

# **USC-SIPI REPORT #244**

**The USC-SIPI Image Data Base: Version 4**

**by**

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**November 1993**

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# The USC-SIPI Image Database

## Introduction

The USC-SIPI image database is maintained primarily to support research in image processing, image analysis, and machine vision. The database is divided into volumes based on the basic character of the pictures. Images in each volume are of various sizes such as 256×256 pixels, 512×512 pixels, or 1024×1024 pixels. All images are 8-bits/pixel for black and white images, 24-bits/pixel for color images. The following volumes are currently available:

<b>Textures</b>	154 monochrome images 129 512×512, 25 1024×1024.
<b>Aerials</b>	38 images (37 color, 1 monochrome) 12 512×512, 24 1024×1024.
<b>Miscellaneous</b>	40 images (16 color, 24 monochrome) 14 256×256, 22 512×512, 4 1024×1024.
<b>Sequences</b>	69 monochrome images: 3 sequences of 16, 32, and 11 256×256 images, 1 sequence of 10 512×512 images.

The database may be purchased in its entirety or by individual volume. Random images are not available due to the time and effort involved for extraction. The database is copyrighted and may only be used by the original purchaser.

## Data Format

**Note:** It is the database purchaser's responsibility to figure out how to read the images into whatever computer they will be using, and how to access the files from within application programs. USC-SIPI does not have the resources to provide assistance in these areas. If you are in doubt about whether or not you will be able to read the images on your computer, please check with your system managers and show them the following description of the tape and image formats.

Copies of the SIPI image database are only supplied on computer-compatible magnetic tape. The normal tape format used is the Unix "tar" format. The preferred media at this time is either 8mm or 4mm DAT (DDS) cartridges since this allows the entire database to be on one cartridge. The database can also be distributed on 9-track, 1/2 inch, 6250bpi tape, SUN 150mb cartridges (QIC-150) or Hewlett-Packard 133mb cartridges (HP 9145). Customers who select a media that forces splitting a volume onto more than one tape will be charged extra. Other medias and formats may be available for a higher fee. Contact USC-SIPI for more information.

The file format used is the simplest possible in hopes that this will make it easy to convert the images to whatever format is eventually used. The images are stored in a raw binary format with no

header or other information. The data is stored in a left to right, top to bottom sequence with one byte for each image pixel. For example, in a 512×512 image file, the first 512 bytes is the first line of the image (left to right), the second 512 bytes is the second line, etc. The last 512 bytes is the last line of the image. The number of bytes in the file is equal to the number of rows times the number of columns. Images that are 24-bit color have the red, green, and blue components stored as three separate files. Each byte in an image file contains the brightness value of one pixel. The pixel brightness is an eight-bit, unsigned, binary quantity where zero is black and 255 is full brightness.

Users of the database images should be aware that a few of the images have a few blank or otherwise incorrect lines at the top or bottom or sides of the images due to the scanning process. These generally do not extend more than one or two pixels into the image area. In addition, in some of the images the outer portions of the scanned area contains elements from the borders of the film such as 35mm sprocket holes, alignment marks, etc.

Most of the images in the database were scanned over a period of several years, usually by graduate students at USC-SIPI. Some of the older images in the Miscellaneous and Sequences volumes were scanned with a Muirhead scanner which no longer exists. The Textures and Aerials volumes, and the newer images in the Miscellaneous and Sequences volumes were scanned with a Optronics C-4100HS drum scanner. For the most part, there is very little additional technical information available about the images, such as scanning resolution, etc. If you have questions about the scanning process or need other information about the images, please contact us at telephone number (213) 740-4147, Internet: [sipi@usc.edu](mailto:sipi@usc.edu).

## Ordering Information

Price information is available from USC-SIPI at the address shown below or telephone (213) 740-4145. To order part or all of the USC-SIPI image database, send purchase orders or checks to:

Laboratory Accountant  
Signal and Image Processing Institute  
University of Southern California  
3740 McClintock Ave., Room 404  
Los Angeles, California 90089-2564

Checks should be payable to the Signal and Image Processing Institute.

**Note:** Shipping charges and sales taxes (if applicable) will be added to prices.

It is the policy of USC-SIPI that all foreign orders must be pre-paid in full, including shipping costs, before the order can be processed. Amounts under \$100 must be paid with a check drawn on a U.S. bank. Orders of \$100 or more may be paid with a check from a non-U.S. bank.

# Table of Contents

The following pages list the contents of all volumes in the database. Each image in the table of contents is listed along with the following information:

**File name:** This is the name of the image file. Many of the images have numerical file names due to an identification scheme used in an earlier version of the database. Images that are 24-bit color have the red, green, and blue components stored as three separate files with filename extensions of “.red”, “.grn”, and “.blu”.

**Image description:** A brief description of the image contents.

**Image size:** This is the image size in pixels. All images are square unless indicated otherwise.

**Color/Mono:** Indicates whether the image is a 24-bit color image or an 8-bit monochrome image.

Following the table of contents are reproductions of most of the images in the database. For the color images, the reproductions use either one of the three (red, green, or blue) components of the image, or a monochrome image created by combining the three color components, whichever gave the best appearance in the reproduction. Some of the reproductions have been cropped slightly to remove extraneous portions of the image, such as sprocket holes and blank scan lines or columns.

## Volume 1. — TEXTURES

<u>Name</u>	<u>Description</u>	<u>Size</u>	<u>Color/Mono</u>
1.1.01	Brodatz - Grass (D9)	512	Mono
1.1.02	Brodatz - Bark (D12)	512	Mono
1.1.03	Brodatz - Straw (D15)	512	Mono
1.1.04	Brodatz - Herringbone weave (D15)	512	Mono
1.1.05	Brodatz - Woolen cloth (D19)	512	Mono
1.1.06	Brodatz - Pressed calf leather (D24)	512	Mono
1.1.07	Brodatz - Beach sand (D29)	512	Mono
1.1.08	Brodatz - Water (D38)	512	Mono
1.1.09	Brodatz - Wood grain (D68)	512	Mono
1.1.10	Brodatz - Raffia (D84)	512	Mono
1.1.11	Brodatz - Pigskin (D92)	512	Mono
1.1.12	Brodatz - Brick wall (D94)	512	Mono
1.1.13	Brodatz - Plastic bubbles (D112)	512	Mono
1.2.01	Brodatz - Grass (D9) *	512	Mono
1.2.02	Brodatz - Bark (D12) *	512	Mono
1.2.03	Brodatz - Straw (D15) *	512	Mono
1.2.04	Brodatz - Herringbone weave (D16) *	512	Mono
1.2.05	Brodatz - Woolen cloth (D19) *	512	Mono
1.2.06	Brodatz - Pressed calf leather (D24) *	512	Mono
1.2.07	Brodatz - Beach sand (D29) *	512	Mono
1.2.08	Brodatz - Water (D38) *	512	Mono
1.2.09	Brodatz - Wood grain (D68) *	512	Mono
1.2.10	Brodatz - Raffia (D84) *	512	Mono
1.2.11	Brodatz - Pigskin (D92) *	512	Mono
1.2.12	Brodatz - Brick wall (D94) *	512	Mono
1.2.13	Brodatz - Plastic bubbles (D112) *	512	Mono
1.3.01	Brodatz - Grass (D9)	1024	Mono
1.3.02	Brodatz - Bark (D12)	1024	Mono
1.3.03	Brodatz - Straw (D15)	1024	Mono
1.3.04	Brodatz - Woolen cloth (D19)	1024	Mono
1.3.05	Brodatz - Herringbone weave (D16)	1024	Mono
1.3.06	Brodatz - Pressed calf leather (D24)	1024	Mono
1.3.07	Brodatz - Beach sand (D29)	1024	Mono
1.3.08	Brodatz - Water (D38)	1024	Mono
1.3.09	Brodatz - Wood grain (D68)	1024	Mono
1.3.10	Brodatz - Raffia (D84)	1024	Mono
1.3.11	Brodatz - Pigskin (D92)	1024	Mono
1.3.12	Brodatz - Brick wall (D94)	1024	Mono
1.3.13	Brodatz - Plastic bubbles (D112)	1024	Mono

For the Brodatz texture images, the number in parenthesis (i.e. D12) is the page number in the Brodatz texture book that the image came from (P. Brodatz, *Textures: A Photographic Album for Artists and Designers*, Dover Publications, New York, 1966).

\* Images 1.2.01 through 1.2.13 are histogram equalized versions of 1.1.01 through 1.1.13

## Volume 1. — TEXTURES (continued)

<u>Name</u>	<u>Description</u>	<u>Size</u>	<u>Color/Mono</u>
1.4.01	Brick wall	1024	Mono
1.4.02	Wood shingle roof	1024	Mono
1.4.03	Wood shingle roof	1024	Mono
1.4.04	Brick wall	1024	Mono
1.4.05	Tile roof	1024	Mono
1.4.06	Wood fence	1024	Mono
1.4.07	Metal grates	1024	Mono
1.4.08	Brick wall	1024	Mono
1.4.09	Brick wall	1024	Mono
1.4.10	Grass	1024	Mono
1.4.11	Sand	1024	Mono
1.4.12	Sand	1024	Mono
1.5.01	Brick wall	512	Mono
1.5.02	Hexagonal hole array	512	Mono
1.5.03	Rough wall	512	Mono
1.5.04	Sand	512	Mono
1.5.05	Gravel	512	Mono
1.5.06	Brick wall	512	Mono
1.5.07	Grass	512	Mono
rotate/bark	Bark (D12), 7 rotations	512	Mono
rotate/brick	Brick (D94), 7 rotations	512	Mono
rotate/bubbles	Bubbles (D112), 7 rotations	512	Mono
rotate/grass	Grass (D9), 7 rotations	512	Mono
rotate/leather	Leather (D24), 7 rotations	512	Mono
rotate/pigskin	Pigskin (D92), 7 rotations	512	Mono
rotate/raffia	Raffia (D84), 7 rotations	512	Mono
rotate/sand	Sand (D29), 7 rotations	512	Mono
rotate/straw	Straw (D15), 7 rotations	512	Mono
rotate/water	Water (D38), 7 rotations	512	Mono
rotate/weave	Weave (D16), 7 rotations	512	Mono
rotate/wood	Wood (D68), 7 rotations	512	Mono
rotate/wool	Wool (D19), 7 rotations	512	Mono
texmos1.p512	USC texture mosaic #1	512	Mono
texmos2.p512	USC texture mosaic #2	512	Mono
texmos2.s512	USC texture mosaic #2 (info)	512	Mono
texmos3.p512	USC texture mosaic #3	512	Mono
texmos3.s512	USC texture mosaic #3 (info)	512	Mono

The “rotate” subdirectory contains thirteen Brodatz textures digitized at seven different rotation angles: 0, 30, 60, 90, 120, 150, and 200 degrees (total of 91 images).

