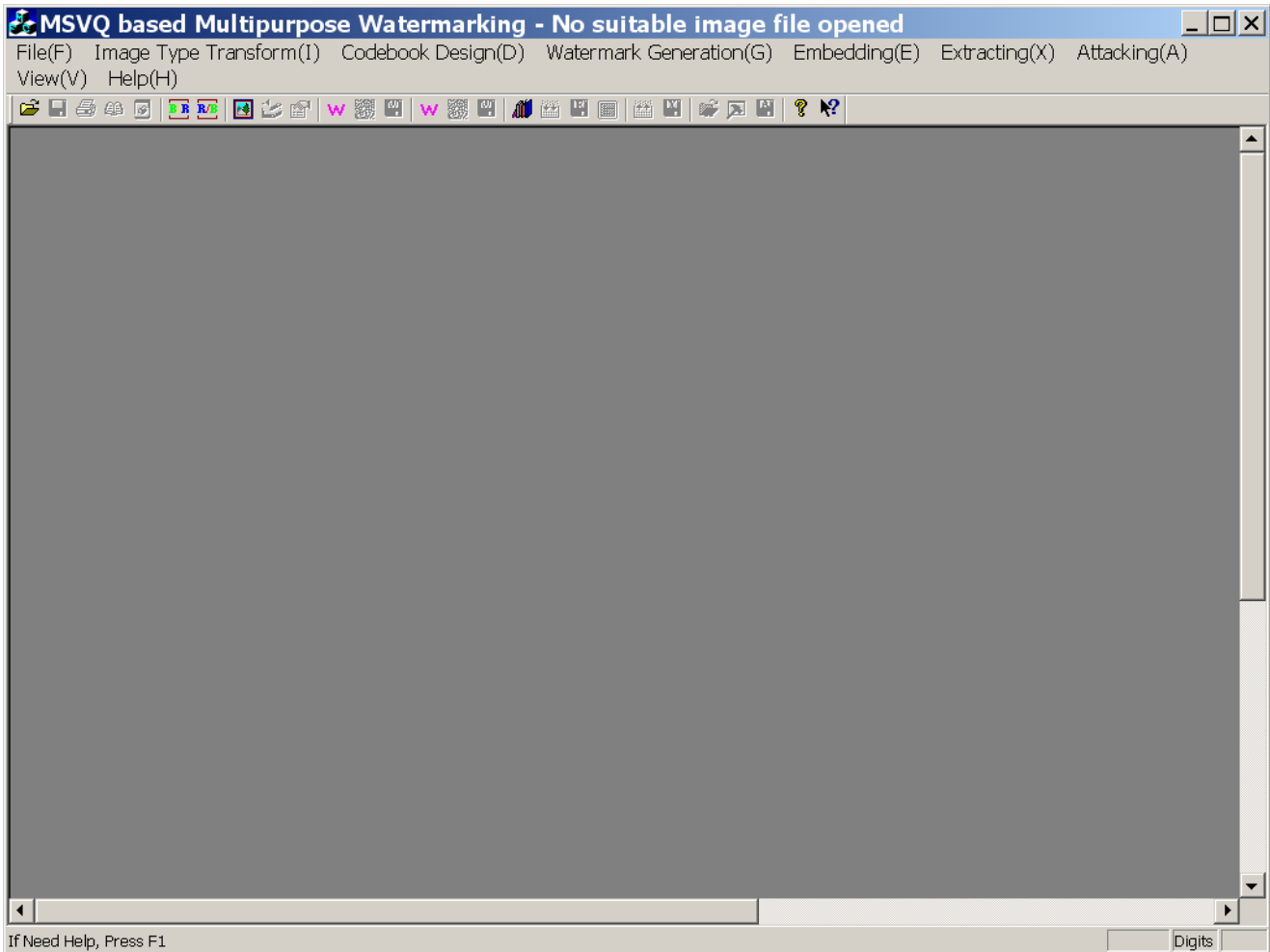
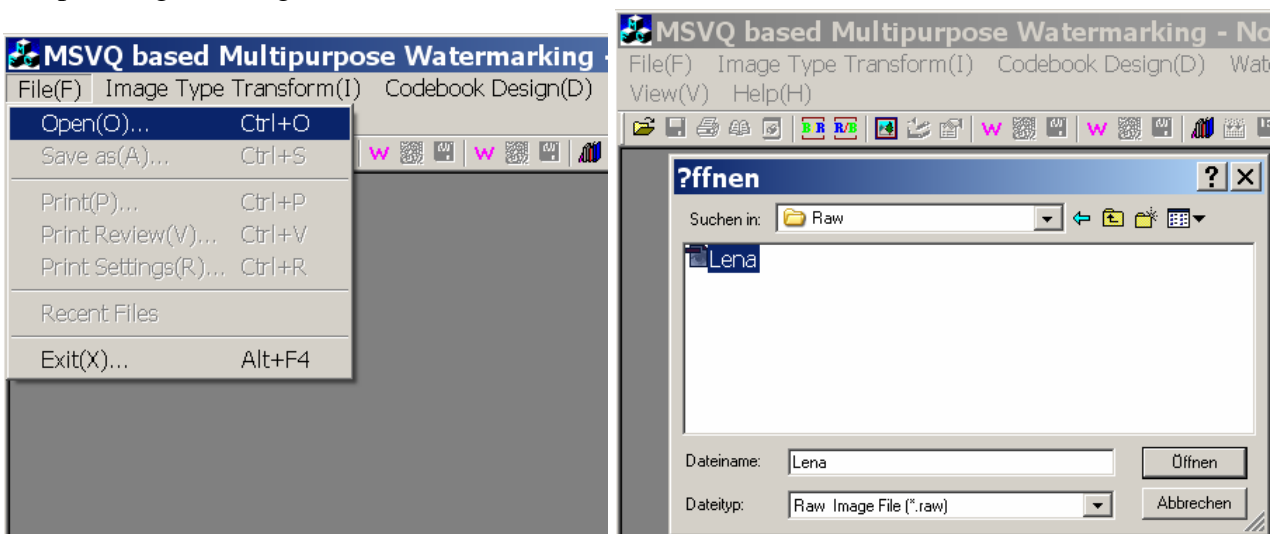


