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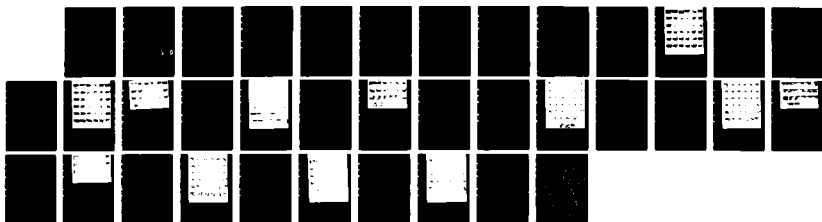
PROJECT WIND PHASE 4 (SMOKE TEST) MEADOW BROOK VALLEY
RED BLUFF CALIFORNIA(U) RISOE NATIONAL LAB ROSKILDE
(DENMARK) T MIKKELSEN ET AL. 07 OCT 87

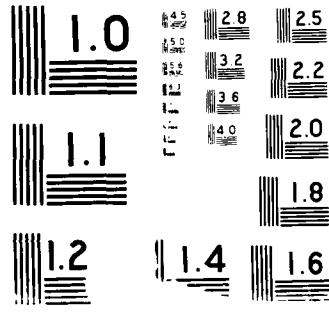
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First Interim Report

Project Wind, Phase IV (smoke test)

Meadow Brook Valley, Red Bluff, CA

Sep. 23 - Oct 7, 1987

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1 Objectives

We have supported the above-mentioned smoke diffusion test programme, by conducting the following two experimental activities in Meadow Brook Valley during Project Wind, Phase IV:

1. Operated two sonic anemometers/thermometers to measure velocity and temperature signals and therefrom obtained direct measurements of mean variances and fluxes of wind speed, turbulence, shear and heat fluxes.

One sonic, sonic # 1. (see fig. 1) was located centrally in the valley near CP and the main mast.

Sonic # 2 was located immediate up wind (down valley) from the day-time smoke emission point.

2. Operated a small general aviation air plane over the experiment site to obtain instantaneous observations of the plume dispersion and flow pattern.

2 Status

Our combined activities during Project Wind, Phase IV are summarized in Table 1.

2.1 Sonic measurements

Sonic # 1 (central valley) was in continuous operation through the entire experimental campaign.

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<i>A-1</i>		

Sonic # 2 was in operation during all day-time (up-valley) smoke and tracer release trail.

All these data (some 30,000 10-min averages) are now safely transferred from tape to files on our main-frame computer. All data looks fine at this point.

2.2 Aerial photography

Approximately 350 35mm pictures were taken from the aircraft as documentation for 10 successfully conducted trials. Five of these were taken during unstable (daytime) conditions, the remaining five during stable (early morning) trials. Four trials were not supported by photography: Two trials are missing due to problems with the M3A4-smoke generator, two trials were conducted at night-time with insufficient light for us to do aerial photography.

Contact-prints of the raw-films from the 10 successful smoke trials are enclosed in Appendix I, together with our log-report on the experiments. Although not evident from the Xerox-copies enclosed in Appendix I, the raw-films are of very high quality and applicable to sufficient enlargement. In addition, each of the pictures are provided with exact timing for exposure (year, day, hour, min, sec.).

Daytime pictures are taken + 2000 ft. above the smoke emission point with a 50 mm lens. Night time pictures are taken + 3000 ft. above the smoke emission point also with a 50 mm lens.