The texture mosaics (texmos1, texmos2, and texmos3) are mosaics of eight Brodatz textures for use in image texture segmentation research. The files texmos2.s512 and texmos3.s512 are images showing which pixels are from which textures in the corresponding mosaics.

## Volume 2. — AERIALS

<u>Name</u>	<u>Description</u>	<u>Size</u>	<u>Color/Mono</u>
2.1.01	San Diego, CA (Miramar NAS)	512	Color
2.1.02	San Diego, CA	512	Color
2.1.03	San Francisco, CA (Golden Gate)	512	Color
2.1.04	Oakland, CA	512	Color
2.1.05	San Diego, CA (North Island NAS)	512	Color
2.1.06	Woodland Hills, CA	512	Color
2.1.07	Foster City, CA	512	Color
2.1.08	San Diego, CA	512	Color
2.1.09	San Diego, CA (Point Loma)	512	Color
2.1.10	San Diego, CA (Shelter Island)	512	Color
2.1.11	Earth from space	512	Color
2.1.12	San Diego, CA (Downtown)	512	Color
2.2.01	San Diego, CA	1024	Color
2.2.02	San Diego, CA	1024	Color
2.2.03	San Diego, CA	1024	Color
2.2.04	Richmond, CA	1024	Color
2.2.05	San Diego, CA (Miramar NAS)	1024	Color
2.2.06	San Francisco, CA (Bay Bridge)	1024	Color
2.2.07	Oakland, CA	1024	Color
2.2.08	San Diego, CA	1024	Color
2.2.09	San Francisco, CA	1024	Color
2.2.10	Richmond and San Rafael, CA	1024	Color
2.2.11	Stockton, CA	1024	Color
2.2.12	San Francisco and Oakland, CA	1024	Color
2.2.13	Stockton, CA	1024	Color
2.2.14	Shreveport, LA	1024	Color
2.2.15	San Francisco, CA	1024	Color
2.2.16	San Francisco, CA	1024	Color
2.2.17	San Francisco, CA	1024	Color
2.2.18	Stockton, CA	1024	Color
2.2.19	Stockton, CA	1024	Color
2.2.20	Stockton, CA	1024	Color
2.2.21	San Francisco, CA	1024	Color
2.2.22	San Francisco and Oakland, CA	1024	Color
2.2.23	San Diego, CA	1024	Color
2.2.24	Stockton, CA	1024	Color
3.2.25	Pentagon building	1024	Mono
wash-ir	Washington, D.C. (infra-red)	2250	Color

## Volume 3. — MISCELLANEOUS

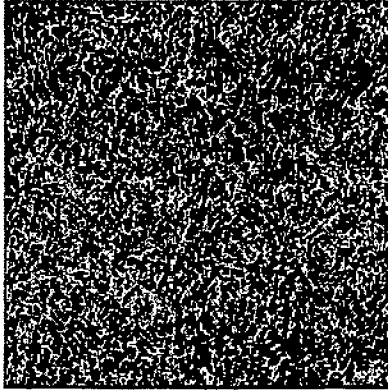
<u>Name</u>	<u>Description</u>	<u>Size</u>	<u>Color/Mono</u>
4.1.01	Girl	256	Color
4.1.02	Couple	256	Color
4.1.03	Girl	256	Color
4.1.04	Girl	256	Color
4.1.05	House	256	Color
4.1.06	Tree	256	Color
4.1.07	Jelly beans	256	Color
4.1.08	Jelly beans	256	Color
4.2.01	Splash	512	Color
4.2.02	Girl (Tiffany)	512	Color
4.2.03	Baboon	512	Color
4.2.04	Girl (Lenna)	512	Color
4.2.05	Airplane (F-16)	512	Color
4.2.06	Sailboat on lake	512	Color
4.2.07	Peppers	512	Color
5.1.09	Moon surface	256	Mono
5.1.10	Aerial	256	Mono
5.1.11	Airplane	256	Mono
5.1.12	Clock	256	Mono
5.1.13	Resolution chart	256	Mono
5.1.14	Chemical plant	256	Mono
5.2.08	Couple	512	Mono
5.2.09	Aerial	512	Mono
5.2.10	Stream and bridge (only 64 gray levels)	512	Mono
5.3.01	Man	1024	Mono
5.3.02	Airport	1024	Mono
7.1.01	Truck	512	Mono
7.1.02	Airplane	512	Mono
7.1.03	Tank	512	Mono
7.1.04	Car and APCs	512	Mono
7.1.05	Truck and APCs	512	Mono
7.1.06	Truck and APCs	512	Mono
7.1.07	Tank	512	Mono
7.1.08	APC	512	Mono
7.1.09	Tank	512	Mono
7.1.10	Car and APCs	512	Mono
7.2.01	Airplane (U-2)	1024	Mono
boat.512	Fishing Boat	512	Mono
elaine.512	Girl (Elaine)	512	Mono
house	House	512	Color
test/gray21.512	21 level step wedge	512	Mono
test/numbers.512	256 level test pattern	512	Mono
test/ruler.512	Pixel ruler	512	Mono
test/testpat.1k	General test pattern	1024	Mono



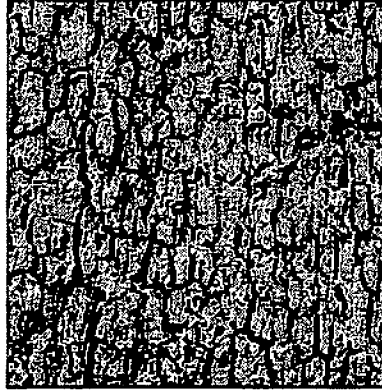
## Volume 4. — SEQUENCES

<u>Name</u>	<u>Description</u>	<u>Size</u>	<u>Frames</u>	<u>Color/Mono</u>
6.1	Walter Cronkite	256	16	Mono
6.2	Chemical plant (close view)	256	32	Mono
6.3	Chemical plant (far view)	256	11	Mono
motion	Toy vehicles	512	10	Mono

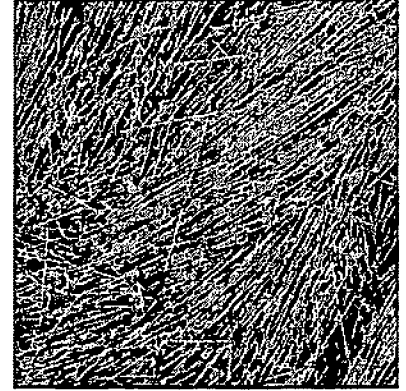
Volume 1: Textures - Brodatz textures, 512x512



