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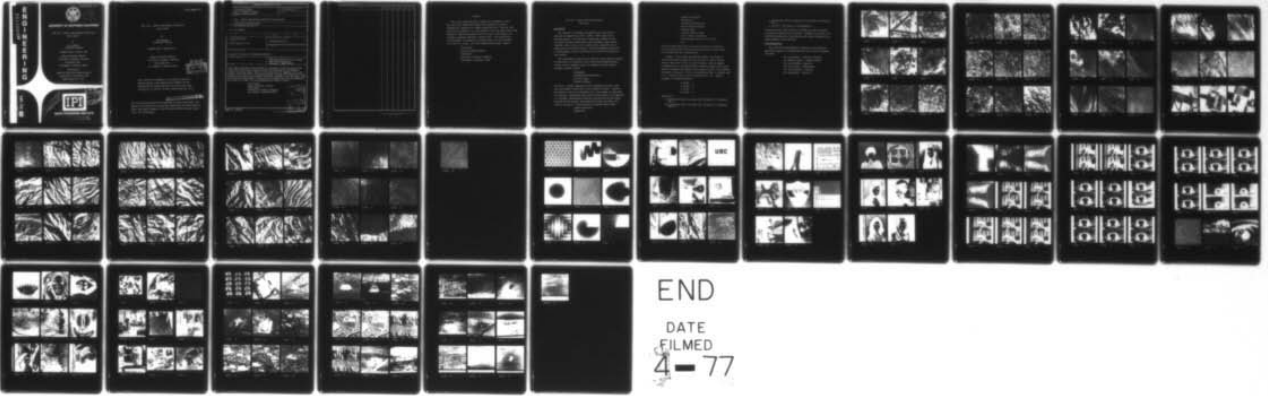
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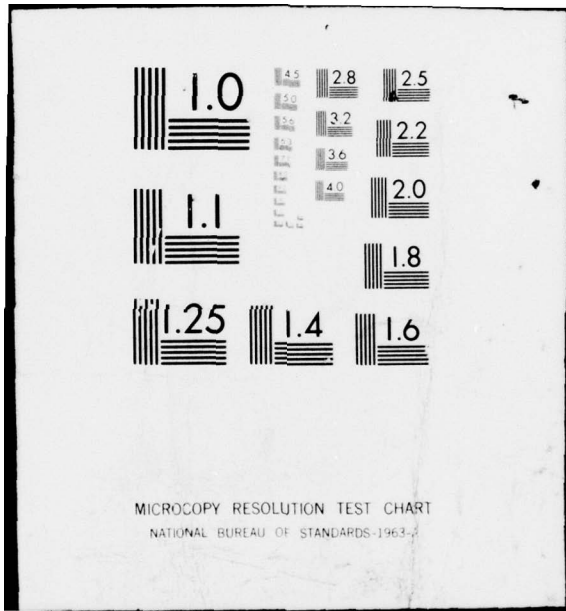
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## UNIVERSITY OF SOUTHERN CALIFORNIA

THE USC - IMAGE PROCESSING INSTITUTE  
DATA BASE

by

Ray Schmidt  
Laboratory Manager

Original Issue: October 1976

Image Processing Institute  
University of Southern California  
University Park  
Los Angeles, California 90007

Sponsored by  
Advanced Research Projects Agency  
Contract No. F33615-76-C-1203  
ARPA Order No. 3119

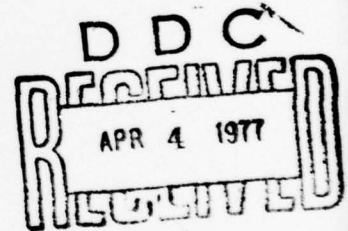
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13. ABSTRACT

This report represents effort expended in attempting to meet the needs of the ARPA-IPTO Image Understanding community in providing the availability of a digital image data base. The data base will never be complete as it is the intention of the USC-IMAGE Processing Institute to update and maintain the base as long as the sponsor and scientific community indicates a need for same. The picture files are individually or collectively accessible either over the ARPANET or via the U.S. mails. For such administrative details, contact:

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Security Classification

### Abstract

This report represents effort expended in attempting to meet the needs of the ARPA-IPTO Image Understanding community in providing the availability of a digital image data base. The data base will never be complete as it is the intention of the USC-Image Processing Institute to update and maintain the base as long as the sponsor and scientific community indicates a need for same. The picture files are individually or collectively accessible either over the ARPANET or via the U.S. mails. For such administrative details, contact:

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Los Angeles, California 90007

The USC - Image Processing Institute  
Data Base

Introduction

The objective of developing the digital picture data base is primarily in support of the DoD - ARPA - IPTO Image Understanding program. The data base is primarily available to this community but will be distributed to other individuals upon request. Naturally no data base is ever complete and we expect this set to expand as time and interest dictate. For those individuals interested in contributing to the base, provisions can be made for inclusion of such imagery.

The organization of the base and character of the imagery included is motivated by the objectives of the Image Understanding program. *Various areas of military activity* are addressed by this program examples of which include:

Cartography  
Surveillance/Reconnaissance  
Tactical Cueing  
Terminal Guidance

Therefore, an initial suggestion for the organization structure of the data was parallel to these above area of military activity. However, this approach soon led to frustration and a new attempt at organization was proposed. Specifically image sensor characteristics were suggested as a possible organizational method for the data such that the sensor that gathered the imagery would define the category into which such imagery was placed. Typical sensors of interest might include:

visible monochrome  
visible color

infrared monochrome  
infrared color  
narrowband multispectral  
forward looking infrared  
side look radar  
synthetic aperture radar  
stereo visible monochrome  
time sequential frames (T.V. movie)  
etc.

As can be seen by this list, the category of sensor can itself become an unnecessarily cumbersome task which does not lend itself to convenient data base categorization.

Finally, a very simple classification method was chosen to avoid categorically limiting the data base due to current military mission and/or state of the art sensor design. This new method of organization is to simply develop a numbering scheme which represents the computer description of the imagery at hand. For simplicity all images are square. If they are monochrome, they are labeled with a "B". If they are color, they are labeled with a "C". Typical examples of categories might be:

- a) B1288 - 7
- b) B2566 - 21
- c) B5128 - 3
- d) C5128 - 5

referring to:

- a) monochrome (black and white) 128 x 128 pixels at 8 bits/pixel, file 7.
- b) monochrome (black and white) 256 x 256 pixels at 6 bits/pixel, file 21.

3

c) monochrome (black and white) 512 x 512 pixels at 8 bits/pixel, file 3.

d) color 512 x 512 pixels at 8 bits/pixel, file 5.

Larger data bases (1024 x 1024) are available and will be included in subsequent updates of this document. Similarly time (movies and television) sequences have been digitized and will be available in subsequent updates of this document.

#### Acknowledgements

The Image Processing Institute is pleased to acknowledge the enthusiastic support in developing this data base from the following individuals.