3 Further work

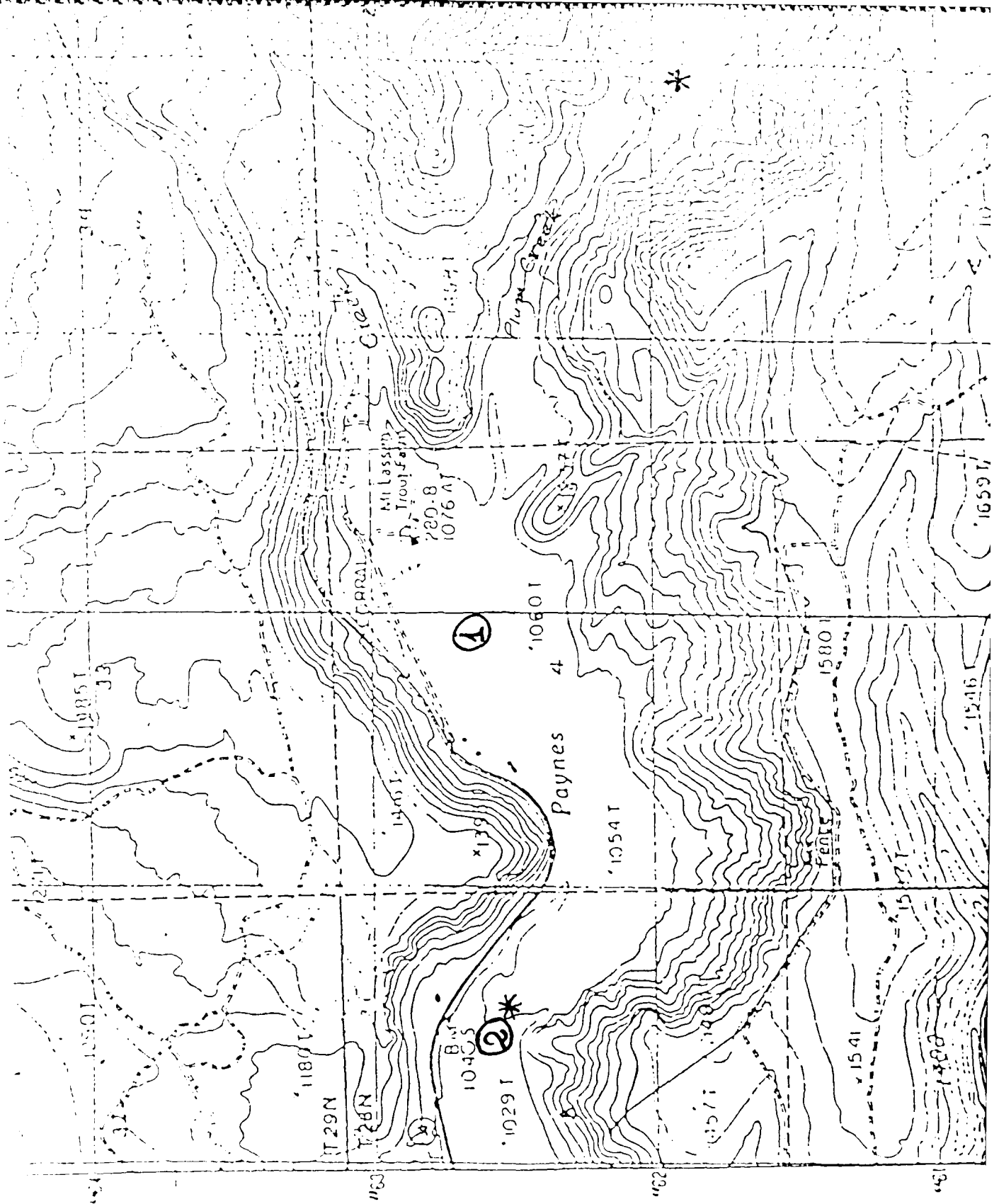
3.1 Turbulence data

The next task is here to plot time series of important variables such as mean wind speed and direction, turbulence levels, shear stress and heat fluxes.

3.2 Photography

In collaboration with ATDD/NOAA oak Ridge, the next task is here to:

1. Confine and select suitable series/sequences from the plume-photography.
2. Categorize the different trials with respect to stability-effects and flow type.
3. Register (digitize) the plume dispersion.
4. Select and enlarge suitable pictures for the overall flow-visualization.



Sonic Station # 1 : ①

Sonic Station # 2 : ②

1" = 1.87 km

Overview - Rise air, Rise ground activity

TABLE 1.

			STATUS	
			TURBU- LLENCE (SONIC)	AERIAL PHOTOGRA phy
<u>Unstable trials (daytime)</u>				
21. Sep	'dry run'	(No smoke)	OK	-
23. Sep	Run #1	Smoke	OK	OK
25. Sep.	Run #3	(No smoke)	OK	-
26. Sep.	Run #4	Smoke	OK	OK
28. Sep	Run #6	Smoke	OK	OK
1. Oct.	Run #10	Smoke	OK	OK
2. Oct.	Run #12	Smoke	OK	OK
<u>Stable trials (Night & early morning)</u>				
24. Sep.	Run #2	No light	OK	-
27. Sep.	Run #5	Smoke	OK	OK
30. Sep.	Run #7	Smoke	OK	OK
30 Sep.	Run #8	No light	OK	-
1. Oct	Run #9	Smoke	OK	OK
2 Oct	Run #11	Smoke	OK	OK
3. Oct	Run #13	Smoke	OK	OK
3. Oct	Run #14	SF ₆ -tracer only	OK	-

Project Wind, Phase IV

Log - report

Day: Mon Sep. 21Meteorology:

Sonic station #1 Start time: 1045 →

Stop time: cont.

Sonic station #2 Start time: 1100

Stop-time: 1600

Tracer-release Run #: 0 (dry run) No snow

FM-tape at st. #1 start time: 1035

stop time: 1835

Photography (Aerial)

start-time: :

stop time: :

Pictures taken: :

Project Wind, Phase IV

Log - report

Day: Tues, Sep. 22

Meteorology:

Sonic station #1 start time: cont.

stop time: cont

Sonic station #2 start time: %

stop-time: %

Tracer-release Run # : %

FM-tape at st. #1 start time: %

stop time: %

Photography (Aerial) start-time: %

stop time: %

Pictures taken: %

Project U.S. of Phase III

Log - report

Day: Wed. Sep. 23

Meteorology:

Sonic station #1 start time: cont.
stop time: cont.

