

MaxAppleZoom v1.43

Users of previous versions should skip directly to the v1.4x release notes on page 13.
Please do not distribute MaxAppleZoom without this MacWrite-format documentation.
Fonts used in this text: Geneva 10, Geneva 12, Times 24.

What is it ?

In the crowded world of INITs, CDEVs etc. for the Macintosh II, I believe this program stands out because it has, to the best of my knowledge, absolutely no equivalent.

What this INIT/CDEV does is simple to describe, but was quite difficult to implement:

MaxAppleZoom actually reprograms Apple's standard Mac II video card so that it displays a 704 * 512 pixel screen instead of the normal 640 * 480.

Nearly every application software you own (be it Word processing, Spreadsheet, Graphics, Music composition etc. etc.) will gain more usefulness and comfort thanks to this larger display area !

Incidentally, have you noticed that display systems (monitor + video card) prices are roughly proportional to the square of the number of pixels displayed ? A 19" display of 1024 * 768 resolution (approx. 800000 pixels) will not cost 2.5 but something like 6 times the price of your old faithful 300000-pixel Apple 13" monitor. A little survey of the market will doubtless provide a lot of data that substantiate this observation.

Thus your 1000+US\$ Apple display system will see its value increase by 350+US\$ if you use this software.

(And if you believe this I've just got some spare land on the Moon I'm willing to sell you for cheap) However, it's a fact that you will use more of the capacity that was hitherto dormant of those expensive video RAM chips on your video card.

Well, let's be serious. Life isn't so simple, and this INIT has its share of (potential ?) problems :

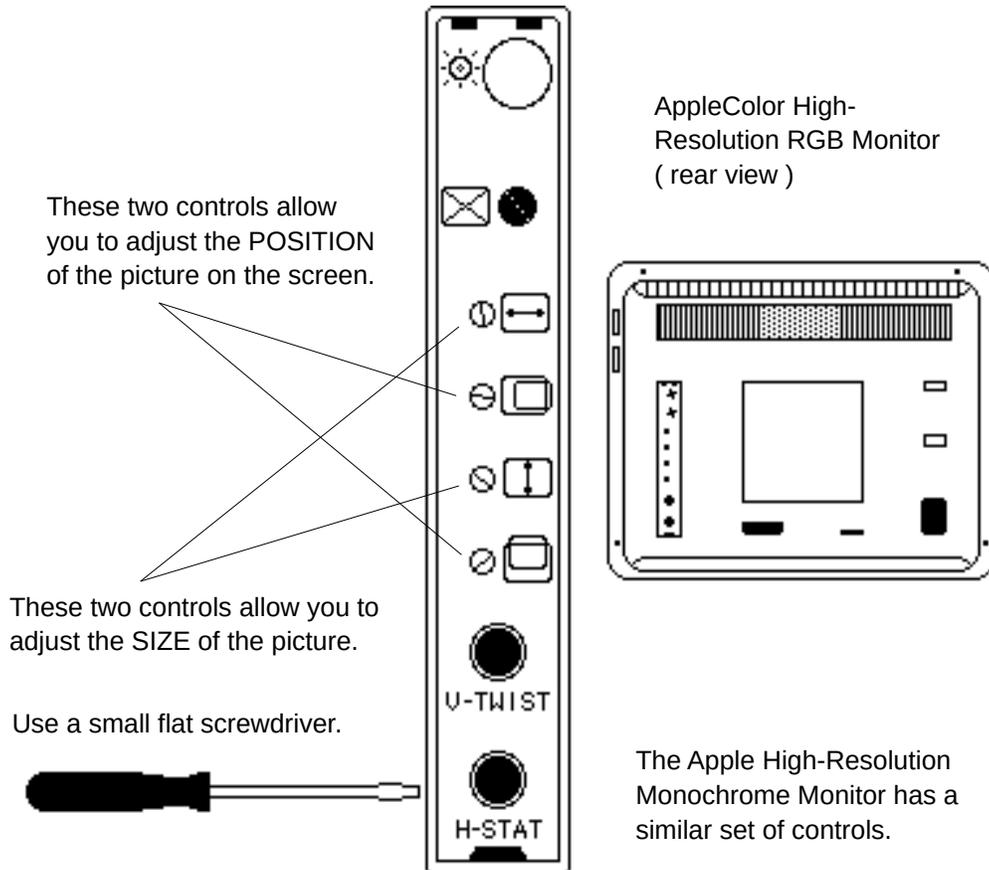
- It works ONLY with 4-bit and 8-bit Apple video cards (Surprised ?)
- It works only if you have only one display system connected to your Mac II. (I guess most of us have only one screen and video card, so this shouldn't be too much of a problem).
- In 1-bit/pixel mode, you will probably see on the right edge of the picture tube some noise in the form of regularly spaced horizontal lines that are 32 pixels wide. I've tried very hard to eliminate this problem, but so far without success. It looks like we have reached some hardware limit on the card. Luckily, this noise does not appear in 2-, 4- and 8-bit/pixel modes. At lower resolutions I have experimented with, the noise disappears too but I think this problem is only a minor annoyance compared to the usefulness of an increased desktop real estate. This "feature" obviously does absolutely no harm whatsoever to the documents you work with, the applications you run or, for that matter, to your hardware. Think of it as a permanently available ruler or as some dirt on your screen...

How do You use it ?

MaxAppleZoom is a INIT/CDEV, which means that if you want to activate it, you must put it in your System Folder and then restart your Mac.

You can prevent MaxAppleZoom from being activated (though why you would want to do such a thing is beyond me) in three ways:

- Remove MaxAppleZoom from your System Folder and then restart.
- When starting up, hold down the mouse button or the shift key.
- Set the MaxAppleZoom on/off switch in the Control Panel to 'off', then restart.