Mr. Ray Schmidt - Laboratory Manager

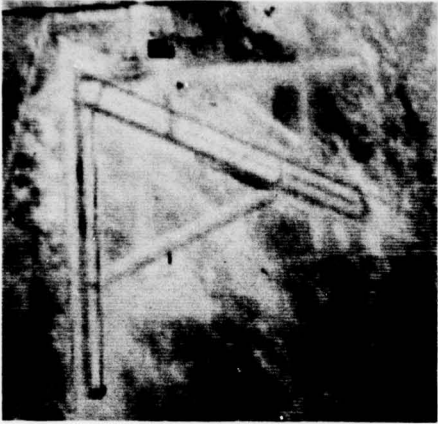
Mr. Behnam Ashjari - Graduate Student

Mr. Scott Johnston - Operator

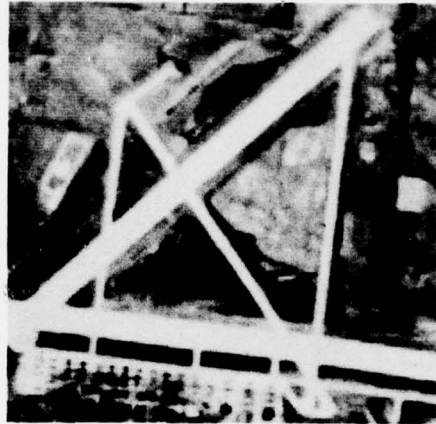
Mr. David Nagai - Photographer

Mr. Clay Olmstead - Operator

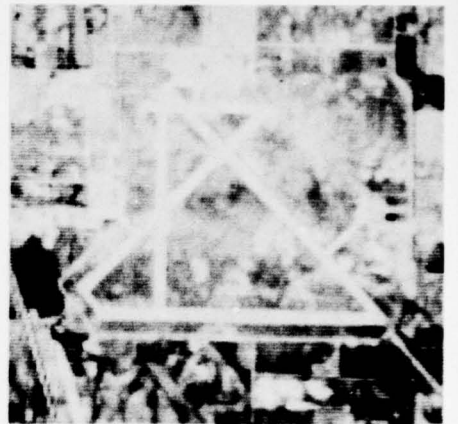
Mr. Mike Patton - Operator



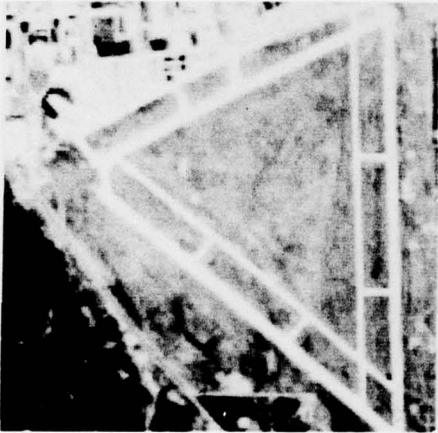
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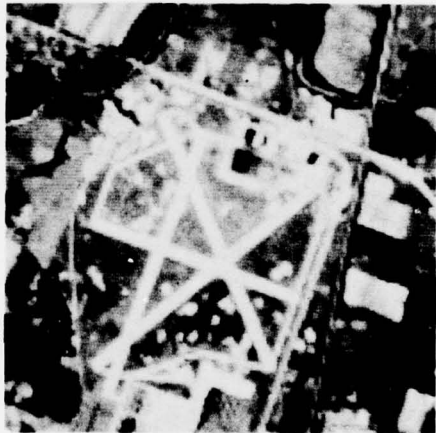
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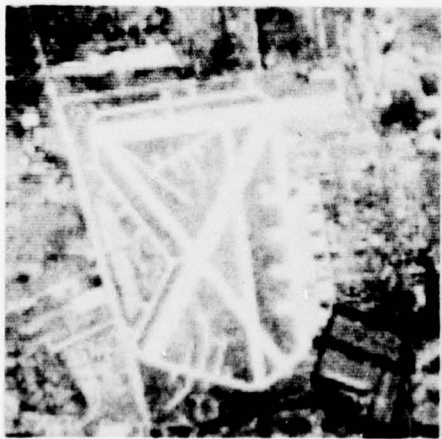
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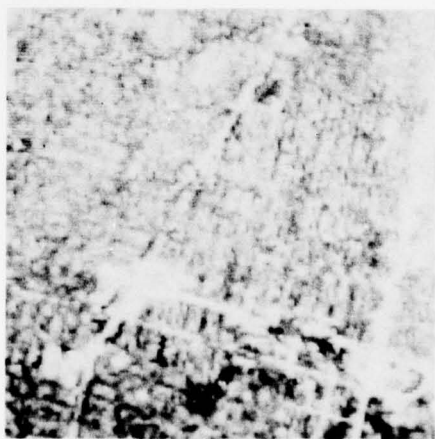
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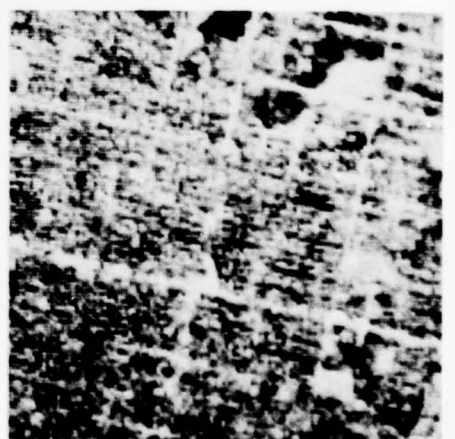
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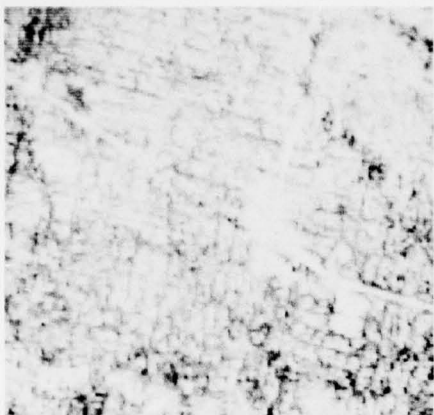
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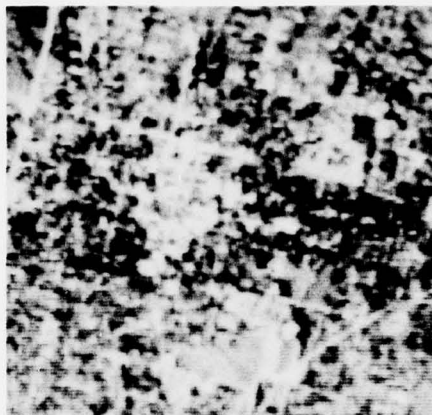
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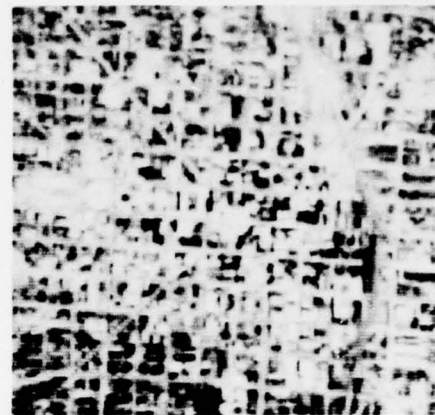
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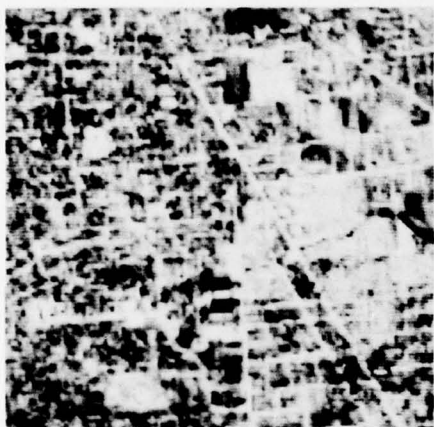
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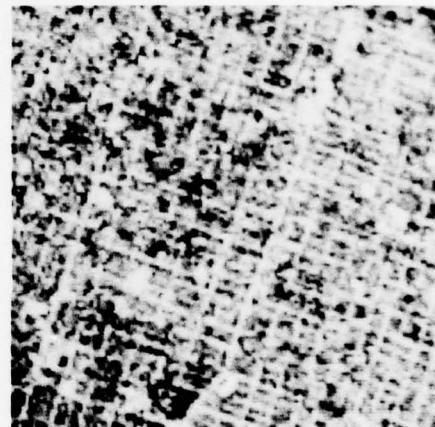
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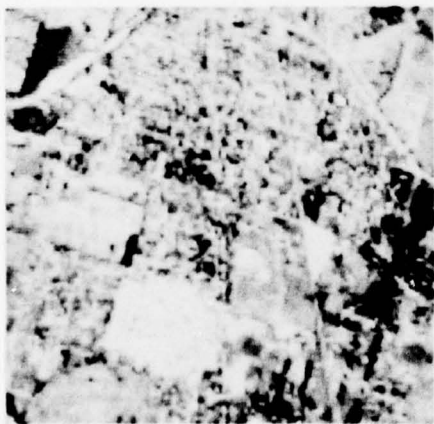
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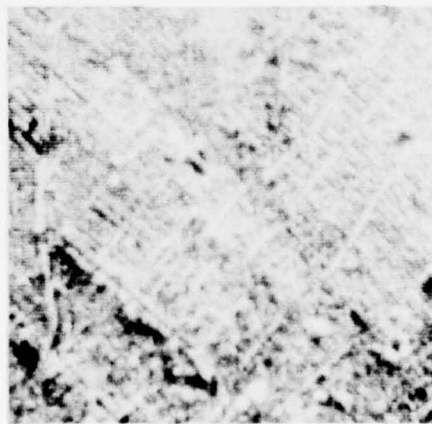
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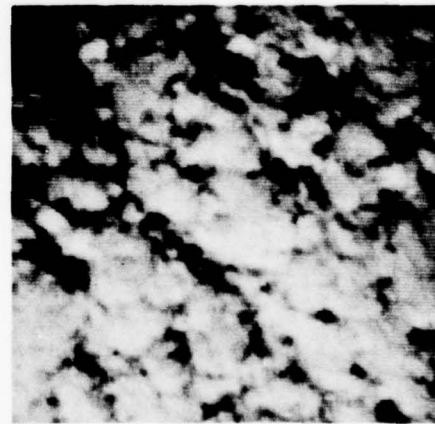
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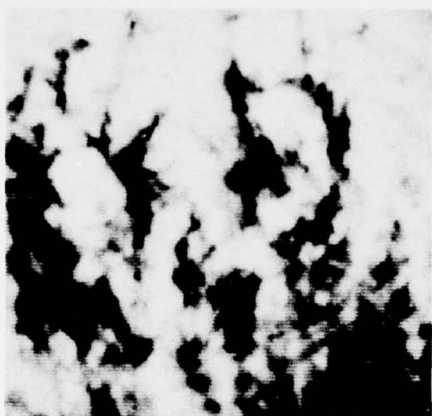
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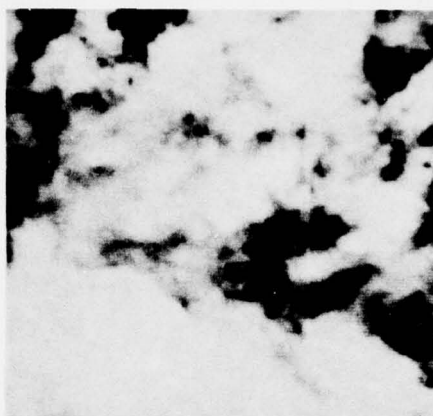
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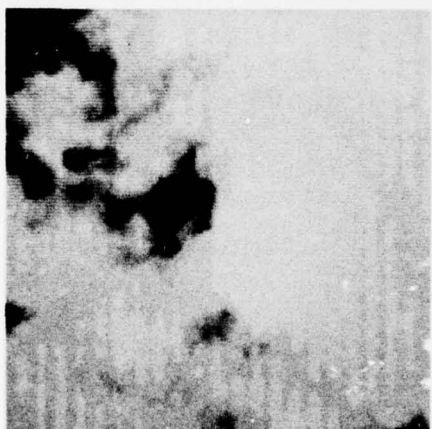
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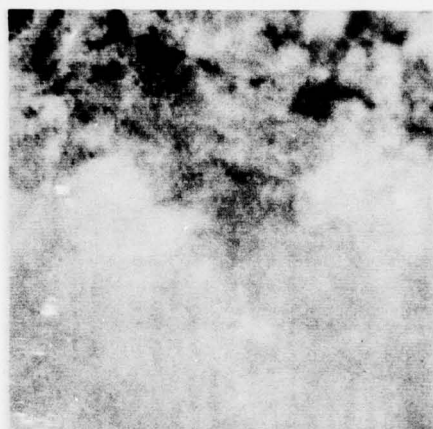
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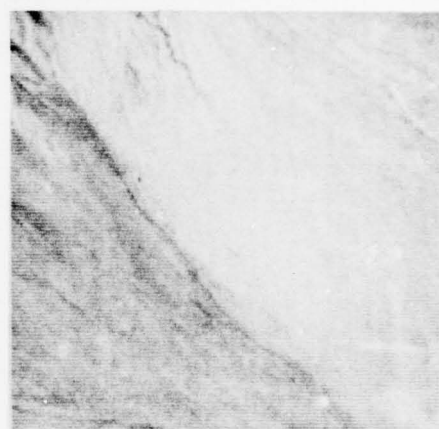