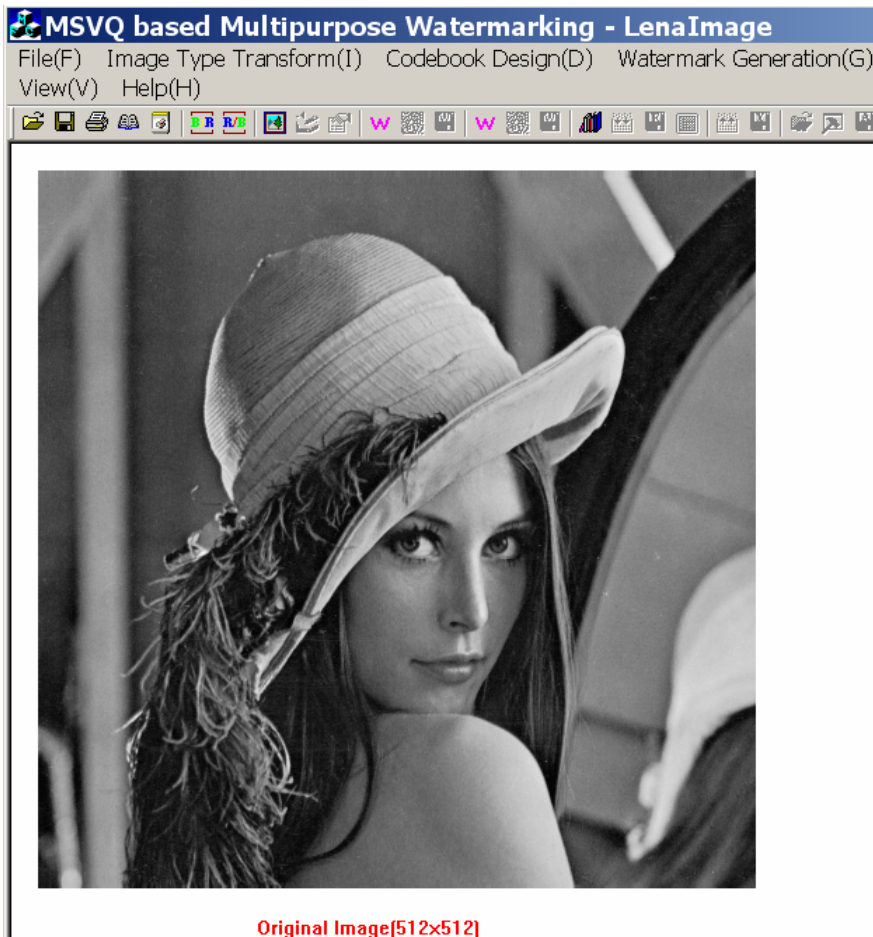
# How to use the msvqwater.exe

1. The initial interface is as follows

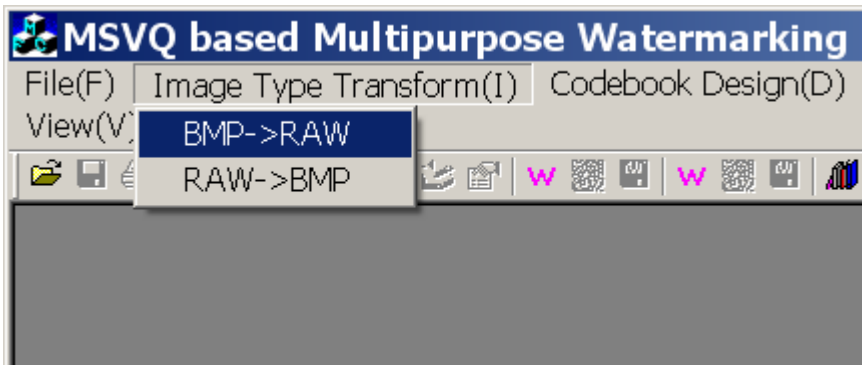


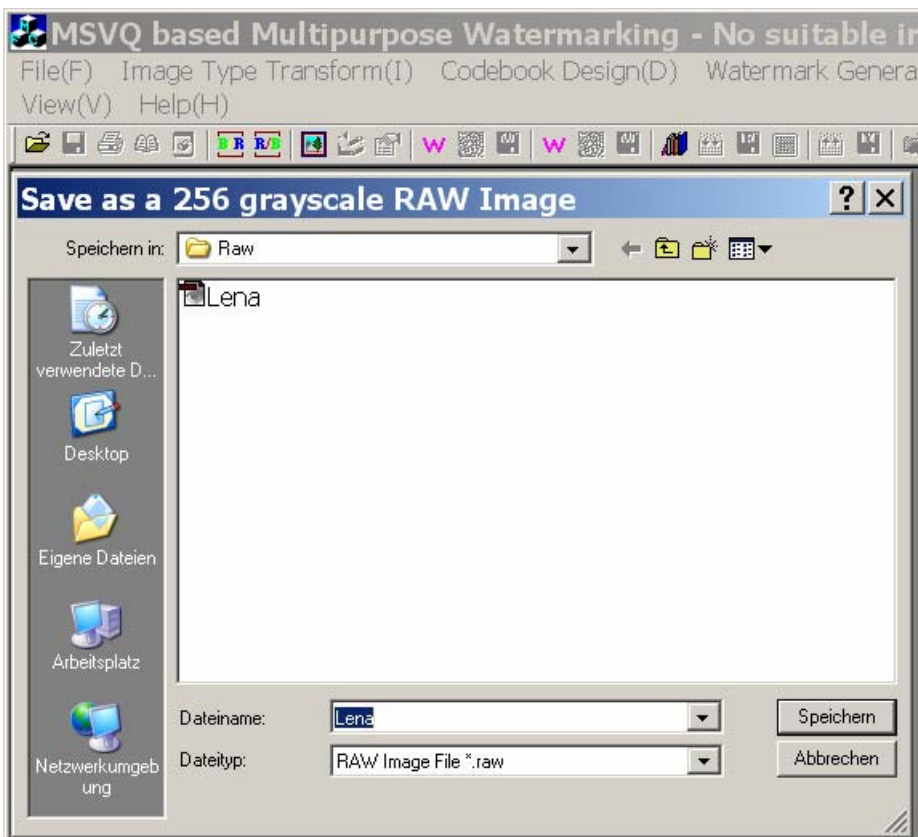
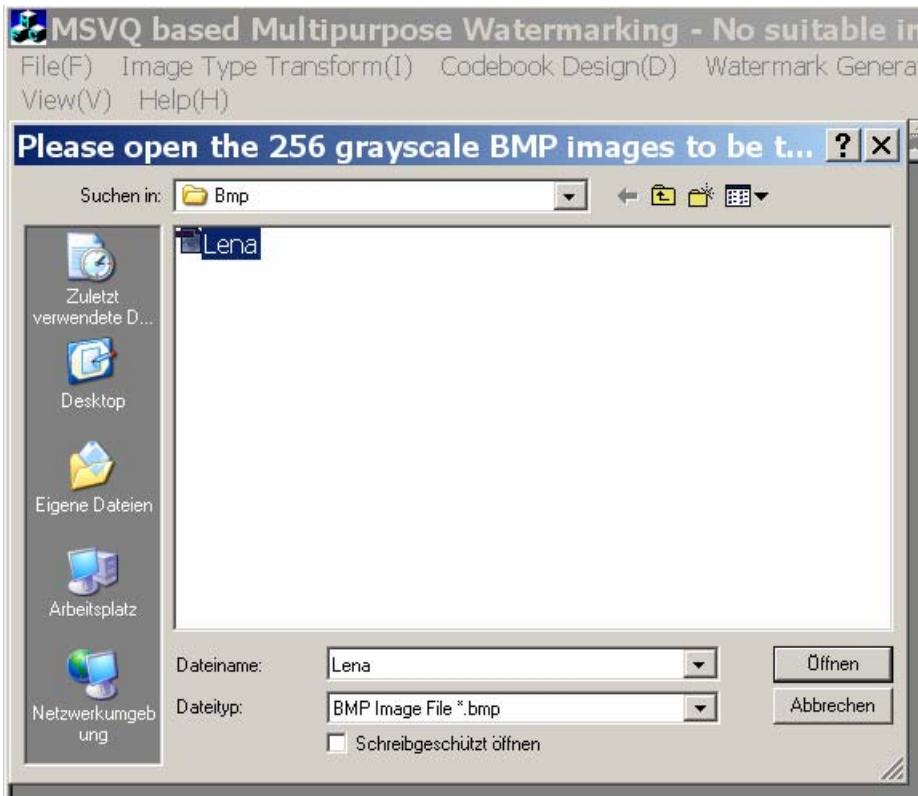
2. Open Original Image to be watermarked



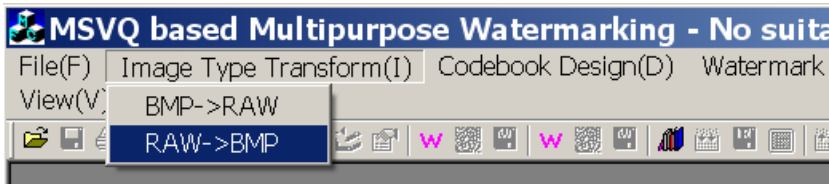


If you only have 256 Grayscale BMP file to be the original image, please transform it to be a RAW file by:



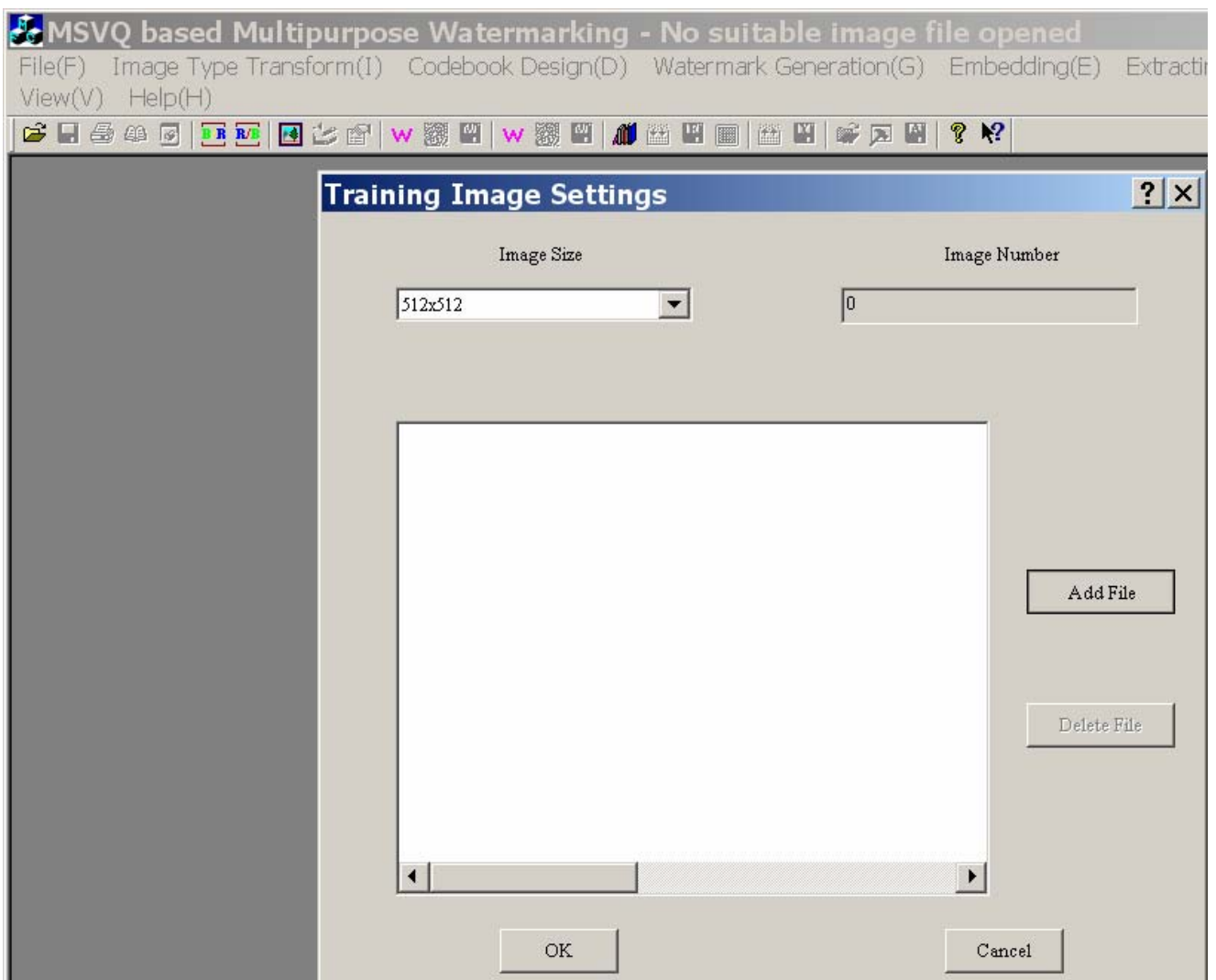
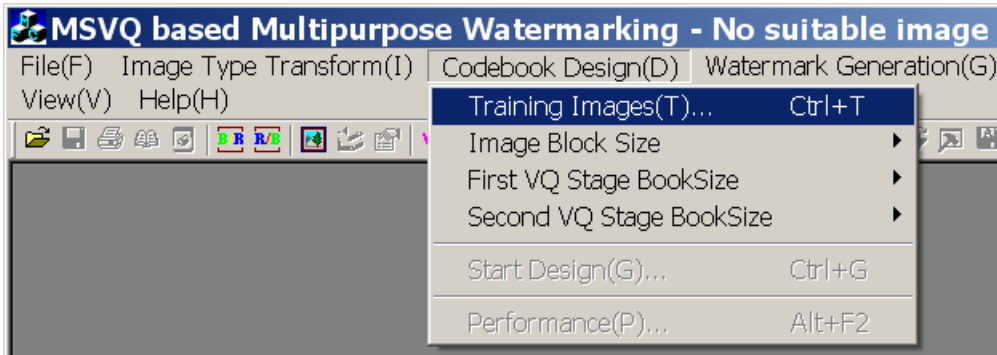