The factory setting of the image size on the picture tube on all Apple monitors I have examined is compatible with the larger display area. If you think however that you would like a wider black border around your picture, you can adjust the picture size controls on the back of the monitor (those hidden behind a small rectangular cover. Pop this cover off using a flat screwdriver). Doing so however will also shrink the image size when in 640 * 480 mode, and you may find the normal image size ridiculously small especially after you have become accustomed to the display size provided by MaxAppleZoom. Users with newer video cards will probably need to adjust the picture position controls. This will be elaborated on in the v1.2 release notes below.

MaxAppleZoom conducts a quite thorough check of the system to determine if it can safely run. The video card in particular is carefully inspected, to make sure that it's a version that can be reprogrammed to a higher resolution. So it's quite possible that even if you have an Apple video card, it may be a newer version different enough for MaxAppleZoom to refuse to be activated. MaxAppleZoom is also quite picky about its software environment, and will refuse to run if it detects anything bizarre about the video setup. Such is the price of being a nearly-bullet-proofware... Huh ? What do you say ? Muffin's law ? This program certainly has nothing to do with muffins !?

This INIT must be loaded before those INITs that tinker with the apparent screen size, like BlackBox or Stepping out. As INITs are loaded by the system in alphabetical order, MaxAppleZoom has actually a leading special white character (ASCII code 01) in its name so that it loads before nearly anything else. Sometimes, this character can get lost somewhere, especially as some bulletin boards don't very much like to have bizarre characters in the name of the files they receive, and so they just strip them. The presence of this character is especially important for KanjiTalk users lest their input conversion window appearing at the bottom of the screen behave strangely.

If you have several System Folders on your hard disk(s), very rarely, the Finder and application programs that used to work well with MaxAppleZoom will make use only of a 640 * 480 part of the screen, even though the resolution of the video card has been augmented. In these cases, a restart should fix things up.

If for any reason MaxAppleZoom does not activate (for example if MaxAppleZoom's switch in the Control Panel is off), the icon shown at the bottom of the screen when the Mac is starting up will tell you so. The Control Panel will also tell you if your Mac is incompatible with MaxAppleZoom.

Bugs ?

```
#include <StandardDisclaimer.h>          /* Hee hee */
```

Considerable effort has been made to make MaxAppleZoom one of the safest INITs you have seen since a long time. The World has certainly little use for a new INIT which, although sometimes useful, increases the already too high frequency of Bomb apparitions on the Mac. This is especially important for programs like MaxAppleZoom which are active nearly permanently when you use your computer.

I personally have NEVER experienced during my extensive testings a single System Error caused by MaxAppleZoom, but unfortunately this doesn't mean that you won't too. I do very much care about reliability so, instead of sending me hate mail, please send me a precise description of the problem (reproducibility etc.) should you ever encounter one.

Trivia...

Conceiving this software without any meaningful hardware information published by Apple has been, er, a major undertaking. A "significant" amount of time and effort has been devoted to analyzing Apple's video card, programming around 24- and 32-bit addressing mode "features" of the slot manager (the part of the operating system that deals with cards), QuickDraw (the graphical kernel of the Macintosh OS), and not least 32-bit Quickdraw. What Apple programmers do in 32-bit QuickDraw is horrifying and doesn't quite follow the "Generally Accepted Macintosh Programming Practices". Looks like those guys had somehow access to inside information about the Mac OS ?!

What's the SEC (Software Ethics Council) doing ?

Let me mention here that MaxAppleZoom is compatible with 32-bit QuickDraw.

I have in the works a chip that replaces one present on the Apple video card and that accomplishes the same purpose as MaxAppleZoom, but most users balk at modifying their hardware, and besides an integrated circuit would be rather difficult to duplicate or upload to a server, if you haven't got the right equipment. The advantage of this solution is that the card really appears to the Mac as being a 704 * 512 one, without any supplementary programming.

What is done by software here is less complete, and users of some "special" programs like MacsBug for example will notice that in some parts of the Mac's memory still lie some information describing the card as a 640 * 480 one. Part of the task of MaxAppleZoom is to find and replace most of this data, but it is quite difficult to do a thorough job, given the constraints of available development time (related to my "copious" free time). The Mac is a complex system, and QuickDraw doesn't like to have the resolution of a card it examined at startup time to be later changed surreptitiously. Most users will hopefully not notice any glitches in the performance of their systems.

Business matters

This software is distributed under the shareware system, which allows you to try it before you buy. I retain all rights on it, but feel free to duplicate and distribute it to your friends or upload it to bulletin boards etc., on condition that you do not separate MaxAppleZoom from this documentation.

If you wish to continue to use this program after a reasonable period of trial, you must become a registered user by sending in a shareware fee (US\$ 25 suggested) to the address mentioned in the registration form you will find at the end of this document.

What risk do you run if you do not pay the shareware fee ? Well, suppose that in a few months from now, because of a new Apple System release or whatever, MaxAppleZoom ceases to function. If I haven't received a reasonable feedback by that time, I certainly won't release an updated version and MaxAppleZoom will have been rather short-lived.

The trial period allows you to evaluate the usefulness of MaxAppleZoom, and to determine if its future availability is worth the shareware fee.

Please do not forget that:

- Each individual is somewhat a barometer of the behavior of others, that is, if YOU do not pay, it is very likely that others won't pay too.
- No matter how much you may have spent to actually get into possession of this program (download time, PD disks, CD-ROM collection of shareware etc.), I will not get a single cent, unless you send money directly to me.

