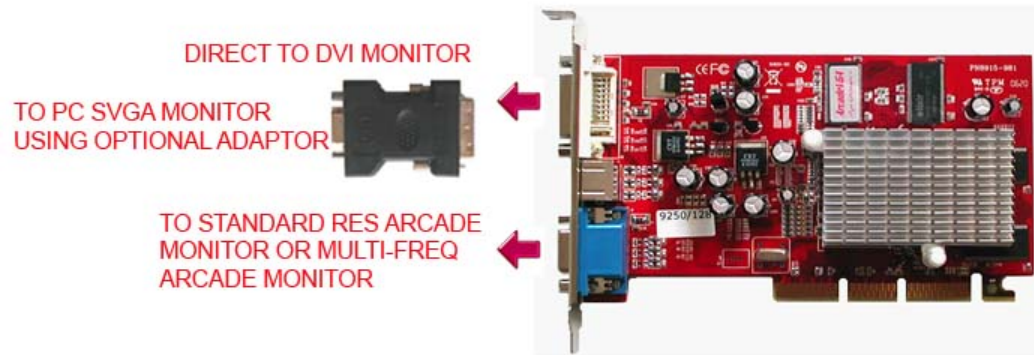


ArcadeVGA

VERSION 2 AGP/PCIE

INSTALLATION



Monitor Connection:

You can connect a PC monitor (DVI or VGA) or an arcade monitor or both at the same time.
The arcade monitor always connects to the 15-pin D connector on the card.
The PC monitor connects directly to the DVI port (digital LCD) or using a VGA plug adaptor (VGA monitor).

Connecting a PC Monitor:

PC Monitors (including conventional or flat panel) **MUST** be connected to the DVI port. If you connect to the VGA port you will get no picture.
Digital DVI monitors just plug in. CRT VGA monitors with a 15-pin VGA plug will need the DVI adaptor plug.

Connecting an arcade monitor:

If you are using a J-PAC :

Simply plug the J-PAC VGA cable into the connector on the card. The J-PAC has a built-in video amplifier for monitors that need a higher signal.

If you are using an arcade monitor with our Video Amp:

Some monitors (*not* Hantarex or Wells-Gardner) need a 5 volt video RGB signal and the ArcadeVGA card supplies 1 volt. To boost the signal level you can use our Video Amplifier. This comes with a VGA cable. Connect the RGB, Sync, GND screw connectors to the monitor inputs. Note the GND connection is on the input side of the amp. This must be connected to the monitor ground input. You will need to add the ground connection alongside the existing wire.

The video amp needs no separate power source as it takes power from the ArcadeVGA card.

Full information on the video amp can be found [here](#):

Direct Connection:

If not using a J-PAC or video amp, many monitors (including all Wells-Gardner and Hantarex) can accept a 1 volt signal level that the ArcadeVGA card supplies. So with these monitors you can make your own cable (See [here](#) for details.) or use our pre-stripped and labelled VGA breakout cable. Note we are unable to supply fully assembled cables as there is no established standard connector or pinout for arcade monitors in a non-JAMMA setup, so we would not know what connections your monitor has. If your monitor has a single sync input (composite sync) you can connect the H-Sync and V-Sync wires together. The ArcadeVGA card always sends negative H and V sync in all video modes, so this method works fine. The connections on the **VGA breakout cable** are marked as follows:

R, G, B = colours

H = horizontal sync. H and V sync can normally be connected together for most monitors to produce composite sync.

V = vertical sync

- = ground

Connecting a Multi-Frequency Arcade Monitor (eg Wells-Gardner D9200)

These monitors can run from 15Khz scan rate up to 31Khz or above.
Plug the cable supplied with the monitor into the VGA port. If you are using a J-PAC in your cabinet, the video section of the J-PAC is not used.
After installing the ArcadeVGA drivers (see below) download and install the Tri-Sync Utility from our download page.

Starting Up

Boot the PC. A normal boot screen should be displayed. You will almost certainly have to adjust the monitor for the correct picture size and centering. If the picture is rolling vertically, adjust the V-Hold control. The ArcadeVGA card produces vertical sync in the range of 50-60 Hz so you may need further adjustment to find an eventual setting that locks within this full range. Horizontal hold is not expected to be adjusted but Wells-Gardner monitors sometimes show a slant at the top of the screen which can be cured by adjusting this control.
If you have both an arcade and a PC monitor connected, the arcade monitor will not display a picture until Windows starts.

Windows XP, 2000 Driver Install.