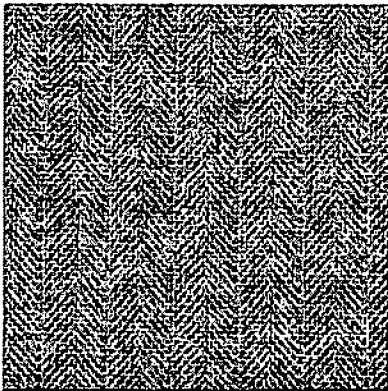
1.1.1



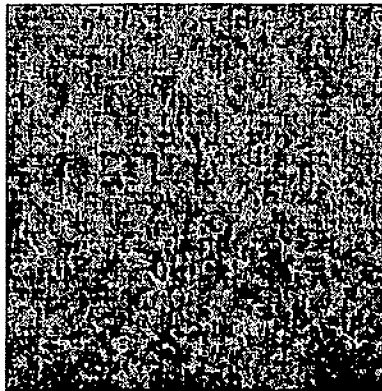
1.1.2



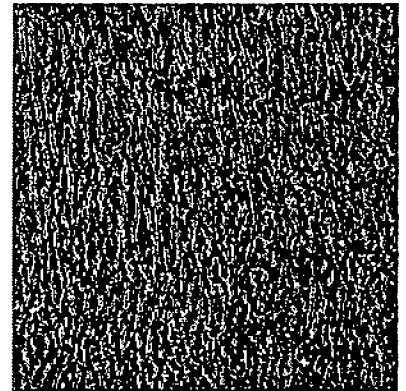
1.1.3



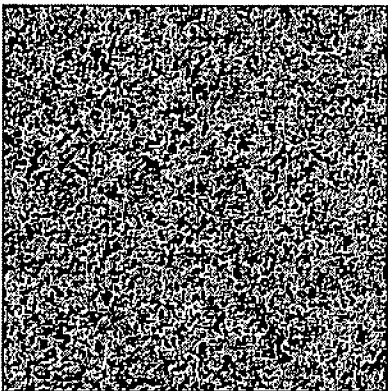
1.1.4



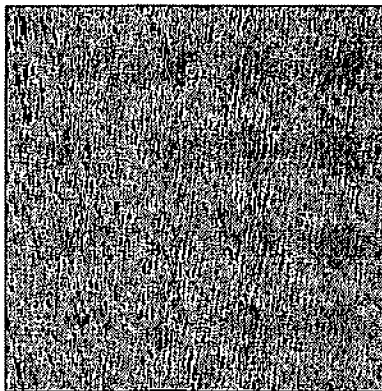
1.1.5



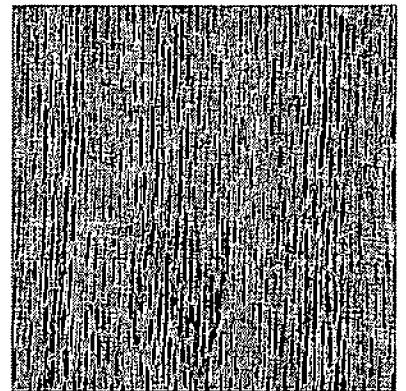
1.1.6



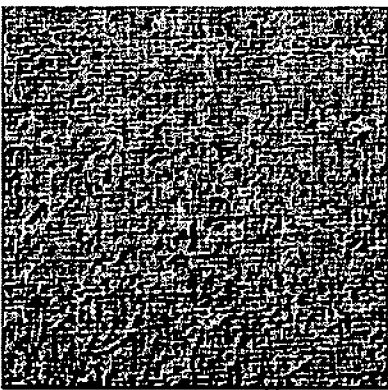
1.1.7



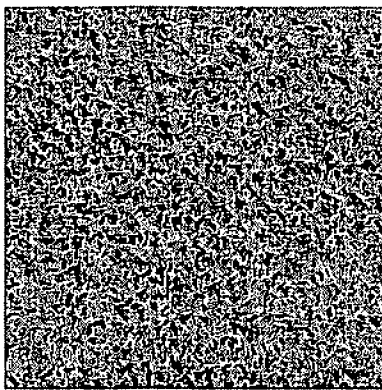
1.1.8



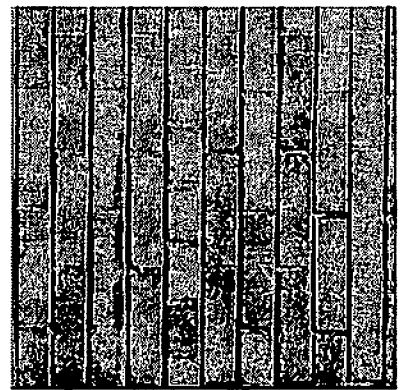
1.1.9



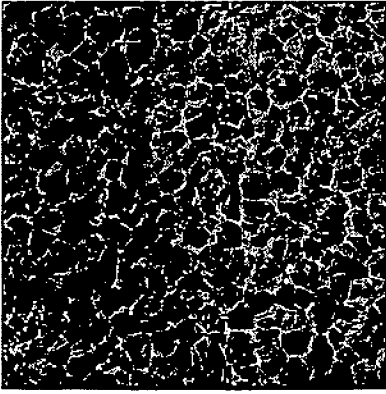
1.1.10



1.1.11

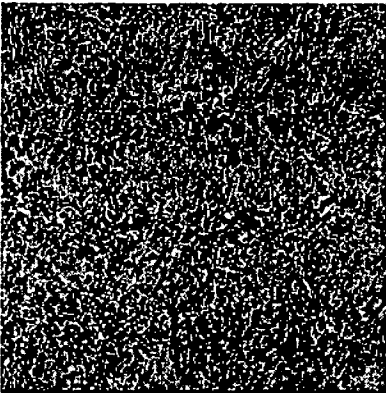


1.1.12

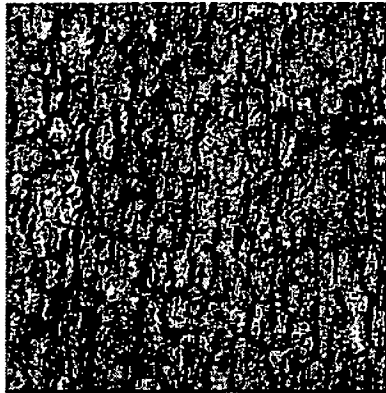


1.1.13

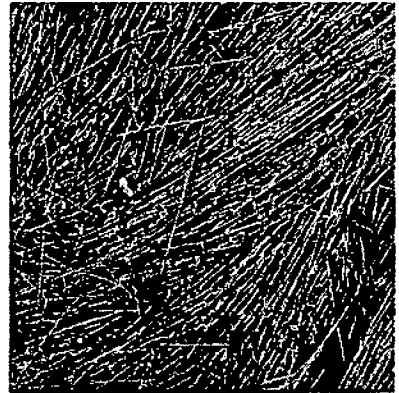
Volume 1: Textures - Brodatz textures, 512x512, histogram equalized



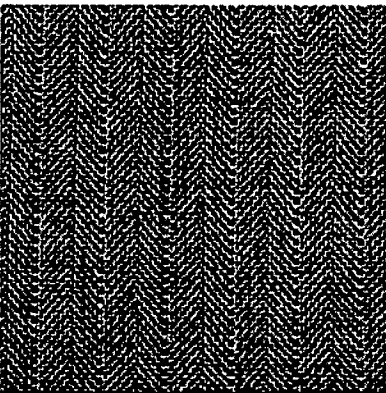
1.2.1



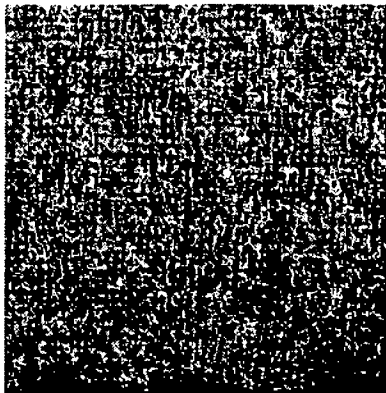
1.2.2



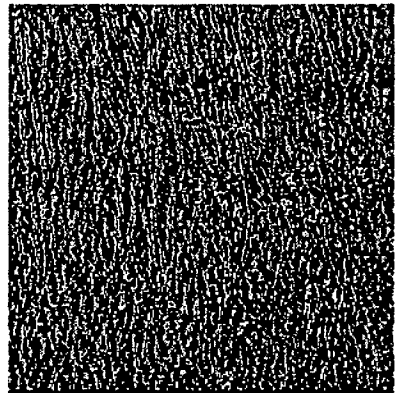
1.2.3



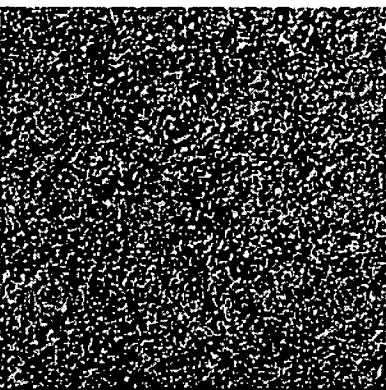
1.2.4



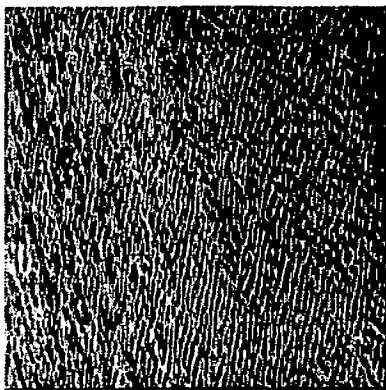
1.2.5



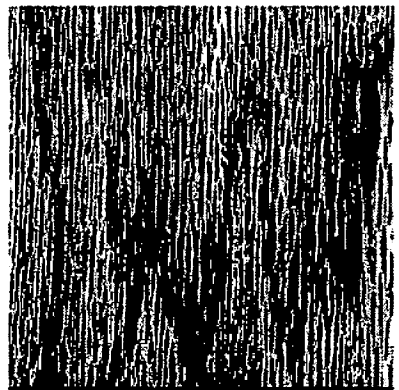
1.2.6



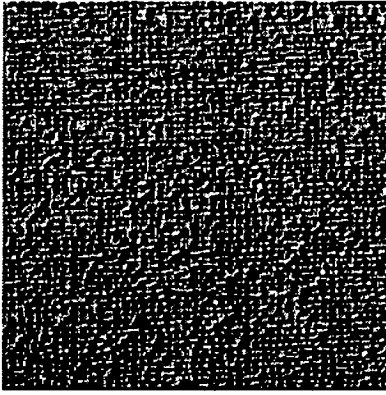
1.2.7



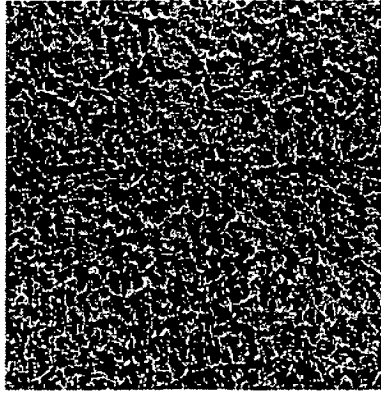
1.2.8



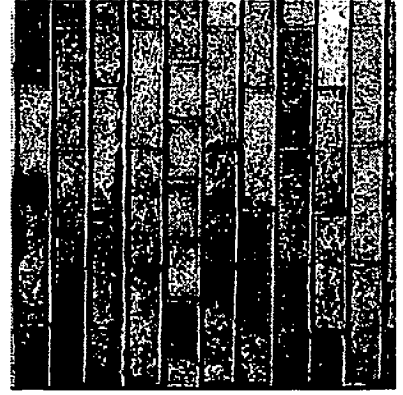
1.2.9



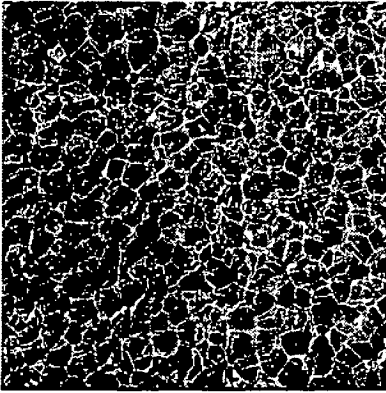
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1.2.11