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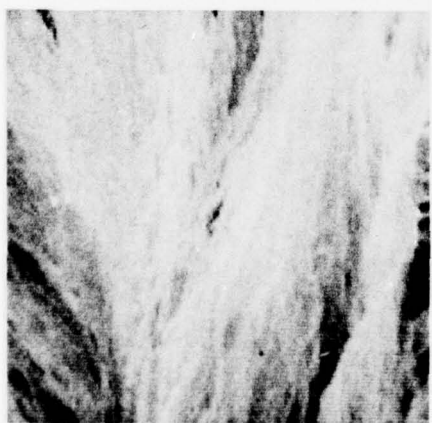
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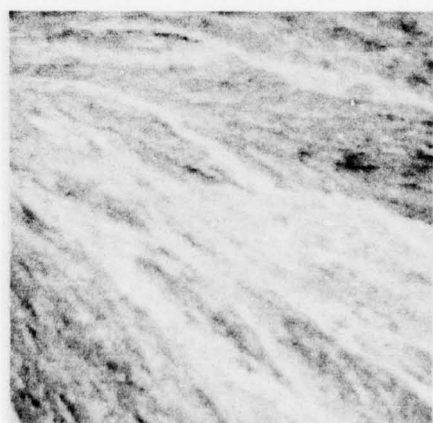
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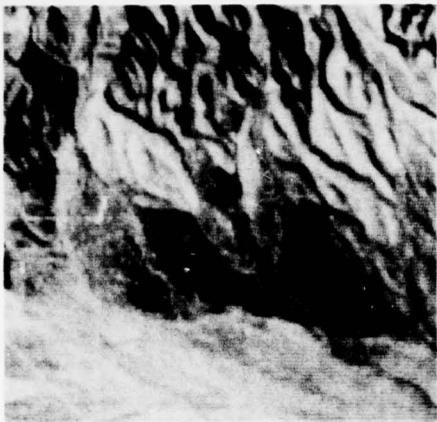
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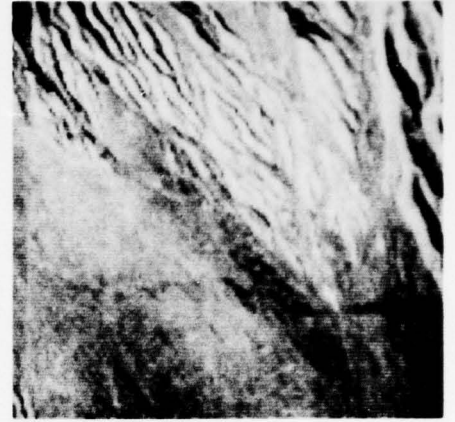
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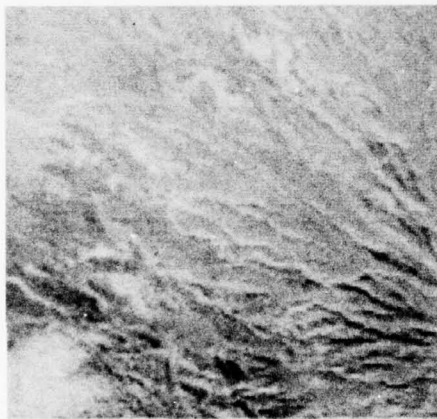
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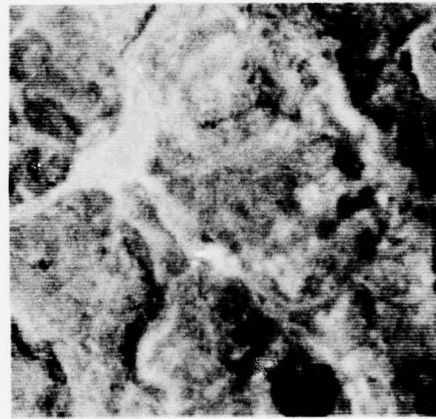
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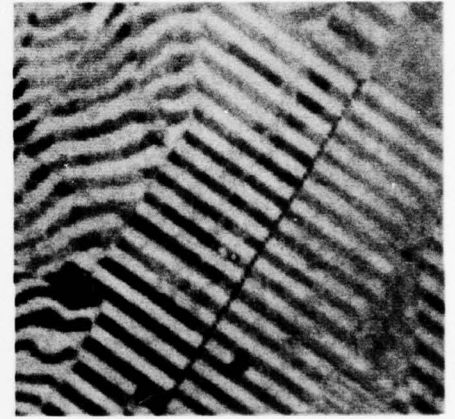
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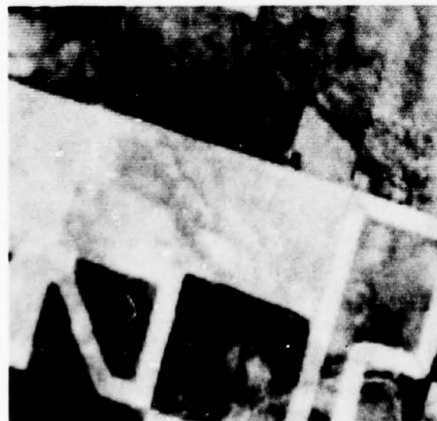
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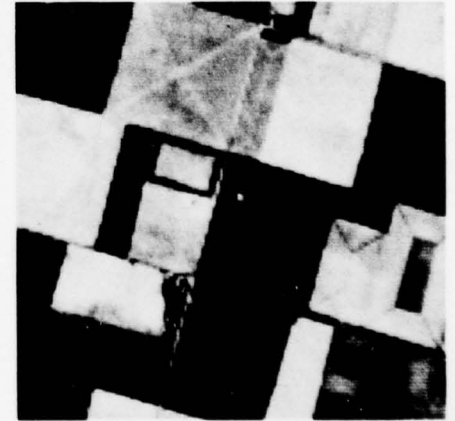
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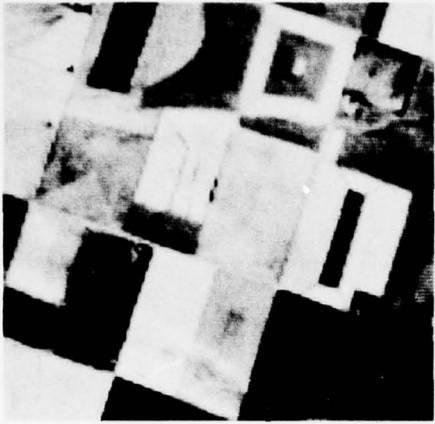
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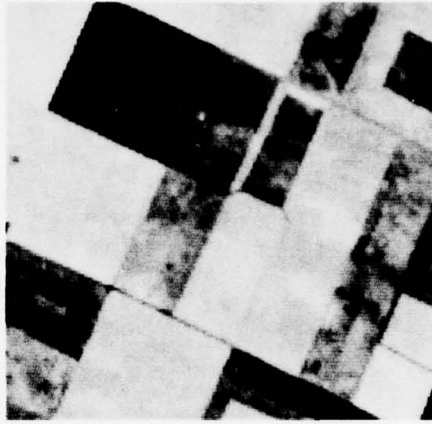
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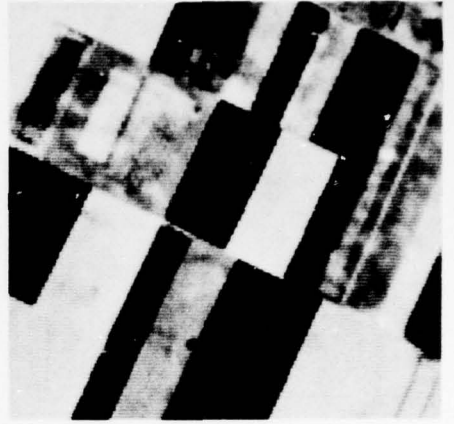
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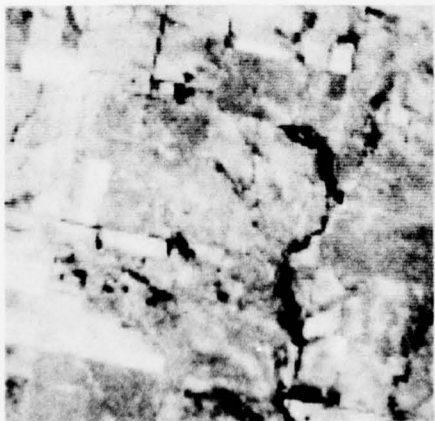
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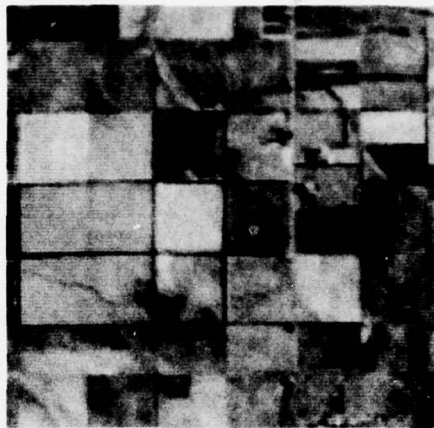
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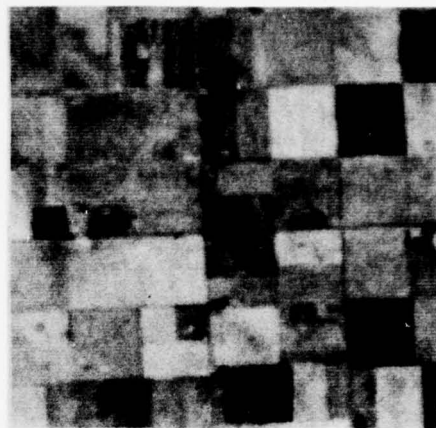
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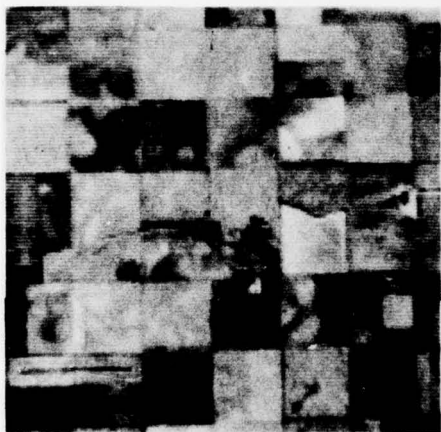
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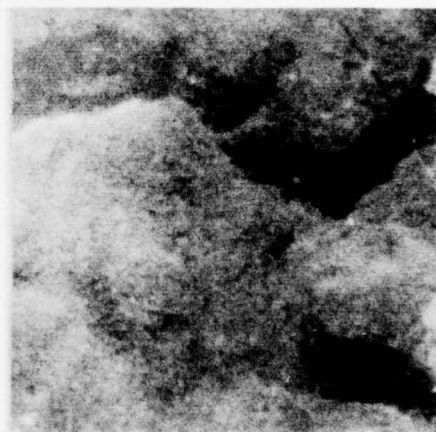
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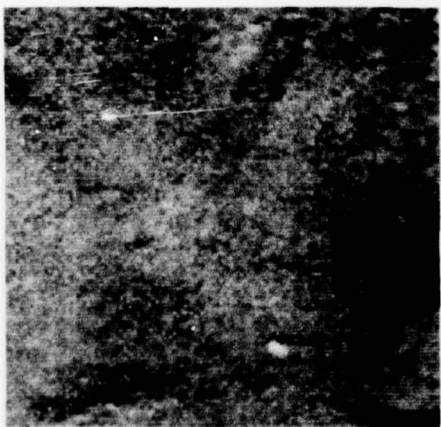
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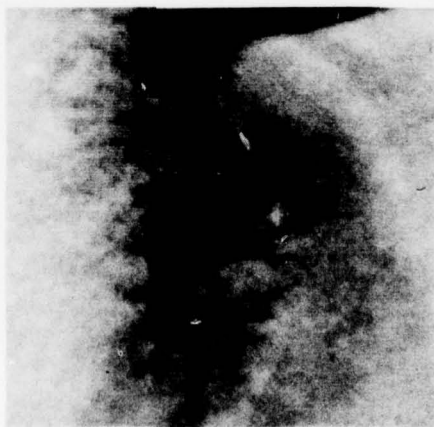
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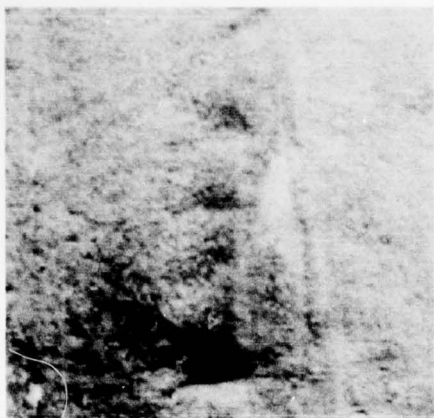
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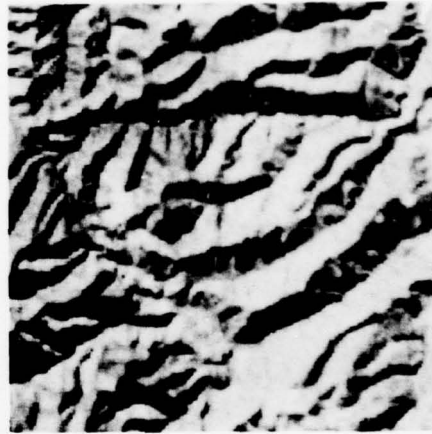
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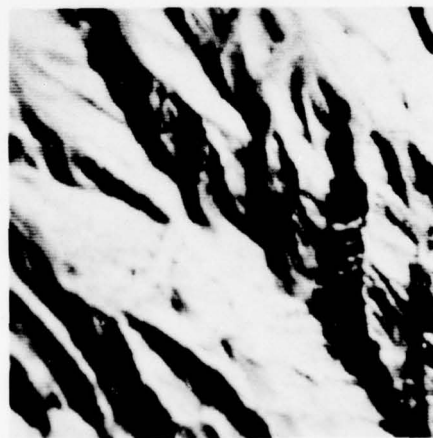
