

GettingStarted

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Contents

1	GettingStarted	1
1.1	GettingStarted.guide	1
1.2	What's on the CD-ROM	2
1.3	Starting Exploring	2
1.4	Getting help	3
1.5	Installation	4
1.6	Changing resolutions	5
1.7	Multiple windows and requesters	6
1.8	Cool feature: Show location	6
1.9	New for 2.0	7
1.10	Bonus Fractals	8
1.11	Bonus Commands	8
1.12	Conclusion	8
1.13	Credits	9
1.14	Contact Information	10

Chapter 1

GettingStarted

1.1 GettingStarted.guide

Mand2000 CD-ROM Startup Guide:

Thank you for purchasing the Mand2000 CD-ROM. We hope you enjoy using it to explore the amazing world of fractals.

Although the Mand2000 CD-ROM does not come with a printed manual, that does not mean that Mand2000 comes without documentation. Quite the opposite. Mand2000 comes with almost a hundred pages of documentation, covering every aspect of the program. However, because this documentation is in electronic form, rather than in a printed manual, it can be a bit tricky to find at first. That's what this startup guide is for. If you read through this startup guide you'll end up with a good understanding of how some of the important and unique features of Mand2000 work, and you'll know where to find the documentation on all of the other features.

If you are already familiar with how Mand2000 works, perhaps from using a previous version, you should still read this manual - particularly the 'New for 2.0' section at the end.

What's on the CD-ROM

Starting Exploring

Getting Help

Installation

Changing resolutions

Multiple windows and requesters

Cool feature: Show location

New for 2.0

Bonus Fractals

Bonus Commands

Conclusion

Credits

Contact Information

1.2 What's on the CD-ROM

As well as containing the full release version of Mand2000, the best fractal exploration program on the Amiga, or any other computer, this CD-ROM also contains over 30,000 frames of animation and thousands of individual images. These images can be used as is, royalty free, or can be used as starting points or inspirations for future exploring.

The CD-ROM is organized into categories of effects that you can create with Mand2000. There's a drawer for Zoom animations, one for Julia Seed animations, one for pictures, etc. In each drawer there is a text file explaining how you can create additional animations of this type, and there are also some more drawers, with names like NTSCHAM, NTSC256, etc.

In an attempt to please all of the people all of the time, all of the images and animations have been rendered out in a number of different resolutions. This means that all of them can be viewed to best effect on all systems. Those with non-AGA machines can view the NTSCHAM or PALHAM versions. Those with third-party graphics boards can view the NTSC256 or HIRESNTSC versions. And those with AGA Amigas can view whichever ones they feel like.

Calculating the images for this CD kept an Amiga 4000 busy for quite some time. Something well over ten trillion floating point calculations were required to calculate the images on this disk. Much more would have been required, if it weren't for Mand2000's ability to reuse iteration data for multiple pictures and animations in some situations.

For more information on how this CD-ROM was created, check out the "TheMakingOf" directory, which contains many of the ARexx scripts and source images used.

1.3 Starting Exploring

The first thing you probably want to do with Mand2000 is start exploring fractals. You may have figured out how to do this already, but you should read this section anyway, because not all of the methods are obvious.

The simplest way to get started is to place the mouse over an interesting area, one with a lot of detail, and then double click the left

mouse button. The picture will zoom out - animated - placing the area that was under the mouse in the centre of the window. Pretty cool! Each time you double click the magnification doubles.

Other easy ways to move around include:

- Click and drag with the mouse - the picture follows.
- Scroll with the arrow keys - press shift or alt to scroll faster.
- Scroll with the numeric key pad - press shift or alt to scroll faster.
- Press 'I' to zoom in, or 'D' to zoom out.
- Select the 'Box zoom' menu and then draw a box around the area you want to magnify.
- Select the 'Set location' menu and type in coordinates.
- Select a location from the 'Good spots' menu.
- Select the 'Open' menu and load one of the sample pictures from the PICS directory.

As you can see there are lot of ways to move around. That's because that's what fractal exploration is all about - zooming in, scrolling around, hunting for that perfect spot, and enjoying the magical complexity of fractals.

1.4 Getting help

As mentioned earlier, Mand2000 comes with a lot of documentation. Some of this is available through the 'Help and info' command in the 'Project' menu. Select this and you'll be presented with some buttons, offering you options as to what you would like help on. The help available through this menu item is excellent for giving you an overview of what Mand2000 is and how to best use it.