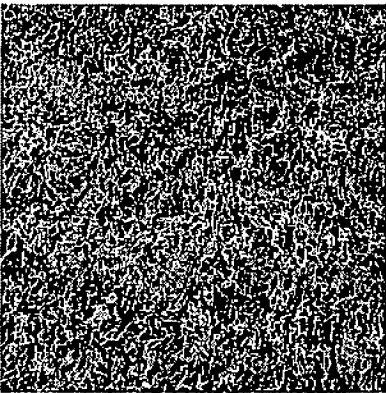


1.2.12

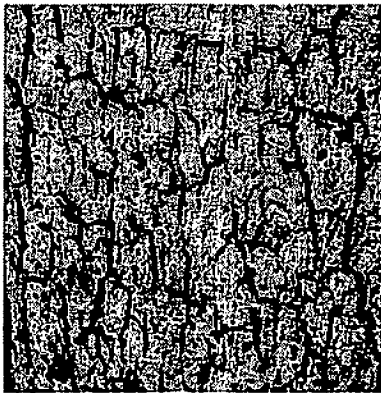


1.2.13

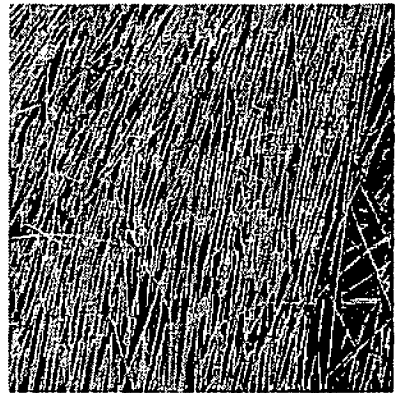
**Volume 1: Textures - Brodatz textures, 1024x1024**



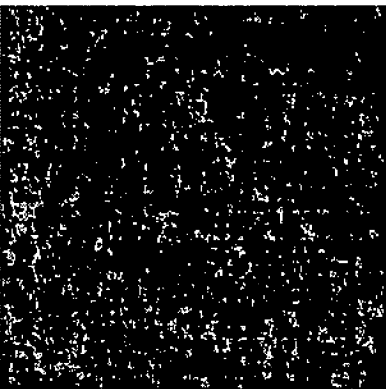
1.3.1



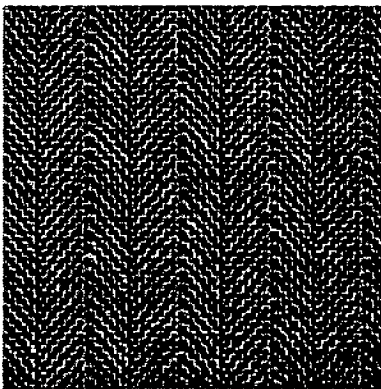
1.3.2



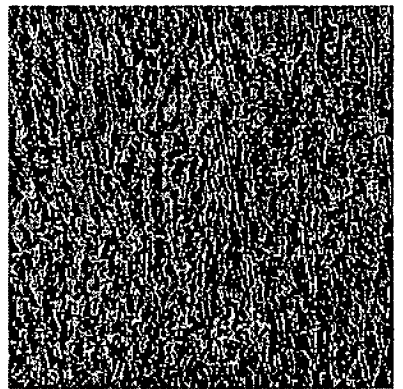
1.3.3



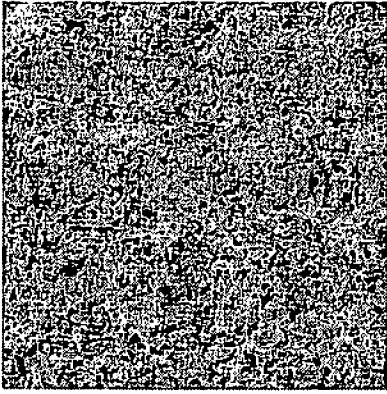
1.3.4



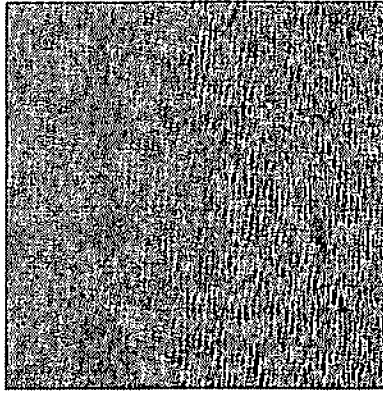
1.3.5



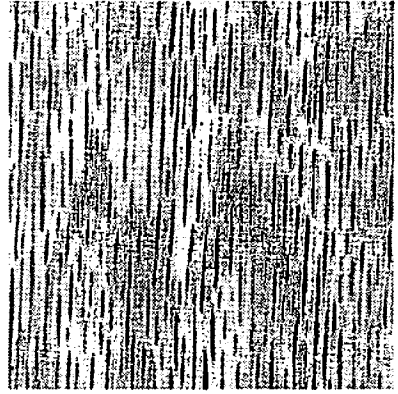
1.3.6



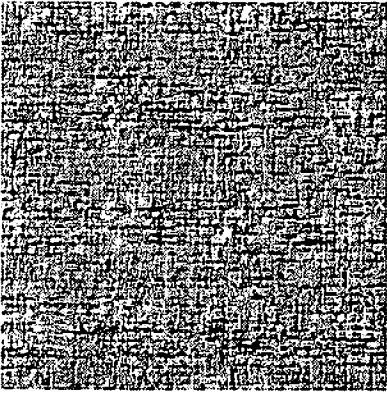
1.3.7



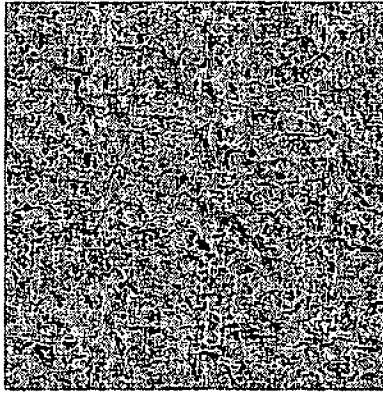
1.3.8



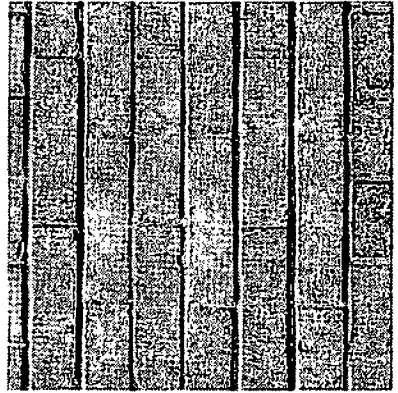
1.3.9



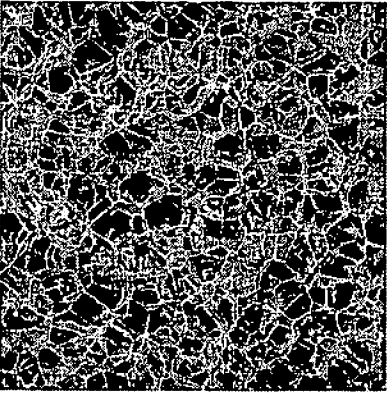
1.3.10



1.3.11

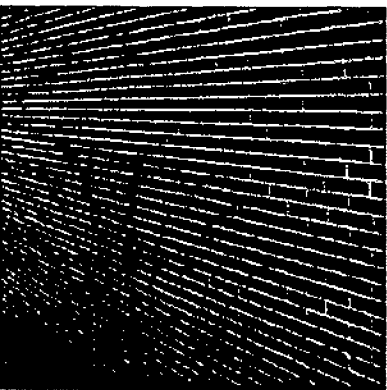


1.3.12

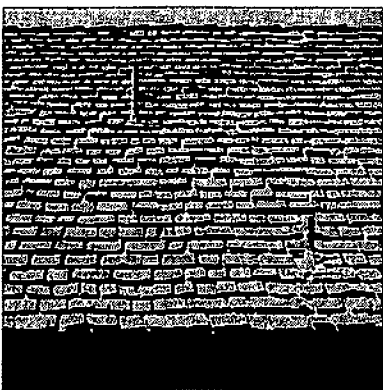


1.3.13

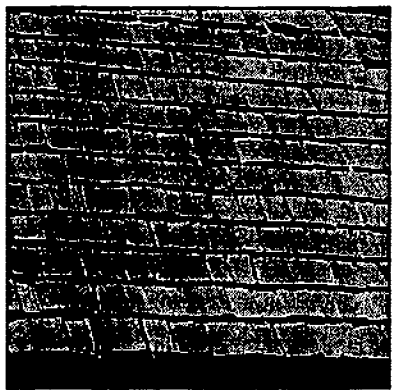
Volume 1: Textures - Miscellaneous textures, 1024x1024



