



Amiga Accelerators
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*Quick start guide
&
information for beta testers*

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1. General Informations

Warp System Components

Warp accelerator card is modern approach to classic Amiga addons.

It integrates many improvements in a single, easy to install and use device.

Main system components:

- MC68060 CPU, last and best microprocessor from 68K Motorola family
- 256MB DDR3 RAM
Currently splitted to 224MB for AmigaOS and 32MB for RTG
- 64kB L2 Cache to minimize impact of high memory latency and take benefit from large memory bandwidth
- RTG graphics with digital video output, 128bit blitter and up to 1920x1080 resolution in full color
- 16bit audio codec with original Amiga audio mixing capability
- 32bit 400MHz ARM microcontroller which act as board manager and specialized chipset giving additional IO like USB, and offload 68K CPU from various tasks like MP3 or JPEG decoding
- ESP32 WiFi module for networking support
- 8MB ROM which contains board firmware, but also can be used to store up to four kickstart versions
- Fast IDE port optimized for use with CF cards
- SD card slot

Current stage of the project

All system components are proven to be working at hardware and low-level software layer, but many of them are waiting to be integrated with the AmigaOS.

Software components that need to be developed:

- 16bit sound driver (AHI driver)
- Network (bsdsocket.library or SANA2 compatible device driver)
- MP3 decoder (mpga.library)
- JPEG decoder (jpeg.datatype)
- Separate device driver for onboard IDE (something like cswarpide.device)

RTG also will be improved over the time. More operations will be accelerated by the hardware and pointer will be implemented as hardware sprite. Now it is done by software and it flickers in some circumstances.