Sonic station #2 start time: 1130
stop-time: 1545

Tracer-release Run #: 1 smoke

FM-tape at st. #1 start time: 1100
stop time: 1552

Photography (Aerial) start-time: 1407
stop time: 1453
pictures taken: -



Log - report

Day : Thursday, Sep. 24

Metevology :

Sonic station #1 start time : cont.

stop time : cont.

Sonic station #2 start time : /

stop-time : /

Tracer-release Run # : 2 (night-wn) No w-z smoke

FM-tape at st. #1 start time: 2105

stop time: + 8 hours

Photography (Aerial) start-time: /

stop time : /

Pictures taken:

Project - the 1st Phase IV

Log - report

Day : Friday, Sep. 25

Metereology :

Sonic station #1 start time : cont.

stop time : cont.

Sonic station #2 start time : 1300

stop-time : 1400

Tracer-release Run # : 3 (canceled) No sm

FM-tape at st. #1 start time : 13:35

stop time : 21:35

Photography (Aerial) start-time : ?

stop time : ?

pictures taken : ?

Project Wind Phase II

Log - report

Day : Saturday, Sep. 26

Meteorology :

Sonic station #1

Start time : cont.

Stop time : cont.

Sonic station #2

Start time : 0945

Stop-time : 1330

Tracer-release Run # : 4 Smoke

FM-tape at st. #1

Start time : 1030

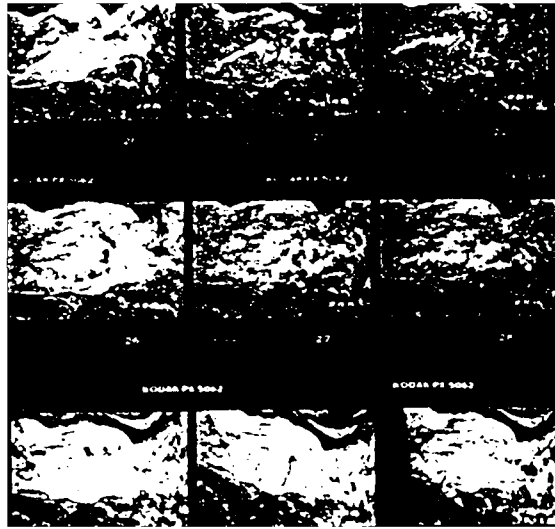
Stop time : 1330

Photography (Aerial)

