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Contents

1	000000-0	1
1.1	Magic Illusions Hilfe	1
1.2	Magic Illusions - Einleitung	2
1.3	Magic Illusions - Die Bilder...	2
1.4	Magic Illusions - Sehtechniken	7
1.5	Magic Illusions - Paralleltechnik	8
1.6	Magic Illusions - Schieltechnik	8
1.7	Magic Illusions - Hilfspunkte	8
1.8	Magic Illusions - Die Geschichte...	9
1.9	Magic Illusions - Mathematische Grundlagen	9
1.10	Magic Illusions - Eigene Bilder...	11
1.11	Magic Illusions - Augenschäden?	11
1.12	Magic Illusions - weitere ASCII-Stereogramme	12

Chapter 1

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1.1 Magic Illusions Hilfe

M A G I C I L L U S I O N S

STEREOGRAM-CDROM FOR AMIGA AND PC

Introduction

The~pictures~on~the~CD

Viewing~techniques

Die '

Parallel~technique

,

Die '

Squint~technique

,

Auxiliary Points

History of the stereograms

Mathematical principles

Creation of own pictures

Damage of the eyes

?

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1.2 Magic Illusions - Einleitung

Welcome to the world of magic 3D-Pictures!

You certainly have met people during the last few months, who have put their nose deep into a huge book or were standing squinted and excited in front of a poster, where you couldn't find a motive. Maybe you already belong to the growing group of followers who enjoy the magic of the threedimensional pictures. We are happy to present you a huge amount of new 'food' for your eyes on this CD. The magic is a harmony of mathematics and optics and is known as 'Autostereograms'. This is just a small note for beginners. The result, magic or not, is astonishing.

It doesn't matter, if you're interested in the
 history
 or the
 principles
 of the autostereogram, or if you prefer to
 create your own pictures
 , or
 if you just want to have fun, to
 view pictures
 , on this CD, there is
 something for everybody.

Have fun while watching the pictures!

1.3 Magic Illusions - Die Bilder...

The pictures of the 'MAGIC ILLUSIONS'-CD

On this CD there are over 200 stereogram pictures, that are sorted by subject. You can either start them by double-clicking the icons from Workbench or you can use the program 'MAGIC Viewer'.

The Pictures on this CD are Public Domain und come from divers sources, mostly from the global Internet; ergo they quality is ranging from poor to professional. In order to easen the Introduction all pictures are sorted in the chapter by subject. The list contains additional information about each picture.

Explanation:

SIRDS Random dot stereogram
 SIS Texture stereogram

 ohne HP without auxiliary points
 mit HP with auxiliary points

ANIMALS

AFFEN Two apes, SIS, without HP
 AMEISE Ant, SIS, without HP

BAER1 Bear with fish, SIS, without HP
 BAER2 Bear at dungeon, SIS, without HP
 DELPHIN1 Two dolphins, SIS, without HP
 DELPHIN2 Dolphin, SIS, without HP
 DELPHIN3 Three dolphins, SIS, without HP
 DELPHIN4 Several dolphins, SIS, without HP
 DELPHIN5 Three dolphins, SIS, without HP
 DELPHIN6 Dolphins, SIS, without HP
 ELEFANT1 Elephant, SIS, without HP
 ELEFANT2 Elephant, easy, SIS, without HP
 ENTE Rubber duck, easy, SIS, without HP
 FISCH Fish, SIS, without HP
 HAIE Several Sharks, SIS, without HP
 HASE1 Jumping Rabbit , SIS, without HP
 HASE2 Sitting Rabbit, easy, SIS, without HP
 HASE3 Jumping Rabbit, SIS, without HP
 HIRSCH Stag with antlers, SIS, without HP
 KANGU1 kangaroo, SIS, without HP
 KANGU2 kangaroo, SIS, without HP
 KANGU3 kangaroo, SIS, without HP
 KROKODIL Krokodil, SIS, without HP
 KUH Cow, easy, SIS, without HP
 LEOPARD Leopard, SIS, without HP
 SCHMETT1 Butterfly, SIS, without HP
 SCHMETT2 Butterfly, SIS, without HP
 PFERD Horse, SIS, without HP
 SCHILDKR Turtle, SIS, without HP
 SPIDER2 Spider, SIS, without HP
 EICHHO Squirrel, SIS, without HP
 WAL Whale, SIS, without HP

DINOSAURS

DINO1 Several dinos, SIS, without HP
 DINO2 Swimming dino, SIS, without HP
 DINO3 Rubber dino, easy, SIS, without HP
 STEGOSAU Stegosaurus, SIS, without HP
 TREX1 Tyrannosaurus Rex, SIS, without HP
 TREX2 Several TRex, SIS, without HP
 TRI Triceratops, SIRDS, with HP
 TRICER Triceratops, SIS, without HP