Planned improvements for future versions include support for other video cards, multiple screen and System 7 compatibility.

Realizing this potential of MaxAppleZoom is up to you.

Changes in version 1.1 from the - in retrospect - er, rather weak version 1.0 of MaxAppleZoom (You aren't still using it, are you ?!) include :

- Support for Apple 4-bit color video cards .
- An even more thorough check of the hardware configuration information provided by the Mac's operating system (read: even more paranoiac programming).
- Better compatibility with Berkeley Systems' Stepping Out II™.
- A new Control Panel option for expanding the StartupScreen (a picture loaded from a file named StartupScreen - if it is present in the System Folder - and that greets you every time your Mac starts up). This picture expansion feature suppresses the gray desktop pattern appearing around a 640 * 480 startup picture when the screen's resolution is augmented to 704 * 512 pixels.

Acknowledgements

I would like to thank the members of the European Community Computer Club of Brussels for their support (especially Guy Fiems and Riccardo Ettore for providing valuable suggestions and an array of various Mac II's to test this software on).

Thanks also to Paul Mercer for providing the code (ShowINIT) which displays MaxAppleZoom's icon at boot time.

Version 1.2 release notes.

Some users of version 1.1 have complained that the left edge of their screen, a strip about 10 pixels wide, was not being displayed. Some users also reported that MAZ didn't work at all on their systems.

I was quite disturbed by these reports, for during my pre-release testings on all the Macs I had access to in Belgium I never encountered a single card causing problems.

I had (foolishly ?) written to some MAZ users that I hoped to release a corrected version by March. The deadline was approaching fast and I was yet to lay my hands on one of these funny cards, let alone analyze and write code for it.

I didn't really like the options left to me, like visiting computer showrooms with my testing gear to be probably quickly thrown out by unenlightened dealers, or prowling the floors of computer exhibits, a disk with test programs in the pocket, hoping to find an unguarded Mac II. Was MAZ v1.2 to become one of the first vaporwares of the shareware industry ? Read on.

The breakthrough came when I encountered by chance a friend I hadn't seen for several years. Learning about my predicament he drove 160 kilometers in a stormy night, impervious to flying tiles, falling trees and chimneys - February 1990 was not a nice period to be in Western Europe, meteorologically speaking - to bring me in an interesting place full of new Apple equipment. Thanks, Pierre. I'm glad we both survived.

Here's what I can report from what I learned there:

- It looks like Apple has been busy developing and releasing new versions of its standard video card, without telling me.
- Video cards named "Toby frame buffer card" are usually reprogrammable. Use a CDEV like Ken McLeod's MacEnvy to find the name of your video card. If you haven't MacEnvy, check whether the copyright date printed near the video connector on your video card is ©1987 or ©1988. If MAZ refuses to reprogram such a card, it is almost certain that it is due only to a software incompatibility, not to a hardware one.
- The changes in the video circuitry in some of the newer cards named "Mac II High-Resolution Video Card" are so extensive that I haven't yet finished analyzing them, but from what I've seen so far, I don't think I'll be able to reprogram them. This is thus a real hardware incompatibility.

Please note that NOT all the cards named "Mac II High-Resolution Video Card" have this totally new and incompatible circuitry.

Version 1.2 of MAZ adds support for those monitors that lose pixels on the left edge of the screen, as well as some versions of the cards named "Mac II High-Resolution Video Card".

I mentioned in a previous version of these release notes that the pixel clipping problem was probably due to a new design of the video card, but it actually looks like to be related to the age of the monitor. I wish to thank Mr. John R. Howell for correcting my error.

I haven't been able on these monitors to expand the picture while keeping it centered on the display without losing a few pixels. The method I've chosen is thus to bring up an unclipped picture slightly off-center on the screen, and requiring the user to adjust the picture position controls at the back of the monitor. See the illustration on page 2 if in doubt.

A new button labeled "Sync" has been added in the Control Panel to MAZ, and here's how you should use it:

First, put MAZ v1.2 in your System Folder (remove MAZ v1.1 from your System Folder before...) and restart. If no software or hardware incompatibilities prevent MAZ from running, and if MAZ's on/off switch in the Control Panel is "on", the display will expand and you will be in one of the following states:

- 1 The expanded picture is centered and perfect: You are done with MAZ's installation.
2. At the left of the screen, a strip of pixels is not being displayed: Click on the "Sync" button, then restart. Wait for the picture to come up again, and then adjust the position controls at the back of the monitor to center it. Installation is then complete.
- 3 The picture displayed is too much to the right: Click on the "Sync" button, then restart. You should now be in state 1 or 2.

Among other visible new features of v1.2, I could cite that it makes the startup icons of Capture and Moire behave better, but not yet as well as they should. Both programs use indeed rather "creative" ways to display their icons. This is quite obvious for people with an Apple CD-ROM drive, because on their Macs these two startup icons often don't show up at all. Further analysis is now up to Apple and to the authors of these programs.

One of my few registered users has brought to my attention an interesting incompatibility between Steve Jasik's TheDebugger™ and MAZ. He says that renaming MAZ so that TheDebugger loads before it solves the problem. Thanks, Mike.

The suggestion to transform MAZ to a MacsBug-like file, so that it loads before nearly anything else, and to rename MacsBug to Disassembler is interesting, but unfortunately it seems that the Virtual Memory Manager of the Mac already does the same trick. So, what would happen if one wants to use VM, MAZ and a debugger ?

A word about incompatibilities

If you haven't been able to make any version including this one of MAZ run at all on your Mac, and if your card is named "Mac II High-Resolution Video Card", you have probably a hardware incompatibility. In that case, if you want to use MAZ, there isn't much you can do but to get rid of your new video card and try to get an older one.