Install the card into the AGP slot. The card must be installed to install the drivers.
If Windows displays a message "New Hardware Found" you MUST quit this and not let the standard Windows drivers install.

If your PC has previously had any ATI card installed, you will need to remove the existing ATI drivers. Do this by downloading and running **this utility**:

Start (or restart) Windows. The Windows screen should be displayed at 640 X 480 interlaced, 16 colours. To use the ArcadeVGA built-in modes the ATI driver needs installing. Insert the Ultimarc CD. Run the driver Setup program in the correct folder (XP or 2K). Reboot as prompted. Windows may ask if you want to replace newer files with old. You MUST choose to replace all the files. After re-boot, optionally install the ATI control panel by running Setup in the "Cpanel" folder on the CD.

Right-click on the desktop, select "properties" and set the colour depth to "32 bit colour".

Blue Screens in XP/2000 Windows XP may try to invoke the built-in Microsoft ATI driver and this will not work with the ArcadeVGA card, and causes a blue-screen error. If you see this, re-start and hold down "F8" and choose to start in Safe Mode, then install the ATI driver from the ArcadeVGA CD. To do this, you will need to enter device manager, right click on the expanded video card listing under 'Display Adapters' (or, the undesignated option, if the device has not been recognized at all, and has a yellow X next to it), click on properties, go to driver tab, and click on 'update driver'. This is the only way to install the driver in safe mode, as attempting to install via ATI's setup utility will produce error messages and result in a failure to install the driver. You will need to point the driver install to the correct location on the CD as mentioned in "Forcing a driver install", further down this page.

After you have installed the driver, check that it ic correctly installed by clicking on the Galaga icon on the taskbar.You should see the following which is a list of all available resolutions:

1280 by 1024, 16-bit color

240 by 240, 32-bit color

256 by 240, 32-bit color

256 by 256, 32-bit color

256 by 264, 32-bit color

288 by 240, 32-bit color

296 by 240, 32-bit color

304 by 240, 32-bit color

321 by 200, 32-bit color

321 by 240, 32-bit color

321 by 256, 32-bit color

336 by 240, 32-bit color

352 by 256, 32-bit color

352 by 264, 32-bit color

352 by 288, 32-bit color

368 by 240, 32-bit color

384 by 288, 32-bit color

392 by 240, 32-bit color

401 by 256, 32-bit color

448 by 240, 32-bit color

488 by 384, 32-bit color

512 by 240, 32-bit color

512 by 288, 32-bit color

512 by 384, 32-bit color

512 by 448, 32-bit color

512 by 512, 32-bit color

632 by 264, 32-bit color

640 by 240, 32-bit color

640 by 288, 32-bit color

640 by 480, 32-bit color

720 by 480, 32-bit color

800 by 600, 32-bit color

1024 by 768, 32-bit color

1152 by 864, 32-bit color

✓ 1280 by 1024, 32-bit color

Display Properties

20:34



MAME Configuration (General)

This step is VITAL. If you do not do this you will not get any of the benefit of the ArcadeVGA card.

By default MAME is configured to stretch and re-process the picture to fit on whatever resolution your PC happens to be running at. YOU DO NOT WANT THIS TO HAPPEN because using the ArcadeVGA card you can have un-distorted video with a one-to-one pixel mapping.

The basic changes you need to make are:

HARDWARE STRETCH MUST BE OFF YOU MUST USE DIRECT-DRAW NOT DIRECT3D SWITCH RESOLUTIONS MUST BE ENABLED

The command-line switches to do this if running Mame from a command line are:

-video ddraw -nohwstretch -switchres

Configuring DOS MAME (DMAME.EXE).

DO NOT configure for an arcade monitor.

If you have changed from defaults, ensure: TWEAK = NO, VESAMODE = VESA3, SCANLINES = NO

Use the command-line mentioned above.

Configuring Windows Command-Line MAME (MAME.EXE)

NOTE THE DEFAULT SETTINGS OF MAME WILL NOT GIVE GOOD RESULTS. YOU NEED TO DO THIS STEP:

You will need to check/edit the MAME.INI file, which should reside in the Mame folder. If this file does not exist, you will need to run from the command-line:

MAME -CREATECONFIG

After the INI file is created, open with Notepad and check the following (this is from MAME 0108. Earlier versions do not have all these options)

```
#
# VIDEO OPTIONS
#
video ddraw
numscreens 1
window 0
maximize 1
keepaspect 1
prescale 1
effect none
pause_brightness 0.65
waitvsync 0
syncrefresh 0

#
# DIRECTDRAW-SPECIFIC OPTIONS
#
hwstretch 0

#
# FULL SCREEN OPTIONS
#
triplebuffer 0
switchres 1
```

MAMEWAH.