Start-time : 1203

Stop time : 1308

Pictures taken : 56



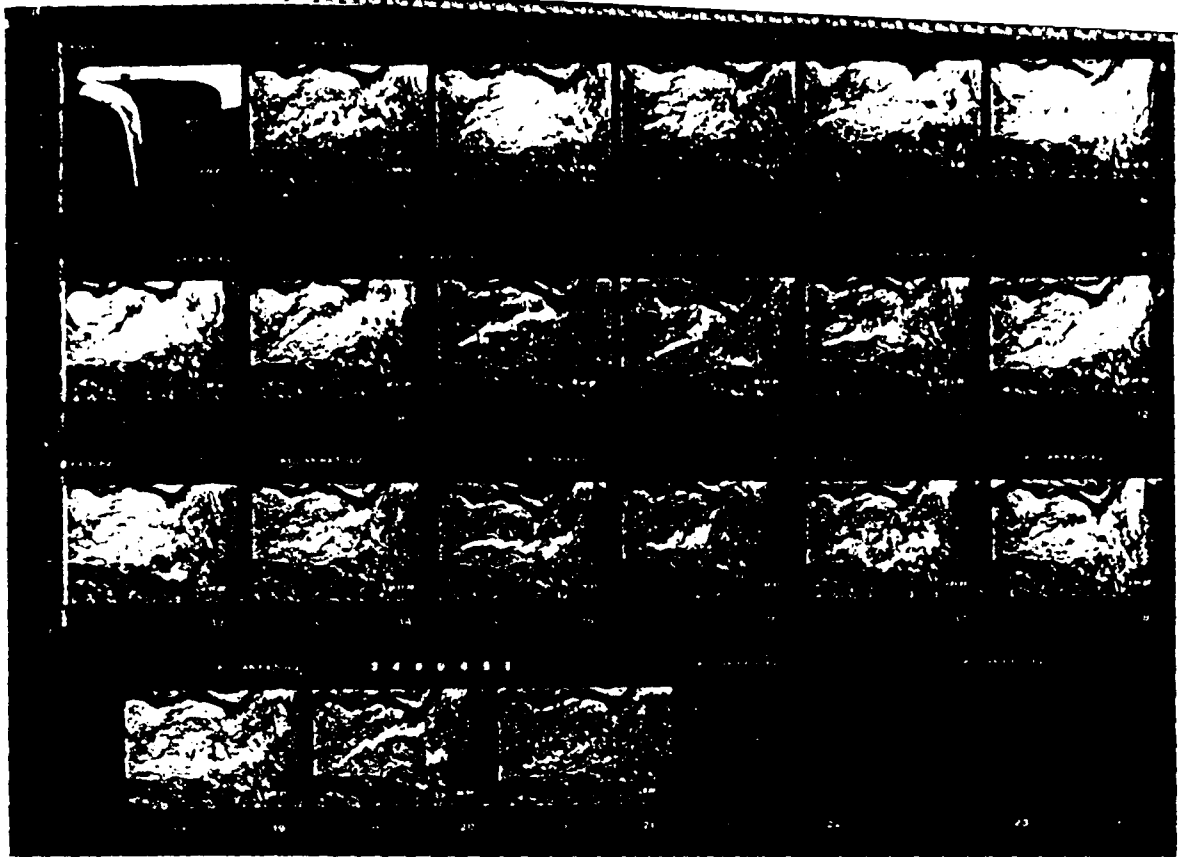


Plate #3

Project Wind Phase IV

Log-report

Day: Sunday, Sep. 27

Meteorology:

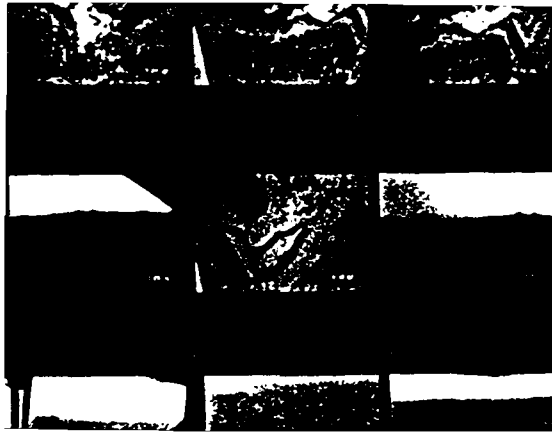
Sonic station #1 start time: cont.
 stop time: cont.

Sonic station #2 start time: ?
 stop-time: ?

Tracer-release Run # : 5 (^{Early morning}~~night run~~)

FM-tape at st. #1 start time: 0615
 stop time: 1215

Photography (Aerial) start-time: 0645
 stop time: 0713
 Pictures taken: 34



Project Wind, Phase IV

Log - report

Day: Monday, Sep. 28

Meteorology:

Sonic station #1	Start time:	cont.
	Stop time:	cont.
Sonic station #2	Start time:	1000
	Stop-time:	1430

Tracer-release Run # : 6 smoke

FM-tape at st. #1	start time:	1020
	stop time:	1452

<u>Photography</u> (Aerial)	start-time:	1039
	stop time:	1058
	Pictures taken:	20

