Amiga Clouds

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Chapter 1

Amiga Clouds

1.1 Amiga Clouds by Krzysztof Kobus

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                                    Clouds 1.01


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1.2 Disclaimer

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  Disclaimer
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No responsibility or liability will be accepted for any damage that may
appear to have resulted from use of this program. All use is at your own
risk. The software is provided "as is" without any warranty implied or
otherwise to the fitness or accuracy of the software and documentation.
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without notice.

1.3 The Program

                                                          The Program

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1.4 Overview

   1. Overview

Clouds is the first program on Amiga platform, giving you visual
modeling and realistic animation of turbulent motion of clouds. It is
based on spectral synthesis method. The method employs a variety of
intuitive parameters describing natural properties of clouds phenomena, as
cloudiness, contrast, wind direction, strength of wind and turbulent
changes. Such wide range of controls allows a creative animator to
generate all kinds of clouds, gases, mists and so forth. Resulting images
can then be used as backgrounds, textures in 3-D programs or alpha channel
information - to mention just a few possibilities. The program has
standardized user interface and is fully controlled via ARexx. Clouds is
Kickstart 1.3/2.0/3.0/3.1 compatible although its all possibilities can be
achieved only under 2.0+. Additionally, program takes advantage of AGA
chipset.

1.5 Getting Started

             2. Getting started

   2.1 Size of the image.

Spectral synthesis, which the entire idea is based on, requires Fourier
Transformation calculations to be made. In order not to calculate single
frame by several hours, Fast Fourier Transform (FFT) has been implemented
in the program, what apart from major speed up, gave rise to some
restrictions concerning picture size. With FFT, only square regions can be
calculated and then their width must be equal to natural power of two (16,
32, 64, 128, 256, 512, 1024 in this case).

To get rid of this limitation Clouds is equipped with Goraud scaling
engine, and is able to produce smooth images of any size supported by IFF
picture format. Yet, it shouldn't be forgotten that original picture is

always a square, which side's length is equal to FFT parameter, thus this
is the parameter of the highest importance for detail's level of the final
picture. Its value can be changed by pressing cycle gadget with FFT on it,
located in the bottom part of the main screen. Size of the output picture
can be defined by typing needed values in "Width" and "Height" gadgets.

In the further part of this manual the original picture will be referred
to as "texture", and the final picture, defined by "Height" and "Width"
simply as "the picture" or "the image".

   2.2 The "Control" parameter.

The state of "Control" gadget determines what happens to calculated
images. Actually there are three possibilities:

  – Only Save   : Pictures go only to the disk.
  – Only Display : Pictures are displayed on the screen which opens
                   especially for this purpose.
  – Display&Save : This is the combination of above two.

   2.3 Opening the project.

When image and texture size have been set and gadget "Control" is in
required position, one can attempt to open the project. It should be
stated here that as "the project" we mean not only animation, but single
pictures as well. To accomplish this please select "Project/Open project"
from the menu.   What happens now depends mostly on text that reads on
the "Control" gadget:

  – Only Save. The file requester appears asking you to specify path and
root filename for storing image data. This means that should select volume
and drawer where you want images to be written and then type the name that
is "base name" and which will be appended with frame number (according to

                Config/Save format
                option) when saved. Quickly after that, program
starts to allocate memory required for calculations. In case of failure,
message "Sorry, not enough memory..." appears. If so, you should decrease
parameter FFT, as its value is strongly related to amount of used memory
(the higher value the more RAM you need) and then try again to select

                Project/Open project
                  – Only Display. Programs immediately starts to allocate needed ↩
                    memory,
and short after that tries to open screen for graphical visualization of
the calculations (this means you will see the clouds on it). If any
problems occur, message "Cannot open graphics environment..." is displayed
on the screen. Usually, this happens as the result of insufficient memory.

  – Display&Save. Actions taken will be combination of above two.

If everything went right gadget "Calculate" becomes unghosted and
"Control", "FFT", "Width", "Height" and "Quit" gadgets – ghosted (i.e. you
can't change them).

1.6 **Parameters**

3. Parameters

Having the project successfully opened one can proceed with settings
describing directly cloud's appearance and controlling animation system.

  3.1 Spatial structure parameters.

   3.1.1 Seed.
         This is the start value for random number generator. By changing
         this value you can obtain different shapes of basic cloud's
         structure.