You have a software incompatibility when you know that MAZ v1.2 should run on your system - either because it ran once or twice on your Mac, or because your card is a Toby Frame Buffer - and yet it doesn't, showing only the dreaded "Sorry, MaxAppleZoom 1.2 won't run on this Macintosh system." message. What can you do then ?

- Re-read MAZ's documentation, but it probably won't do much good.
- Discuss the matter on on-line services, hoping that somebody else has had the same problem and found a solution. Results are not always guaranteed.
- Register your copy and contact the author. He knows more about MAZ and is more concerned with its flawless performance than most people. If there is indeed a problem he has probably already found a cure for it, be it a workaround or a brand new version. This is in my opinion the method likely to bring the most results ^(^

To conclude I wish to thank my less-than-a-handful registered users (I would be quite ashamed to cite their exact number) for their kind and encouraging words. A special mention is due here to America Online sysop Paul M. Smallwood for becoming one of my first registered users and taking the trouble to collect, print and air mail me at his own expense interesting reports about MAZ v1.1's problems on the new video cards. I sure wish I could subscribe to an on-line service with such friendly and efficient sysops but transatlantic phone calls, especially from Belgium, are for now far beyond my financial depth. Besides, would you believe that a PTT-approved 1200bps modem costs in Belgium 800+US\$? I have yet to buy one...

Version 1.31 release notes.

The major change from version 1.2 is that a revised version of the Apple "Mac II High-Resolution Video Card" is now supported. This is the 8-bit video card that you probably got if you purchased your Mac before Fall 1990. Hopefully, all the Apple 4-bit and 8-bit color cards introduced before the recent Apple Display Card 4.8 are now MAZ-compatible. However, as I don't know exactly how many types of the standard video card exist, I'm conducting a little market research: in the lower right corner of MAZ's control panel display, you'll find a two-character code representing some configuration information about your video card. Please transcribe it to the registration form, as it will help me to know what kind of circuitry your card has and plan future MAZ improvements.

And what happened to version 1.3 ?

Differences between v1.31 and the short-lived v1.3 are minimal, and are mostly only internal. The handling of the "Narrow Monochrome Mode" option should be more consistent, though. (Thanks Raymond)

Among other features of v1.3x, I could also cite that:

- MAZ is more well-behaved with a program named "Symantec AntiVirus for Macintosh, version 2", or SAM v2.0 for short.
- Some users found the noise in monochrome mode too obtrusive and requested a narrower display. A new setting named "Narrow Monochrome Mode" has thus been added to the Control Panel. When this option is chosen the width of the display in Monochrome (i.e. 1 bit/pixel) mode is reduced by 16 pixels, clipping off a strip running along the right edge of the screen. This Monochrome Mode display size modification will occur when you switch the bit depth of the screen from 2-, 4- or 8-bit/pixel to 1-bit/pixel mode.

It should be noted that although the physical size of the display changes, the size seen by the Mac OS does not. The Finder will thus display the volumes and Trash icons too much to the right, for example. This option might thus be seen as a kludge, but changing the size of the screen when applications - and the Finder is also an application - are already running is very difficult. As an example I know of no easy way to tell Microsoft Word when it's displaying a full-screen print preview of a document that the width of the screen desired by the user has changed and that it should thus slightly reduce the size of its display. Every application would probably require a custom supplementary bit of code, and I personally lack the time and information needed to address this problem thoroughly.

I must also add that depending on the circuitry present on your video card, the "Narrow Monochrome Mode" control may or may not be available.

Some users suggested that MAZ should be modified to load before MacsBug, so that the debugger uses the enlarged display. Unfortunately MacsBug has been written to use only a centered 640*480 area on the screen, even when the display is a bona fide big picture monitor. So tinkering with the load order brings no real benefits.

When using MAZ, it is possible that even though the display's size becomes larger, the size seen and used by the Mac OS reverts back to 640*480 when you use the Monitors cdev in the Control Panel, or when you invoke an incredibly useful screen-depth switching FKEY named Switch-A-Roo (written by Bill Steinberg. Thanks, Bill).

To prevent this from happening:

- Before putting MAZ in your System Folder, delete the file named "Roo File" created by Switch-A-Roo. Then put MAZ in your System Folder, restart, and immediately change the bit depth of the screen using the Monitors cdev in the Control Panel. Close the Control Panel, restart, and then rebuild "Roo File" by invoking Switch-A-Roo.
- If your computer is a Mac II, IIx or IIcx running System 6.0.4 or later, please make sure that the file "32-bit Quickdraw" is present in your System Folder. If you don't have this file, contact your friendly Apple dealer or your local user group.
- Your System Folder must be in pristine state. If 32-bit Quickdraw is present and the problem mentioned above persists, it is quite possible that the file directory of your System Folder is subtly damaged. You can then either reformat your hard disk (the best solution, but perhaps a little too drastic), or create a New Empty Folder on your Hard Disk, and move all the files found in your System Folder to this new folder. The New Folder you created will then become your System Folder. You should then use a superb program named "Tidy it Up!" - written by Guy Fiems. Thanks, Guy :-) - to reorganize the jumble of icons in your new System Folder, and thrash the old System Folder that should now be empty.
- Avoid having several volumes containing a System Folder mounted. i.e., if you have say, two hard disks connected to your Mac, it is preferable that only one contain a System Folder.