This front end deserves special mention because it is ideal for use with the ArcadeVGA card and Windows, especially if used in a cabinet with no keyboard. We also like it because it has integrated support for on-the-fly downloading of I-PAC key codes. It can be downloaded from mameworld.net

MAMEWAH supports 640 X 288 mode in Windows for a flicker-free non-interlaced display with an arcade monitor. (to configure this, look in mamewah.cfg and change the "640 X 480" to "640 X 288").

When using this front end, the easiest way to ensure you have all games correctly configured is to run the AVRES utility after installing MAME (see below).

MAME32.

MAME32 is basically MAME with a built-in GUI and is a reasonable choice when not using a cabinet (ie you have a keyboard connected). It is not as good at supporting 640 X 288 as MAMEWAH (above) but slightly easier to configure as it works "out of the box".

Ensure the default settings in MAME32 are as follows (version 108, earlier versions differ)

Display Tab:

VideoMode: DirectDraw

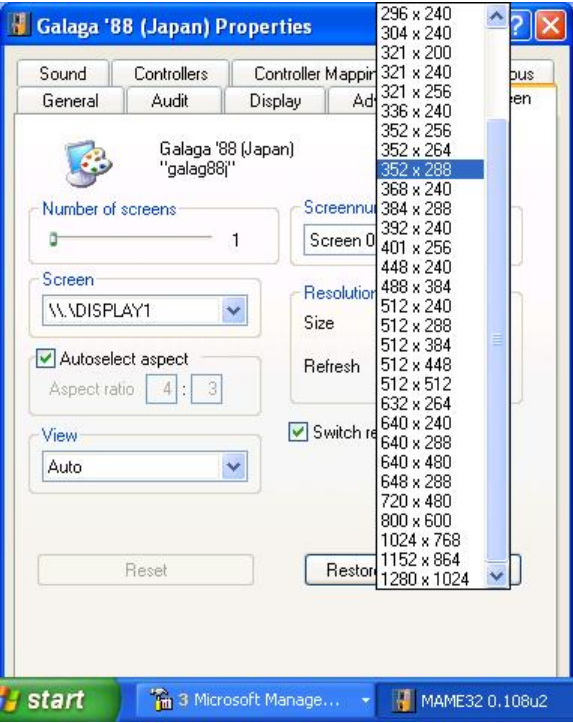
Stretch Using Hardware = OFF (if this is greyed out you have not switched Windows to 16 or 32-bit colour mode)

Screen Tab:

Screennumber = 0

Screen = \\.\DISPLAY1
Resolution, Size = Auto (or select from drop-down list in game as required)
Switch Resolutions to fit = ON

The screenshot below shows the open drop-down for "Size" in Mame32 v 108. This is where you can select the resolution for each game.



ArcadeOS.

This is a good choice for a DOS front-end but does not automatically read the available VESA resolution list from a VGA card. The list of available resolutions is held in the MAME.DAT file. Thanks to Tony Saxton, (<http://mame.how.to/>) there is a special MAME.DAT file [here](#) for using this card with ArcadeOS. Download the file ULTIMARC.DAT and copy over the existing file in your ArcadeOS folder. Then all of the ArcadeVGA resolutions will be available for choice in the game configuration menu (press "start").

Selecting a resolution for each game.

TheArcadeVGA card has the following built-in resolutions:

H	V	Horizontal Refresh (Arcade Monitor)	Vertical Refresh (Arcade Monitor)	Horizontal Refresh (VGA Monitor)	Vertical Refresh (VGA Monitor)
240	240	15Khz	60Hz	31Khz	60Hz
256	240	15Khz	60Hz	31Khz	60Hz
256	256	15Khz	60Hz	31Khz	60Hz
256	264	15Khz	58Hz	31Khz	58Hz
288	240	15Khz	60Hz	31Khz	60Hz
296	240	15Khz	60Hz	31Khz	60Hz
304	240	15Khz	60Hz	31Khz	60Hz
320	200	(321 X 200 in Windows) 15Khz	60Hz	31Khz	60Hz
320	240	(321 X 240 in Windows) 15Khz	60Hz	31Khz	60Hz
320	256	15Khz	60Hz	31Khz	60Hz
336	240	15Khz	60Hz	31Khz	60Hz
352	256	15Khz	60Hz Vert on Horizontal Mon	31Khz	60Hz
352	264	15Khz	58Hz Vert on Horizontal Mon	31Khz	60Hz
352	288	15Khz	51Hz Vert on Horizontal Mon	31Khz	60Hz