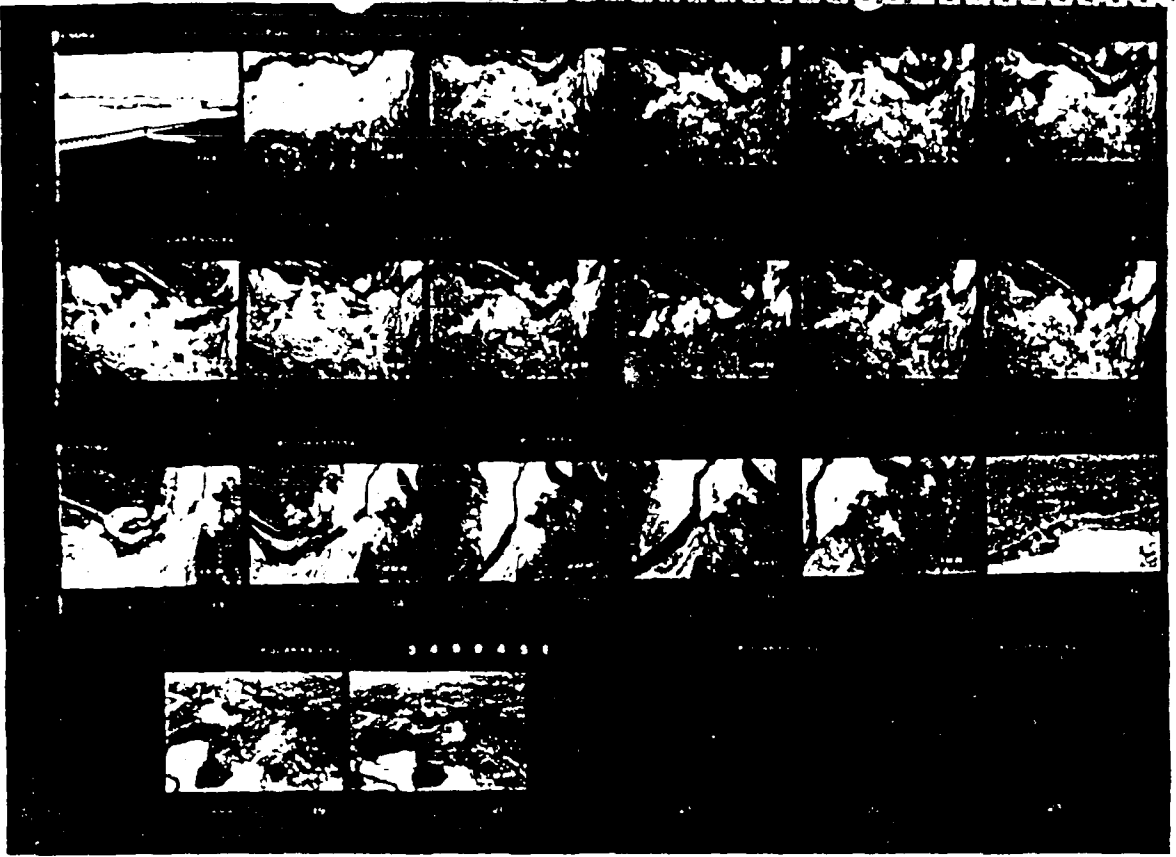


Plate # 5

Project Wind, Phase IV

Log - report

Day: Tuesday, sep. 29

Meteorology:

Sonic station #1 start time: cont

stop time: cont

Sonic station #2 start time: %

stop-time: %

Tracer-release Run # : %

FM-tape at st. #1 start time: %

stop time: %

Photography (Aerial) start-time: %

stop time: %

pictures taken: %

Project Wind, Phase IV

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Log - report

Day: Wednesday, Sep. 30

Meteorology:

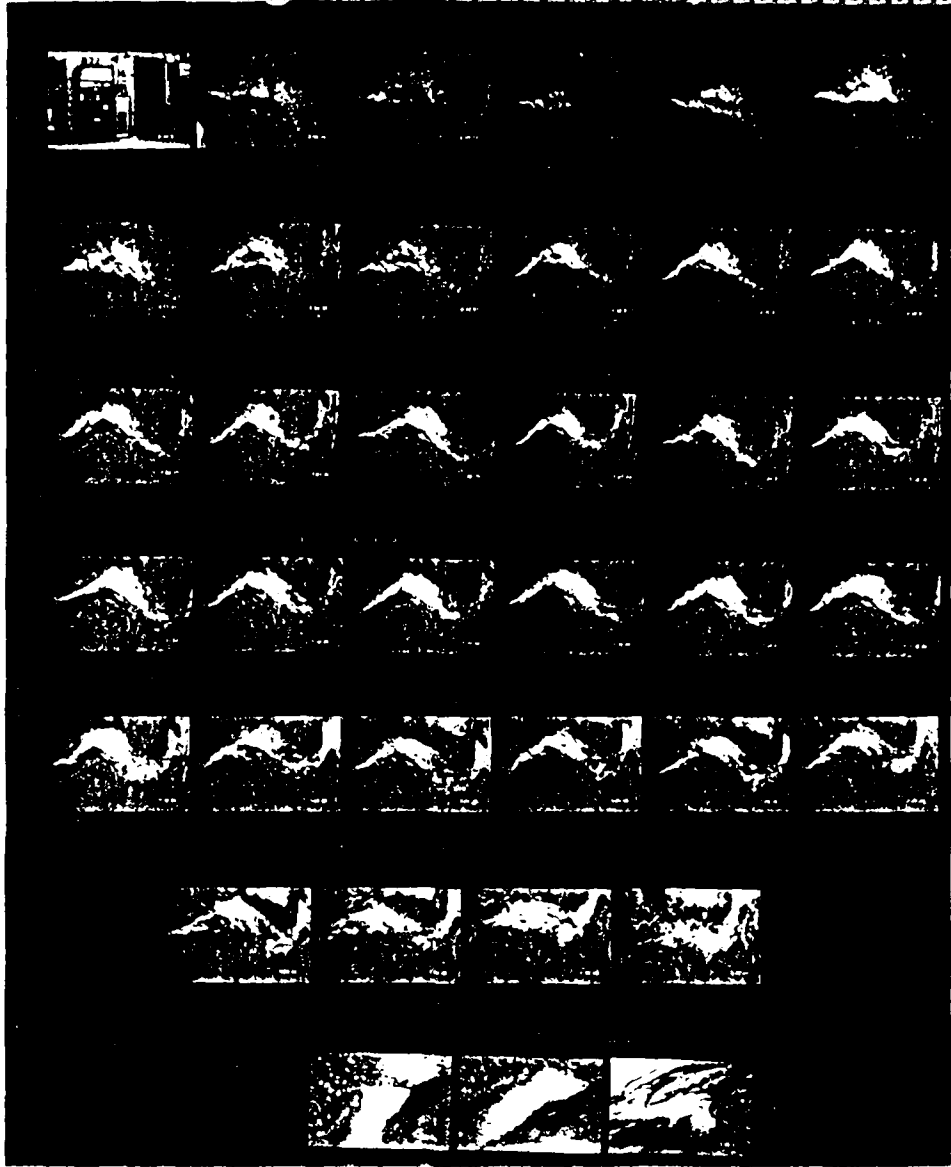
Sonic station #1 start time: cont
stop time: cont

Sonic station #2 start time: i.
stop-time: i.