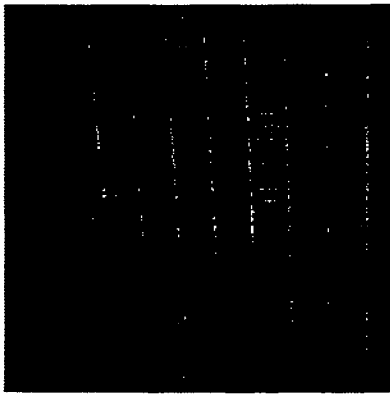
1.4.1



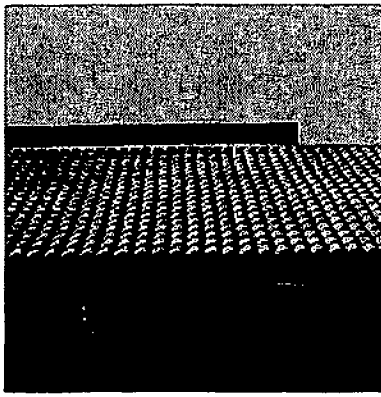
1.4.2



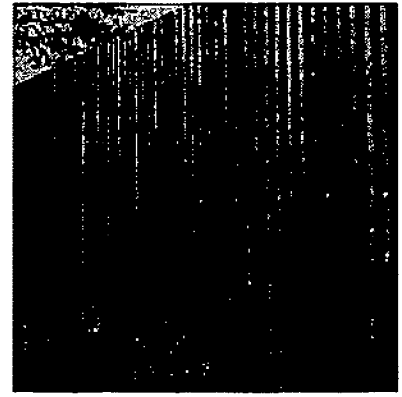
1.4.3



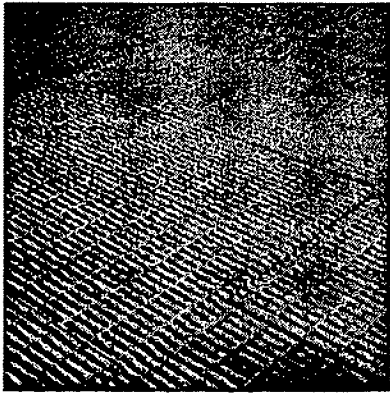
1.4.4



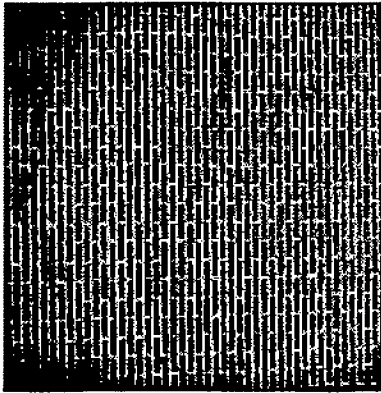
1.4.3



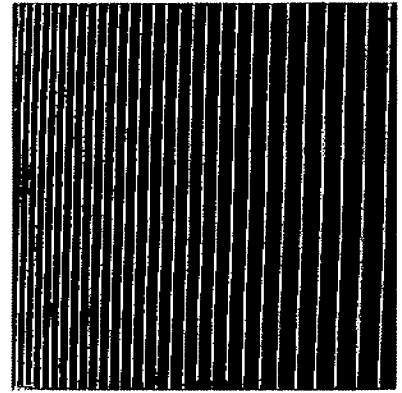
1.4.2



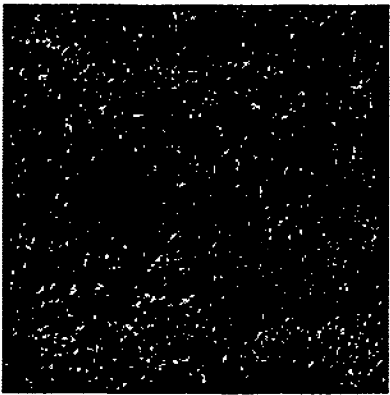
1.4.7



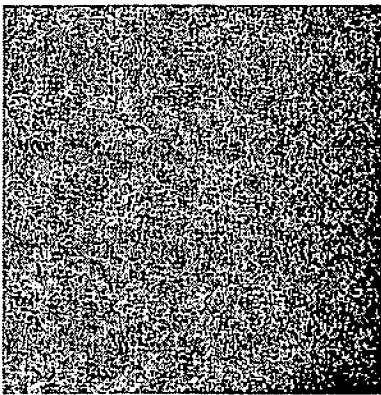
1.4.8



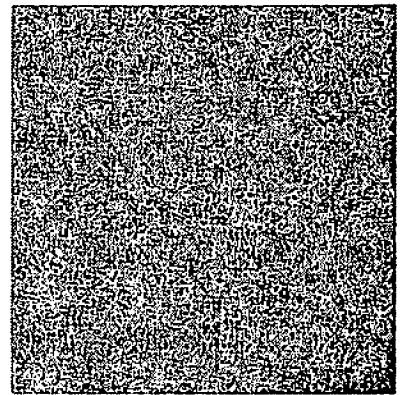
1.4.9



1.4.10

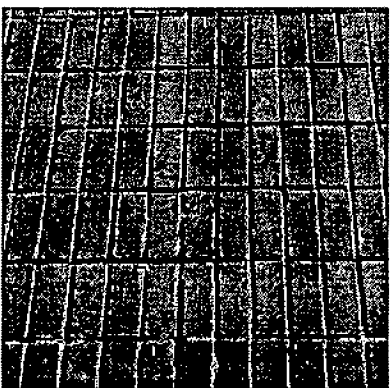


1.4.11

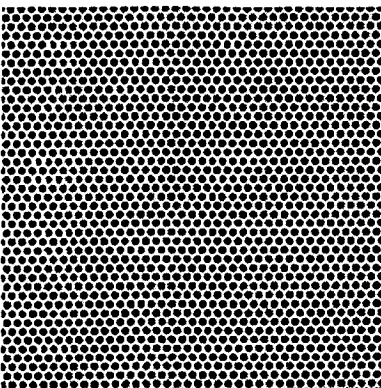


1.4.12

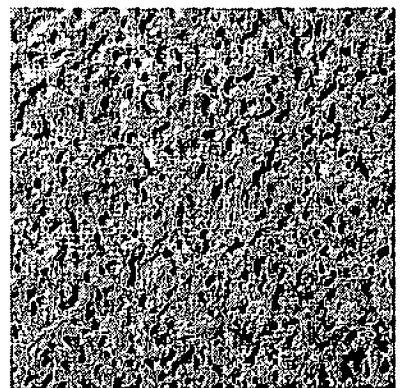
Volume 1: Textures - Miscellaneous textures, 512x512



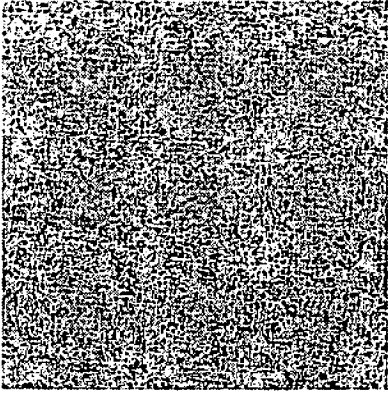
1.5.1



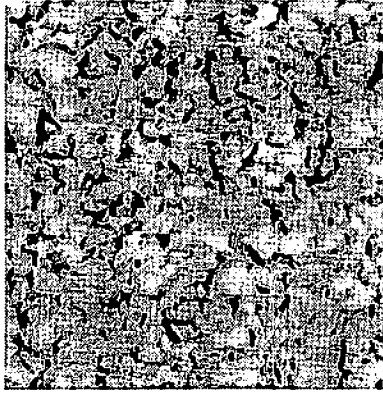
1.5.2



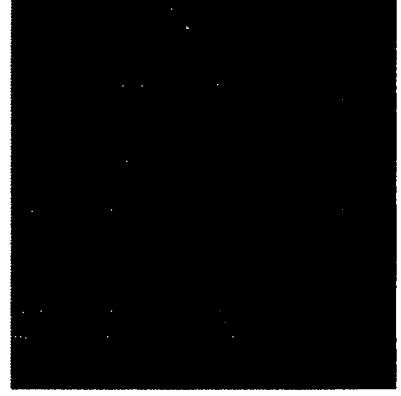
1.5.3



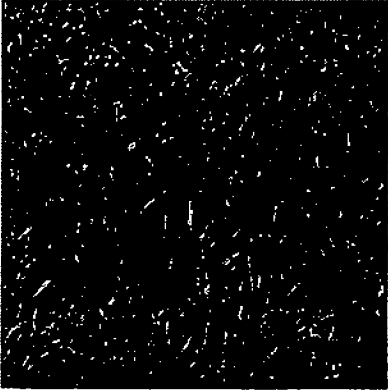
1.5.4



1.5.5

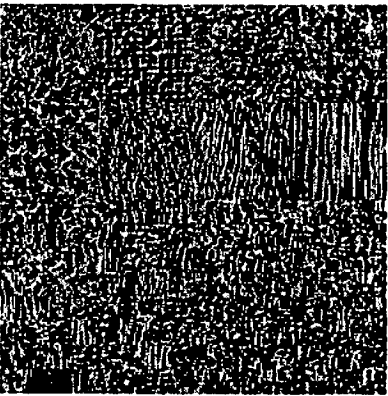


1.5.6

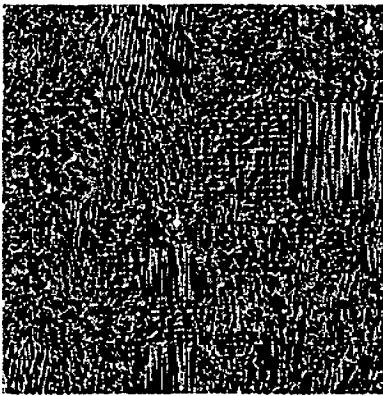


1.5.7

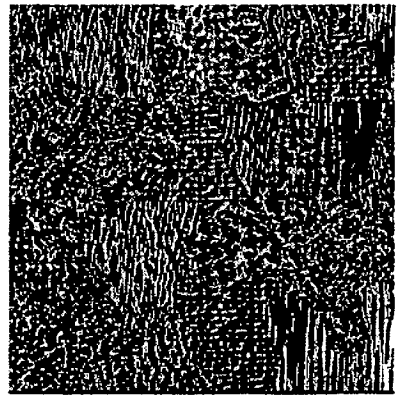
Volume 1: Textures - Texture mosaics, 512x512