368	240	15Khz	60Hz	31Khz	60Hz
392	240	15Khz	60Hz	31Khz	60Hz
384	288	15Khz	51Hz	31Khz	60Hz
400	256	(401 X 256 in Windows) 15Khz	53Hz, Mortal Kombat etc	31Khz	53Hz (Note some LCDs cant display this)
448	240	15Khz	60Hz	31Khz	60Hz
448	384	Not Available		48Khz (Requires Multi-Freq Mon)	70Hz
512	240	15Khz	60Hz	31Khz	60Hz
512	288	15Khz	51Hz	31Khz	60Hz
512	384	Not Available		48Khz (Requires Multi-Freq Mon)	70Hz
512	448	15Khz	60Hz Vert on Horizontal Mon	31Khz	60Hz
512	512	15Khz	58Hz	31Khz	60Hz
632	264	15Khz	57Hz	31Khz	60Hz
640	240	15Khz	60Hz	31Khz	60Hz
640	288	15Khz	60Hz	31Khz	60Hz
640	480	15Khz	60Hz	31Khz	60Hz
800	600	15Khz	50Hz	31Khz	60Hz
Higher Resolutions	Not Available. "Dummy" resolutions are used. Right-Click and "Properties" to change back to a lower resolution if accidentally selected.			Various. Requires Multi-Frequency Monitor or PC Monitor	

These are in addition to all the normal VGA text/graphics modes.

NOTES:

Three of the resolutions are one pixel wider in Windows, as shown. This was necessary because these are native Direct-X double-scanned modes and we don't want double scanning so we need to use a slightly different value to prevent Windows from invoking double-scan. In fact only the Windows "name" of the resolution is different, they actually scan the correct number of pixels, 320. So applications which need 320 X nnn resolutions will be supported. The resolutions which show no vertical rate in the table have an arbitrary rate which is the result of scanning the required number of lines at 15Khz. They are mostly around 50Hz. Arcade monitor timings prevent these resolutions from being displayed at 60Hz.

Note about 224-line resolutions (eg Neo-Geo): The list does not contain any 224-line resolutions for the reason that is explained fully in the Arcade Monitor FAQ, basically arcade monitors cannot display these modes without top/bottom borders (otherwise the vertical refresh rate would be > 60Hz), so using a 240 line mode instead gives *exactly* the same result. (ie MAME inserts the borders instead of the resolution mode).

The ArcadeVGA card allows your PC to exactly duplicate the original game-boards video logic. To do this the resolution must match that of the original game, or be slightly higher (giving small borders). For the best gaming experience, you can over-ride MAME's choice of resolution. MAME often does not pick the best resolution. Here are some pointers: Choose a resolution that has an H and V value equal or slightly greater than the original game unless there is a resolution that is only a few pixels less, in which case choose this one. For vertical games on a horizontal monitor, choose a horizontal resolution which is about double the game resolution as you want side borders. The resolutions of 352 Horizontal are especially suited to vertical games. You will find that vertical resolutions of 240 and 200 or less are indistinguishable from each other. The reason for this is given on the **arcade monitor FAQ** page. A few games with a vertical resolution of between 301 and 450 will need Hardware Stretching because arcade monitors cannot display these resolutions, see **arcade monitor FAQ** for the reason.

Auto-Resolution Utilities.

There are currently two utilities which can be used to generate INI files for MAME which tell the program which resolution to run every game.

MameWah Resolution Tool Can be downloaded [here](#)

Or Gavin Bensons Utility [here](#). This new version (Aug 2006) will also handle the newer format of MAME 106u12

Both these utilities will scan the game list and generate INI files which specify the best resolution for each game. After running once, you don't need to worry about choosing the resolutions again. MAME will always run every game at the optimum resolution.


Windows desktop modes on an arcade monitor

H	V	
640	288	Non-Interlaced
640	480	Interlaced
800	600	Interlaced
1024	768	XP and 2000 Auto-Pan only

(this information does not affect gaming, only Windows desktop)
In addition, Windows XP and 2000 can run in "auto-pan" mode. This allows a non-interlaced 640X300 desktop which pans up and down as required. You can set a "virtual desktop" of 800X600 or 1024X768 with auto-pan. PC monitors can display all the usual Windows resolutions.

Switching desktop resolutions in Windows.