I had also received reports about some programs like The Puzzle Gallery 1.11, Fedit+ 1.1 or Flex 3.0 showing "unacceptable" (mis)behavior when used in conjunction with MAZ. I thus analyzed them, expecting to find in their code references to some subtle screen-related data structures I forgot to update when I enlarged the display. What I found instead was that reducing slightly the height of the picture produced by MAZ - to 480 pixels - was often the only method to make MAZ compatible with these programs. I was willing to modify MAZ in whatever way was necessary to accomodate the programs causing problems, if in doing so the functionality of MAZ was not too reduced (as with SAM v2.0). The required modifications to MAZ were thus considered unacceptable. So here are the solutions I propose for these programs:

The Puzzle Gallery 1.11

This program probably won't run well on any screen taller than 480 pixels. I thus suggest the following patch: Using ResEdit, in the CODE ID=2 resource search and replace the Hex string FFF86F00000E with FFF86C00000E. The Puzzle Gallery will then run well on all screens, regardless of their height. If you don't have ResEdit (a free program from Apple), use a program like Fedit (a commercial program marketed by MacMaster Systems) and do a search and replace of the same Hex strings. Please remember to always keep a backup copy of the original program before you do any ResEditing or Fediting on it !

Flex 3.0

The "dissolve" effect of this nice screen saver caused some trouble: It was making some assumptions about the organization of the video memory. After examining the size of the screen, and thus the size of the video memory associated with it, this program then tends to write in memory locations slightly beyond these limits. What was innocuous when the display was only 480 pixels high became fatal when the video memory was used to its maximum to display 512 lines. The program started accessing a reserved memory space, resulting in spectacular crashes. I thus propose the following patch: In the Fcod ID=-4048 resource, replace the Hex string A852206E000E262E000A with 4CEE0018000A42042044. Then skip 40 bytes, and replace the Hex string 1084A853 with 10844E71.

Fedit+ 1.1

On displays that are not exactly 480 pixels high, this program refuses to display a full disk block for editing. This is inconvenient for displays taller than 480 pixels. I propose the following patch: In the CODE ID=5 resource, replace the Hex string 0C4001E06730 with 0C4001E06C30.

And as I'm mentioning patching, I might as well give you this one: If you are chagrined to be unable to activate the "super fast play" mode of the game Crystal Quest 2.2c on your 68030-based Mac, try the following patch: In the CODE ID=1 resource replace the Hex string 0C380002012F6606 with 0C380002012F6D06. This program and patch have nothing to do, even remotely, with MAZ.

On monitors

Monitors are often designed to accept only one kind of video signal as input: the timing and voltages for example must be within a well-defined range for the monitor to be able to correctly display a picture. There are also monitors specifically engineered to accept a wide variety of video signals as input. They are called multi-sync monitors, and are chiefly bought for cheap computers based on a quite widespread architecture using Intel microprocessors and thus aren't in widespread use with Macs.

The AppleColor High-Resolution RGB monitor is designed to accept a 640*480 pixel video signal. When powered on, the synchronization circuitry in the monitor begins to observe the incoming video signal, ready to lock on anything that resembles a 640*480 pixel one. Even though the monitor is not multi-sync, this circuitry has a limited ability to adapt itself to video signals with timing characteristics slightly different from the standard signal. The degree of this adaptability varies between monitors. When monitors with very little adaptability see a MAZ-produced 704*512 pixel signal they usually ignore it, giving a black screen. To overcome this, MAZ tries to augment gently the resolution of the video signal, starting from a 640*480 one. Once the monitor is locked on a 640*480 video signal, it isn't all that difficult to convince it to accept a slightly "faster" video signal leading to a 704-pixel/line display. The important factor here is the 640*480 stage: suppose that the Mac is already up and running, the video card producing a 704*512 pixel signal and you suddenly decide to switch off the monitor. When you switch it on again, it will see a 704*512 pixel signal incoming, and it could very well choose to be picky and say "Hey, this is not for me !" and just give you a black screen. If you are not a confirmed blind typist and mouser, your only option probably would be to restart your Mac, to go again through the 640*480 stage and MAZ startup. As I mentioned above, adaptability differs from monitor to monitor and mine, as well as those of all my friends for example, are very forgiving: you can give them directly a 704*512 video signal without going through the 640*480 stage, and they'll synchronize themselves to it without a hitch. This may be due to the fact that our equipment is usually quite new. I bought my color monitor only recently, when I became tired of the black and white pictures produced by a computer touted for its color capabilities. It seems that having had to wait so long was not without benefits: older Apple monitors seem to be less adaptable and thus more likely to show synchronization difficulties.

I should also add that the expanded picture quality on the Apple Monochrome Monitor is never very good, and you should thus definitely get an Apple High-Resolution RGB Monitor for your Mac II. Believe me, it's worth it.

New Payment Schemes.

I believe that all the aspects of payment about which users had reservations (like security, for example) have been addressed:

US\$ checks, drawn on a US bank, are now welcome. And Credit Cards (VISA and MasterCard only) are also accepted. You'll find below a table presenting the different payment methods available to you.

My mailing address is a Post Office Box. You won't be able to send me your payments or bug reports using Federal Express or TNT or DHL or whatever :-), but on the other hand this scheme allows your letters to be safely buffered during my periods of absence. This is especially useful during the holiday seasons, because mailboxes look, er, a little vulnerable.

Payment modes:	If you live in:			
	Belgium	Europe	U.S.A.	Rest of the World
Eurocheque, in Belgian Francs			PNA	PNA
US\$ check, drawn on a U.S. bank				
ANY other check different from above				
Credit Card, VISA/MC only				
(International) Money Order				
Cash, in your local currency				



Recommended



Good



Less secure, thus less recommended



Impossible or too expensive to cash

PNA

Probably Not Applicable, and certainly too expensive anyway

Version 1.43 release notes.