PEOPLE

BEETHOV Beethoven, SIS, without HP
 BTVNRDS Beethoven, difficult, SIRDS, without HP
 BUDDHA Buddha statue, SIS, without HP
 FACE Face, SIRDS, with HP
 FAERIES Two women, SIRDS, without HP
 HAND Hand, SIS, without HP
 HAND2 Showing Hand, SIS, without HP
 HEAD Head, SIS, without HP
 KOPF1 Laughing Face, SIS, without HP
 KOPF2 Face, SIS, without HP
 MAEDCHEN Girl, SIS, without HP
 HUMANS Man and woman, SIS, without HP
 MASKE Mask, SIS, without HP

SKELETT1 Skull, SIS, without HP
 SKELETT2 Skull, SIS, without HP
 SKULL Skull with bones, SIS, without HP
 TORSORDS Body, SIS, without HP
 VENUS Venus statue, SIS, without HP

NATURE

APFEL Apple, SIS, without HP
 BLUME Blossom, SIS, without HP
 EARTHRS Worldmap, difficult, SIRDS, without HP
 EISSTERN Kristal, SIS, without HP
 KLEEBLAT Clover-Leaf, easy, SIS, without HP
 PFLANZE Plant, difficult, SIS, without HP
 ROSEN1 Roses, difficult, SIS, without HP
 WBAUM XMas-Tree, SIS, without HP
 WBAUM2 XMas-Tree, SIS, without HP

TECHNICS

APPLE Apple-Logo, SIS, without HP
 AUTO Car with palm trees, SIS, without HP
 AUTO2 Car, SIS, without HP
 COMPUT1 Monitor + Keyboard, SIS, without HP
 COMPUT2 Desktop with Monitor, SIS, without HP
 DC10 Plane, SIS, without HP
 FIGHTER Plane, SIS, without HP
 FIGHTER2 Plane, SIS, without HP
 FLUGZEUG Bi-Plane, difficult, SIS, without HP
 HIV Aids-Virus, SIS, without HP
 INDYCAR Racing Car, SIS, without HP
 JOYSTIK Joystick, SIS, without HP
 KAFFEE Coffee machine, SIS, without HP
 MERCEDES Car, SIS, without HP
 MOTORRAD Motorcycle, SIS, without HP
 RENNWAG Racing car, SIS, without HP
 ROBODOG Dog robot, SIS, without HP
 SANDUHR Sand clock, difficult, SIS, without HP
 TELEFON Telephone, easy, SIS, without HP
 TRUCK Lorry, difficult, SIS, without HP
 UHR Watch, difficult, SIS, without HP
 ZUG Locomotive, difficult, SIS, without HP

SPACE

ASTRONAU Astronaut, SIS, without HP
 COMET Comet, SIRDS, with HP
 ENTERPR2 StarTrek Enterprise, SIRDS, with HP
 SHUTTLE Space Shuttle, difficult, SIS, without HP
 WARBIRD StarTrek Warbird, easy, SIS, without HP
 XWING StarWars XWing, difficult, SIS, without HP
 XWING2 StarWars XWing, SIRDS, with HP

SPORT

BALLON Balloon, SIS, without HP
 BASEBALL Baseball, SIS, without HP

BASKETB Basketball, SIS, without HP
 CLIFFHA Climber, SIS, without HP
 EISHOCK Icehockey, SIS, without HP
 FOOTBALL American Football, SIS, without HP
 FUSSB1 Football, SIS, without HP
 FUSSB2 Football, SIS, without HP
 GOLF Golf player, SIS, without HP

MISC

ANTIKA Building, SIS, without HP
 CITY Skyscraper, SIS, without HP
 DRACHE Flying Dragon, SIS, without HP
 KEGEL Bowling, SIS, without HP
 OSSOWSKI Schatztruhe Logo, SIS, without HP
 SCHAUKEL Rocking Horse, SIS, without HP
 SCHIFF Sailing Ship, SIS, without HP
 SCHLOSS Castle, SIS, without HP
 SCHUH Shoe, SIS, without HP
 TAP Tap, SIS, without HP
 TEAPOT Tea kettle, SIS, without HP
 TEEKANNE Tea kettle, SIS, without HP
 TEMPLRDS Salt Lake Temple, SIRDS, without HP
 TOYS Toy soldier, SIS, without HP
 TUERE Door, SIS, without HP
 WASHAHN Tap, SIS, without HP