Users can also transform a raw file to a bmp file by

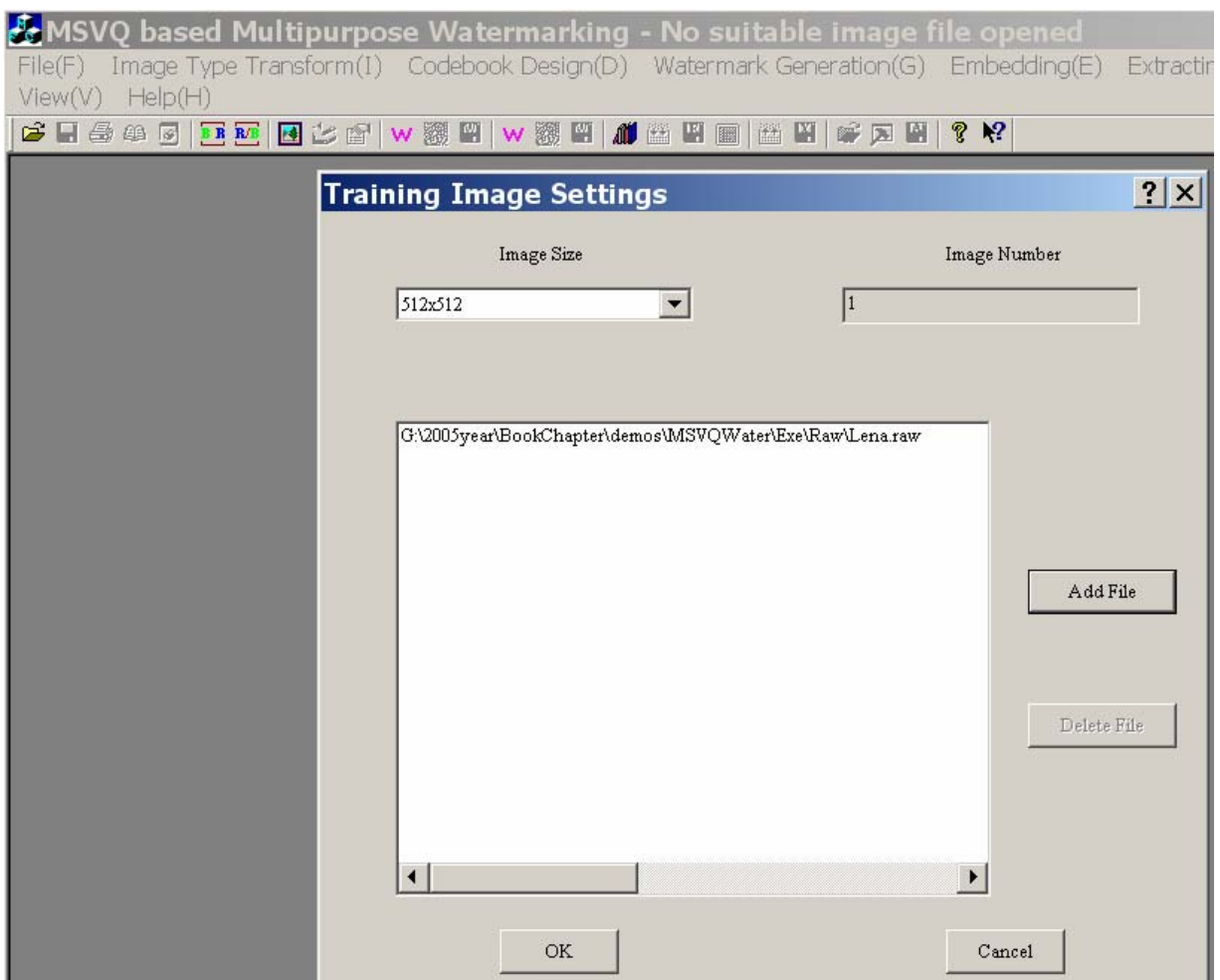
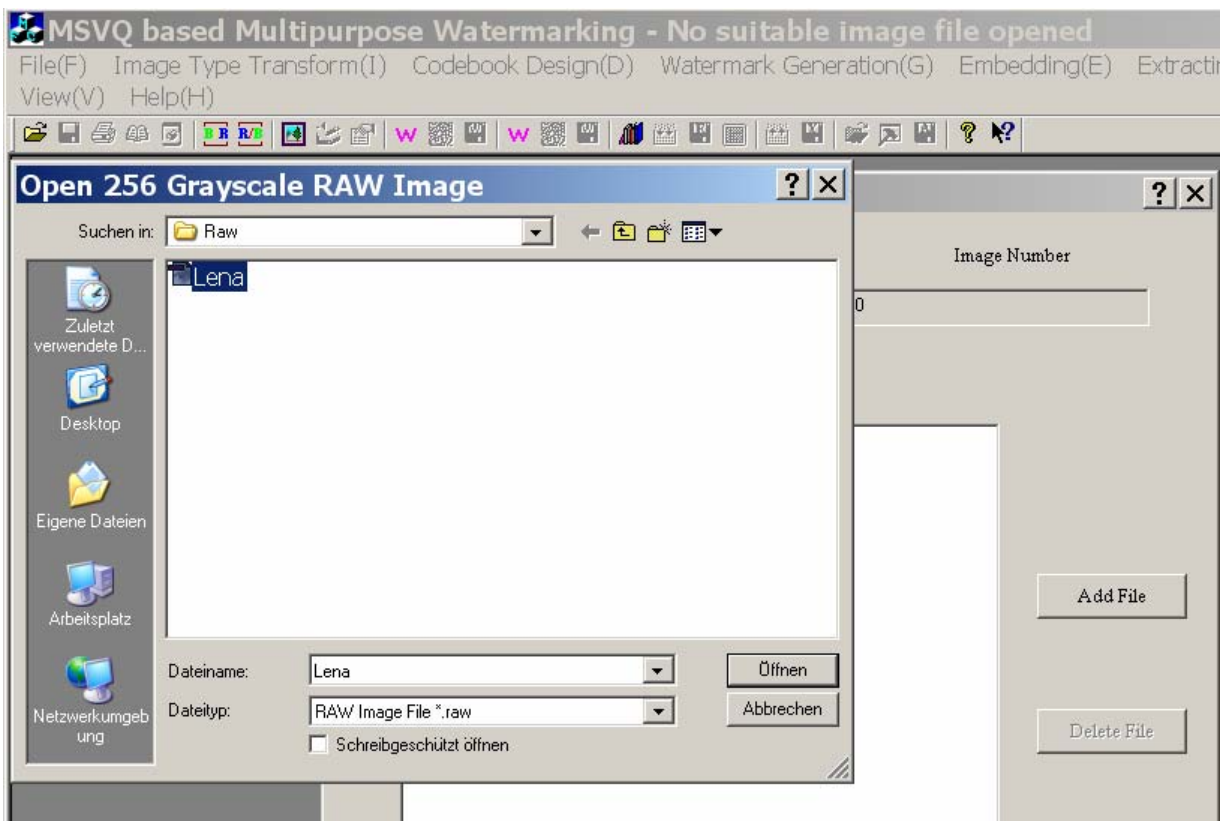


3. Generate Two Stage Codebooks (It is an independent step, if you have already design it, you can omit this step)

3.1 Select the training image

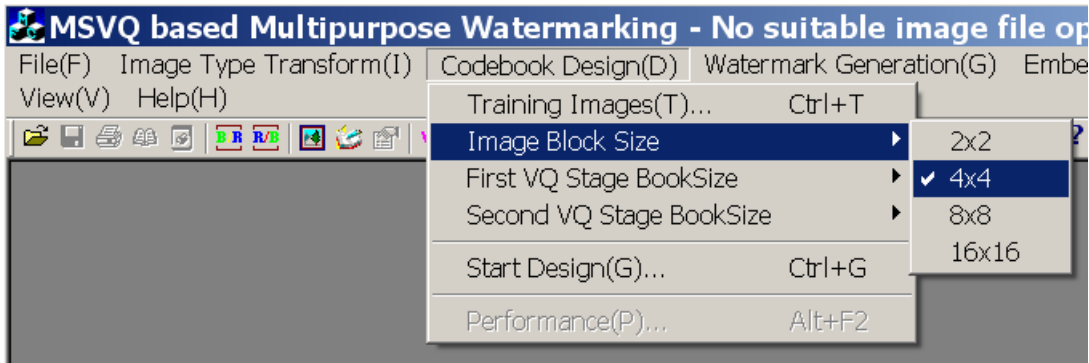


For Lena image, we select the lena.raw image to be the training image.

