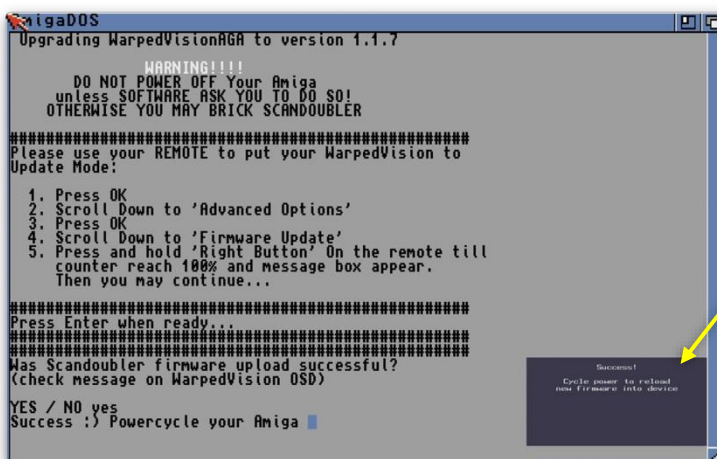
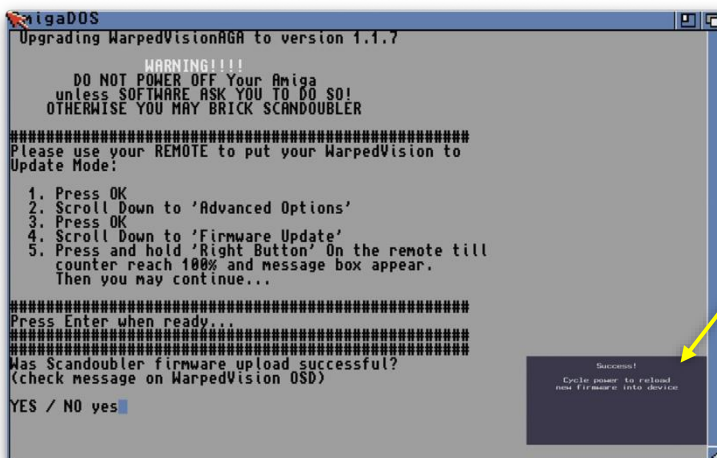
- Press **Enter** to continue. Flash will be erased, and new firmware transmitted.



- Wait until upload process finishes and confirm if there is a *success* message on the OSD.



- If everything went smoothly, answer *yes* to the question and power cycle Amiga to reload new firmware. Answering *no* will restart uploader. Remember to **NOT power down** Amiga if upload was not successful. In case of complete crash or hang you can reset the system, but don't switch power off unless you see *success* message on the OSD.



Manual update

If for some reason you need to update device manually, unpack firmware archive, then you find uploader app in the **InstallFiles/C** and firmware files in **InstallFiles/Devs/WarpedVision** directory.

Usage:

warpedVisionUploader <firmware file name>

It is strongly advised to boot with no startup-sequence and run only **SetPatch** command before starting uploader. Also remember to put WarpedVision into upload mode first: **Advanced options / Firmware Update**.

Defining new display mode

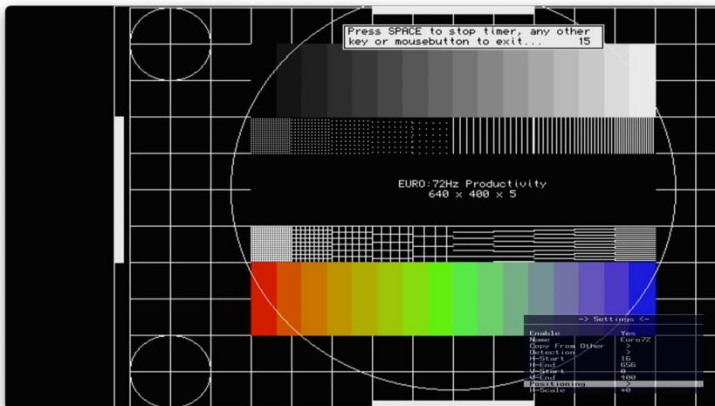
This chapter is intended for relatively advanced users who want to try some nonstandard Amiga display modes or monitor drivers. How to do that?

