derode

keys:	**[from]**	*<number>*	source picture
	[to]	*<number>*	destination picture
	radius	*<number>*	size of structuring element
options:	**diamond/square/octagon/circle**		shape of structuring element

You use the **derode** command to erode a binary source image with a circular disc of arbitrary radius. The output picture will contain the binary, eroded result, which represents the area swept out by the centre of the structuring element whilst the structuring element is contained entirely within the foreground regions of the source image. You can select a different shape for the structuring element by specifying one of the options **diamond, square** or **octagon**. In all cases, the size of the structuring element is specified with the **radius** key.

Examples

```
derode 1 2 radius 11.2
```

This command erodes the binary image in picture 1 with a circular disc of radius 11.2 pixel units and outputs the result to picture 2.

```
derode 1 square radius 10
```

This command erodes the binary image in picture 1 with a 21 by 21 square structuring element.

```
derode octagon radius 20
```

This command erodes the binary image in the current picture with an octagon of radius 20.

Description

The source picture is treated as a binary image: zero values denote background pixels and non-zero values denote foreground pixels.

The **derode** command works by thresholding the distance transform of the source image (see the **dt** command for more information about distance transforms). The distance transform can be obtained with just two or four passes through the image which means that the time it takes to erode the source image does not depend on the size of the structuring element. By default, the Euclidean distance transform is evaluated, which means that the source image is eroded with an exact circular disc with the specified radius.

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In fact, the **derode** command is exactly equivalent to using the commands **dt** and **threshold** in turn. That is, the result obtained from the command

```
derode <shape> radius r
```

can be obtained also in the following way

```
dt <shape> fg
threshold gt r
```

where <shape> is the option **diamond, square, octagon** or **circle.** However, the **derode** command is faster and more convenient to use.

When calculating the distance transform, the **derode** command may have to open a temporary picture (see the **dt** command for details).

The **derode** command will fault any source picture which has a zero range. On successful completion, the range of the final result is stored in the output picture label.

Notes

see also: **dt, threshold**

Defaults and Ranges

keys/options	defaults	range
[from]	current picture, held in the variable *select*	valid picture number
[to]	source picture	valid picture number
radius	*none*	real positive number
diamond/square/ octagon/circle	erode with a circular disc	