Version 1.41 should be easier to install on some Macs than v1.4

Version 1.42 is identical to v1.41 except that the "expiration date" feature was removed.

Version 1.43 corrects a small bug in the video card list display of the Control Panel.

Notable new features of version 1.4x are:

- The "noise" lines appearing on some video cards in Monochrome Mode should now be a thing of the past.
- A choice between two expanded screen widths: 704 pixels/line and 672 pixels/line. The narrower width will mostly be useful for the Apple 12" Monochrome Display, as this monitor, unlike the Apple High-Resolution 13" Color Monitor, isn't generally able to display a 704-pixel wide display.
- Support for Macs with multiple video cards.
- A simulated 900-pixel high "Portrait" mode using hardware smooth scrolling.
- Apple Display Card 4.8 and 8.24 support. The Display Card 8.24GC is NOT supported. MaxAppleZoom will refuse to load if the monitor connected to your card is an incompatible -Portrait, Two-Page Display, RS-170A etc. - video device.
- MAZ v1.4x requires 32-bit QuickDraw and will refuse to load if it is not available.

Suppressed features are:

- The Narrow Monochrome Mode option, because there shouldn't be any "noise" lines now.
- The "Expand StartupScreen" option, as it took too much memory and computation time to maintain the integrity of a StartupScreen picture while reshuffling the display memory to expand the screen.
- The "Sync" button has been replaced with a simpler Left/Right button.

The "Portrait" mode

When this mode is activated, MaxAppleZoom uses the video memory present on the Video Card to maintain a 900-pixel high by 640-, 672- or 704-pixel wide virtual display. The card's hardware doesn't support horizontal scrolling, so the width of the virtual display is the same as the width of the screen. The height of the virtual display is a fixed 900 pixels. The screen then acts as a scrolling window over this virtual display. Vertical scrolling is automatic: the screen follows the mouse-controlled cursor.

The major advantage of using video memory to hold the virtual display is that scrolling is extremely fast and smooth, and that little or no system RAM of the Macintosh is used. The major disadvantage is that it limits the maximum number of colors displayable on the screen. This is because a larger number of pixels than usual must be kept in the same amount of video memory, and thus there is less memory available for each pixel. On 8-bit (256-Color) video cards, the maximum pixel depth in Portrait mode will be limited to 4 bits (maximum 16 simultaneously displayable colors). On the Display Card 8.24, the maximum number of colors will be reduced to 256. I consider this sacrifice of the maximum pixel depth available acceptable, since the Portrait mode will probably be useful only in a limited number of occasions. Some word processing tasks, perhaps ?

Automatic scrolling by cursor tracking can be irritating when one wishes the screen to stay put. Quickly pressing twice the "Control" key on the left side of the keyboard will "freeze" the screen at its current position. To re-enable scrolling, press again twice the "Control" key. On multiple monitor systems, the Control key will only operate on the screen containing the cursor, thus allowing you to selectively freeze and un-freeze your screens.

Extended keyboards users should note that the "Control" key on the right side of the keyboard will NOT be recognized to lock or unlock the screen. As for the "Control" key on the left side of the keyboard, I hope that the keycodes generated by the various international versions of the Apple keyboards are all the same, or else we are in trouble. I'm reluctant to buy 20 keyboards only to test a single keycode...

The Control Panel allows you to set the default setting of the Portrait mode (On or Off). You can override and invert this setting at restart by holding down the "P" ("P"ortrait) key. This will temporarily enable Portrait Mode for all the Video Cards present in your Mac for which the default Portrait Mode is "Off" and vice-versa. This feature saves you the trouble of having to go to the Control Panel to change the settings before restarting.

A small problem arises in the following case: Let's suppose that:

- Your card is a 256-color video card
- Your default Portrait Mode is "Off"
- You use Switch-A-Roo and have configured it to toggle between monochrome and 256-color modes.
- You activate the Portrait mode, either with the Control Panel or using the "P" key

If you invoke Switch-a-Roo, it will try to switch to 256-color mode, even though in Portrait mode the maximum depth available is 16 colors. Switch-a-Roo will notice the reduced maximum pixel size, and display its large reconfiguration dialog box. This is quite annoying when all you want to do is quickly change the pixel depth of your screen.

I'd prefer that Bill Steinberg, the author of Switch-A-Roo, modifies its program so that if a pixel size is not available on a video card, the FKEY automatically chooses the nearest pixel size. Meanwhile, one possible workaround is to install two copies of Switch-A-Roo, assigned to different keys e.g. Command-Shift-8 and Command-Shift-9. One copy of Switch-A-Roo will then be configured to toggle between the monochrome and 256-color modes, and the other configured to toggle between the monochrome and 16-color modes.

How do you install two copies of Switch-A-Roo ? If you are familiar with ResEdit, just paste two copies of the FKEY resource contained in Switch-A-Roo to your System file. It is not necessary to copy the other resources contained in Switch-A-Roo. Once you've pasted two copies of this resource, assign them two different IDs e.g. 8 and 9. When you configure Switch-A-Roo, it creates in your System Folder a file named "Roo File" - note the space between the two words - to save its settings. We must patch one of the two FKEY resources to prevent one copy of Switch-A-Roo from overwriting the configuration file created by the other. Open one FKEY resource, and search and replace the string "Roo File" - without the quotes - with a string that has the same length e.g. "Roo2File". Voilà, that's all.

A simpler method than the one outlined above is to duplicate, using the Finder, the FKEY file containing Switch-A-Roo and to use a program like SuitCase (marketed by Fifth Generation Systems) to assign each copy to a different key. It will however be still necessary to use a program like ResEdit or FEdit to replace the string "Roo File" in one of the FKEYs with something like "Roo2File".