   3.1.2 Roughness.
         As the name indicates describes roughness level of clouds.
         The smaller values the stronger level of roughness and vice versa.

   3.1.3 Granularity.
         By increasing this parameter, "water-color" effect can be
         achieved and clouds appear to be some more "delicate".

  3.2 Turbulence parameters.

   3.2.1 Globality.
         Observations conducted in the past show that during real motion
         of clouds (and other gases) turbulent changes happen in the very
         first row to smallest eddies. All in all it wasn't so hard to
         notice that on cloudy and windy day, when clouds move across the
         sky, large structures are nearly unmodified and these are small
         ones that undergo changes. The "Globality" parameter is expressed
         in percents and specifies how big structures are to be modified
         in turbulent way (e.g. 5 percent means only very small ones, 100
         percent – all of the structures).

   3.2.2 Strength.
         Determines speed of turbulent changes measured in pixels of
         texture per frame.

   3.2.3 Abruptness.
         Small values of this parameter additionally strengthen movement of
         large structures. Big ones – decrease.

  3.3 Wind parameters.

   3.3.1 Velocity.
         Defines speed of translative changes. It is measured in pixels
         per frame and this value corresponds to the texture, not to the
         image defined by "Width", and "Height" parameters. For example
         if you specify "FFT" equal to 128, Width = 256, Height = 256 and
         Velocity equal to 1.00, then resulting speed on the image,
         measured in pixels per frame will be equal to 2.00.

   3.3.2 Direction.
         This parameter indicates direction of translative motion. It is
         measured in degrees. This parameter also corresponds to texture.

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   3.4 Cloud parameters.

   3.4.1 Density.
        Specifies white to blue ratio. The higher value - the more white
        color in the image.

   3.4.2 Contrast.
        As the name indicates - specifies contrast of the resulting image.
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1.7 Calculating

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   4. Calculating
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Just before you start producing your images, number of frames to be
generated should be specified in the "Frames" gadget. It not necessarily
means that your finished animation will be of that length, because if you
want to change some cloud's properties in time, you should set this field
to some small value, calculate, then modify required properties (as density
or speed) and calculate again, possibly changing "frames" to new value.
This will result in length of your animation being a sum of specified frame
values. To easily achieve interesting results we advise you to use ARexx,
which greatly simplifies the process.

Depressing "Calculate" gadget starts the calculation procedure. The
first frame may take longer to compute as some precalculations have to be
made.

1.8 Menus

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   5. Menus

   5.1 Project

   5.1.1 Open Project.
        Opens project, possibly asking you for path/filename and/or
        opening the screen for graphics output.

   5.1.2 Close Project.
        Closes project, frees memory and closes rendering screen if it
        was present.

   5.1.3 About.
        Displays some information about Clouds' author and
        ARexx's port name.

   5.1.4 Quit.
        Ends session with Clouds.


   5.2 Config
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5.2.1 Display colors.
       This allows you choose how many colors will be present in images
       rendered by Clouds. The option allows for 16 or 256 color
       screen. The 256-colors rendering is only available on AGA machines.

5.2.2 Save colors.
       This options selects how many colors will be present in frames
       saved to disk. This time the 256-colors are accessible for all
       Amigas, moreover - it is recommended.

5.2.3 Save format.
       Specifies format of filenames used for saving frames.

5.2.4 Priority.
       Specifies program's task priority while calculating.

5.2.5 Screen mode.
       This option is available only under System 2.1+. It allows you
       specify display screen's mode.

5.2.6 Load config.
       Can be used to load configuration files other than
       "clouds.config", which is loaded automatically. File requester
       which will appear should be used to select file previously saved
       with the "Save config" option.

5.2.7 Save config.
       Saves actual settings of config menu, and state of all
       other parameters including "Control" and "FFT". File
       requester will appear allowing you to specify configs' file name.
       When Clouds is invoked, it automatically looks for "clouds.config"
       file in the actual directory, to use it as a default config.

1.9 ARexx port

  6. ARexx

Clouds features a full ARexx interface. All functions can be
controlled from ARexx, and there are even some additional commands
accessible only from ARexx. There is a brief description of all
available commands. Parameters given in "{}" are required, while
parameters in "[]" are optional and may be omitted. Every command
returns 0 in RC if everything went right, else it returns 10 in RC
and short note in CLOUDS.LASTERROR prompting why an error occurred.