texmos1

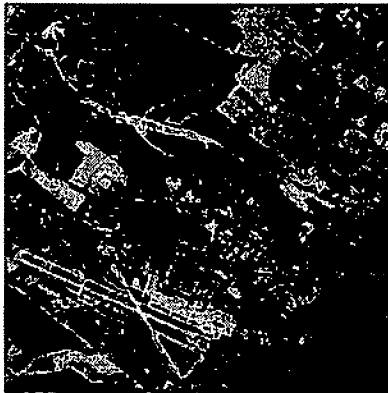


texmos2



texmos3

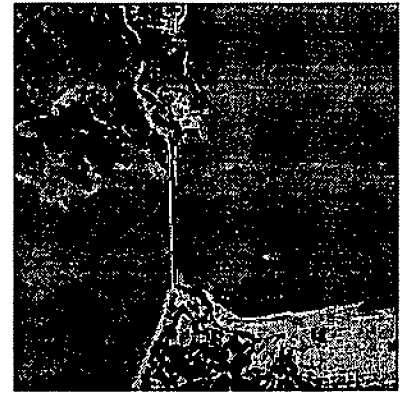
Volume 2: Aerials - Color, 512x512



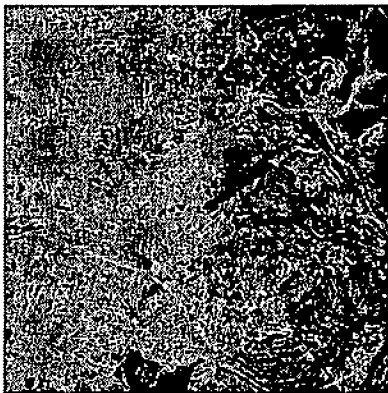
2.1.1



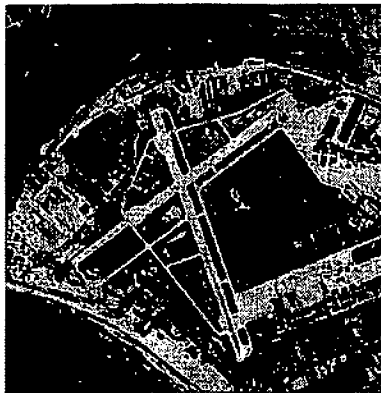
2.1.2



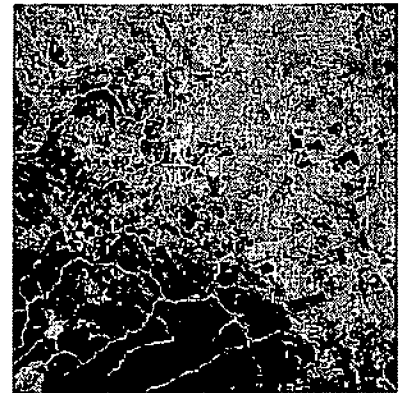
2.1.3



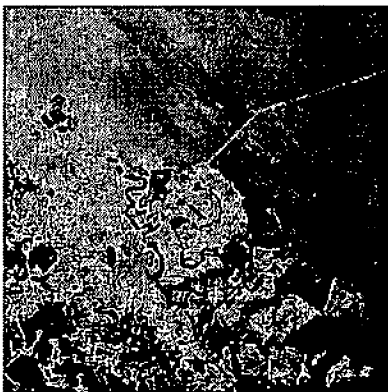
2.1.4



2.1.5



2.1.6



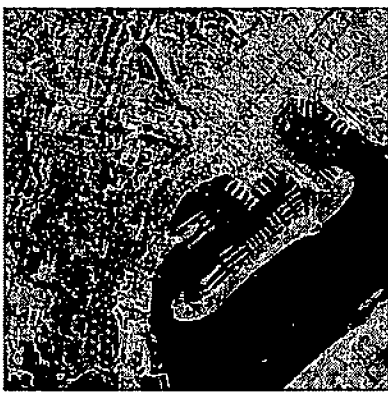
2.1.7



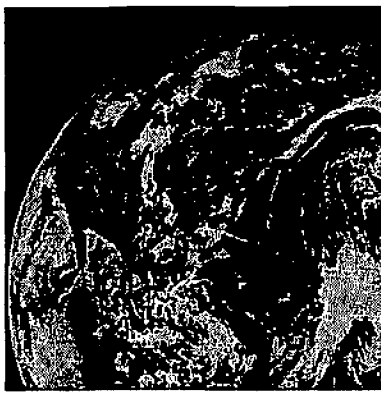
2.1.8



2.1.9



2.1.10



2.1.11



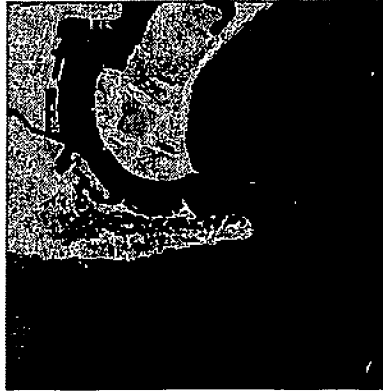
2.1.12



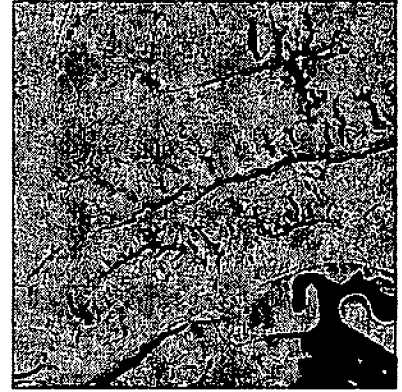
Volume 2: Aerials - Color, 1024x1024



2.2.1



2.2.2



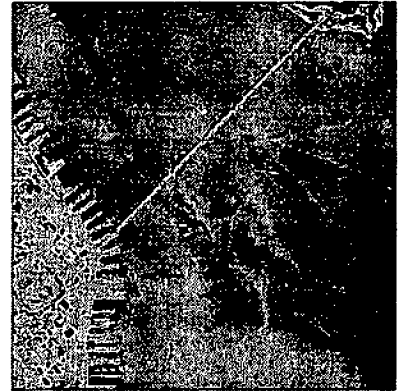
2.2.3



2.2.4



2.2.5



2.2.6



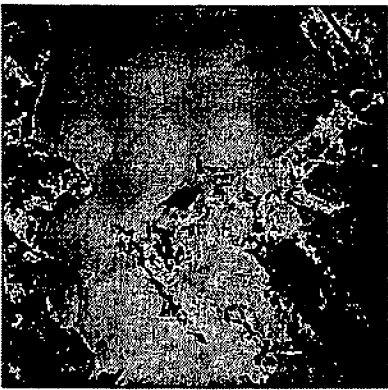
2.2.7



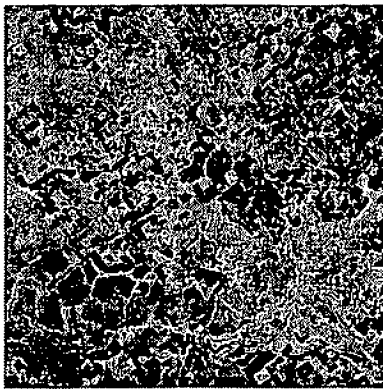
2.2.8



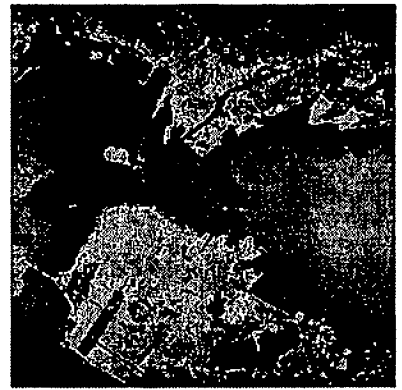
2.2.9



2.2.10

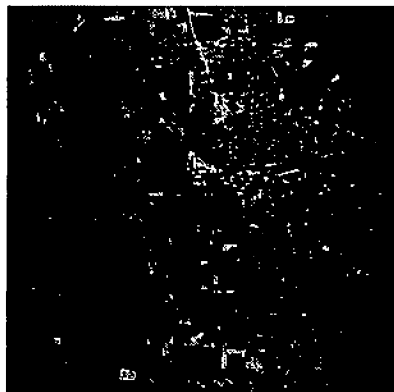


2.2.11

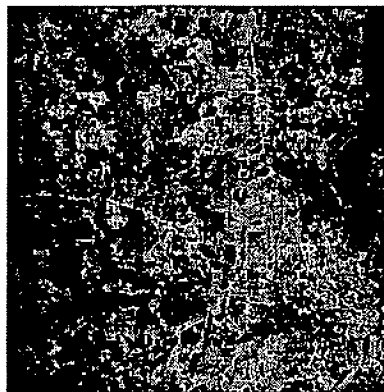


2.2.12

Volume 2: Aerials - Color, 1024x1024, continued



2.2.13



2.2.14



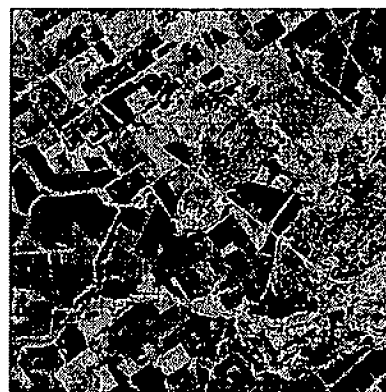
2.2.15



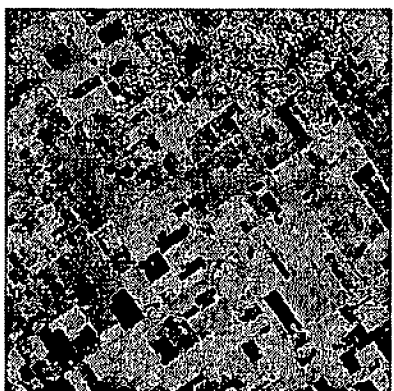
2.2.16



2.2.17