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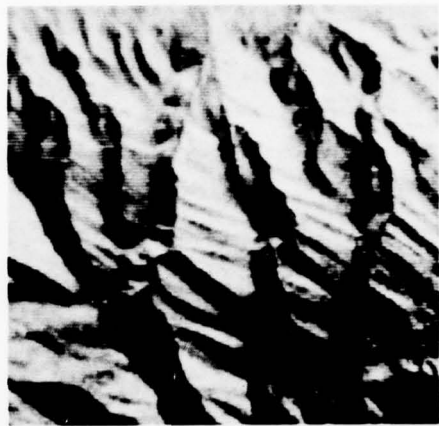
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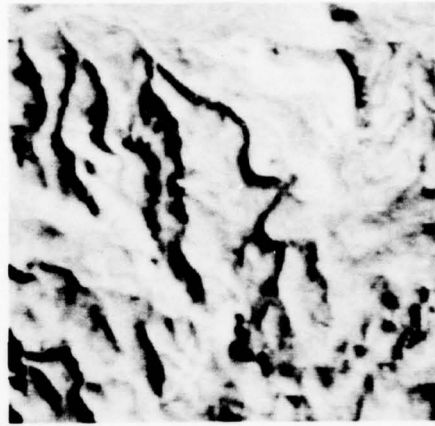
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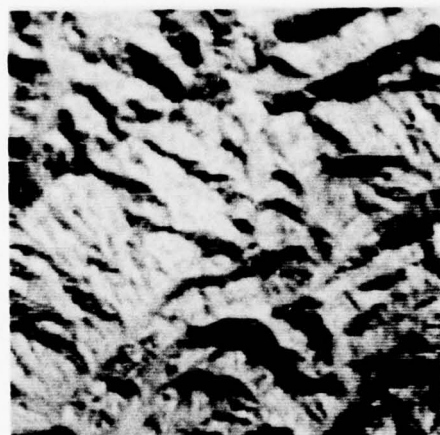
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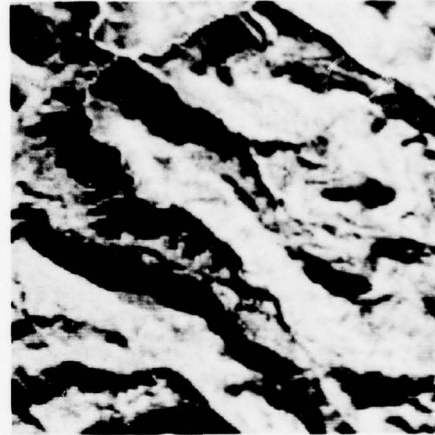
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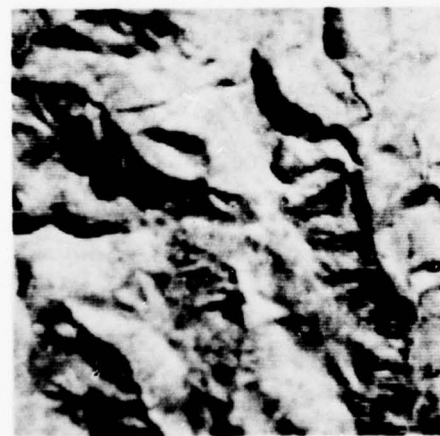
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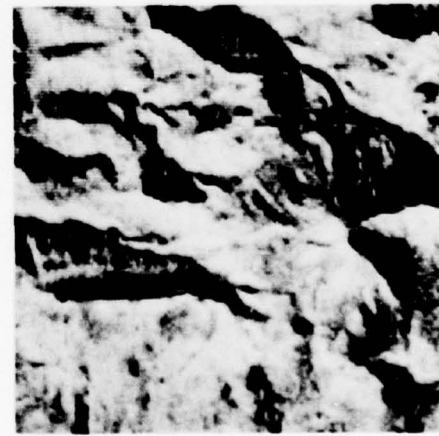
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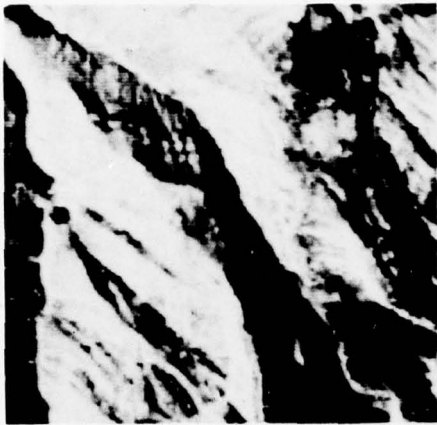
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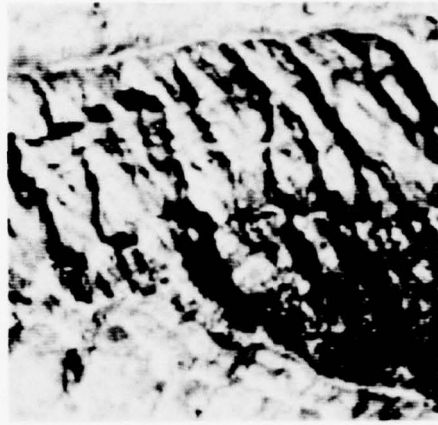
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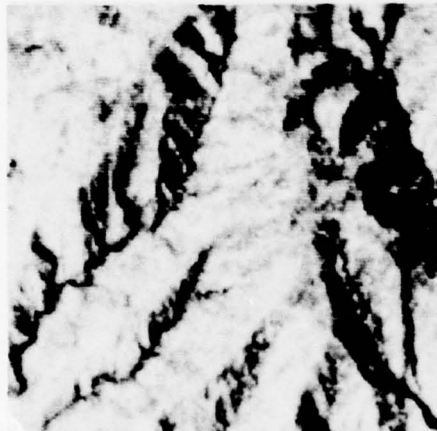
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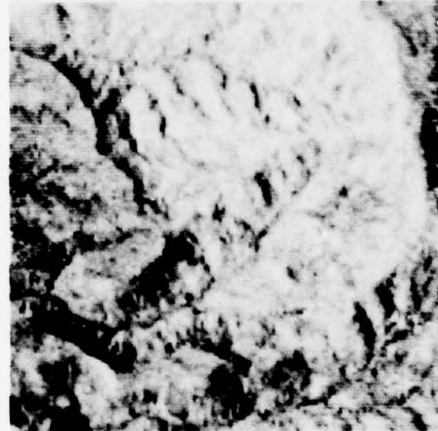
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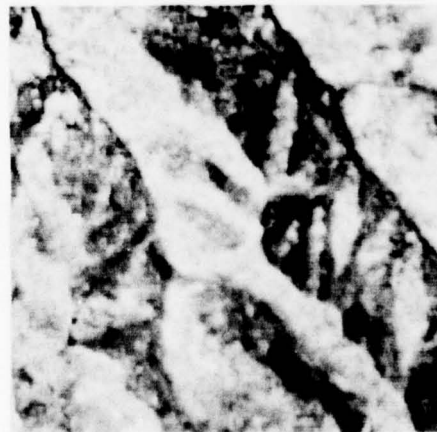
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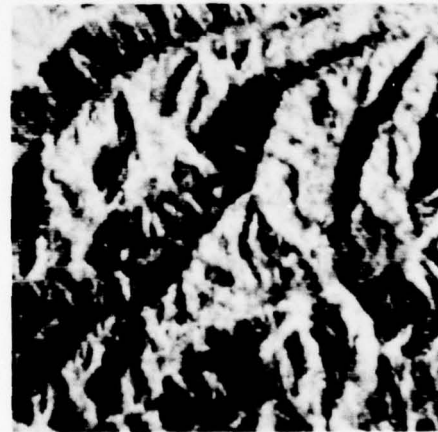
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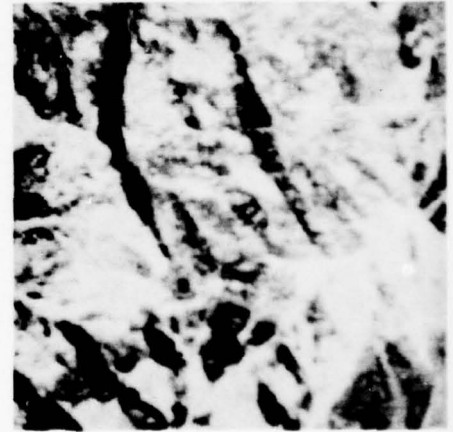
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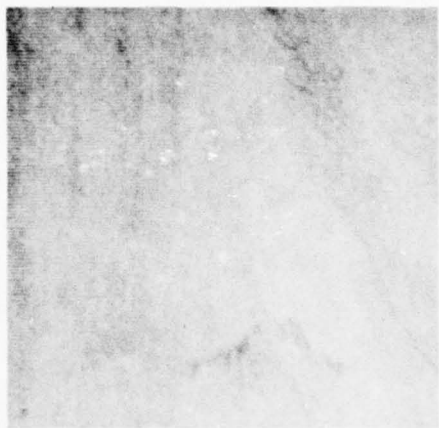
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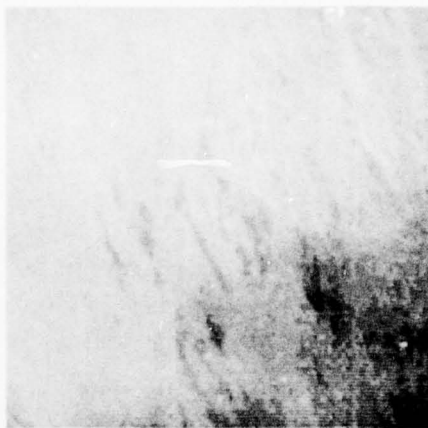
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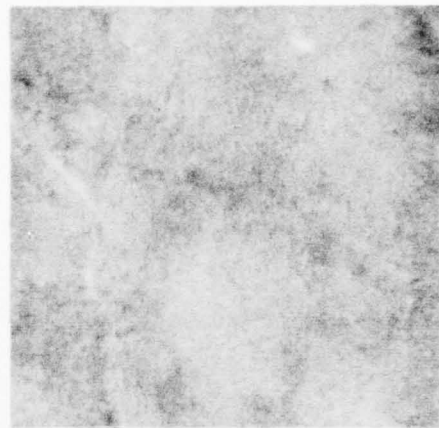
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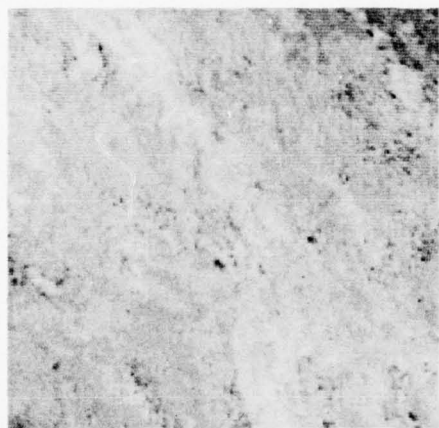
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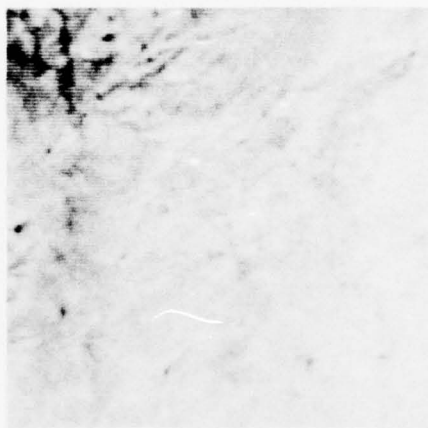
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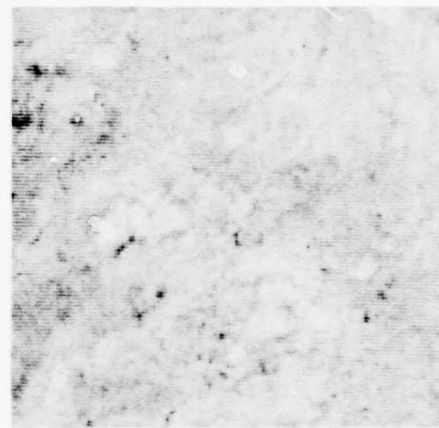
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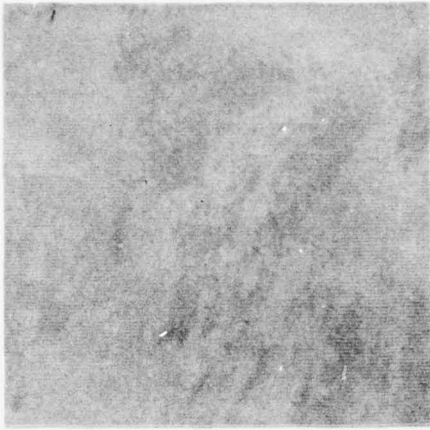
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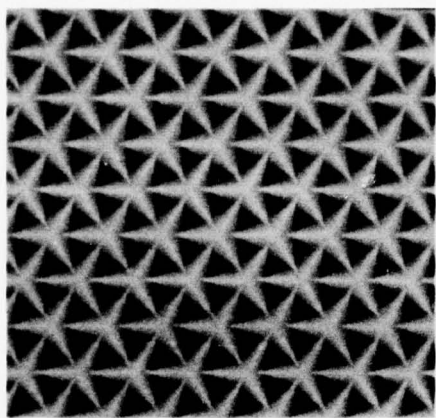
B1288 89