Whereas the 'Help and info' help gives you an overview of a range of Mand2000 topics, the context sensitive help gives you information on a specific menu item. To use the context sensitive help, run Mand2000 and use the mouse to highlight one of the menu items - it doesn't matter which one. While the menu item is highlighted, press the help key. Mand2000 will search through the file Mand2000.help - which should be in the same drawer as Mand2000 - and find the section that describes how that particular menu item works. What could be simpler? Make lots of use of this feature. With it you can interactively explore all of Mand2000's menus. And remember, while the help is up, you can continue to use Mand2000. This means that you can read about how a menu item works while you use it. Every single menu item has help on it, sometimes several pages worth. We strongly urge you to make use of this help - it makes Mand2000 much easier to use.

But wait, there's even more documentation. For those interested in

extending Mand2000's abilities, a few simple ARexx scripts can do wonders. Full documentation on Mand2000's powerful ARexx scripting abilities is contained in 'ARexx.guide' in the documentation directory. This documentation is in MultiView/AmigaGuide format for ease of use.

For the truly technically minded, those interested in writing support programs for Mand2000, there is documentation of Mand2000's custom IFF chunks in the file Mand2000Tech.doc in the documentation directory. Mand2000's files are fully IFF compatible and can be loaded by hundreds of programs that support loading IFF images. However Mand2000's files also contain some custom chunks of data for storing such things as the location, fractal type, and optional iteration data.

Finally, there is one last hidden treasure trove of documentation, missed by all but the most astute. All of the ARexx scripts in the ARexx directory are extensively documented - they are typically at least 75% comments. If you are at all interested in ARexx programming, or if you have used one of these ARexx scripts and you wish it behaved just a little bit differently, load some of these into your favourite text editor (we recommend CygnusEd). In many cases changes can be made with only a slight understanding of ARexx programming.

1.5 Installation

Installing Mand2000 is quite easy, which is why this section appears so late in this document. You don't have to copy any of the programs off of the CD-ROM, but if you do so you will get faster more convenient access. To do this, make a drawer on your hard drive, or on the floppy disk you will be using, and copy the following files:

- Mand2000 - the actual program.
- TweenPlayer - for playing zoom movies.
- Mand2000.help - the help file - must be in the same directory as Mand2000.

That's all the files you need to copy. Mand2000 doesn't require any special libraries other than those that come with your 2.04 or higher system. No special configuration of your Amiga is necessary. When Mand2000 is run it automatically senses which processor you have (68000, 68010, 68020, 68030, 68040 or higher, plus 68881 or 68882) and uses the fastest calculation routines available for that processor. It also senses what screen modes, such as AGA or ECS, your Amiga supports.

Although it isn't necessary, it is STRONGLY RECOMMENDED that you also install the ARexx scripts, even if you have zero knowledge of how to program in ARexx. Installing the ARexx scripts means that suddenly, with almost no effort on your part, you get at least eight new menu commands. These commands let you produce spectacular animations, let you put Mand2000 in an eye catching demo mode, and more. To install these ARexx scripts and reap all these benefits just click on the 'InstallRexx' icon. This will execute a script which will copy all of the Mand2000 ARexx scripts to your 'Rexx:' drawer, and will copy an ADPro script to your 'ADPro:commands2' drawer. ADPro - Art Department Professional - is a commercial product

available from ASDG Inc. If you don't have ADPro then the ADPro script will not get installed - just cancel the requester asking for the 'ADPro:' disk.

ARexx is supplied with every copy of AmigaDos 2.04 and higher. However Commodore delivers their computers with ARexx disabled to save a few kilobytes of memory. To enable ARexx, locate the 'RexxMast' icon on your workbench disk. On some systems it is in the system drawer, but on other systems it may be elsewhere. When you locate it, double click on it. A window will appear briefly. ARexx is now running. After installing the scripts and running RexxMast, run Mand2000. In the 'User' menu (the rightmost menu) you should notice a new set of menus. These menus actually correspond to ARexx scripts, but you can use them as if they were part of the program. To have ARexx automatically run each time you restart your Amiga, drag the RexxMast icon into the WBStartup drawer on your workbench disk.

The Mand2000 CD-ROM was designed to be viewed either from the CLI, from any image viewer, or from the workbench. If you will be exploring it from the workbench, you may be interested in how the icons have been setup.