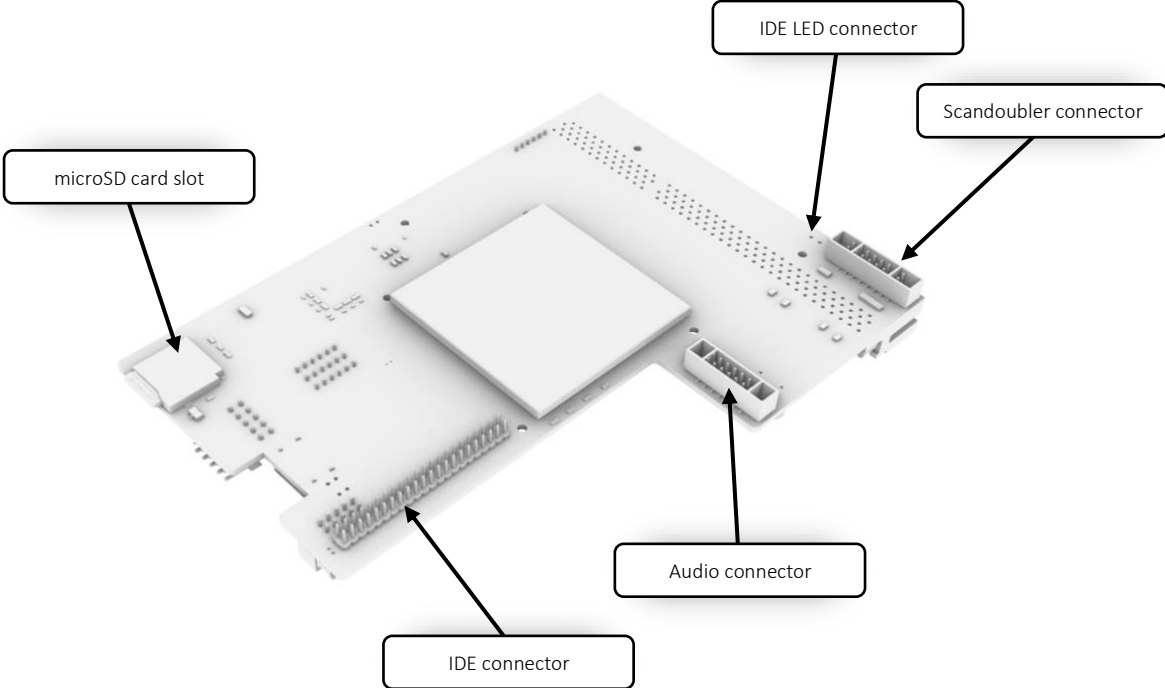
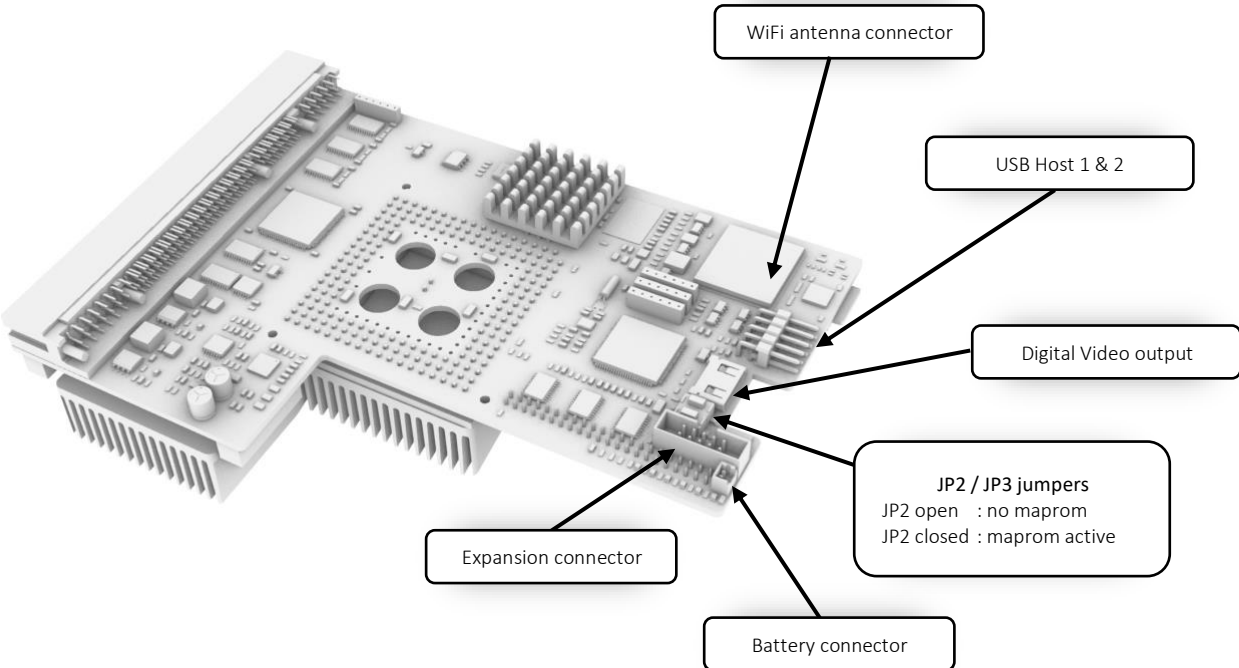
L2 Caching will also be significantly improved in the future updates which should give some further performance gains.

So, what is working, you may ask? ;-)