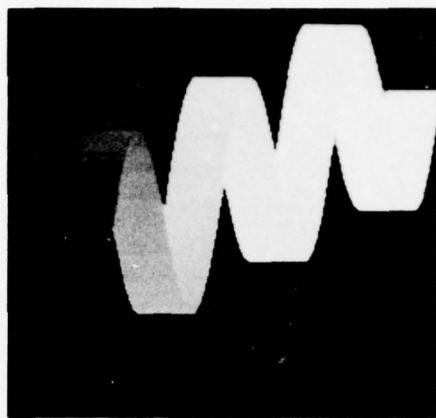
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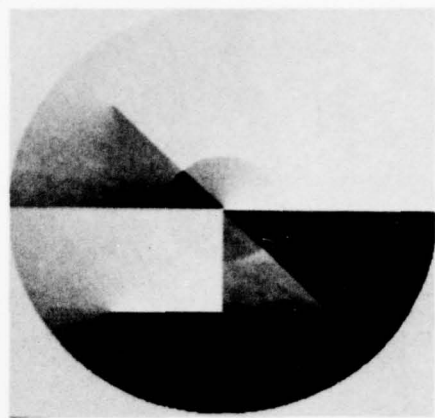
B1288 91



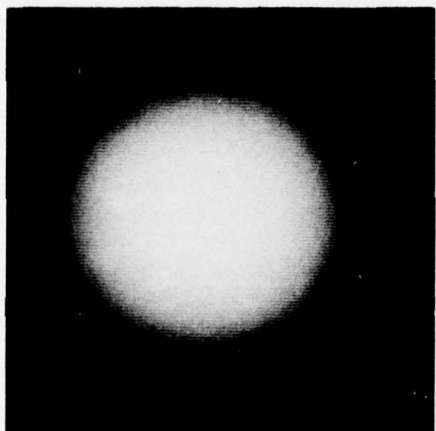
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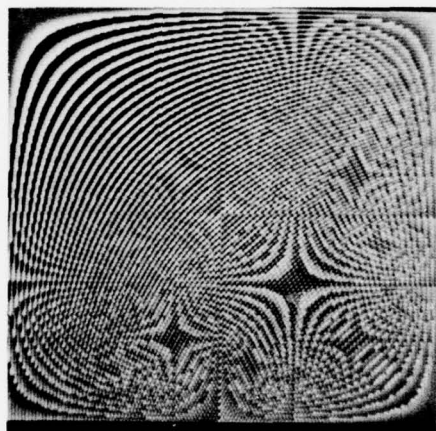
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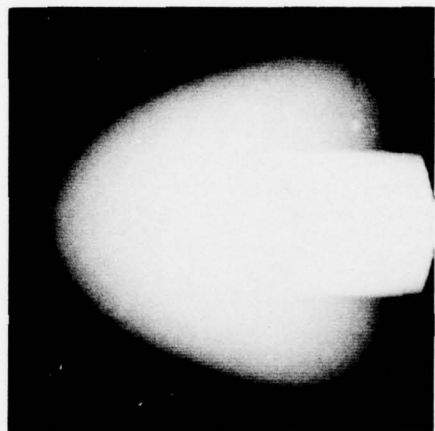
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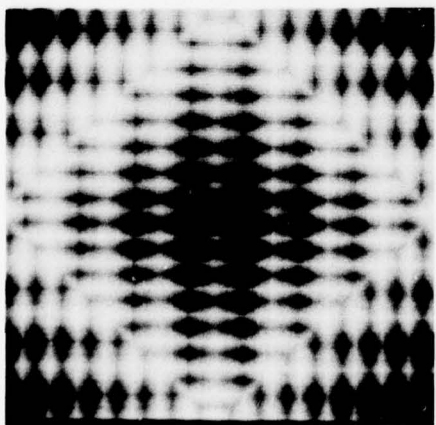
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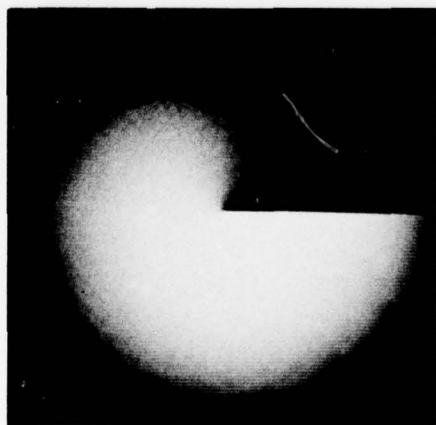
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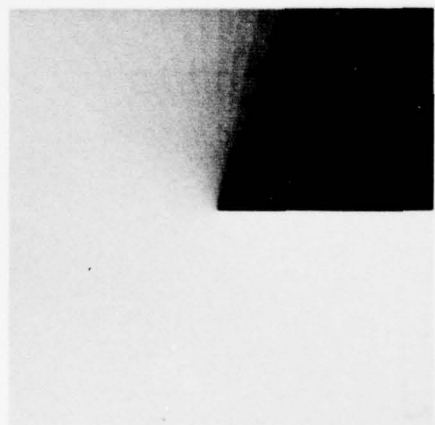
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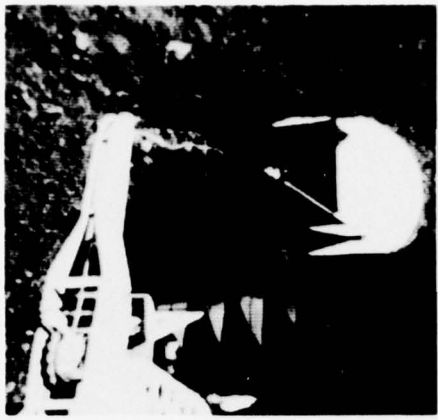
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B2566 8



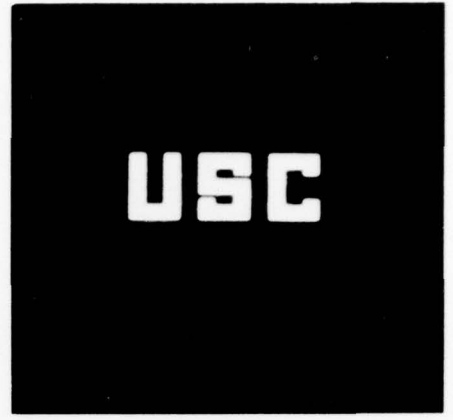
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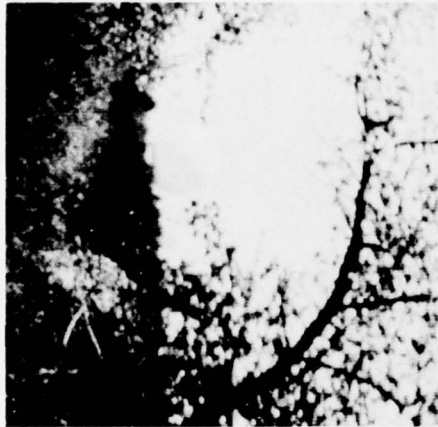
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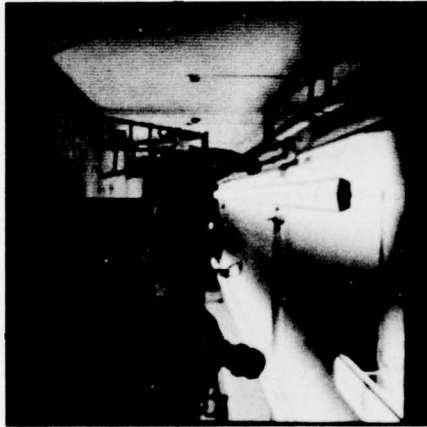
B2566 11