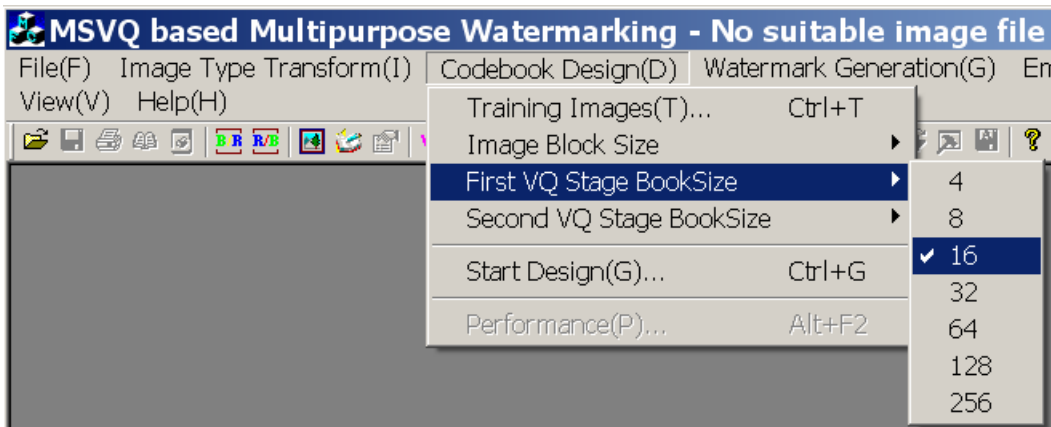


Press OK, return to the main interface

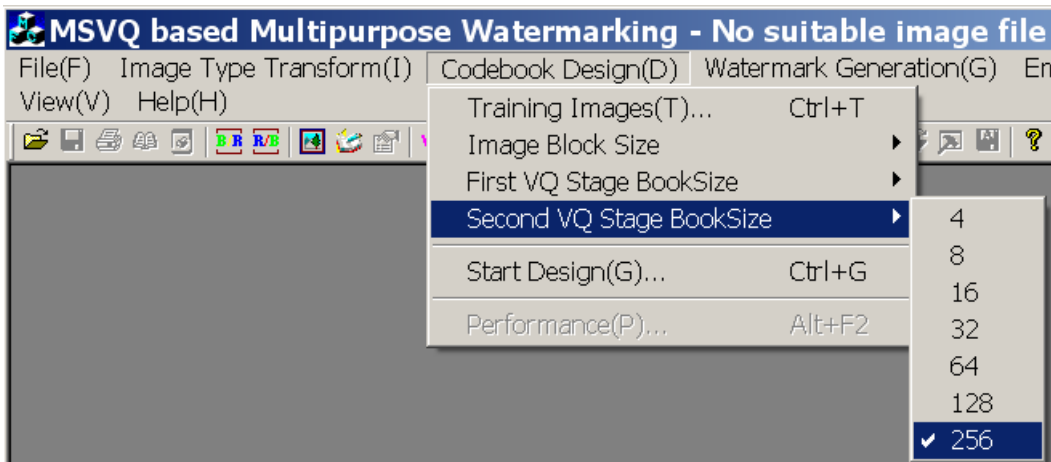
### 3.2 Select the image block size



### 3.3 Select the first stage VQ codebook size



### 3.4 Select the second stage VQ codebook size

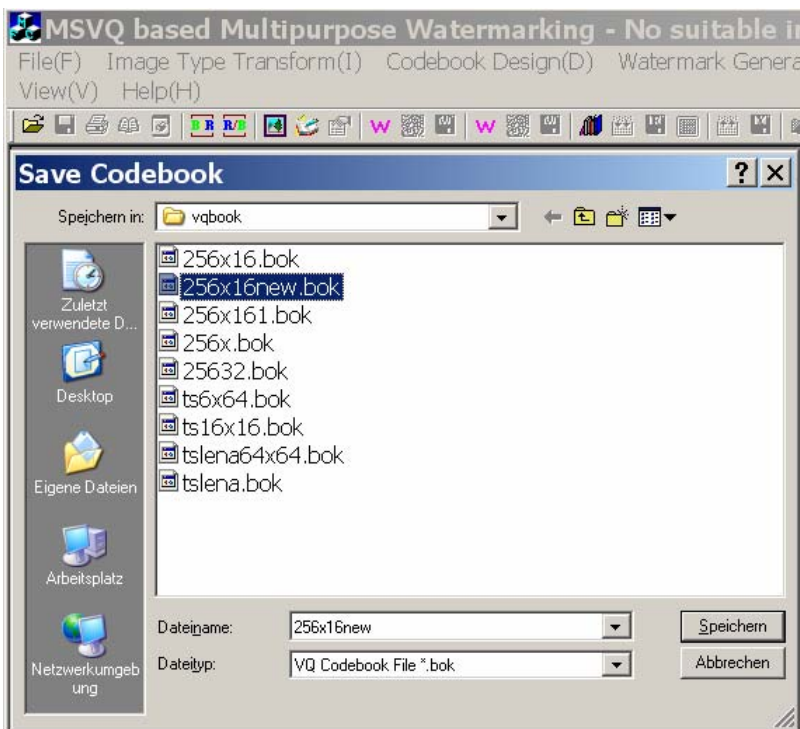


### 3.5 Start Design

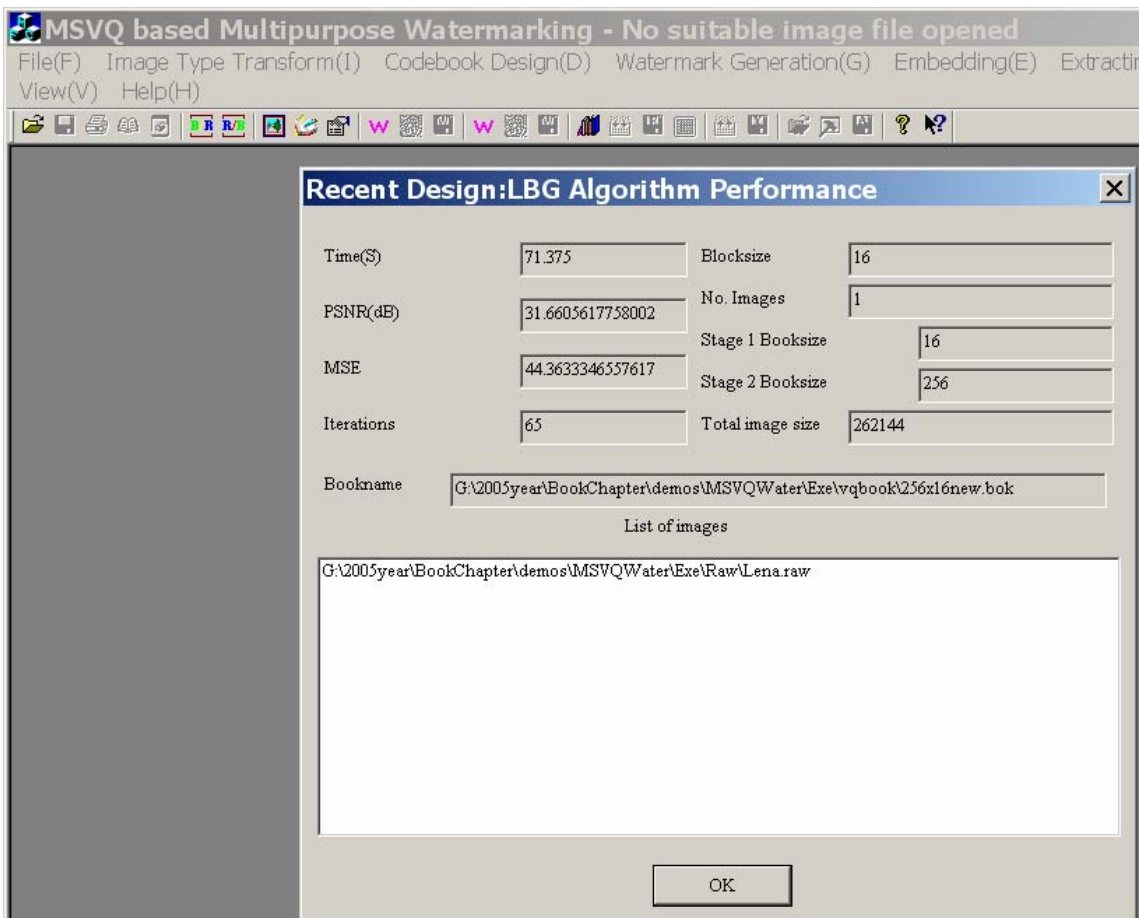




Wait some time, maybe one to thirty minutes (decided by computers' CPU) it will be finished and pop up a dialog to save book file