1. Set **Overscan** in **Global Settings** to 0%.
2. Configure Amiga to display mode you want to configure. In this example I'll use **Euro72** monitor driver, 640x400 **Productivity** mode, which is not included in WarpedVision's preconfigured modes.
3. Go to the **Display Modes** submenu and choose mode nr. I'll go with first non-used (14 in my case).
4. Set **Enable** to **YES**, and name to **Euro72** (press * to exit onscreen keyboard).
5. Set **H/V Scale correction** to 0.
6. Set **Overscan Range** all values to 0.
7. Set **Pixel Time** to **Always 35ns** (**Euro72** is ~30kHz mode, that's why pixel time is always 35ns).
8. Now, enter **Detection** menu and click **OK** on the **Auto Set V/H**. This will store current frame dimensions as parameters for mode autodetection. Write down H-Total and V-Total values, they may be useful later. Picture may get corrupted at this moment because mode is detected, but not yet configured. This is normal.
9. **Euro72** is 640x400 pixels, auto detection gave me 975x401¹⁴ total frame size. Our active 640x400 area is somewhere in this total area. The quickest way is to initially guess some reasonable values, and fine tune it later. So, we set parameters like below:

H-Start	16
H-End	656
V-Start	0
V-End	400

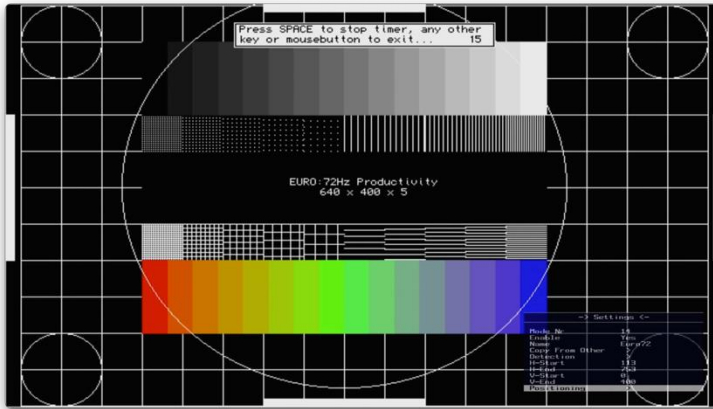
(notice that $H-End - H-Start = 640$ and $V-End - V-Start = 400$, matching configured mode 640x400 size).

10. Picture should be now visible and stable. We can fine tune position. Do to this, we need some sort of test content on the screen. AmigaOS 3.2 screen preferences "Test" is perfect for that. You can also use some image prepared in some paint program. As you can see, picture is shifted, so enter **Positioning** option and move content until it fits in visible area.



¹⁴ These values may differ, depend on chipset (AGA/ECS) or even AmigaOS version, but overall procedure will be the same.

11. In this case only shift to the left was needed.



12. Click * on the remote two times to get back to info display on OSD (this will save settings to the flash).

And... that's all.

WarpedVision will switch automatically to our freshly created **Euro72** mode every time it detects it.

Optionally you can configure overscan range for this mode. To do that, set 100% overscan in **Global Settings**. Set overscan preferences in AmigaOS to max and display again test picture. Now, in the **Display Modes** settings, enter **Overscan Range** submenu and adjust top, bottom, left and right values to fit screen content. This can be a bit finicky e.g., I wasn't able to fit all content of Euro72, probably in max overscan begin of active area is bit too close of sync signals, but after changing left and top position in Amiga Overscan preferences just slightly, everything was fine.

In general, depending on display mode, fine tuning can take some time, but in most cases is possible to get perfect or at least usable results 👍