Multiple Video Card Support

MaxAppleZoom can now run on Macs containing several video cards. The Control Panel display will present you with a list of all the video cards found in your Mac that are compatible with MaxAppleZoom. You may assign a different setting like the width etc. to each card just by selecting it from this list. The number preceding the video card's name in this list match the numbers appearing on the screens when you click on the "Identify" button in the "Monitors" cdev in the Control Panel, thus enabling you to see which card controls which screen.

When you invoke "Monitors" in the Control Panel, you will see small rectangles representing the different displays connected to your Mac. One of these contains a small menu bar. When you hold down the "Option" key, a tiny happy Mac appears in one of these small rectangles. Drag this tiny happy Mac to the small rectangle containing the menu bar. MAZ v1.41 will work correctly *only* if the tiny Happy Mac and the Menu Bar are in the same screen.

How do you install MaxAppleZoom v1.41 ?

Drag MAZ v1.41 to your System Folder, after removing any older versions of MAZ you might have. Invoke the Control Panel, select MAZ, select a video card from the list of compatible devices, and set the expanded display width to something other than 640 pixels. Close the Control Panel and restart your Mac. On multiple-monitor systems, you must also, after restarting, select the Monitors Control Panel and re-arrange the rectangles representing the screens to match the physical layout of these screens on your desk. That's all. It is also possible that you have an Apple Color Video Card that is not recognized by MAZ v1.41. This is because v1.41 has quite new features, and I had to search and re-analyze all the color video cards sold by Apple since the introduction of the Mac II. I might have missed some of them, because arranging access to all these cards is quite difficult. I think that all the video cards types owned by the registered users of MAZ are supported by v1.41 (judging by the configuration codes on the registration forms). Some Control Panels and System Extensions - i.e. cdevs and INITs - like Timbuktu (by Farallon) or Disk Light (by Peter Norton Computing), CloseView and most foreign-language front-end processors (FEPs) must be loaded *after* MAZ, because they expect the screen size they see when they are loaded to remain unchanged. If you don't use one of these programs, it might be possible to rename MAZ so that it is the last INIT loaded. This is aesthetically more pleasing because MAZ v1.41 erases the StartupScreen picture when it is loaded.

Multiple monitors systems

This section is a very simplified explanation of how the Mac handles multiple video cards. Read it only if you have several monitors and some time to waste. During every restart, the Mac scans its expansion slots for video cards. It then builds an "active" video devices list containing, among other information, the size of each display. The Mac also keeps in its System file on your hard disk the size of all the displays connected to the Mac, as well as their layout i.e. their position relative to each other. This information can be slightly outdated, because you might add or remove cards while the computer is powered off, and a powered off Mac cannot modify its System file. The "active" configuration, on the other hand, always reflect the true number of video cards in your Mac. After the "active" video devices list has been built, it is compared with the information contained in the System file. If the System information is determined to be still valid - the usual case, because you don't add or remove video cards between every restart of your Mac -, the information describing the layout of the displays is read from the System file and used to rearrange the "view" of the displays the Mac has so that it matches the physical layout of the displays on your desk. Thus, to summarize, the "size" information comes from the video cards, and the "layout" information comes from the System file. The comparison of the "active" video list and the System file information to validate the latter is quite extensive, and involves much more than the size of the displays. The Mac can also detect that an Apple 640*480 8-bit video card has been replaced with, say, an Acme Widget 640*480 8-bit board even though their display sizes are identical.

If the System file information is considered invalid, where does the Mac get the "layout" information for the video cards ? Well, to begin with, if you have only one video card, there is obviously no need for any layout information. If you have several video cards, the Mac will simply arrange the displays in a row, the video card in the leftmost slot (when the Mac is facing you) being assigned the leftmost display in the row and so on. This simplified row layout might not match the actual layout of the monitors on your desk.

So, we've seen that an outdated System file information will cause all the displays to be aligned in a row, ignoring any layout information previously given and thus ignoring the true layout of the monitors on your desk. How can we update the System file information to avoid this from happening ? Well, one of the roles of the "Monitors" cdev is just that: get the layout information from the user and write it to the System file. I'll also add that using "Monitors" is the only way this System file information is updated. So, if you never use "Monitors" after you change your video cards, your System file information will probably remain invalid forever.

The algorithm outlined above - Get the screen sizes from the "active" devices list; if the System file information is still valid read the "layout" information from this file else create a simplified layout by rearranging all the screens in a row starting from the leftmost video card - is used not only by the Operating System during restart, but also by the "Monitors" cdev when you first invoke it after a restart. "Monitors" shows you the small rectangles representing the displays with the sizes and layout determined by the above algorithm. After its first invocation, "Monitors" will use a different algorithm to arrange the small rectangles: it will simply duplicate the size and layout information of the "active" devices list.

You might say "Well, why should I care about this stuff ? I have two Apple video cards and have used the Monitors cdev to arrange the display layout a few months ago. I don't spend my time swapping video boards, so my System file information is certainly valid and I'll never have any layout mismatches !"

The answer is that your System file information was valid only until you put a piece of software named MaxAppleZoom in your System Folder. Let's suppose you have configured MAZ to give you two 704*512 displays. When you invoke the "Monitors" cdev, it will compare the "active" devices list - describing two 704*512 displays - with the information stored in the System file - describing two 640*480 displays -. "Monitors" will thus consider the System file information invalid and build a simplified layout by rearranging the displays in a row. This rearrangement might not match the left to right arrangement of your monitors on your desk. The "Identify" button can be used to see if the layout proposed by "Monitors" is acceptable. When you close the Control Panel "Monitors" will write the new and perhaps incorrect simplified row layout in the System file and this information will subsequently be used by the Mac at every restart.