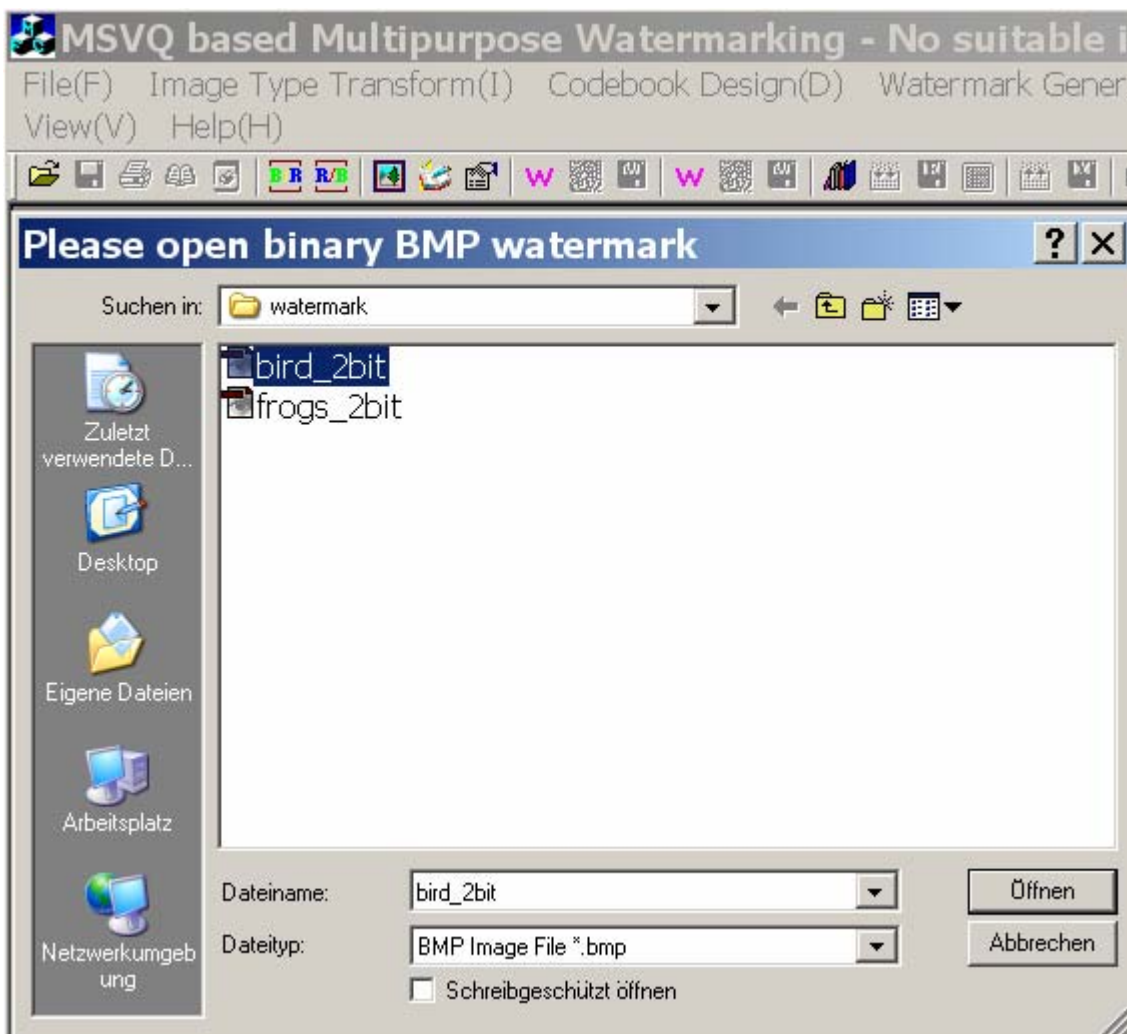
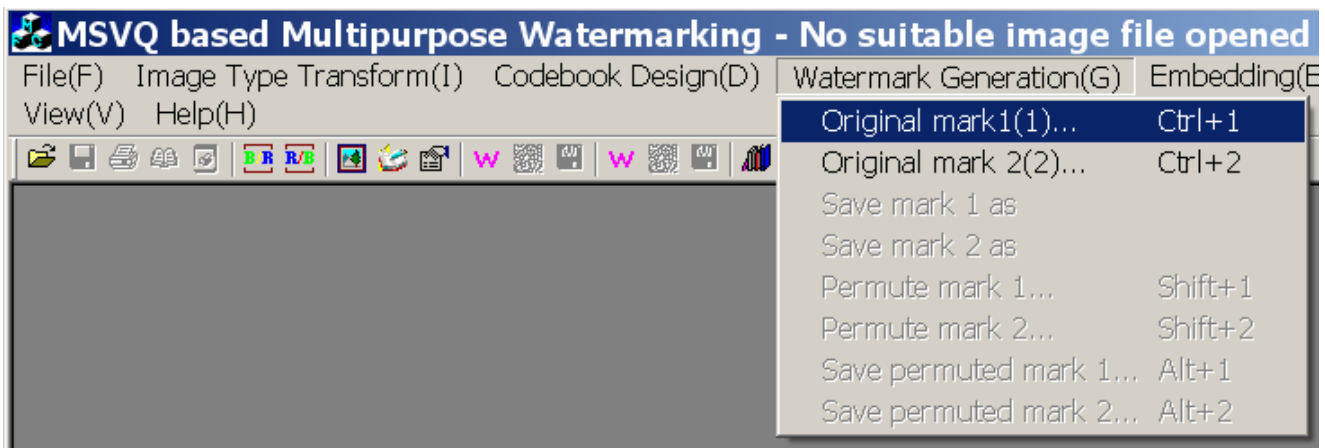


### 3.6 Check the Design performance

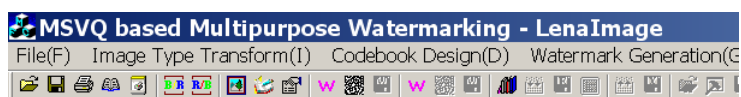


4. Open the original two watermarks

4.1 Open the original robust watermark







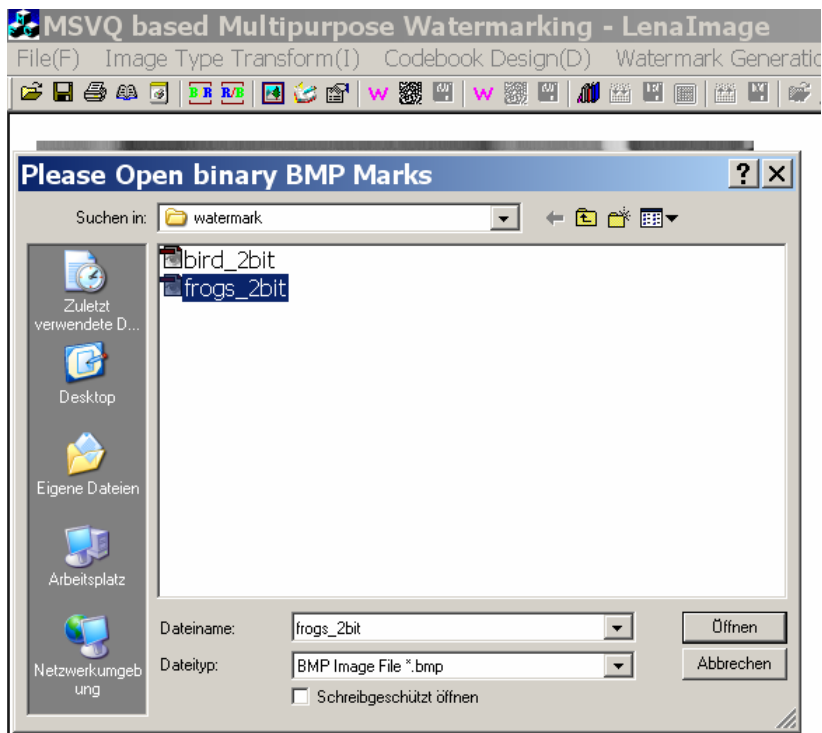
Original Image[512x512]



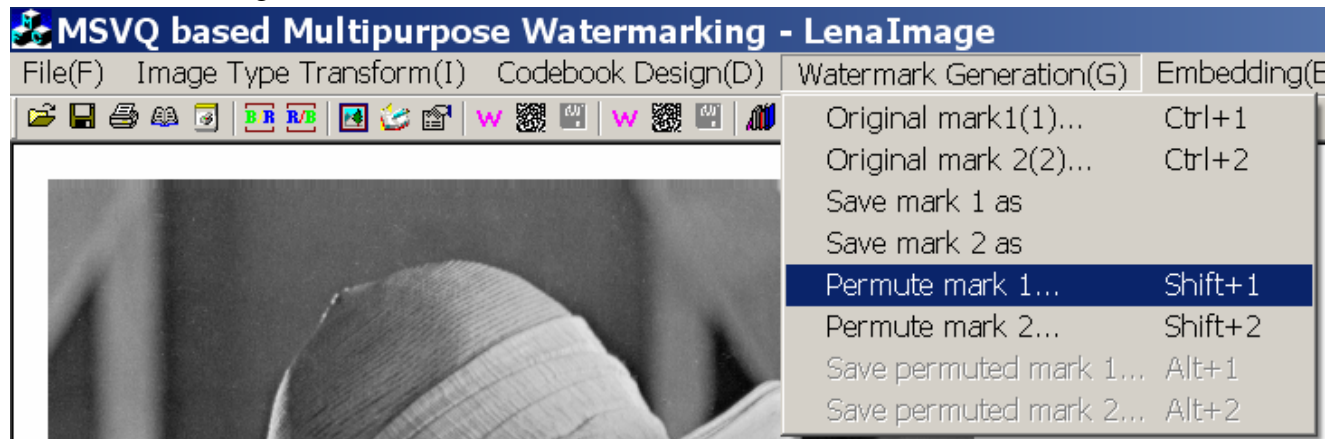
Original Mark1[128x128]