B2566 12



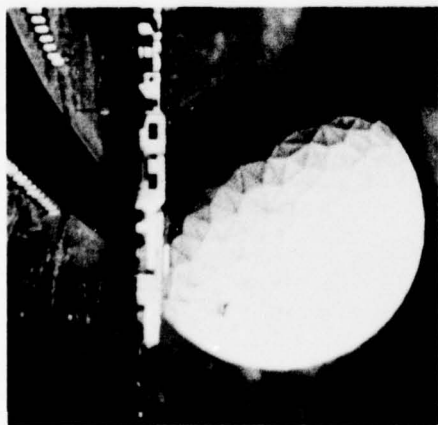
B2566 13



B2566 14



B2566 15



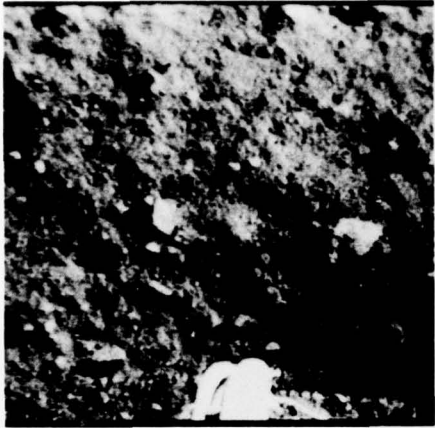
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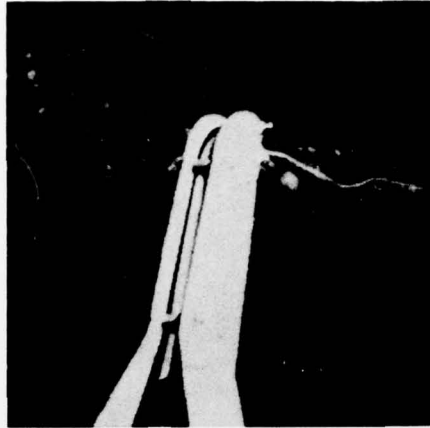
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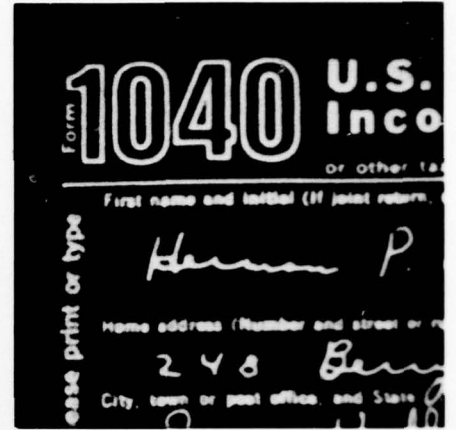
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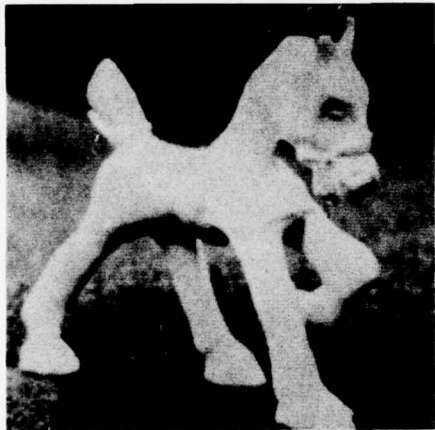
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B2566 20



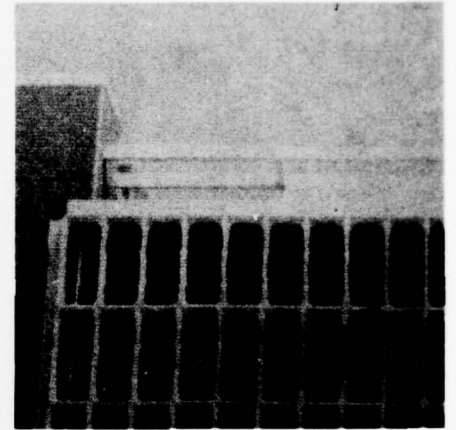
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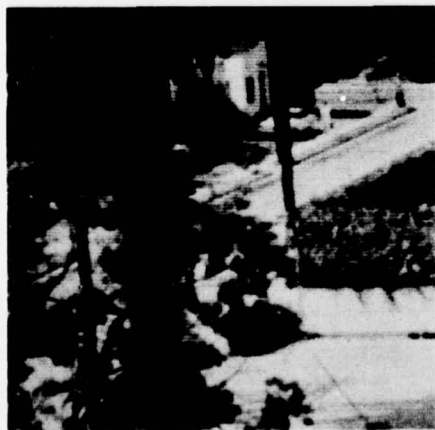
B2566 22



B2566 23



B2566 24



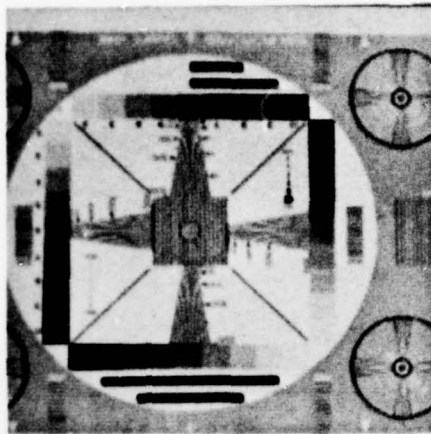
B2566 25



B2566 26



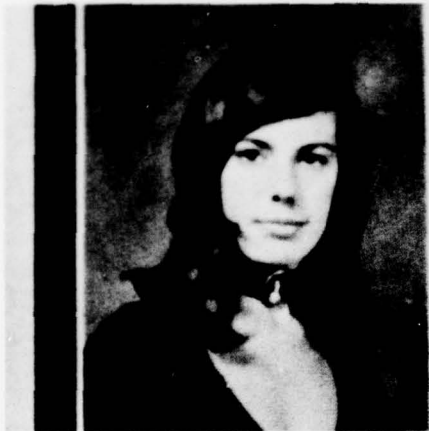
C2568 3



C2568 6



C2568 9



C2568 12



C2568 15



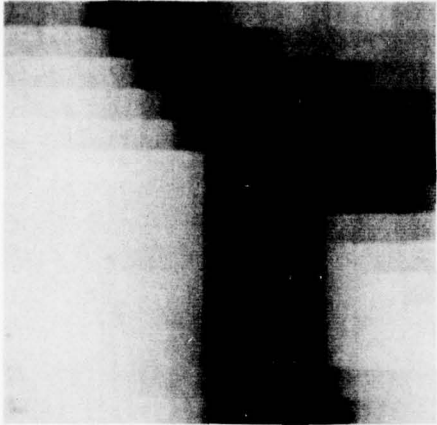
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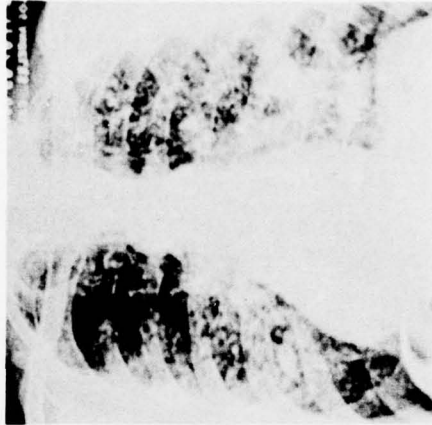
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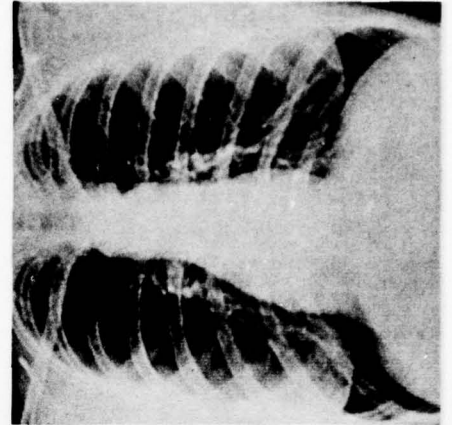
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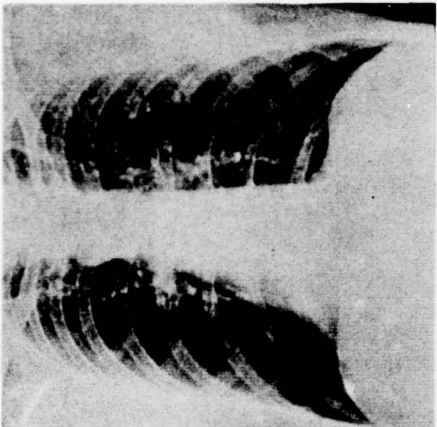
B2568 1



B2568 2



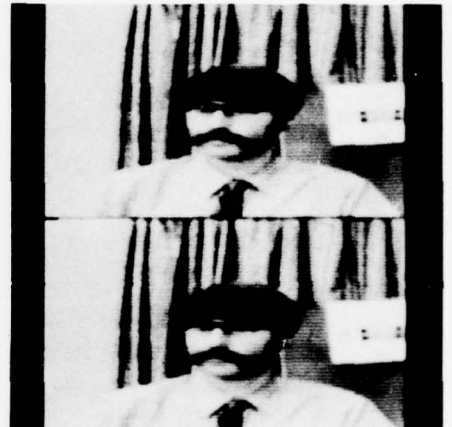
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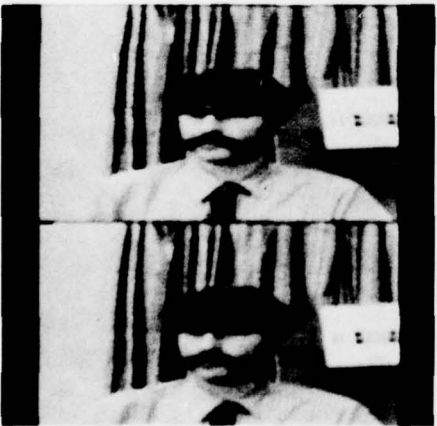
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B2568 5



B2568 6



B2568 7



B2568 8



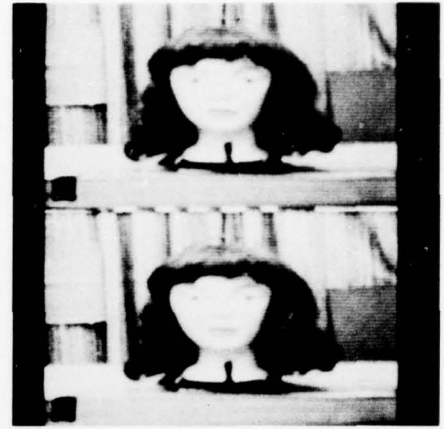
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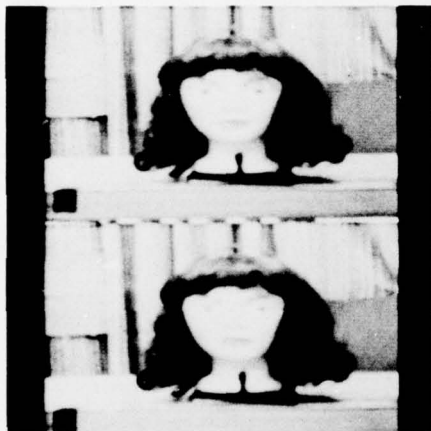
B2568 10