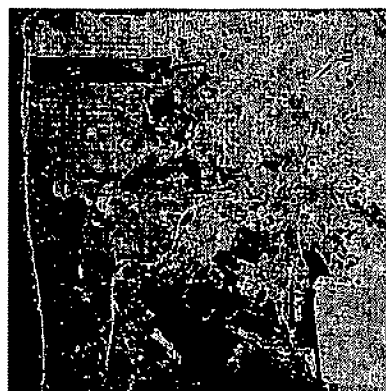
2.2.18



2.2.19



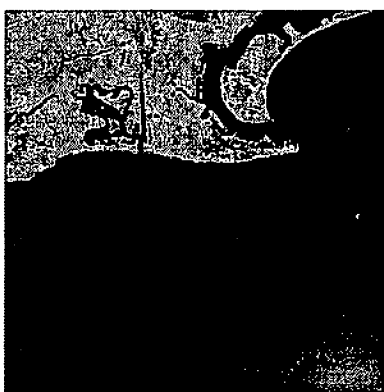
2.2.20



2.2.21



2.2.22

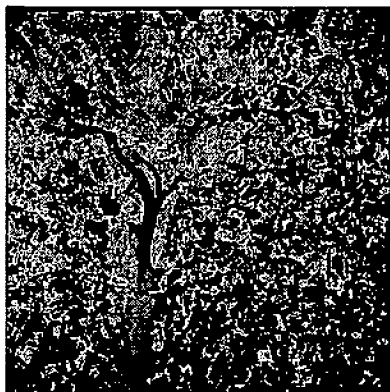


2.2.23



2.2.24

Volume 2: Aerials - Color, other sizes



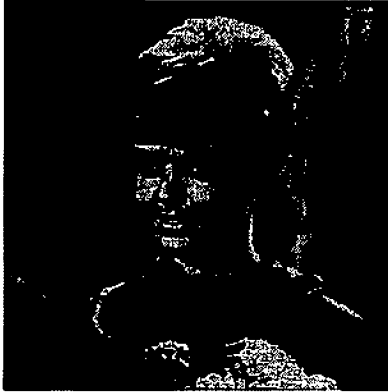
wash-ir (2250×2250)

Volume 2: Aerials - Monochrome, 1024×1024



3.2.25

Volume 3: Miscellaneous - Color, 256x256



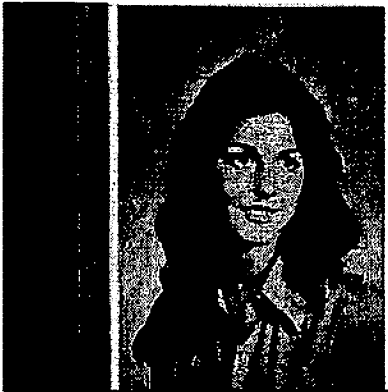
4.1.1



4.1.2



4.1.3



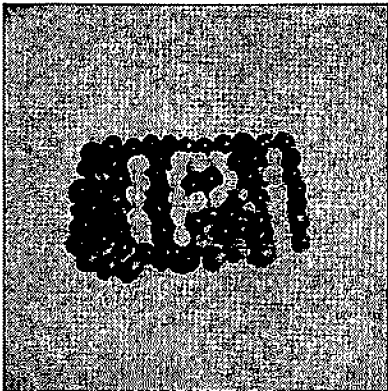
4.1.4



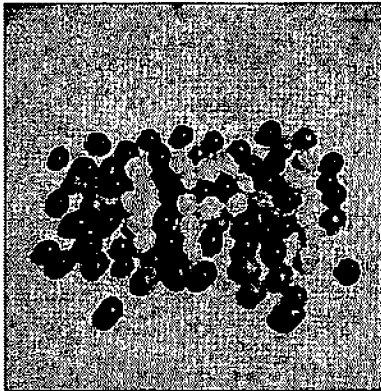
4.1.5



4.1.6



4.1.7



4.1.8

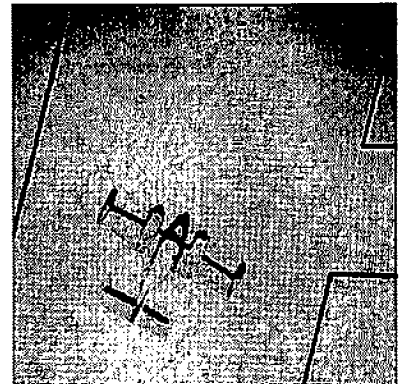
Volume 3: Miscellaneous - Monochrome, 256x256



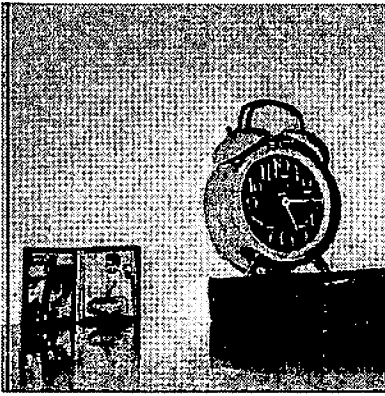
5.1.9



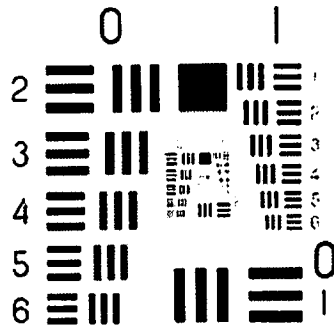
5.1.10



5.1.11



5.1.12

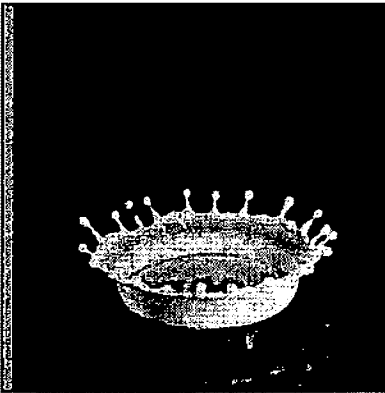


5.1.13



5.1.14

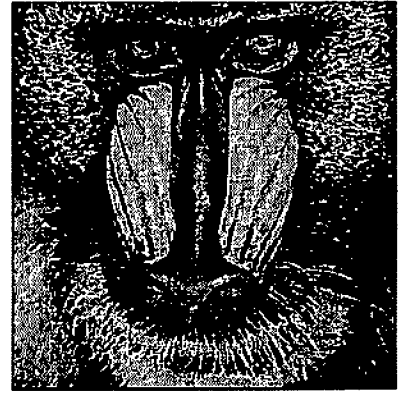
Volume 3: Miscellaneous - Color, 512x512



4.2.1



4.2.2



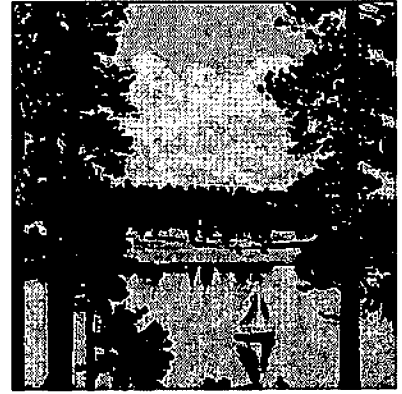
4.2.3



4.2.4



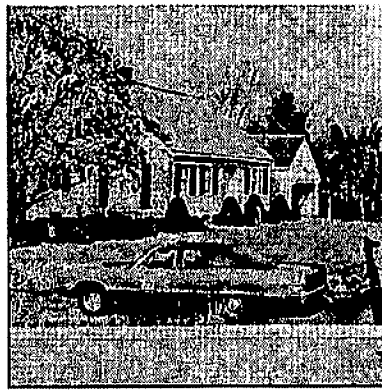
4.2.5



4.2.6



4.2.7



house

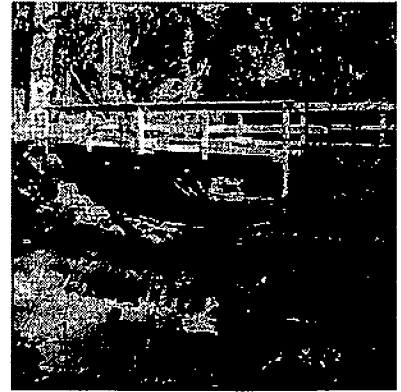
Volume 3: Miscellaneous - Monochrome, 512x512