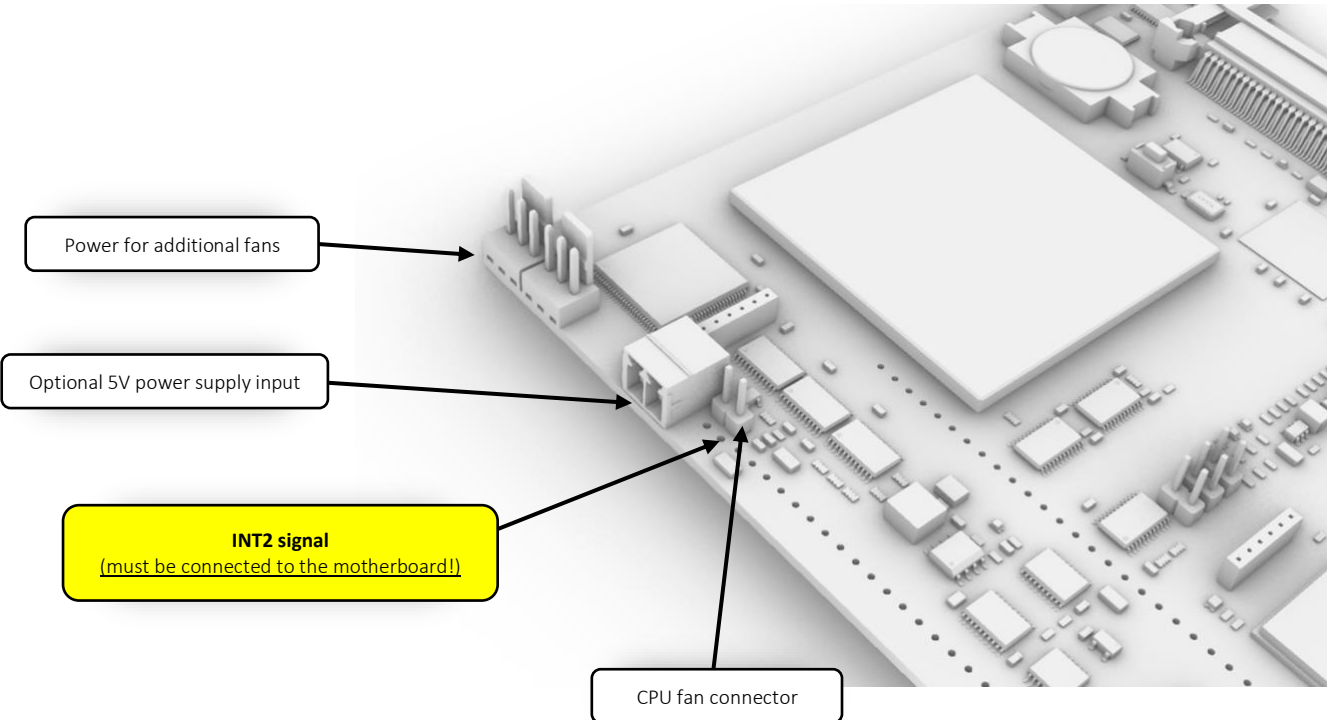
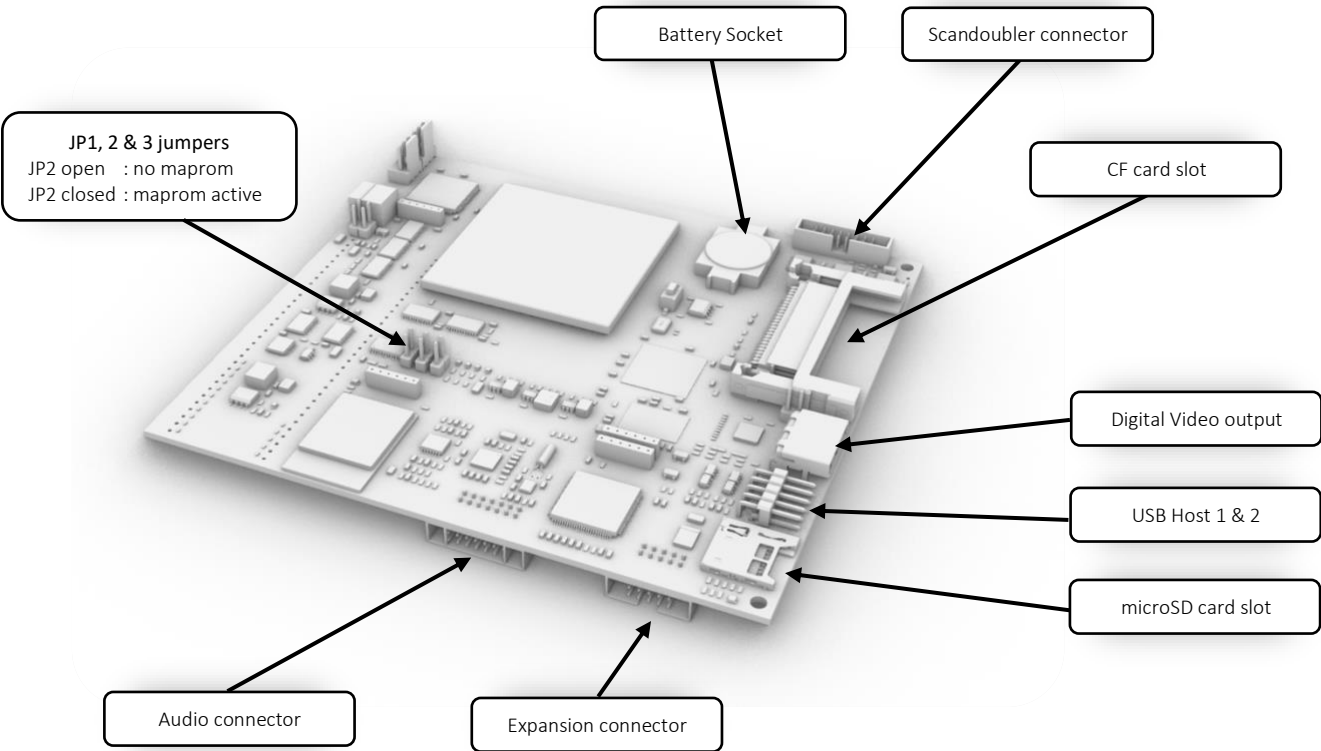
You can use Warp board like an ordinary Amiga accelerator and RTG graphics plus some bonuses like:

- Easy adjustable 68K clock frequency (50, 66, 75, 85, 90, 95, 100, 105MHz)
- Fast IDE (seen by the Amiga as "Gayle" A1200 IDE, but with faster access)
- USB mouse support (seen by the Amiga like original mouse connected to game port)
- Easy Kickstart switching and fast ROM access – onboard ROM is fast enough to popular "map ROM" solutions not be needed anymore.
- Integrated bootloader for easy firmware updating.
- SD card disk driver with DMA support and up to 20MB/s read speeds
- USB disk driver with DMA support and up to 800kB/s read speeds
- AutoBoot from SD/USB disks

Warp1260 connectors and jumper placement



Warp560 connectors and jumper placement



2. Review units demo software

Important!

Firmware and Amiga software was updated since review units was sent.

Please check <http://amigawarp.eu> site for current version.

Review units of the Warp boards are sent with demo CF with preinstalled Workbench 3.1.4, P96 with Warp RTG driver and some additional software to make startup easier for testers. Onboard ROM also contains Kickstart 3.1.4, 3.1 and DiagROM.

All of this software is not a part of normal distribution it was included only with just few test units and should not be redistributed.

Warp devices which will be shipped to the users will have only preinstalled DiagROM in the memory (we have discussed this with the author).

Drivers and other necessary software will be available online on the <http://amigawarp.eu> website.

Warp diagnostic/test software is located on DH0:csWarp directory.

- WarpDiag – graphical (MUI) diagnostic and control tool
- WarpTool – command line diagnostic and control tool

For information about usage see next chapter.

Notes:

1. Turn off “Menu-Shadow” patch in MCP prefs in the included demo CF. It causes that in some apps like AIBB menu contents is not visible.

3. Warp drivers and software

cswarp.library

This library is used by WarpDiag and WarpTool utilities. It will be also used later by AHI driver, and other Warp board system components.

68060 Library

Warp boards are tested with great libraries provided by the MMULib package by Thomas Richter, so use of these libraries is strongly recommended.