FIGURES

3DEGAPIC Several objects, SIRDS, with HP
 3DPLANES Areas, SIRDS, with HP
 ASH Objects on surfaces, SIS, without HP
 BOWL Ball in Semi-Ball, easy, SIS, without HP
 BRIDGE Bridges, SIRDS, with HP
 COVER 3D Writing, SIS, without HP
 CYNTHIA Writing, difficult, SIS, without HP
 DONNASIS Square with Circle, SIS, without HP
 DONUT Torus, easy, SIS, without HP
 EGGBOX Eggbox, SIRDS, without HP
 ESCHER Escher Knot, difficult, SIS, without HP
 ESCHER4 Escher Knot, SIRDS, with HP
 FLATPIC Areas, SIRDS, with HP
 GLASSP1 Glass, SIRDS, with HP
 GLOBUS Lined globus, SIS, without HP
 GLOCKE1 Bell, SIS, without HP
 GLOCKE2 Several bells, SIS, without HP
 HAKEN Tick, SIS, without HP
 HERZ Heart, easy, SIS, without HP
 HIDIMG17 Torus, easy, SIS, without HP
 JAX Cross, SIS, without HP
 KREUZ Cross, SIS, without HP
 KUBUS Open dice, SIS, without HP
 KEGEL Cone, SIS, without HP
 VORSPRNG Wall, SIS, without HP
 MAELSTRO whirlwind, SIS, without HP
 MINDTEST Figure with mug, SIRDS, with HP
 MONO_SPL Waves, SIS, without HP

NO6 Several Dice, SIS, without HP
 NOTEN Notes, SIS, without HP
 PYRAMID Pyramide, SIS, without HP
 REVCONE Tunnel, SIRDS, with HP
 RIVER Areas, SIRDS, with HP
 SCHACHT Shaft, SIS, without HP
 SICK Waves, SIS, without HP
 SPIRAL Spirale, SIRDS, with HP
 SPOKES Stairs, SIRDS, with HP
 STEREO2 Waves, SIRDS, without HP
 STEREOLE Circles, SIS, without HP
 STERNE Stars, difficult, SIS, without HP
 TRIANGLE Triangles, SIRDS, with HP
 TUNNEL Tunnel, SIS, without HP
 TUNNEL2 Tunnel, SIS, without HP
 TWISTERR Square with Circle, SIS, without HP
 WELLEN1 Waves, SIS, without HP
 WELLEN2 Waves, SIS, without HP
 WELLEN3 Waves, easy, SIS, without HP
 WUERFEL Dice, SIS, without HP
 YINYANG Ying Yang Symbol, SIS, without HP

FRACTALS

FRACT01 Fractal, SIS, without HP
 FRACT02 Fractal, SIS, without HP
 FRACT03 Fractal, SIS, without HP
 FRACT04 Fractal, SIS, without HP
 FRACT05 Fractal, SIS, without HP
 FRACT06 Fractal, SIS, without HP
 FRACT07 Fractal, SIS, without HP
 FRACT08 Fractal, SIS, without HP
 FRACT09 Fractal, SIS, without HP
 FRACT10 Fractal, SIS, without HP
 FRACT11 Fractal, SIS, without HP
 FRACT12 Fractal, SIS, without HP
 FRACT13 Fractal, SIS, without HP
 FRACT14 Fractal, SIS, without HP
 FRACT15 Fractal, SIS, without HP
 FRACT16 Fractal, SIS, without HP
 FRACT17 Fractal, SIS, without HP
 FRACT18 Fractal, SIS, without HP
 FRACT19 Fractal, SIS, without HP
 FRACT20 Fractal, SIS, without HP
 FRACT21 Fractal, SIS, without HP
 FRACT22 Fractal, SIS, without HP
 FRACT23 Fractal, SIS, without HP
 FRACT24 Fractal, SIS, without HP
 FRACT25 Fractal, SIS, without HP
 FRACT26 Fractal, SIS, without HP
 FRACT27 Fractal, SIS, without HP
 FRACT28 Fractal, SIS, without HP
 FRACT29 Fractal, SIS, without HP
 FRACT30 Fractal, SIS, without HP
 FRACT31 Fractal, SIS, without HP
 FRACT32 Fractal, SIS, without HP
 FRACT33 Fractal, SIS, without HP

FRACT34 Fractal, SIS, without HP
 FRACT35 Fractal, SIS, without HP
 FRACT36 Fractal, SIS, without HP
 FRACT37 Fractal, SIS, without HP
 JULIA_1 Julia, SIS, without HP
 MANDELBR Mandelbrot, SIS, without HP

1.4 Magic Illusions - Sehtechiken

Viewing techniques

In order to explain the different viewing techniques to you, it is useful to explain the phenome of the 'stereogram' first. Tu put it into a nutshell, the stereogram outwits the brain by pretending a threedimensional structure on a twodimensional surface, e.g. on a piece of paper or on the computer monitor. The effect is based on the fact, that each of our eyes views an object from a slightly different angle. We do get to see actually always two different twodimensional pictures from our environment. Our brain creates from these two pictures one threedimensional one.