Tracer-release Run #: 7 smoke

FM-tape at st. #1 start time: 0622
stop time: 0800

Photography (Aerial) start-time: 0648
stop time: 0736
pictures taken: 37



frame 410

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Project Wind, Phase IV

Log - report

Day: Wednesday, Sep. 30 (cont).

Metevology:

Sonic station #1 start time: cont
 stop time: cont

Sonic station #2 start time: ?
 stop-time: ?

Tracer-release Run # : 8

Night-run:

FM-tape at st. #1 start time: 1235
 stop time: + 8 hours

Photography (Aerial) start-time: ?
 stop time: ?
 pictures taken: ?

Project Wind, Phase IV

Log - report

Day: Thursday Oct. 1

Meteorology:

Sonic station #1 start time: cont.

stop time: cont

Sonic station #2 start time: >

stop-time: >

Tracer-release Run # : 9 Smoke

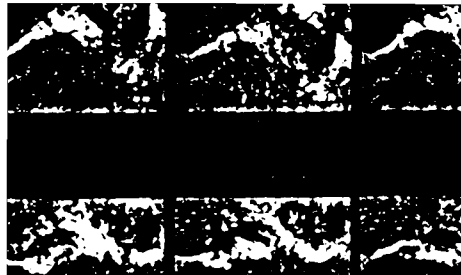
FM-tape at st. #1 start time: 0632

stop time: 1440

Photography (Aerial) start-time: 0653

stop time: 0753

Pictures taken: 56



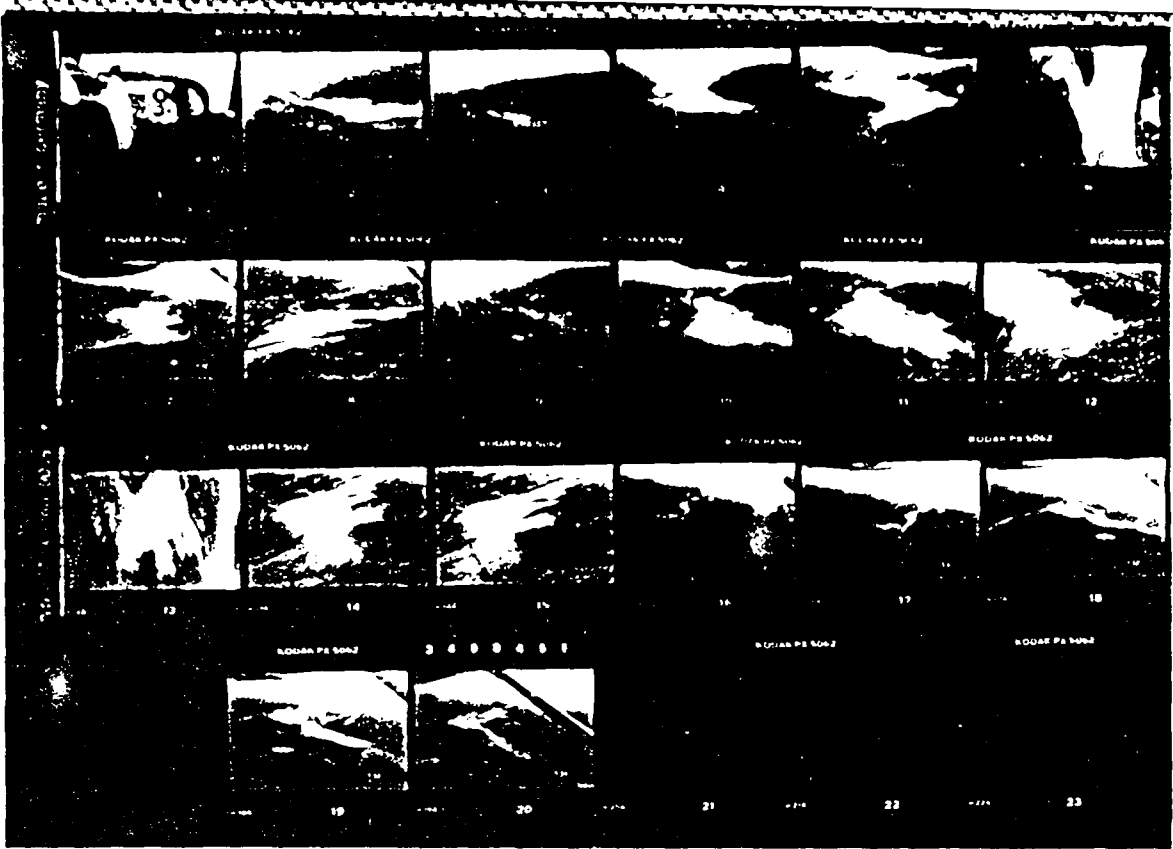


plate #8

Project Cloud Phase IV

Log - report

Day: Thursday, Oct 1 (cont).