You can download it from: <http://aminet.net/package/util/libs/MMULib>

This software package contains also useful tools like:

- MuMove4k
- MuFastZero
- MuRedox

Math libraries

We're recommending fast optimized math libraries by Matthias Henze for maximum performance: <http://www.hsmathlibs.de/>

RTG P96 Setup

To use onboard RTG graphics first you need to install Picasso (P96) system, then copy files:

- 'csgfx.card' to LIBS:Picasso96
- 'Picasso96Settings' to DEVS:
- 'csgfx' and 'csgfx.info' to DEVS:Monitors

WarpTool – command line diagnostic and control

Usage:

WarpTool <options>

Option name	Arguments	Description
Diag		Print diagnostic informations
CPUTurboLevel	0 – 7	Set MC68060 clock frequency 0: 50, 1: 66.6, 2: 75, 3: 85, 4: 90, 5: 95, 6: 100, 7: 105 MHz
IDEMode	A1200, Warp	A1200 mode disables onboard IDE and fallback to mainboard A1200 IDE interface. Useful in case of issues with PCMCIA
IDESpeed	0 – 2	(not yet implemented) set the onboard IDE timings
WiFiSSID	ssid	set WiFi network name (always set together with WiFiPass)
WiFiPass	password	set WiFi password (always set together with WiFiSSID)
HIDMouseRes	1 – 4096	Set USB mouse resolution multiplier 256 for 1.0
KickSel	0 – 3	Kickstart slot select (system will restart after issuing this command)
FANLevel	0 – 2	Set cooler fan level 0: silent, 1: performance, 2: max
PlayMP3 ¹	filename	Play MP3 file from USB or SD Card. This volumes are not yet supported in AmigaOS. Use “0:” for SD Card and “1:” for USB drive (see examples). Audio is played on 16bit codec.
StopMP3 ¹		Stop MP3 playback
PauseMP3 ¹		Pause MP3 playback (not fully supported yet, can cause glitches and other strange behavior)
volMaster	0 – 255	Set audio mixer master volume
volAmiga	0 – 255	Set audio mixer amiga volume
volWarp	0 – 255	Set audio mixer 16bit codec volume
DbgMsg	Text message	Send debug (info) message to TCP clients connected to the WiFi IP address on port 45678
DbgWrn	Text message	Same as above, but sends warning message
DbgErr	Text message	Same as above, but sends error message
TimeShift	Seconds nr	Set your time zone time shift from GMT. This is used for automatic time sync with NTP server if you have configured WiFi. Note that after power on clock may be not adjusted, because of time needed to connect to WiFi network and communicate with NTP server. Issue “SetClock Load” command from Amiga Shell, or just reboot.
xdir ²	path	Read directory contents of SD card(“0:”) or USB drive(“1:”)
ARMInfo		Prints ARM co-processor silicon revision and HAL software version. Important – if you have Warp Board with ARM silicon revID 0x1003, you may experience issues with writing data to SD card. Contact with CS-Lab is such case.

¹ Firmware 1.200 doesn't support HW mp3 playback, special version of mpeg.a.library will be available with future updates

² „xdir” option has no use in firmware 1.200 because now SD and USB disks can be accessed directly by the Amiga

Examples:

- Print diagnostic data

`WarpTool Diag`

- Set CPU clock to 90MHz and USB mouse sensitivity to 40%

`WarpTool CPUTurboLevel=4 HIDMouseRes=102`

- Set CPU clock to 75MHz, cooling fan to silent mode, IDE to A1200 mode and print diagnostic data

`WarpTool Diag CPUTurboLevel=2 IDEMode=A1200 FANLevel=0`

- Setup WiFi (there is no support for this network interface in AmigaOS yet. WiFi is currently used for automatic clock synchronization with NTP server, and for sending test/debug messages. This will change in future versions.)

`WarpTool WiFiSSID="mywifi" WiFiPass="mypassword"`

- Set time zone to GMT+2

`WarpTool TimeShift=7200`

- Play MP3 from SD Card / mp3 folder. Note that in current version SD Card is mounted once after power up, so if you change card, you have to power off and on the computer. This will change in future versions.