You can find this out easily: Take a pen and hold it about 10 - 15 cm away from your nose. When looking directly at the pen, when focussing it, you will see only one pen. But now look 'through' the pen, to some object behind it, e.g. the wall, then you can see two hazy pens. Now take two pens and hold them infront of your nose. In one case you'll see two pens and in the other four, depending on the fact, if you're focussing the pens or the wall.

By squinting you're able to bring the two pens in the middle to only one pen. Just try it out. This is the trick how to view threedimensional stereograms. Within the pictures are repeating patterns, similar to the two pens, we used, but far more complicated,

There are various techniques in order to view stereograms. The following two are the most important and easiest ones:

the

Parallel technique
and

the

Squint technique

You can use both of the techniques to view the pictures on the ' ←
Magic

Illusions'-CD. We recommend the parallel technique, because with it you can view easily most of the pictures. You have to find out yourself which of them is easier for you and then you should use it.

Don't panic, if it doesn't work immediatly. It takes quite a while the first time, until you can see the 3D-Effect.

Our motto is: Practice, Practice, Practice!

In case it does not work with one picture, then just try another one.

There are enough pictures on this CD. At the beginning you should try pictures, that are easy. The easiest way of recognising a picture is using the

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    Auxiliary points
    in the picture. You can find an evaluation of
in the chapter '
    View pictures
    '.

```

Detailed knowledge on the subject of stereograms can be found in the chapter '

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    Mathematical~principles
    ' in this document.

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1.5 Magic Illusions - Paralleltechnik

The Parallel Technique

A good method to see stereogram is the following:

Hold the motive directly in front of your eyes and look through it, just like trying to fix the horizon. Now move the picture slowly from your eyes away, but don't focus it, just stare as you did before. As soon as the motiv has reached reading distance from your face, you should be able to see the 3D effect. In case you don't see it, then move it a little back and forth, until you can see the threedimensional structure appearing. In case you see it hazy, then try to change the angle of the eyes. Don't look at the picture directly, because in this case the effect disappears immediatly.

1.6 Magic Illusions - Schieltechnik

The Squinting Technique

Another way to view a stereogram is to view the motiv in an appropriate distance, e.g. the mentioned reading distance, and then to squint 'inwards'. Now you should see parts of the pattern doubled, just like in the example with the pens. Now focus it by moving the two pictures on top of each other. After a little while you should be able to see the hidden structure. You musn't focus on the picture here either, but you shouldn't squint too hard, because then you wouldn't see anything either.

1.7 Magic Illusions - Hilfspunkte

Auxiliary Points

To focus the eye correctly it is helpful to have two points, which are attached at the top border of some of the pictures (>>

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    View~Pictures
    ).

```

Using these points you should find the stereograms very easily. These picture are for beginners.

Do the same thing with the points we did with the pens. Squint, so that you can see four point and then set the two point in the middle on top of each other. Now you should be able to see the hidden threedimensional object.

In order to easen the focussing you can use the mirroring effect of the monitor, caused by a lamp or a window. This works only if you have a monitor that does reflect other lightsources...

1.8 Magic Illusions - Die Geschichte...

The history of the threedimensional pictures

Mankind has started a long time ago with creating threedimensional objects on twodimensional 'flat' photos or films, in order to increase the viewing impression. In the middle of the 19th century the English physician Sir Charles Wheatstone built an apparatus, which he named 'mirror stereoscope'. This machine did send two different pictures to the eyes through a special optical device and created a threedimensional effect.

There have been a number of other methods, which have been developed over the last century, in order to create the same effect with less expense, in order to make it accessible for the masses. Special spectacles have been developed, where the 3D effect is created by polarisation, i.e. the filtering of information for each eye. Hollywood produced a number of films in the 60s and 70s which you could view with these red-green-spectacles. Maybe you did watch the 'Monster of the Black Lagoone'. A few years ago a German commercial TV channel produced an indecent game show, where you could increase the 'impression' by wearing a special device.