B2568 11



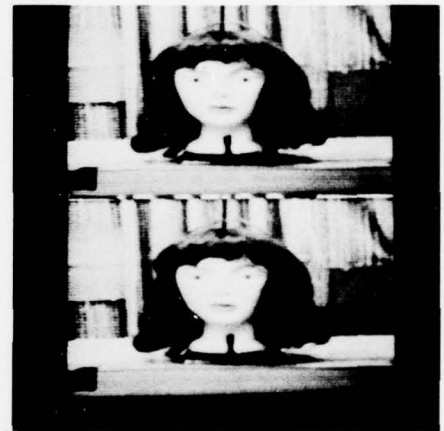
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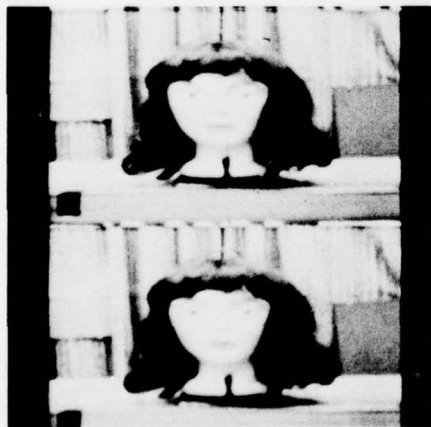
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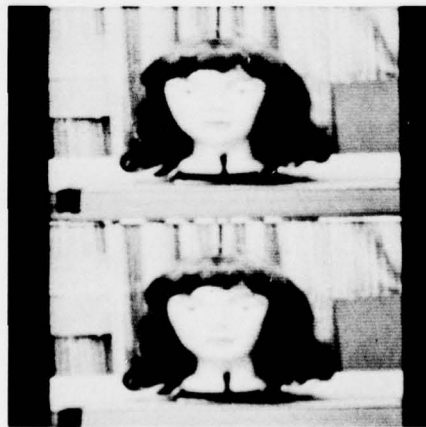
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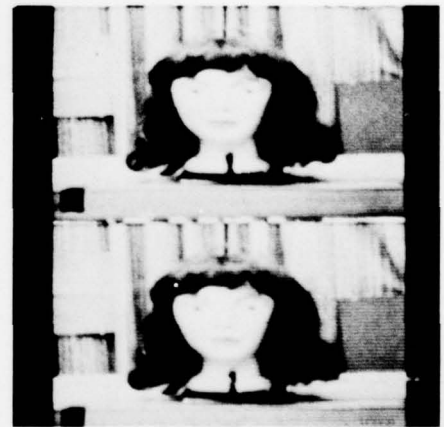
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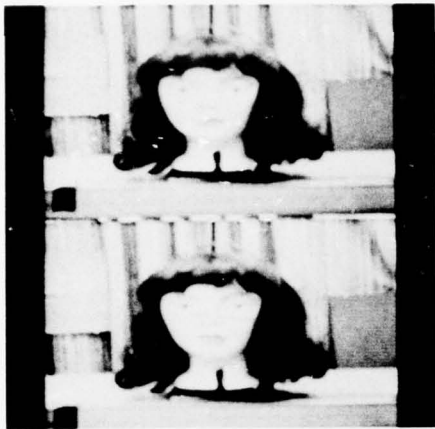
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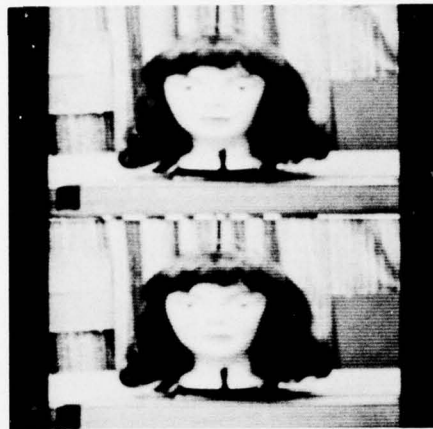
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B2568 18



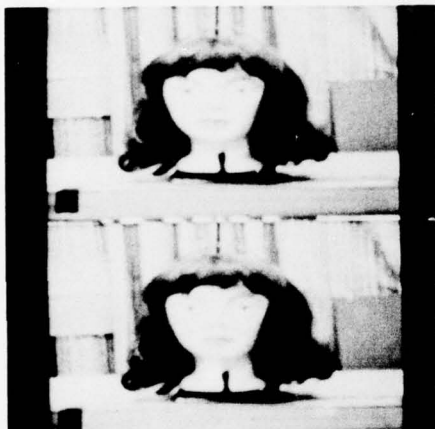
B2568 19



B2568 20



B2568 21



B2568 22



B2568 23



B2568 24

This typewritten passage was scanned and digitized into a 256x256 binary array for experiments in facimile coding using the digital image-processing facilities at USC. Both linear and nonlinear bandwidth reduction techniques will be attempted, including vector decomposition, binary reconstruction and phase only coding.

B2568 25



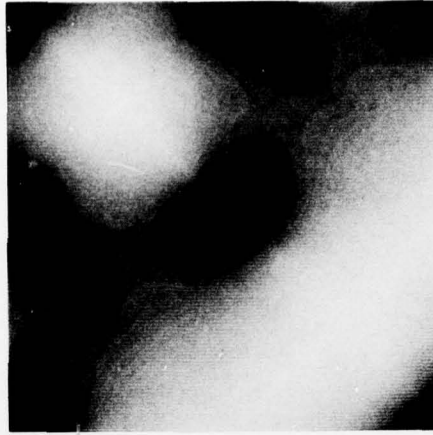
B2568 26



B2568 27



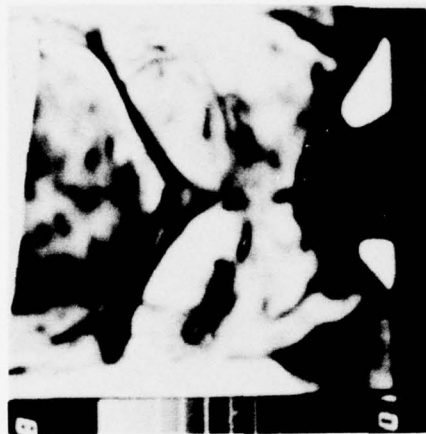
B2568 28



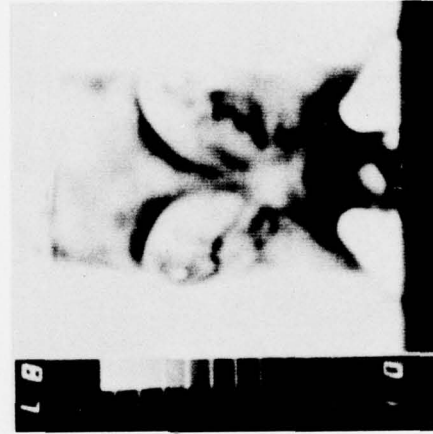
B2568 29



B2568 30



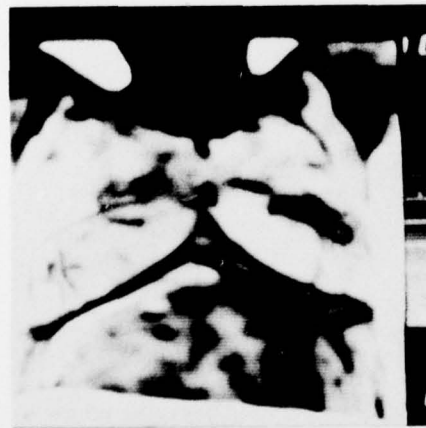
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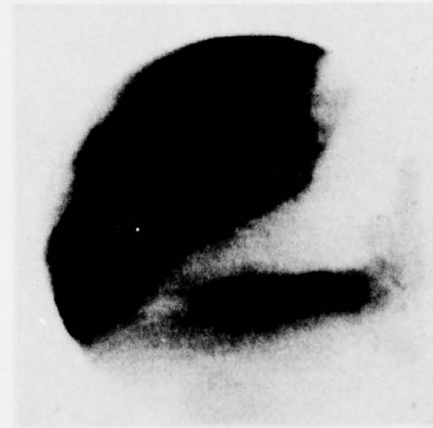
B2568 32



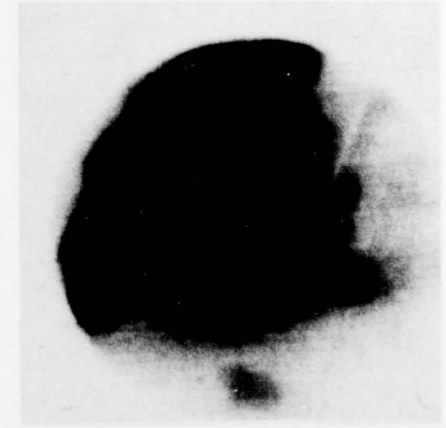
B2568 33



B2568 34



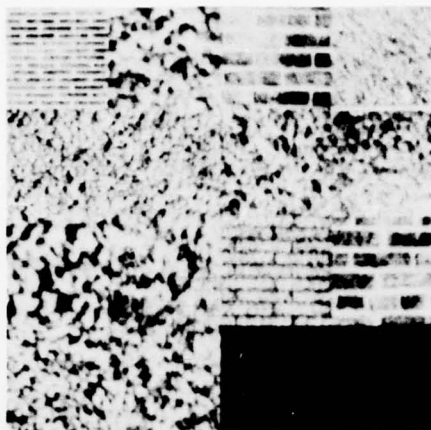
B2568 35



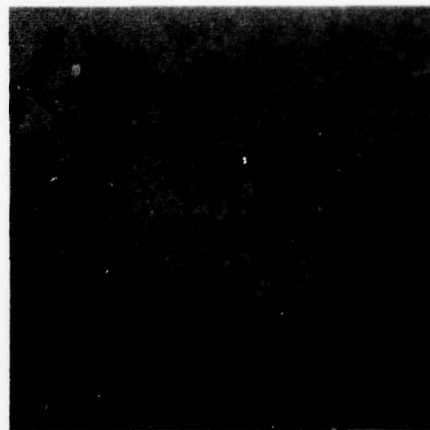
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B2568 37



B2568 38



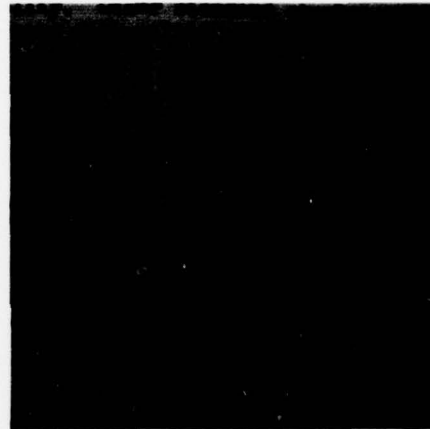
B2568 39



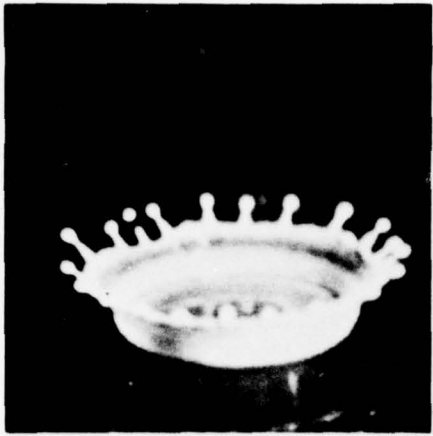
B2568 40



B2568 41



B2568 42



C5128 3



C5128 6



C5128 9



C5128 12



C5128 15



C5128 19



C5128 22



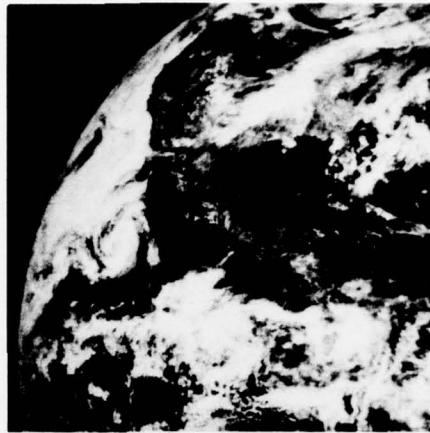
C5128 25



C5128 28



B5128 1



B5128 2

and student could relate to. I was suffering from the most I wanted to describe an engineering student. I actually had been excluded from the landscape of existing by the very class the engineering curriculum general attitude about me. I found it difficult to communicate aspect of society. As with the rest engineering class I had been removed from the inside of I continue during my brief of engineering course and as I into the total technical space of the engineering.

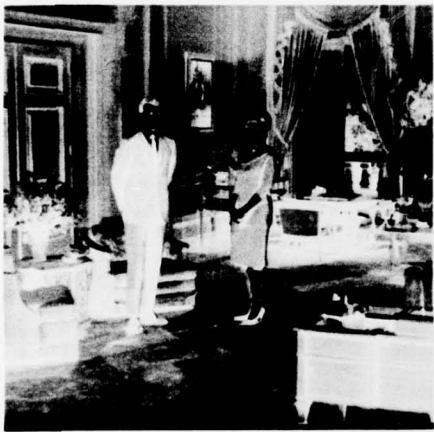
With the arrival of me, I found myself not I with taking a philosophy national relation course of sociology. I was studying art and sociology. In literature it was digital.