`WarpTool PlayMP3=0:/mp3/myfile.mp3`

- Play MP3 from USB drive / mp3 folder and set max volume of 16bit codec on the mixer

`WarpTool PlayMP3=1:/mp3/myfile.mp3 volWarp=255`

- Read SD card directory contents

`WarpTool xdir="0:"`

- Read USB drive, subdir mp3 directory contents

`WarpTool xdir="1:/mp3"`

- Print ARM co-processor revision ID information

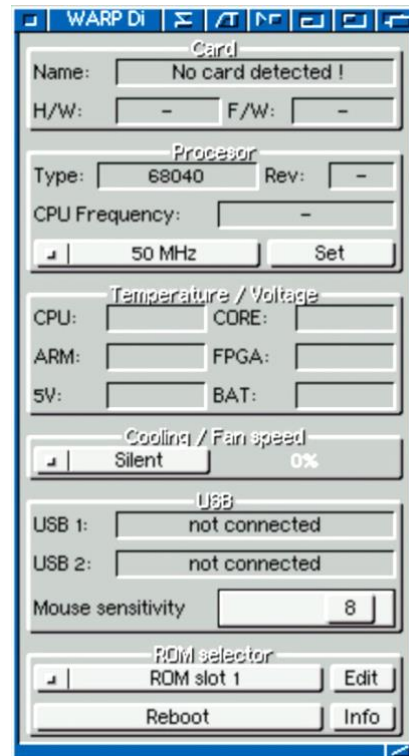
`WarpTool ARMInfo`

Notes:

1. KickSel command on A1200 not always restart Amiga correctly, if system seems to be frozen, issue keyboard reset. Computer should then restart with newly selected kickstart slot. It will be fixed in the future updates.
2. To use KickSel command JP2 jumper must be closed. Otherwise system will use Amiga mainboard ROM chip.
3. Hold reset for >10s to switch back to default (0) Kickstart slot.
4. Hold reset for >30s to reset all settings to default. This will also reset stored WiFi credentials.
5. Settings will be retained after power off only if backup battery is present

WarpDiag – GUI diagnostic and control tool

1. 'Card' Group
 - a. Name – board model name
 - b. H/W – hardware version
 - c. F/W – firmware version
2. 'Processor' group
 - a. Type – CPU type
 - b. Rev – CPU revision
 - c. CPU Frequency – current CPU clock
 - d. Frequency selector
 - e. 'Set' button to switch to new clock
3. 'Temperature / Voltage' group
 - a. CPU – ext. sensor CPU temp.
 - b. CORE – int. sensor CPU temp.
 - c. ARM – ARM MCU temp.
 - d. FPGA – Artix FPGA temp.
 - e. 5V – 5V power supply voltage
 - f. BAT – backup battery voltage
4. 'USB' group
 - a. USB1: port 1 device
 - b. USB2: port 2 device
 - c. USB Mouse sensitivity setting
5. 'ROM selector' group
 - a. ROM slot selector
 - b. Edit button to set names of the kickstarts
 - c. Reboot – set ROM slot and reboots the computer
 - d. Info – informations about the program



Notes:

1. Turn off this application before use any other warp tools such WarpTool or warpaudio.
2. Reboot command on A1200 not always restart Amiga correctly, if system seems to be frozen, issue keyboard reset. Computer should then restart with newly selected kickstart slot. It will be fixed in the future updates.
3. To use ROM selector JP2 jumper must be closed. Otherwise system will use Amiga mainboard ROM chip.
4. Hold reset for >10s to switch back to default (0) Kickstart slot.
5. Hold reset for >30s to reset all settings to default.

warpSD.device – AmigaOS SD card disk driver

This file should be copied to your DEVS: folder.