All of the images on this CDrom have a default tool type of Mand2000CD:Mand2000, so if you double click on an image, it loads into Mand2000.

The zoom movies are stored as Mand2000 Tween movies and have a default tool type of Mand2000CD:TweenPlayer, so if you double click on one of these movies, they load and play.

All of the animations have a default tool type of 'AnimPlayer'. Everybody uses a different anim player, I didn't want to force my own preferences on anyone, so just copy your favourite anim player to C:AnimPlayer and then you can double click to play animations.

1.6 Changing resolutions

One question that Mand2000 users consistently ask is 'how do you change the screen resolution?' If you look under the 'Setup' menu you will find a 'Set screen' menu item. This will bring up the standard screen mode requester, as supplied by Commodore. With this requester you can select any screen mode allowed on your machine, up to 256 colours (hardware permitting). Many graphics board vendors make their boards show up in this list, allowing you to run Mand2000 on the Picasso II, Piccolo, Retina, EGS Spectrum, and many other boards.

One feature of the screen mode requester that many people miss is that the Width and Height fields are editable. This means that a lo-res screen is not forever doomed to being 320 by 200. If you have enough chip memory on your Amiga, you can have a lo-res screen that is 4000 by 3500! In fact, the Amiga deals with overscan screens like this extremely well. Whenever the mouse reaches the edge of the screen, the screen smoothly scrolls away.

If you need to create images that are truly high resolution, perhaps 10000 by 10000, 256 colours, Mand2000 can help you. You can use

the 'Calculate Panels' menu item - in the user menu, see the install section - to calculate an image as a grid of panels. Then you can use the 'LoadPanels' script, in the user commands list of ADPro (Art Department Professional) to load these panels in as a single image, for printing.

1.7 Multiple windows and requesters

Mand2000 is a multiple project program. You can have a dozen different fractal windows open all at the same time. Just select 'New Mandelbrot' or 'New Julia' to create new windows. They all calculate their fractals simultaneously.

Mand2000 is very much a requester based program. Instead of setting the maximum iterations by selecting an item out of a list in the menus, a requester comes up with a slider that you can set to any value you want. You can leave this requester, and other requesters, up as long as you want. Mand2000 happily continues calculating with dozens of requesters open. Because you can have several different 'Set maximum iterations' requester open at one time, Mand2000 puts the name of the window that the requester is attached to at the top of the requester.

As an example of the careful interplay between the requesters and the main windows, select 'Set location' from the 'Zoom' menu. This displays, and allows you to edit, the coordinates of the location being displayed. If you type in a new location, the change will be recalculated immediately. Also, if you zoom or scroll the window whose coordinates are being displayed (try clicking and dragging for the best effect) the coordinates update in real time. Pretty darn cool!

1.8 Cool feature: Show location

One of the many innovative features that are exclusive to Mand2000 is 'Show location'. This is easier to demonstrate than to explain. Run a copy of Mand2000 and zoom in a couple of times by double clicking. Now go to the 'Project' menu and select 'Show location'. A new window will open up with a zoomed all the way out Mandelbrot set. This window will have a small grey box somewhere on it. You should notice that this grey box marks the area being displayed by the other fractal window. If you activate the first fractal window and zoom in, or scroll, you should notice the grey box moving around to keep up. Now that's really cool!

It's not just cool though, it's also very useful. Sometimes when you're exploring around you end up zoomed in a few million times. Or, sometimes you actually zoom in pretty far. When you've zoomed in that far (it doesn't take long) it can be tough to figure out where you came from. With the 'Show location' requester you can easily retrace your steps, by zooming the new window in towards the grey box.

When you select 'Show location' a requester also comes up. This requester is a little bit confusing at first because, for space reasons, it's pretty plain. Recessed at the top is the name of the window this requester is attached to. This is the window that the grey box will appear

in. Below that is a list of all of the other windows, plus all of the locations from the 'Good spots' menu. Whichever one of those is selected is the one whose location is being displayed with the grey box. Play around with it. Use it to find out where some of the sample pictures are (just load them in and then select 'Show location'). It's a valuable tool.