Stereograms which are now very common are not a novum. In the mid-70s stereograms were known to science und were used for visualisation, e.g. in the astromony and archeology.

The avalanche has been released by a single man: Tom Baccei, born 1943 in the USA, founded after his computer science studies a successful enterprise in the computer sector. Together with a photographer, Ron Labbe, he developed a method in order to create autostereograms and created the necessary software. He published a series of books like 'the magical eye' and a huge number of poster, calenders and postcards for the publishing house N.E.Thing Enterprises.

1.9 Magic Illusions - Mathematische Grundlagen

Mathematical principles

In this chapter we will have a look at the mathematical-optical basics of

stereograms. This is no scientific discussion, this is for interested laymen (and women), who want to know a little more than was described in the chapter '

Viewing~techniques

'. You don't have to read this chapter in order to view or create stereograms.

Let us get back to the example with the two pens and refine it a little. Let us think of two point which are set on a horizontal line, but are at different distances, i.e. they have a different depth. Wenn focussing one point, you can see two point without depth information. Four twodimensional points are set together to an threedimensional picture that contains only two points.

When putting up a glass table half way between yourself and the points you could virtually draw the crossing points between each eye and each of the points onto the glass table. You would get a total of four points on the table, which lie at different places on the table, depending on the distance between the real points and you.

Look at the picture ("MathPic_E.IFF"). Use a picture viewer or, if using AmigaOS 3.0 or higher, click on the button 'Show~Pic'.

As you can see easily, the distance between the two 'virtual' points of one 'real' point gives you information about the depth of the point. You can calculate the distance of P1, using P1L and P1R (what we won't do). The same is true for P2, P2L and P2R.

When removing the two real points from our experiment, but leave the glass table with the points on it, then you can see either four twodimensional or two threedimensional points, depending on the fact, if you focus the glass table or the area behind hit. You are able to recreate the threedimensional picture from the twodimensional picture.

This is the effect how stereograms work. You get yourself a picture with depth information, similar to our experiment, but with far more points. Normally grayscale pictures are used, with darker areas meaning that the point is more in the background. Using some mathematical transitions one creates twodimensional points. These are projected into a plain using a texture or a random dot pattern. Decisive is the fact, that the two corresponding point get the some colour. Only then the brain is able to create a threedimensional picture from the two different pictures it gets from the eyes.

It is possible to create stereograms made out of ASCII symbols. Using a text editor and following the points mentioned above you can create a stereogram. Decisive is that you use the same character for the two points. The motives are not as attractive as with the other stereograms using random dot patterns or textures, but it works as you can see in the following example:

```

                                O  O
n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
f  f  f  f  f  f  f  f  f  f  f  f  f  f  f
e  e  e  e  e  e  e  e  e  e  e  e  e  e  e
a  a  a  a  a  a  a  a  a  a  a  a  a  a  a

```

```
a  a  a  a  a  a  a  a  a  a  a  a  a  a  a  a
r  r  r  r  r  r  r  r  r  r  r  r  r  r  r  r
r  r  r  r  r  r  r  r  r  r  r  r  r  r  r  r
```

(Example by Dave Thomas)

»

more~ASCII~Stereograms

1.10 Magic Illusions - Eigene Bilder...

Creation of own pictures

On this CD are not only ready stereograms, but also some programs from the Shareware- and PD-Area in order to create own pictures on an Amiga or an IBM-compatible PC. The programs were created by divers authors, so that we cannot give you a general manual. We will try to explain to you the most important steps.

First of all you need a Depth Picture. This is a picture, which consists of several grayscales, the darker parts are more in the background. You can create your own depth pictures, if you like. On the CD are a lot of them in various sizes and formats available.

Then you should decide, if you want to create a SIRDS (Single Image Random Dot Stereogram) or a SIS (Single Image Stereogramm) SIRDS use a random dot pattern and SIS uses a texture. SIS look normally better, because of the nicer and colourful textures.

In case you use the methode with the texture, you should look that you can add textures to all four sides of it without seeing the transition. Is this not the case, the textures will harass your viewing and won't look as good. On the CD there are many ready textures, and you can create even more with a graphics program.

After selecting the depth picture and a texture you can choose a resolution and a graphics format for the final stereogram. Then you can start the calculation, this can take several minutes, depending on your software and configuration.

The creation of stereograms is easy. With a little patience, experimenting and a few nice motives you can create whatever your mind comes up with.

1.11 Magic Illusions - Augenschäden?

Damage on the eye?

Not everyone can see the threedimensional structures in the stereograms, independent on the used technique, since the viewing of stereograms uses a method that is not common in every days life: A conscious split of

+

+

+

+