You can also find WSD drive in the 1.200 firmware pack

“Amiga Software/Storage/DOSDrivers” directory. This drive is for the FAT32 formatted volumes. You also need fat95 filesystem from aminet for this to work

(<https://aminet.net/package/disk/misc/fat95>).

warpSD.device supports basic SCSI commands, so you can prepare SD card with the HDToolBox to use Amiga RDB partition format and even boot your Amiga from SD card.

Remember to edit HDToolBox icon tooltypes before using it to prepare SD card:

- SCSI_DEVICE_NAME=warpSD.device
- SCSI_MAX_ADDRESS=0

Firmware v1.200 scans SD card for Amiga partitions after reset and automatically mounts them. Custom filesystems (like PFS) are also supported.

warpUSBdisk.device – AmigaOS USB disk driver

This file should be copied to your DEVS: folder.

You can also find WUSB drive in the 1.200 firmware pack

“Amiga Software/Storage/DOSDrivers” directory. This drive is for the FAT32 formatted volumes. You also need fat95 filesystem from aminet for this to work

(<https://aminet.net/package/disk/misc/fat95>).

warpUSBdisk.device supports basic SCSI commands, so you can prepare USB stick with the HDToolBox to use Amiga RDB partition format and even boot your Amiga from USB drive.

Remember to edit HDToolBox icon tooltypes before using it to prepare USB disk:

- SCSI_DEVICE_NAME=warpUSBdisk.device
- SCSI_MAX_ADDRESS=0

Firmware v1.200 scans USB disk for Amiga partitions after reset and automatically mounts them. Custom filesystems (like PFS) are also supported.

Warning!

Maximum available current on the Warp's USB ports is 500mA or less (depending on what power supply powers your Amiga). Attaching HDD's is not recommended, because even small 2,5" drives usually need more power. Using solid state drives and pendrives is much better choice.

4. USB HID keyboard support

USB connected keyboard is seen by the Amiga like an original keyboard.

No driver is needed.

You can also use composite USB device, like integrated mouse/keyboard wireless receiver.

- “Amiga” keys are mapped to Windows/Command keys. If your keyboard doesn’t have right Windows key, right Amiga key is mapped also on right Ctrl key.
- You can switch between original and USB keyboard by F11/F12 keys.
- “Help” key is mapped to the insert key.
- You can also reset Amiga by pressing Ctrl-Win-Win, or Ctrl-Win-RightCtrl

5. Updating board firmware

1. Download update package and save it on FAT32 formatted USB stick in the “__cswarp” directory (two underscores before ‘cswarp’).
 - a. Package name is warp560.pk or warp1260.pk depending for which model is intended for.
 - b. You can have packages for all models, board will find and use the right one
2. Insert USB stick in the USB port and power cycle the computer to reset the ARM MCU.
3. After turning the power on, update process will begin and after max. 2 minutes computer should boot.
4. Remove USB drive

Notes:

1. A1200 model not always reboot computer correctly. You can try issue keyboard reset. This will not interrupt update process if you do this to early. This issue will be fixed in the future updates.
2. Interrupting the update is not recommended, however Warp bootloader is never erased, so if for any reason update was interrupted, just insert USB stick with the firmware package turn on the computer and update process should complete normally.

Reprogramming of Kickstart ROM slots

You can store up to four different Kickstart versions on the onboard fast ROM memory. To program kickstarts into onboard ROM you will need also update package file warp560.pk or warp1260.pk.

1. Put files with the Kickstarts data on the FAT32 formatted USB stick in the “__cswarp” directory together with firmware package file.
 - a. File names should be “kick0.bin”, “kick1.bin”, “kick2.bin”, “kick3.bin”
2. Insert USB drive and power cycle the computer
3. After power on Kickstarts should be programmed into the onboard ROM
4. System will restart when operation completes

Notes:

1. A1200 model not always reboot computer correctly. You can try issue keyboard reset. This will not interrupt update process if you do this to early. This issue will be fixed in the future updates.
2. There are often two version of Kickstart files one intended to burn physical chips and the programmer device, and normal binaries. Always use normal binaries.