Meteorology:

Sonic station #1 start time: cont
stop time: cont.

Sonic station #2 start time: 1240
stop-time: 1500

Tracer-release Run # : 10 smoke

FM-tape at st. #1 start time: 0632
stop time: 1440

Photography (Aerial) start-time: 1411
stop time: 1432
pictures taken: 1?

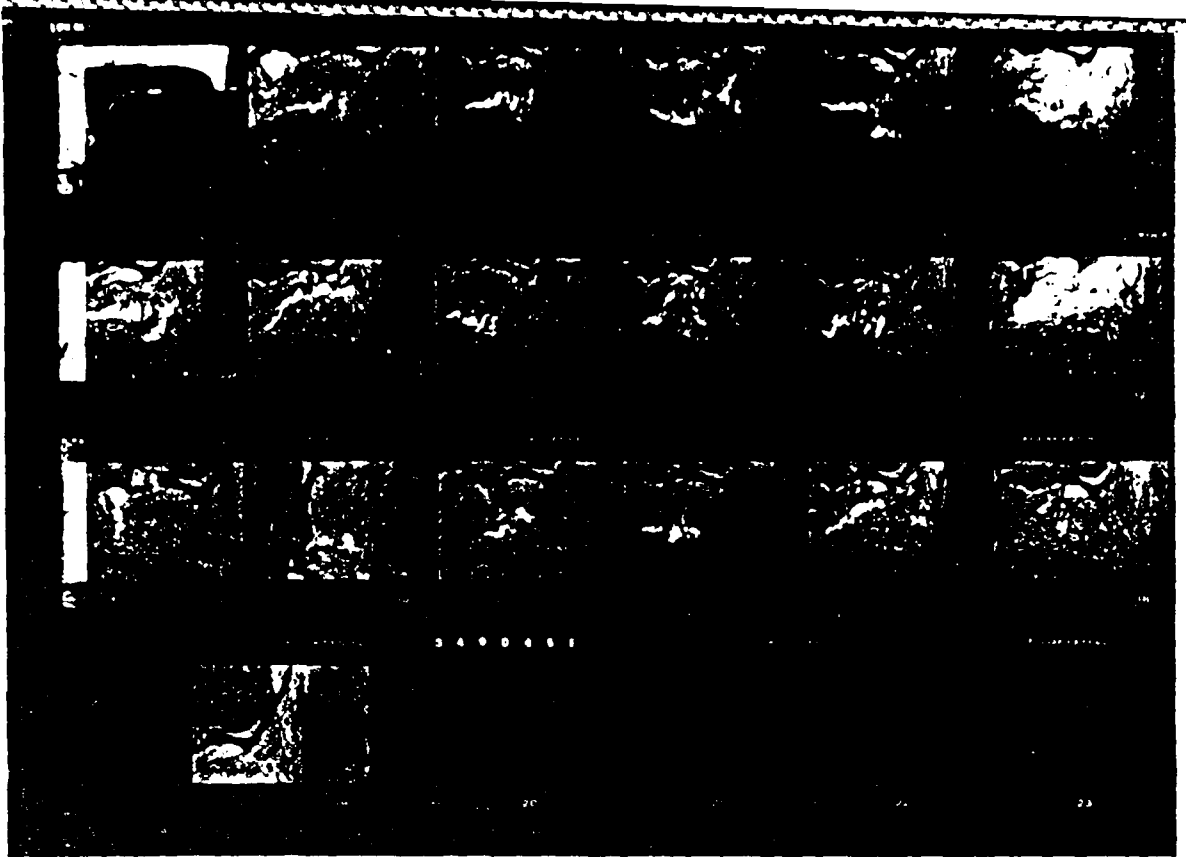


Plate #9

Log - report

Day: Friday, Oct. 2Meteorology:

Sonic station #1

Start time: cont

Stop time: cont.

Sonic station #2

Start time: ..

Stop-time: ..

Tracer-release Run #: 11 Smoke

FM-tape at st. #1

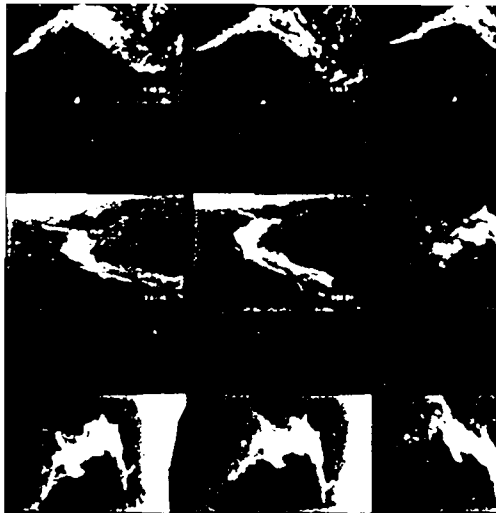
Start time: 0640

Stop time: ~~1448~~
1320Photography (Aerial)

Start-time: 0718

Stop time: 0757

Pictures taken: 36



Project Wind, Phase IV

Log - report

Day: Friday, Oct 2

Meteorology:

Sonic station #1

Start time: cont.