#### 4.2 Open the original fragile watermark

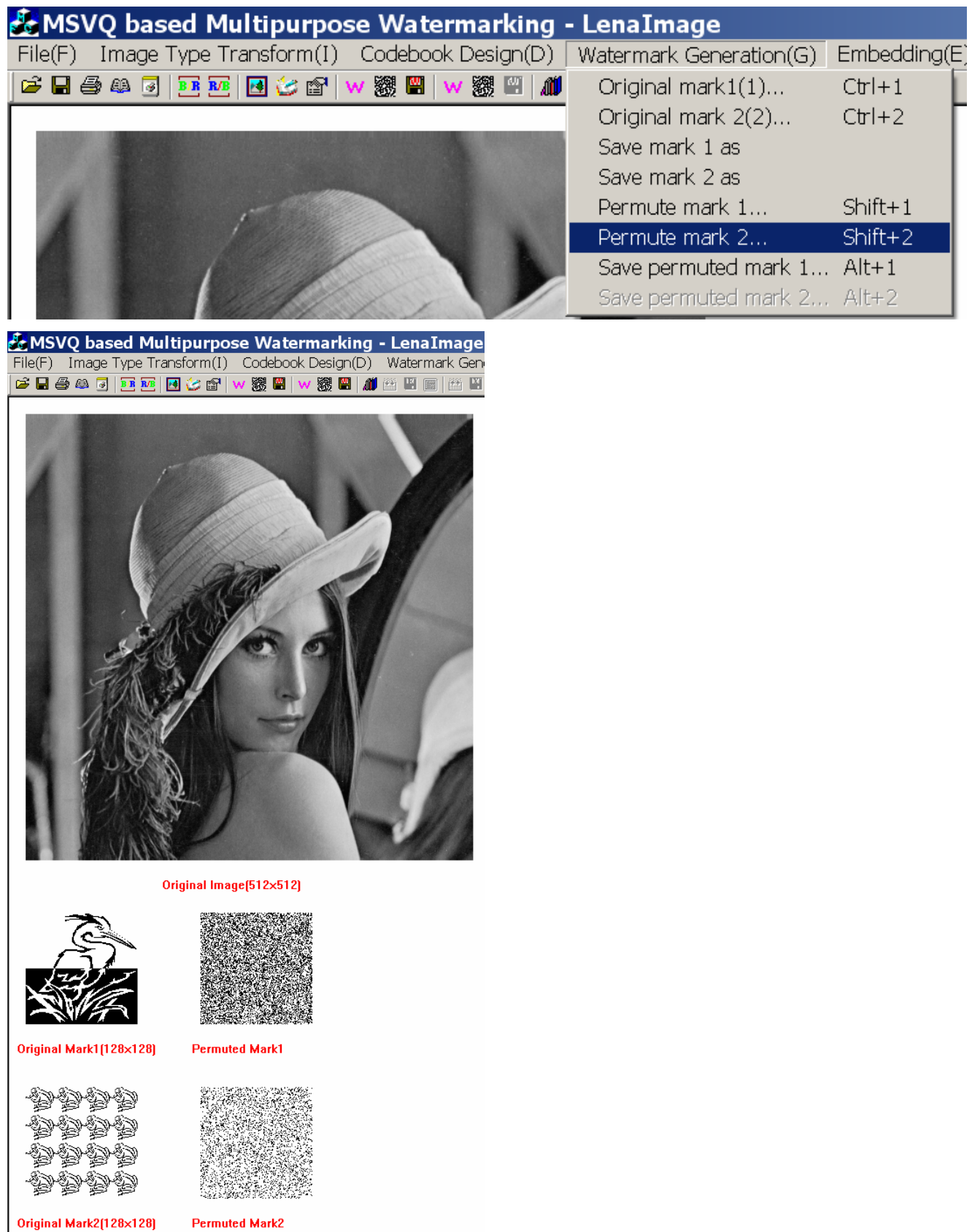




### 4.3 Permute the original robust watermark



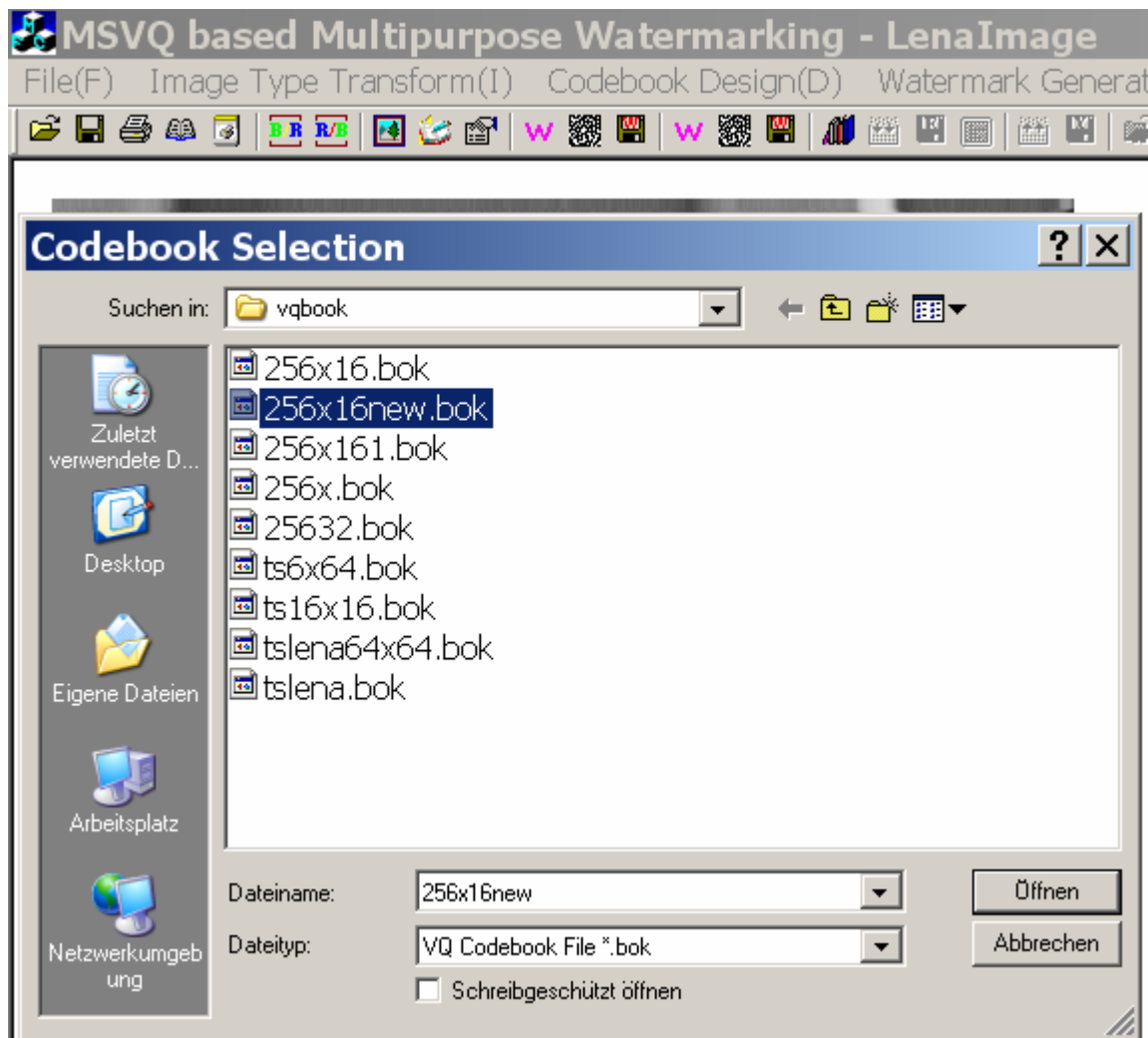
#### 4.4 Permute the original fragile watermark(unchanged)



After opening original marks, we can save original marks as other filenames. Also, After permuting marks, we can save permuted marks as other filenames