The space around me was technical. And as I be immersed in this totally using the free electronic to me and more engineering instead of a change of

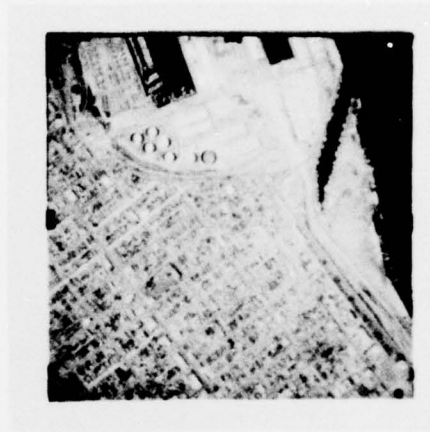
he may take in a sporting event or a movie. But most of the time he comes himself with study, a good technical discussion or he takes me with some quiet.

It is not enough that the best engineering, physics, chemistry, biology, ethics and more is an engineering. Thoughts have shifted from the possible, beyond physics, the science of human existence, or the effect of time on that capacity to conduct experiments, and is more. The abstract of thought evolves to the specific in theory. The means of existence is transformed into action about the boundary conditions of a problem. Social concern takes the form of making sure that you left something down's own own experiment. It's the lab, not the world. Engineers have it that the team engineers are not included in the Dean's list printing in the school newspaper every semester is because the course material interest in the technology oriented and therefore cannot be compared with liberal arts studies. More 15% people have even been heard to say that engineers are

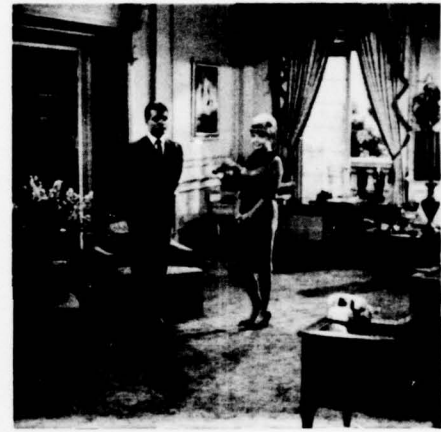
B5128 3



B5128 4



B5128 5



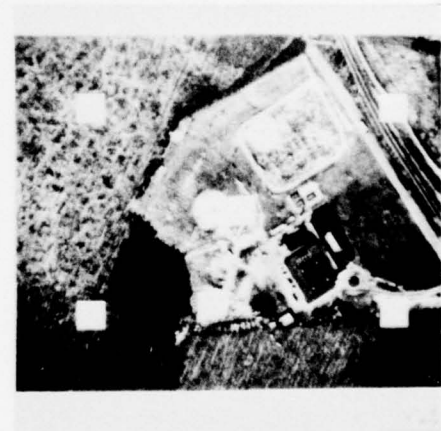
B5128 6



B5128 7



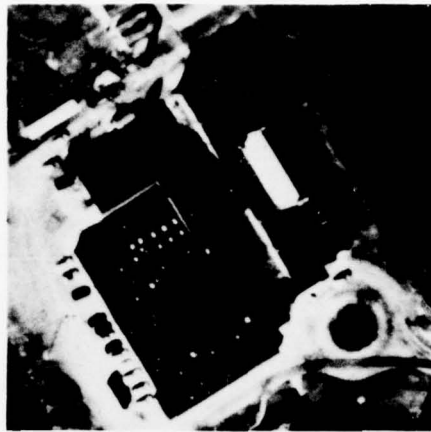
B5128 8



B5128 9



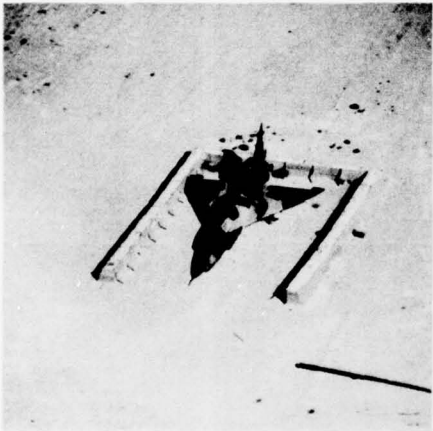
B5128 10



B5128 11



B5128 12



B5128 13



B5128 14



B5128 15



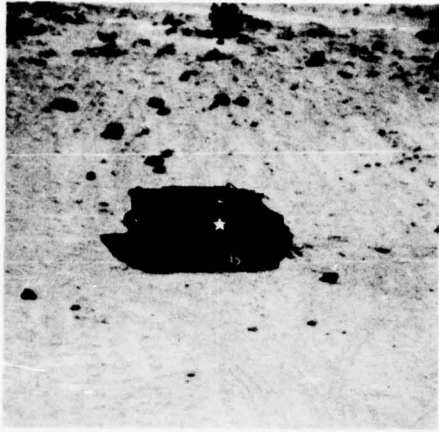
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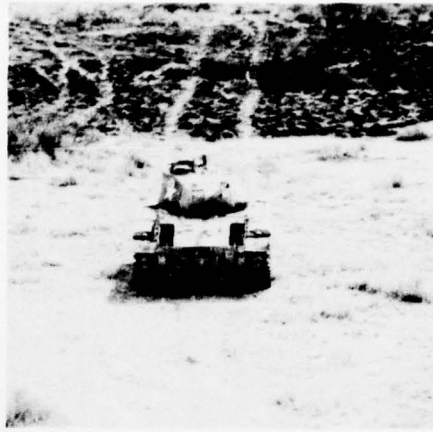
B5128 17



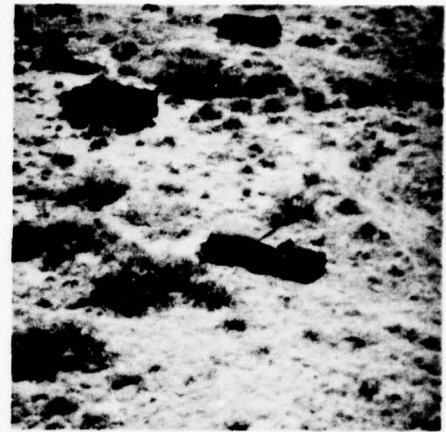
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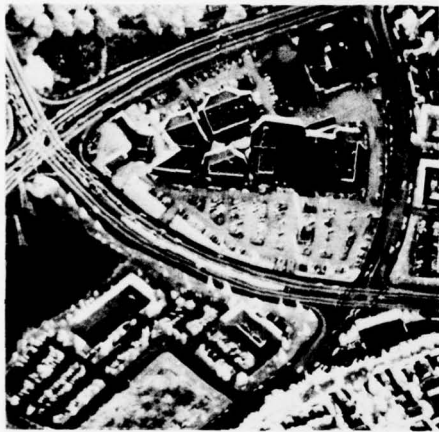
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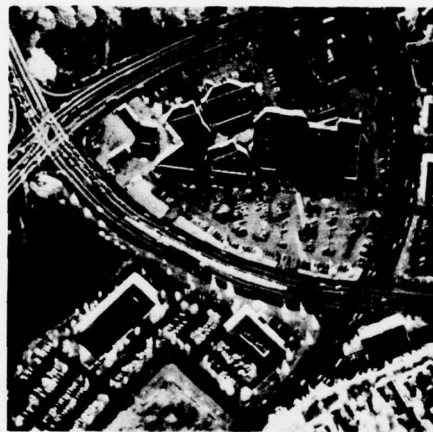
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B5128 21



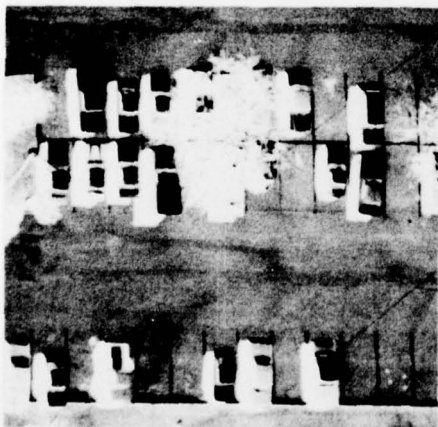
B5128 22



B5128 23



B5128 24



B5128 25



B5128 26



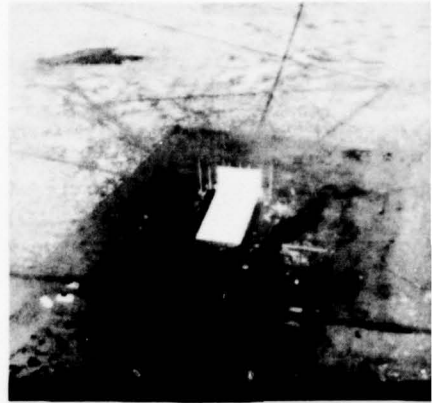
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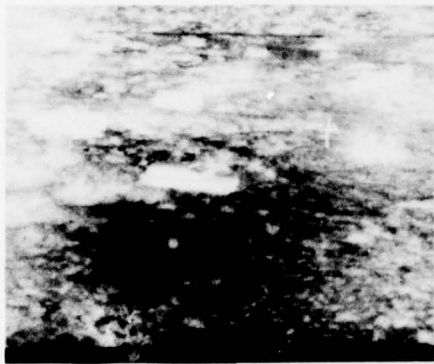
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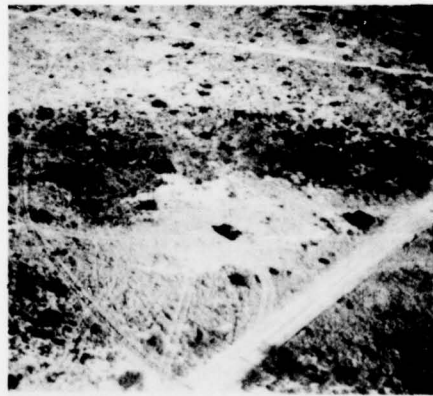
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B5128 30



B5128 31



B5128 32



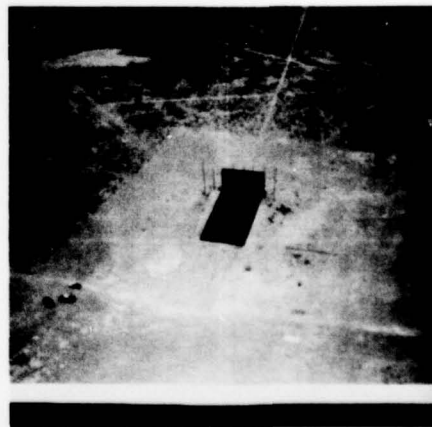
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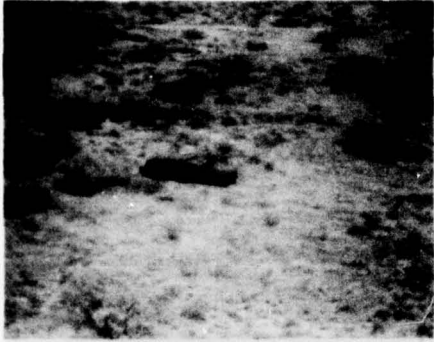
B5128 34



B5128 35



B5128 36



B5128 37