So, to summarize, after you install MAZ in a multiple-monitor Mac and restart, use the "Monitors" cdev to check the display layout and perhaps correct it. This will also replace the old 640*480 descriptors in the System file with the new 704*512 descriptors built by MAZ when you close the Control Panel.

And to conclude...

Version 1.41 is mainly intended to show to registered users that I do listen to their suggestions. Even though it may look like a simple piece of software, its technical aspects took nearly all my free time during the previous 9 months. I wouldn't have released MAZ if I knew beforehand that it would be so difficult, expensive and time-consuming to maintain. I considered it my duty to release an updated version for the registered users, but the fact is that the resources devoted to it are becoming hard to justify, and I'll have no time during the next few months for shareware-related activities.

I'll conclude with answers to some often asked questions.

Q- When will the internal video of the Mac IIci, IIsi and LC be supported ?

A- The answer is "probably never". Choose one from the following list of plausible excuses:

- After innumerable hours of study, it has been determined that the internal video circuitry hasn't the flexibility needed to support stretched displays.
- The market (or the expected return) is too limited.
- Too expensive to develop.
- Other technical reasons, like the difficulty to support it in the future.

Seriously though, I wish some other person than me would develop a MAZ equivalent for these Macs. Somebody at Radius, perhaps ? Developing the Soft Pivot should have given them a lot of experience with the internal video of the IIci and IIsi's..

If we get a slightly technical, one annoying problem is that the IIci and IIsi use the system RAM to hold the frame buffer and use their MMU to conceal this fact. If the display is to be stretched, the virtual address translation tree must be modified. This is quite easy if the Mac isn't running a virtual memory operating system (System 6 with Virtual, Maxima etc. from Connectix or A/UX or System 7/VM). With VM environments, as the virtual address space is already created when the INITs are executed, it is difficult to reallocate the page frames contiguous to the normal frame buffer to hold an expanded frame buffer. To do this would require some method to tell the virtual memory manager to unload the pages held in these page frames, make these page frames unavailable for normal paging, and insert these low memory page frames in the proper place in the virtual address range of the frame buffer seen by QuickDraw. If the operating system offers no support for application requests to make *physical* address ranges uneligible for paging, the page management tables have to be found and be modified directly, assuming these tables can be found and the semantics of the bits in them can be determined. This is unlikely. Another problem is that with Connectix VM products, the address translation tree seems to be stored outside the address space seen by the Mac running in pseudo-supervisor mode. It looks like Connectix implements a simplified virtual machine, and I don't see how it would be possible to modify the address translation tree to increase the memory allocated to the frame buffer.

Q- And what about the compact Macs ? (Plus, SE/30, Classic etc)

A- I'm afraid their video circuitry is too simplified to support something like MAZ.

Q- Don't you support A/UX environments ?

A- No. It's a regrettable fact that it costs several thousand dollars to upgrade an old Mac merely to run a reliable operating system... :(As I'm not really willing to write an UNIX-compatible video card driver, a replacement PROM for the video cards might be a solution. Unfortunately I absolutely don't have the time to develop PROMs and there might be some legal problems if I distribute a chip whose contents are not different enough from Apple's.

Q- Why is it necessary to restart the Mac when you want to change the display's size ? A Dynamic Desktop Size like the Radius Pivot would render, say, the simulated Portrait mode of MAZ far more useful.

A- Well, you're absolutely right, but a dynamically sized desktop is very difficult to develop. Radius has more resources and staff than I do. They are also working full-time on these kind of things, and presumably they have more information about the inner working of various software packages than I have. I would also like to point out that a copy of MaxAppleZoom is less expensive than a Radius Pivot :-)

Q- Why is the expanded display height of a Display Card 8.24 smaller than the one obtainable with a Display Card 4.8 ?

A- The Display Card 8.24 has about 1Mbyte of memory available. In 24-bit pixel mode, displaying 495 lines of 704 pixels consumes 99.7% of this memory . I wanted the display heights in all pixel depths to be the same, so this reduced limit has been chosen. I had the opportunity to tinker with the MMU of a 68030-based Mac, creating 256-byte pages and creating a virtually addressed frame buffer large enough to hold a 704*500+ screen in 24-bit mode. Most of the virtual frame buffer was mapped to the physical VRAM of the 8.24, and the scan lines which could not be kept in VRAM were overflowed to the system RAM. The virtual address space seen by QuickDraw was contiguous, and scrolling the 495-line physical display over the 500+ virtual display was done by combining block copy in the VRAM and page swapping at the MMU level. This scheme was too slow to be bearable and thus was not included in the release version. We should also note that the MMU is not always available for application program use, and 256-byte pages and 4-level translation trees are not guaranteed to be available on future Motorola CPUs.

MaxAppleZoom v1.43 registration form.

Please complete this form and airmail it to:

NAOTO HORII
B.P. 1415
B-1000 BRUSSELS
BELGIUM

Date:

Your name:

Your Postal Address:

E-Mail:

Method of Payment:

Check / Credit Card / Postal Money Order / Cash / Other:

Amount (US\$25 - or equivalent in your local currency - suggested) :

Credit Card information: VISA ___ MasterCard ___

Account #: _____ Expiry Date: _____

Name as it appears on card:

Signature:

Where did you get MAZ v1.43 ?

Your Mac is a: (e.g. II, IIx)

Version of System: (e.g. 6.0.7, 7.0)

Please write here your video card's configuration code (lower right corner of MAZ's Control Panel display) :

Have you any bugs to report or suggestions ?