## 5. Embed

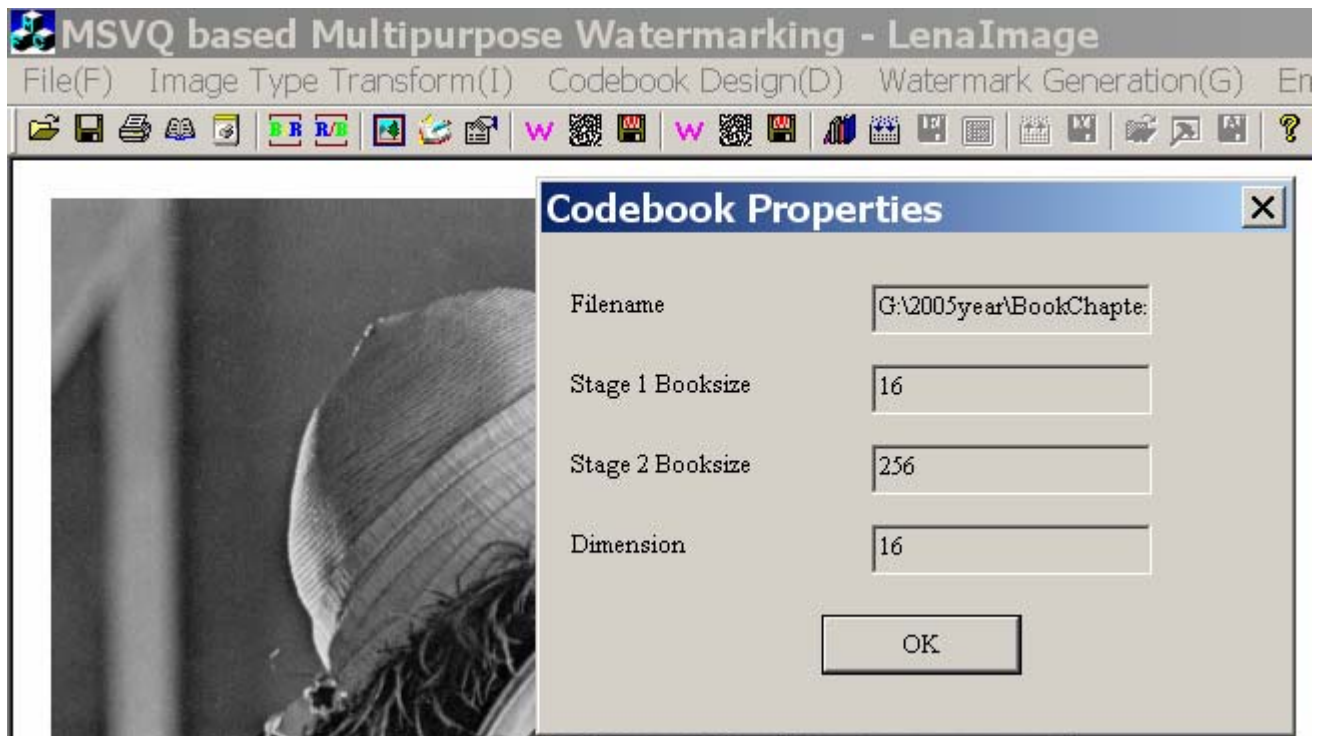
### 5.1 Select Codebook



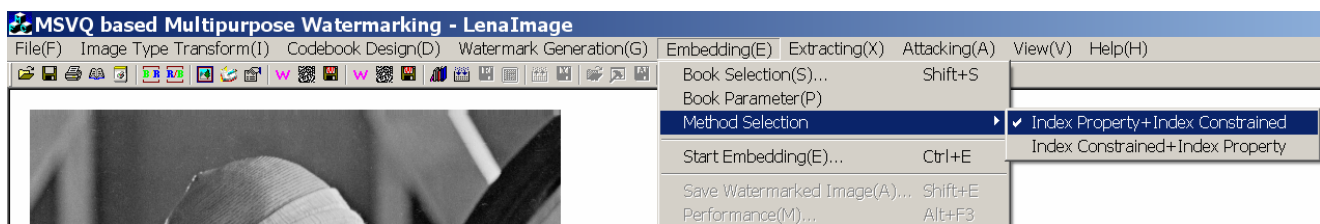
Then we can view the book parameters







## 5.2 Select Embedding Sequence

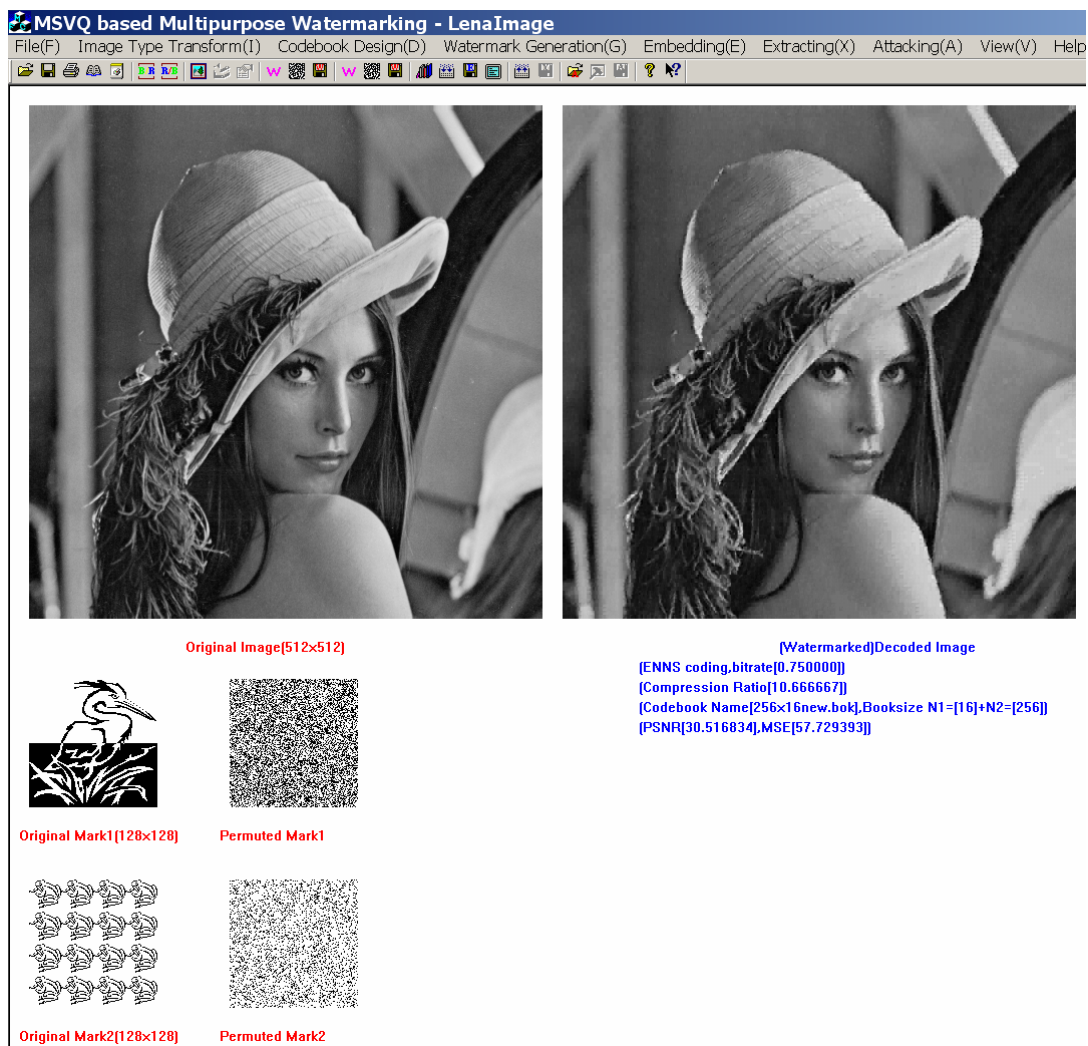


## 5.3 Start Embedding



Wait some time, maybe one to ten minutes(based on the computers' speed)





Then we can save the watermarked image

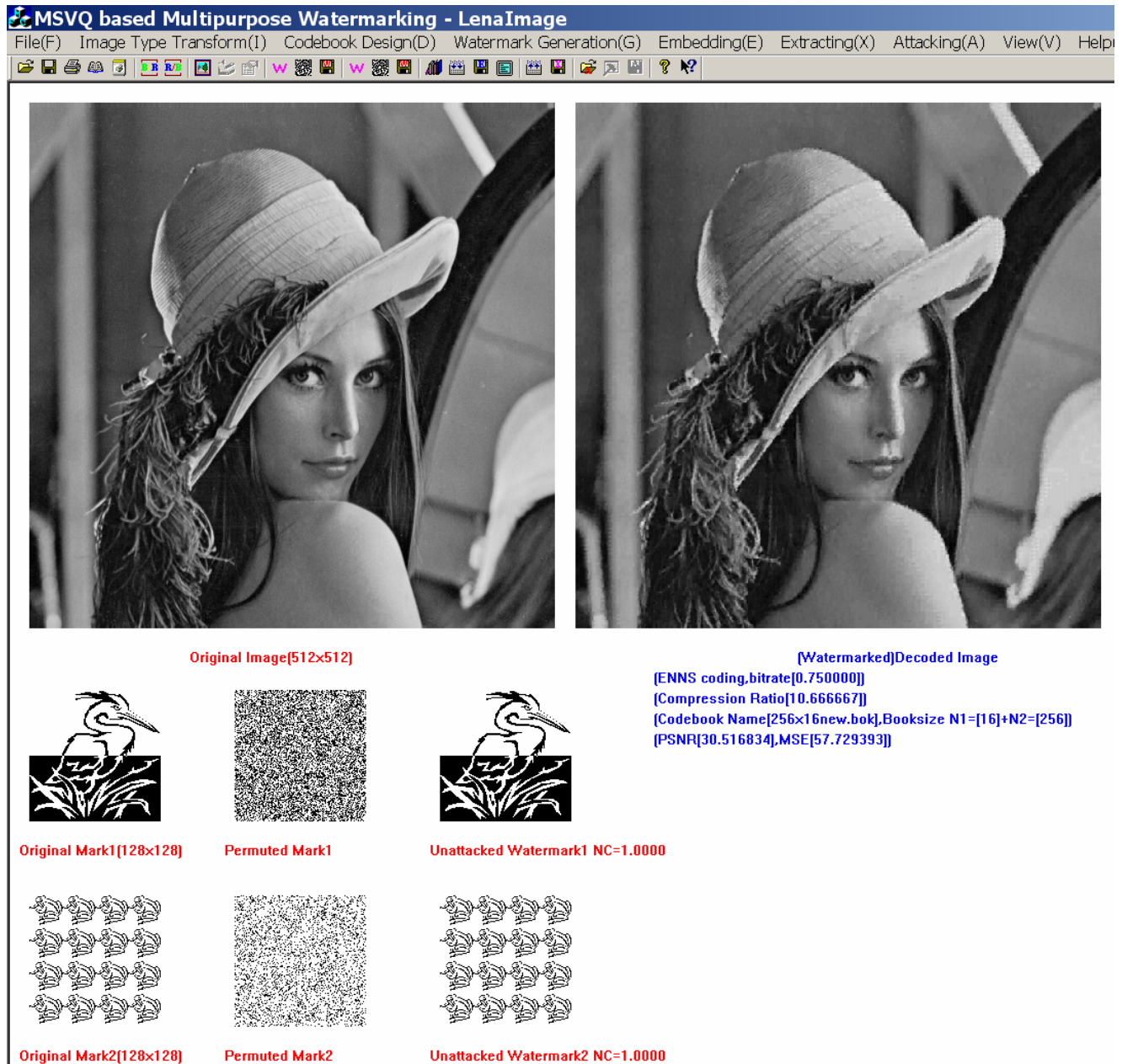




## 6. Extraction without attacks



Wait some time, maybe one to ten minutes(based on the computers' speed)