Windows XP and 2000

To switch resolutions, click on the "galaga ship"  taskbar icon. This is installed with the ArcadeVGA drivers. If you do not have this installed, you can download the utility [here](#). Simply add it to the "startup" group so it runs when Windows is started. This utility allows all of the modes available on the card to be selected.
In all Windows versions, you can save resolutions as schemes and assign a hot-key to select from the control panel. See the ATI help file for details (red ATI icon).

Enable Auto-Panning in Windows XP and 2000.

Click Display, Properties, Advanced, Displays. Click on the active (top left) Monitor heading. In the "Max Resolution" drop-down, select "648 X 288". The desktop will now be a clear non-interlaced display, which auto-pans up and down. If you wish, click on the ATI taskbar icon and increase the desktop resolution to 800 X 600 or 1024 X 768. To turn off auto-pan, select 640 X 480 in the "Max Resolution" drop down box, as above.

Rotating the desktop for vertical monitors.

Right-click on the ATI taskbar icon. Select "Rotation" choose correct value.

Using other DOS Applications.

Any application which directly writes to the VGA registers will over-ride the VGA card internal modes. One such app. is Advanced MAME. If you do use this version, you will need to configure it for an Arcade Monitor so that it will write the correct timings directly to the card. Advanced MAME uses it's own timing modes not the card's built-in timing modes. The ArcadeVGA card has a lower dot-clock limit than ordinary cards so you will be able to set very low resolution modes in Advanced MAME.

Some other old DOS apps also write directly to the VGA registers and these will not work properly.

Using other Windows Applications.

Windows applications such as 3D games should run normally on an arcade monitor provided they can run at 640 X 400 or 800 X 600 resolution, which is the maximum an arcade monitor can display in interlaced modes. PC monitors have no restrictions of course.

Using the TV-Out Connector.

This connector can be connected to a TV for troubleshooting purposes. We do not recommend using TVs for gaming for the reasons we explain in the [Arcade Monitor FAQ](#) (poor TV picture quality). There is no benefit in using the TV-out connection of this card over any other VGA card.

Forcing a Windows Driver Install.

This procedure may be necessary if the driver does not appear to install for any reason.

From Control Panel, click "System", "Hardware", "Device Manager".

Open up the Display entry and right-click the entry "Ultimarc ArcadeVGA". Select "Update Driver".

Select "No, not this time", for searching the web for drivers.

Select "Install from a list or specific location".

Select "Don't search, I will select the driver to install"

Select "Have Disk"

A file open dialog will be displayed. Navigate to the location of the INF file on the Ultimarc CD as follows (assuming D is your CD drive)

Windows XP and 2K: D:\AVGAdrivers\XP\2KXP_inf

A list of available drivers will be displayed, select "Ultimarc ArcadeVGA".

Complete the install process. Do not choose to reboot at this time.

Repeat the above steps but this time, instead of right-clicking "ArcadeVGA" in Device Manager, select "Radeon Secondary". Reboot when complete.

Ignore any warning about the driver not having been tested with your hardware.

Programming notes.

If you are a programmer wanting to write or modify a front-end to use with this card, the following info might be useful:

The ArcadeVGA card enumerates all the in-built resolutions as VESA3 modes. So to get the mode list, the application should do the following:

INT 10 call to get the mode number list

INT 10 call on each of the mode numbers in the list to get the resolution for each mode.

Then set the required resolution using an INT 10 call.

This is all completely standard VESA programming. The full INT 10 calls and sample code for getting the mode list is available in a VESA document which can be downloaded from www.vesa.org.

Troubleshooting.

Jumping/Flickering screen in MAME games:

You have not configured a resolution for the game. MAME does not seem to be able to select the correct resolution for most games (MAME devs please note!), and just runs at the default (Windows desktop) resolution. You will need to check the correct game resolution (displayed on the game start screen or right click, "properties") and then select and save a matching or higher resolution (or perhaps a very close lower resolution).

PC Not booting at all, no disk activity:

If you are using a home-made arcade monitor cable, check the wiring. The only pins that should be used are the colour, sync and ground pins. All other pins such as Monitor ID, etc should not be connected. Connecting the wrong pins could cause a 5 volts power short.

Picture in Boot / DOS but nothing in Windows:

Some older motherboards, especially VIA chipset boards, need an AGP driver to enable the slot. Check the motherboard info.

Only getting 640 X 480 resolution in Windows. No 32-bit colour mode selectable:

Maybe the driver is not correctly installed. Try re-installing the driver.