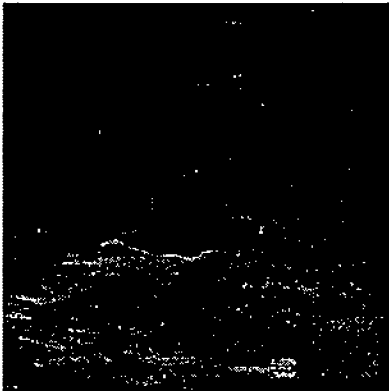
5.2.8



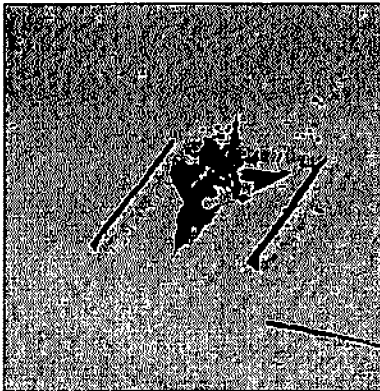
5.2.9



5.2.10



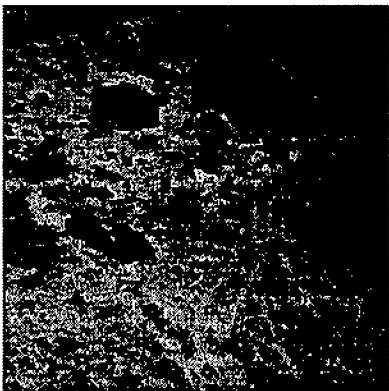
7.1.1



7.1.2



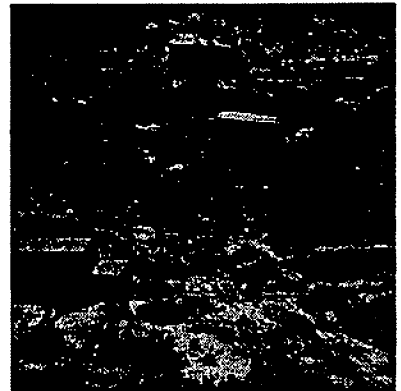
7.1.3



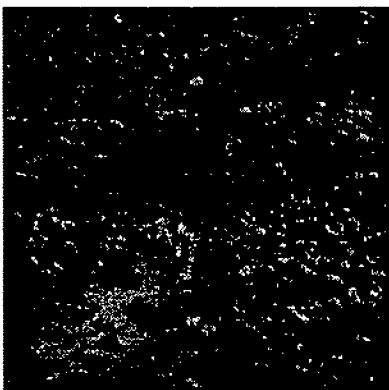
7.1.4



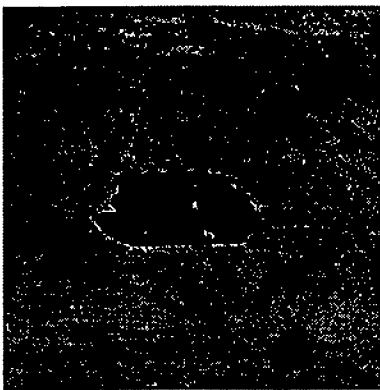
7.1.5



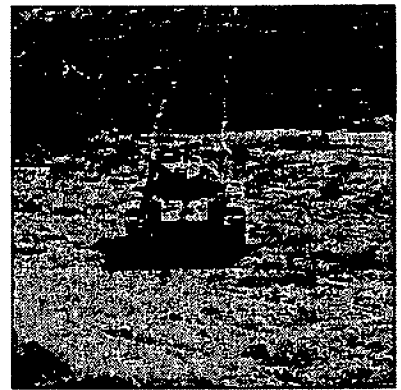
7.1.6



7.1.7



7.1.8



7.1.9



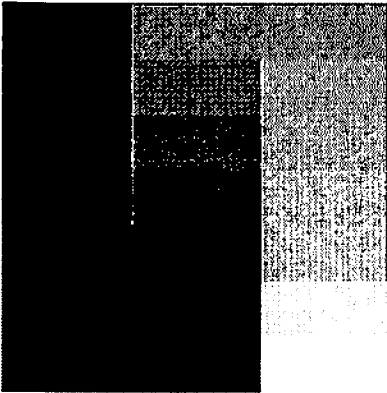
7.1.10



boat.512



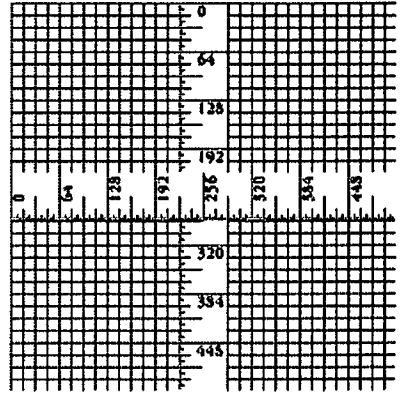
elaine.512



gray21.512



numbers.512

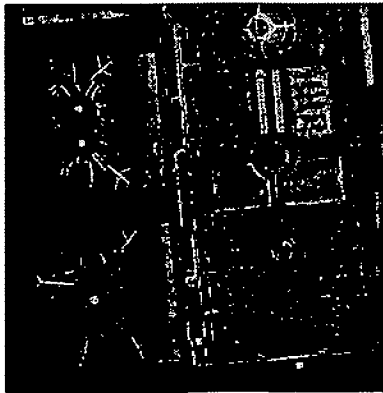


ruler.512

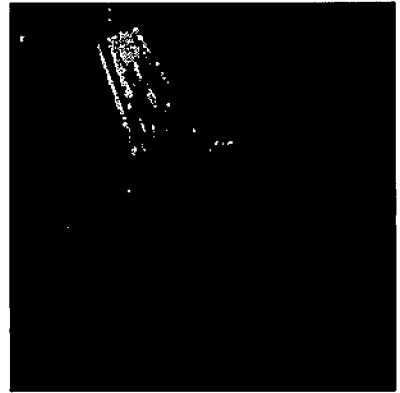
Volume 3: Miscellaneous - Monochrome, 1024x1024



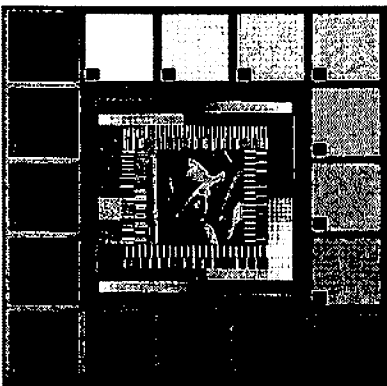
5.3.1



5.3.2



7.2.1



testpat.1k

Volume 4: Sequences - Monochrome, 256x256



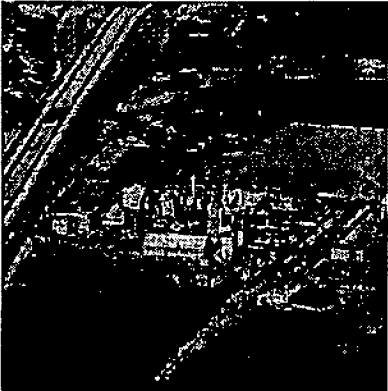
6.1.1



6.1.8



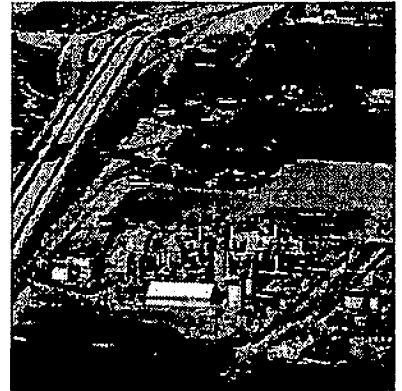
6.1.16



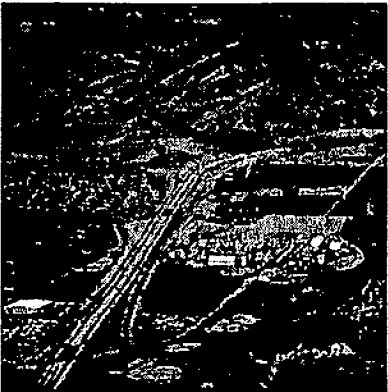
6.2.1



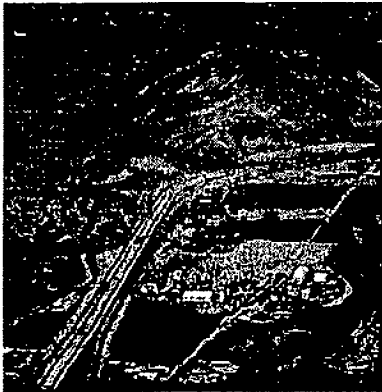
6.2.8



6.2.16



6.3.1

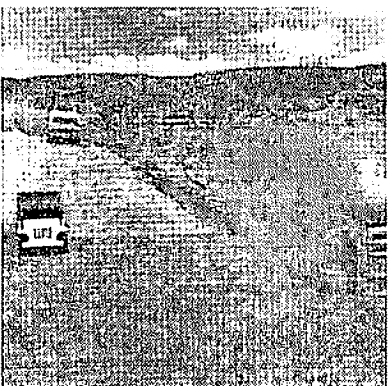


6.3.6

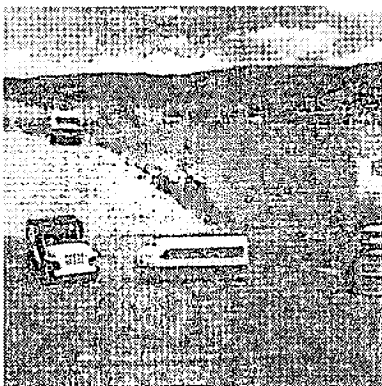


6.3.11

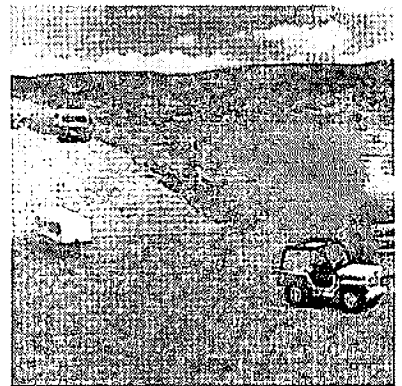
Volume 4: Sequences - Monochrome, 512x512



motion01.512



motion05.512



motion10.512