Then we can save the extracted two watermarks

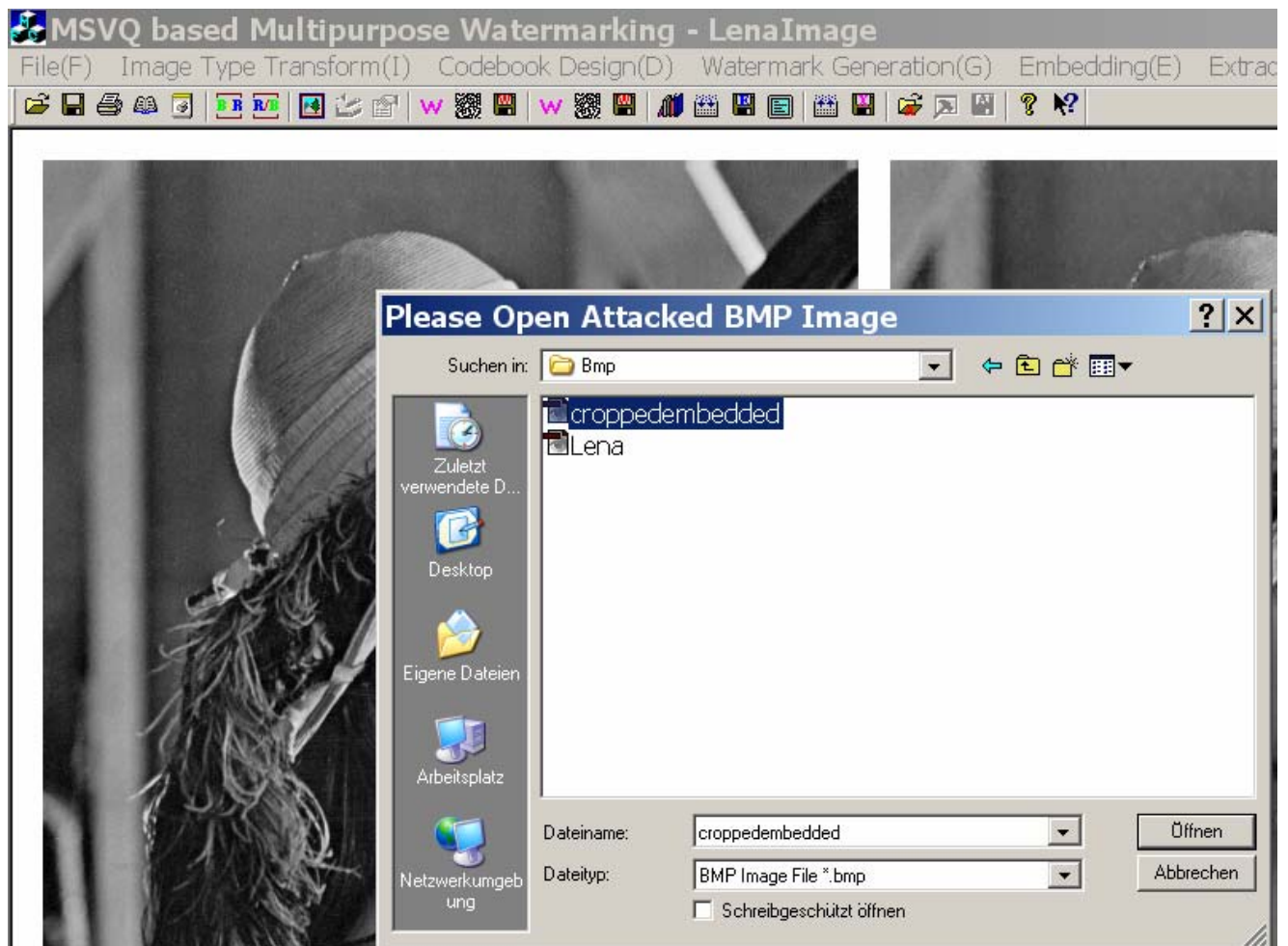


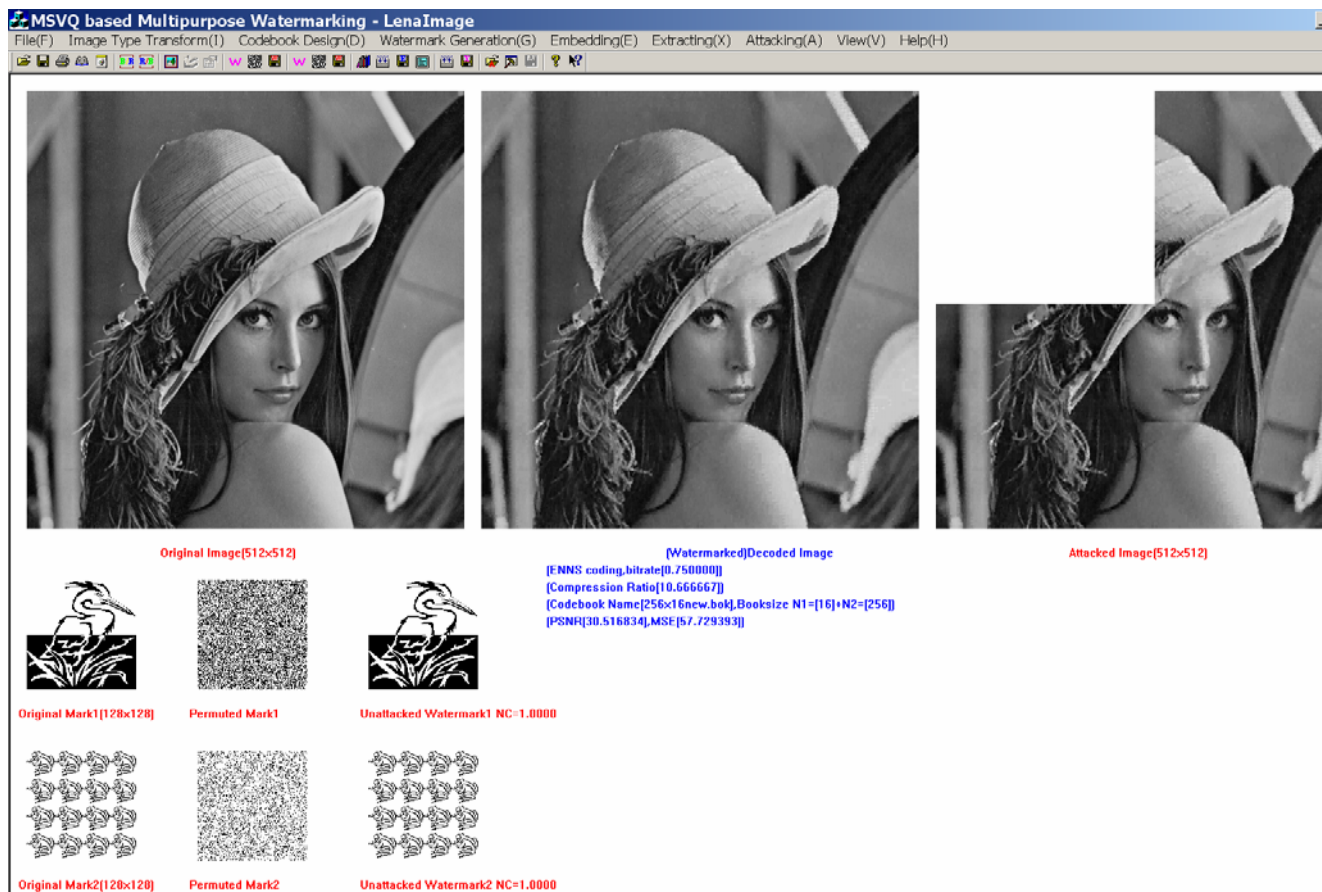
## 7. Extraction with Attacks

Assume the watermarked image has been attacked by image cropping

7.1 Then we can open this attacked image

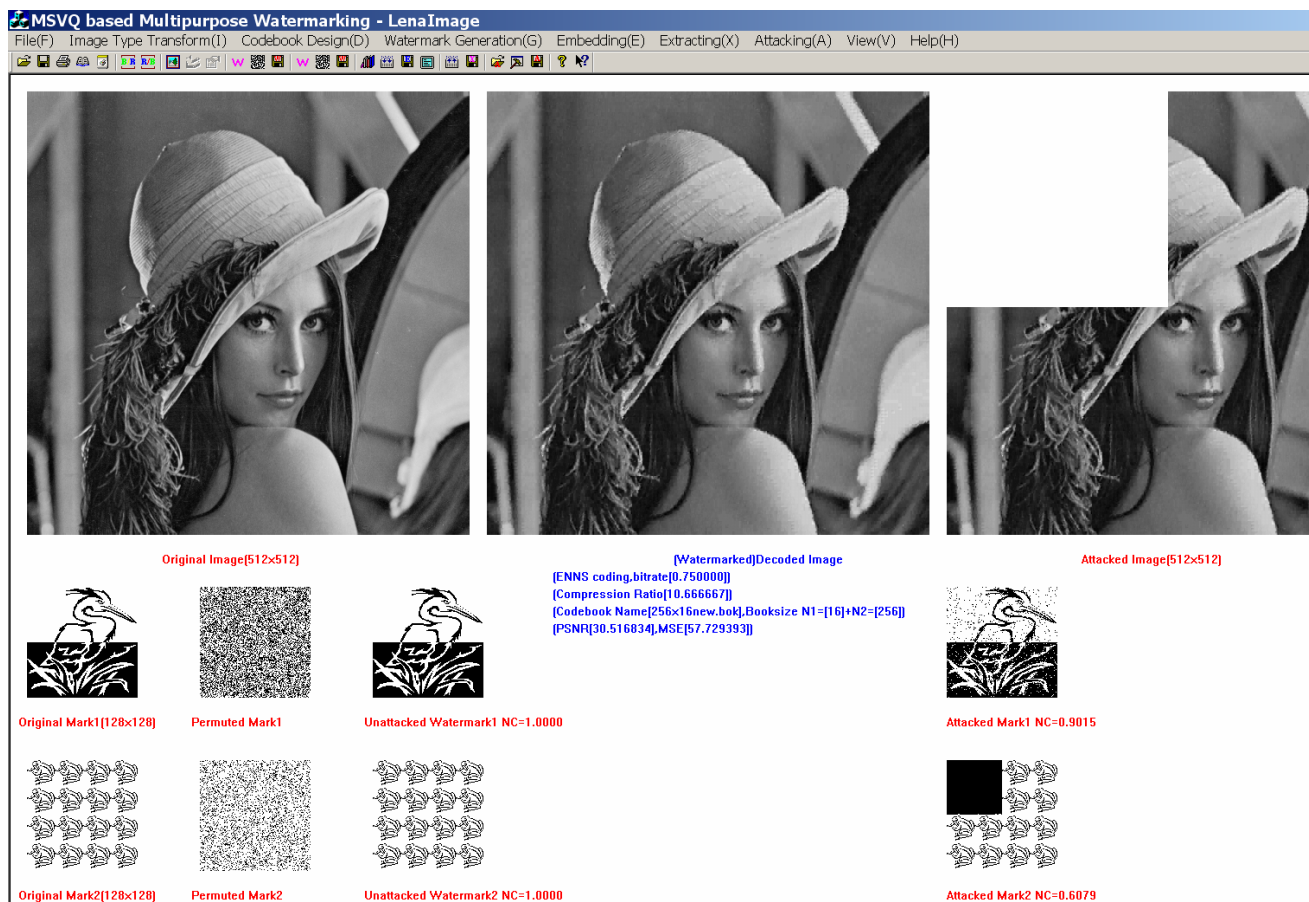






## 7.2 Extraction





Then we can save the extracted mark