Following ARexx commands have identical meaning as theirs GUI equivalents
described above:

  * cl_Seed   {n}
  * cl_Roughness   {n}
  * cl_Granularity   {n}
  * cl_Globality   {n}
  * cl_Strength   {n}
  * cl_Abruptness   {n}
  * cl_Velocity   {n}

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* cl_Direction      {n}
* cl_Density        {n}
* cl_Contrast       {n}

* cl_Frames         {n}
* cl_Width          {n}
* cl_Height         {n}
* cl_Fft            {16 | 32 | 64 | 128 | 256 | 512 | 1024}
* cl_Control        {DisplayAndSave | OnlyDisplay | OnlySave}

* cl_Quit
* cl_About

* cl_DisplayColors  {16 | 256}
* cl_SaveColors     {16 | 256}

* cl_ScreenMode
* cl_Priority       {-1 | 0 | 1}
* cl_SaveFormat     {%s%d | %s%03d | %s%04d | %s.%d | %s.%03d | %s.%04d}

* cl_CloseProject

* cl_OpenProject    [filename]

* cl_LoadConfig     [filename]
* cl_SaveConfig     [filename]

* cl_Calculate
  This command can also return value 5 in RC. This case means that
  calculations have been cancelled by the user.
```

Following commands are accessible only from ARexx level:

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* cl_QuitNow
  Causes program to quit unconditionally. No questions asked.

* cl_Information    {information}
  Brings up a text requester displaying short, one line long information.

* cl_Question       {question}
  Brings up a text requester displaying short, one line long question.
  The user will have two possible answers: 'OK' and 'Cancel'. The command
  returns 5 in RC if 'OK' was pressed, otherwise RC is equal to 0.
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1.10 Additional Notes

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  Additional Notes
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To run Clouds v1.01 you need some libraries installed in your "LIBS:"
drawer. These are:

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 - mathtrans.library
 - asl.library (V36+, preferably V38+) required only under Kick2.0+
 - req.library required under Kick1.3, not used under Kick2.0+
 - rexxsyslib.library, mathieeedoubbas.library required only if you
```

```
      want to take advantage of ARexx interface.
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1.11 Acknowledgements

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  Acknowledgements
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The author wishes to express his thanks to Georgios Sakas for development
of the method.
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1.12 Distribution

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                    Distribution
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Clouds v1.01 is a shareware program. You may freely distribute it as long
as all of its files are included in their original form without additions,
deletions, or modifications of any kind, and only a nominal fee is charged
for its distribution.  It cannot be distributed as a part of commercial
product without author's written permission.  If you like it and use it,
the author encourage you to register.  The shareware fee is USA $20 or 20
DM.  Registered users will be shipped a disk containing the latest release
version of Clouds and also version optimized for math coprocessor.  By
cooperating with this concept you help to ensure continued development of
this product.  Please send your registration card
                Orderform
                and money
(cash) to the
                author
                .
```

```
Thank you for supporting shareware.
```

1.13 How to contact me

```
                        Contact address

                        Krzysztof Kobus
                        ul. Chopina 38/2
                        71-450 Szczecin
                             Poland

                          E-Mail:

                    kk@felix.univ.szczecin.pl
```

1.14 Copyrights

1.15   Cut off, fill and send this orderform

```
*********************************************************************

    Krzsztof Kobus              ***  **     ****   **   **  ****     ***
                                **   **    **   ** **  **   ** **   ** **
    ul. Chopina 38/2            **   **    **     ** **   ** **   **   ***
    71-450 Szczecin             **   **    **     ** **   ** **   **    **
    Poland                      ***  ****  ****    ****   ****     ****

*********************************************************************

       Name: _____

    Address: _____

       City: _____  State: _____

         PC: _____  Country: _____

     E-Mail: _____

     Config: _____

   I use Clouds v ____.____ and love / hate the following things:

                  _____

                  _____

                  _____

                  _____

                               __                  __
         Shareware fee included:  (__) DM20,-   or  (__) $20,-
                          __
         I use MUI:  (__)

      I have read the Copyright and Distribution notes and do agree.


      Date: _____      Signature: _____
```