1.9 New for 2.0

One of the most requested features for Mand2000 has been 24-bit fractals. We are proud to announce that, despite a lack of OS support for 24-bit colour, Cygnus Software has come through. Mand2000 2.0 will happily display fractals in thousands of colours, making use of either HAM, HAM8 or dithered 256 colour. This means that ALL Amigas, from old Amiga 1000s hooked up to TVs to new Amigas with third party graphics boards, can display fractals with no restrictions on the colours.

To use the 'True Colour' rendering, go to Mand2000's 'Setup' menu and select the appropriate 'Rendering Mode' from the new menu. If you have a third party graphics board select 'Dithered True Colour', otherwise select 'HAM True Colour'. In the dithered mode Mand2000 will use an ordered dither to simulate 16 million colours in screen modes with 16, 32, 64, 128 or 256 colour. In HAM mode Mand2000 will use either HAM or HAM8 to display 4096 or 262,144 colours. Either way, use the 'Set screen' requester to choose precisely what mode you would like to run in. If you are using HAM rendering, go to the 'Set misc' requester and make sure that 'Minimize Hammies' is turned on. Otherwise 'hammies' - the horizontal stripes of colour that plague HAM mode - will stretch out to the right of windows and menus.

One immediate change when you go into one of the true colour modes is that the 'Set colours' requester now displays a palette of 256 colours - even if you're running on an Amiga that can't display 256 colours. If you're used to displaying fractals in 32 colours then you can spend a lot of time just exploring the new possibilities that an extra 224 colours bring. The next thing to try is loading several fractals in, each into a separate window. You will find that, contrary to expectations, each window can have its own palette! Wow! The third cool thing to try is loading in some other images. Perhaps you have some IFF24s lying around. Load a few of them into Mand2000 and you'll find that it now makes a rather handy IFF file viewer - multi-window at that.

But, the thing people really want is to be able to have more than 256 colours in a single fractal. Well, you can certainly do that. A fine example of using thousands of colours in a single picture is the file 'Crescents - Tough calc' in the pictures directory on the demo disk. As the name suggests, this picture will take a long time to calculate - mostly because it takes an average of 10,000 iterations per pixel! This picture has been carefully setup to use approximately 30,000 colours! If you look at the palette for this picture you will notice that adjacent colours are quite different - in fact for most of the palette it alternates between black and a series of pastels. This peculiar palette is turned into a beautifully smooth palette by using the 'Colour mapping' requester. If you are using the 'Repeated' mapping type then the 'Skip' count says how many times each colour should be repeated before going on to the next colour. In Mand2000 1.0 the colours were repeated that number of times. For 2.0

however, a smooth 24-bit spread is done. We feel that this method of selecting the palette gives you lots of control over the final palette, without burdening you with having to individually specify over 30,000 different colours!

Also new for 2.0 is the ability to create animations directly in Mand2000. Instead of saving out frames which must later be assembled into an animation, Mand2000 creates .anim files (in Anim5 format) directly from its iteration movie ARexx script, its Julia movie ARexx script, and from its morph movie requester.

Be sure to experiment with Mand2000's ability to open on public screens. This means that you can open Mand2000 on CygnusEd's screen, or you can open CygnusEd on Mand2000's screen! We're not sure what this is useful for, but it must be useful somehow!

Finally, as a cool but silly bonus, Mand2000 2.0 comes with a 'Demo mode' ARexx script (selectable from the menus) which turns Mand2000 into an eye-popping screen saver. Try it, you'll like it!

1.10 Bonus Fractals

Although Mand2000's menus only list two types of fractals - the Mandelbrot set and the Julia set - if you have a floating point unit on your Amiga there are actually six fractals available! These additional fractals are hidden in the 'Set location' requester. When you select 'Set location' a cycle gadget labelled 'Fractal type' will appear and let you choose Mandelbrot, Mand cubed or Mand fourth. These are higher power variations on the regular Mandelbrot set, with their own distinct style. Each of these has a Julia variation also. The Julia variation of Mand fourth can be reached by selecting 'New Julia' and then using 'Set location' to set the fractal type or by selecting 'New Julia' when a Mand fourth window is open.

1.11 Bonus Commands

This is just a reminder that there are over half a dozen extremely powerful commands which should appear in the 'User' menu. If they don't, read the installation section for instructions on how to make them appear. Although these commands are put there by ARexx scripts, absolutely no ARexx programming is required to install and use them. Highly recommended, especially for the iteration movies.

1.12 Conclusion

We hope that this short guide helps you to learn how to make best use of Mand2000's many features. Remember to read through all of the context sensitive help and all of the help available with the 'Help and info' command. This should get you off to an excellent start in making full use of the fun and power which is Mand2000.

If you have problems getting Mand2000 to work properly, be sure to read through the online help regarding the problem area. If you are still unable to solve your problem, feel free to contact us. E-mail is the preferred method of getting tech support, as we are not always available to answer the phone. However feel free to call or write for assistance. We're always happy to hear suggestions, bug reports (there aren't any bugs!) and questions. Dealer enquiries are welcome. If you write any great ARexx scripts, why not send them to us for inclusion in future versions of Mand2000?

Mand2000 is the result of several years of development and many years of training. Although we don't expect to get rich from our labours, we do need your support to help pay the bills and keep us programming. Please support software development on the Amiga by paying for the software you use, and by not giving out copies of the release version of Mand2000. It is illegal to pirate, and not very nice either. The contents of the "Demo Version" directory may be freely distributed on a not for profit basis. Contact us if you would like to put the Mand2000 demo on a cover disk or other for profit distribution.

Have fun exploring fractals with Mand2000.

1.13 Credits

Many people contributed to the creation of the Mand2000 CD-ROM. Some of them don't even realize that they helped, which makes it especially important to recognize them here.

Bill Hawes, author of ARexx, made it possible for me to write scripts that would keep my Amiga 4000 running twenty four hours a day for weeks at a time, computing the tens of thousands of frames required to make this CD-ROM. Thanks Bill.

Colin Fox and Mike Cruse gave me a place to stay and a place to work, respectively, in the early days of creating Mand2000.

My wife, Helen, who put up with me while creating Mand2000, and again while creating this CD-ROM. She also wrote much of the online help, and contributed to the design of the program.

Thomas Ansorge, whom I have only ever met through e-mail, has contributed many ideas to Mand2000, some palettes, and the pictures "Deep_in_Three_Arms_Spiral" and "Sea-Horses_Spiral".

Donald Wright contributed the following pictures:

- Chiroptera
- Crest
- Deuce
- Evileye
- Jewel
- Kudzu
- Leaves
- Leech

Lifeforce
Tetrad
Zeta

D. L. Richardson, who sells computer videos, including a great one on fractals starring Mand2000, contributed some stunning images which really stretch your idea of the sorts of images that can be found in the Mandelbrot set. His images tend to have brilliantly chosen palettes, and tend to be zoomed in sufficiently far that most other fractal programs wouldn't even be able to display them! Here are his contributions:

4-Eyes
CrownJewels
Fiesta
FishHook
FriedEggs
Kaleidoscope
PaintSpill
Peacock
Springtime
Tornados
Twister
Butterfly
Carosel
Earthquake
Fingers
Garden
Siamese-Flower
Spiffy
Zoom

Bruce Dawson, Cygnus Software

1.14 Contact Information

Mand2000 was written by Cygnus Software. Please contact us at the address below with any technical support, questions, suggestions and fantastic pictures you've found.

Cygnus Software also publishes a version of Mand2000 that comes on two floppy disks. The floppy version contains all the same software, but has somewhat fewer sample images and animations. To order, send a cheque, money order or cash to Cygnus Software at the address below. The floppy disk version of Mand2000 costs \$44.95, shipping included. If you wish to pay by credit card, please contact Micro R&D.

Also by Cygnus Software:

Cygnus Software's other major product is CygnusEd. CygnusEd is a high performance text editor, featuring what is probably still the fastest scrolling and text rendering of any editor on the Amiga today. Add to that such invaluable features as unlimited undo, macros attached to any key, full ARexx support and much more. Version 3.5 of CygnusEd was extensively

updated to take advantage of the features that AmigaDos 2.0 has to offer. 3-D gadgets, public screens, the standard file, font and screen requesters, and the full AGA screen resolutions. Meanwhile CygnusEd still maintains full compatibility with version 1.3 of the operating system, bringing the 3-D gadgetry to 1.3. CygnusEd 3.5's macro and configuration files and ARexx scripts are almost 100% compatible with earlier versions of CygnusEd. CygnusEd is no longer published by Elastic Reality, Inc., and is now available directly from Cygnus Software with an online manual for the discounted price of just \$49.95, shipping included.

The Mand2000 CD-ROM is published by Micro R&D. Contact them, or your local Amiga dealer, to purchase additional copies.

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