Stop time: cont.

Sonic station #2

Start time: 1200

Stop-time: 1320

Tracer-release Run # : 12

Smoke

FM-tape at st. #1

start time: 0640

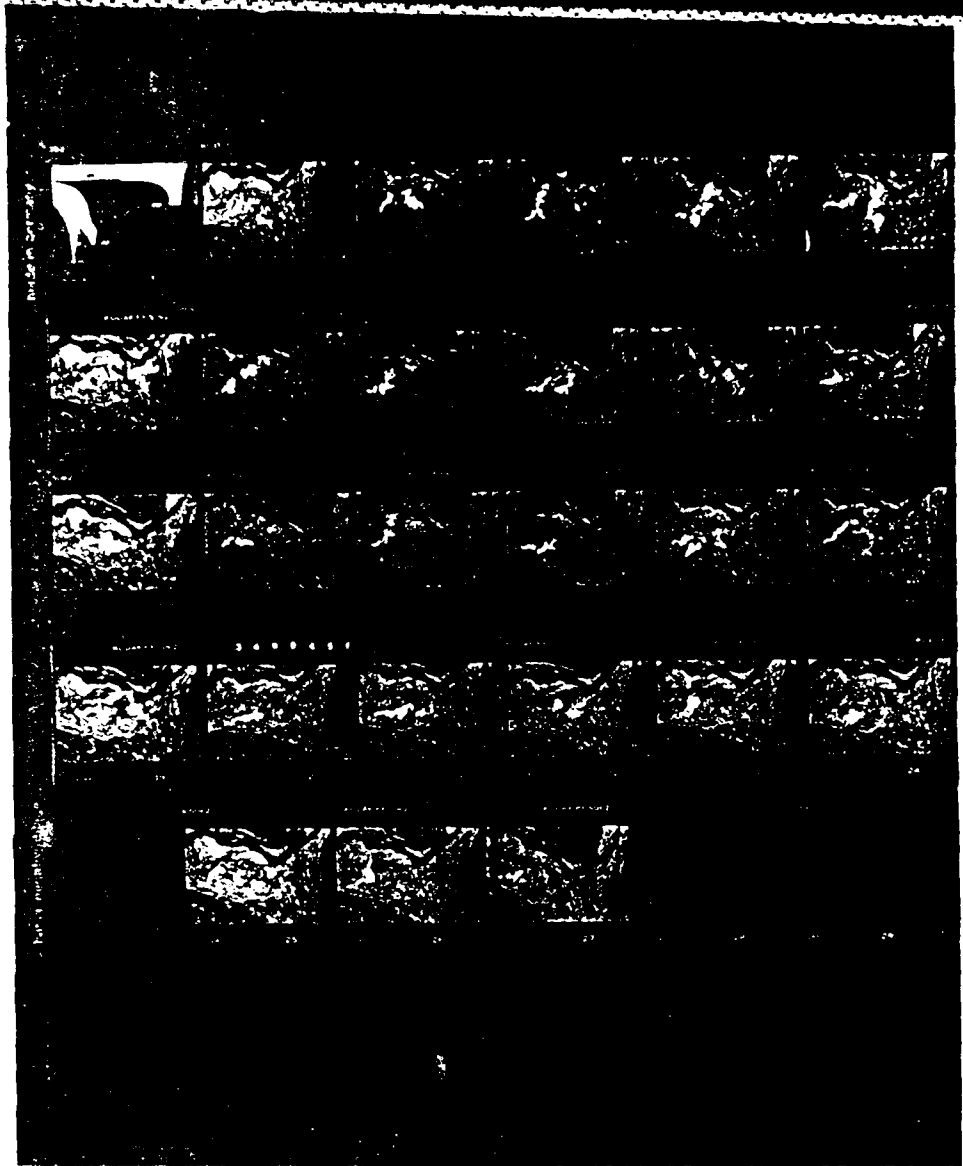
stop time: 1320

Photography (Aerial)

start-time: 1217

stop time: 1259

Pictures taken: 27



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Project 4000, Phase IV

Log - report

Day: Sat. Oct. 3

Metevology:

Sonic station #1 start time: out.
stop time: out.

Sonic station #2 start time: ?
stop-time: ?

Tracer-release Run #: 13 smoke!

FM-tape at st. #1 start time: 0640
stop time: 1234

Photography (Aerial) start-time: 0657
stop time: 0735
pictures taken: 30

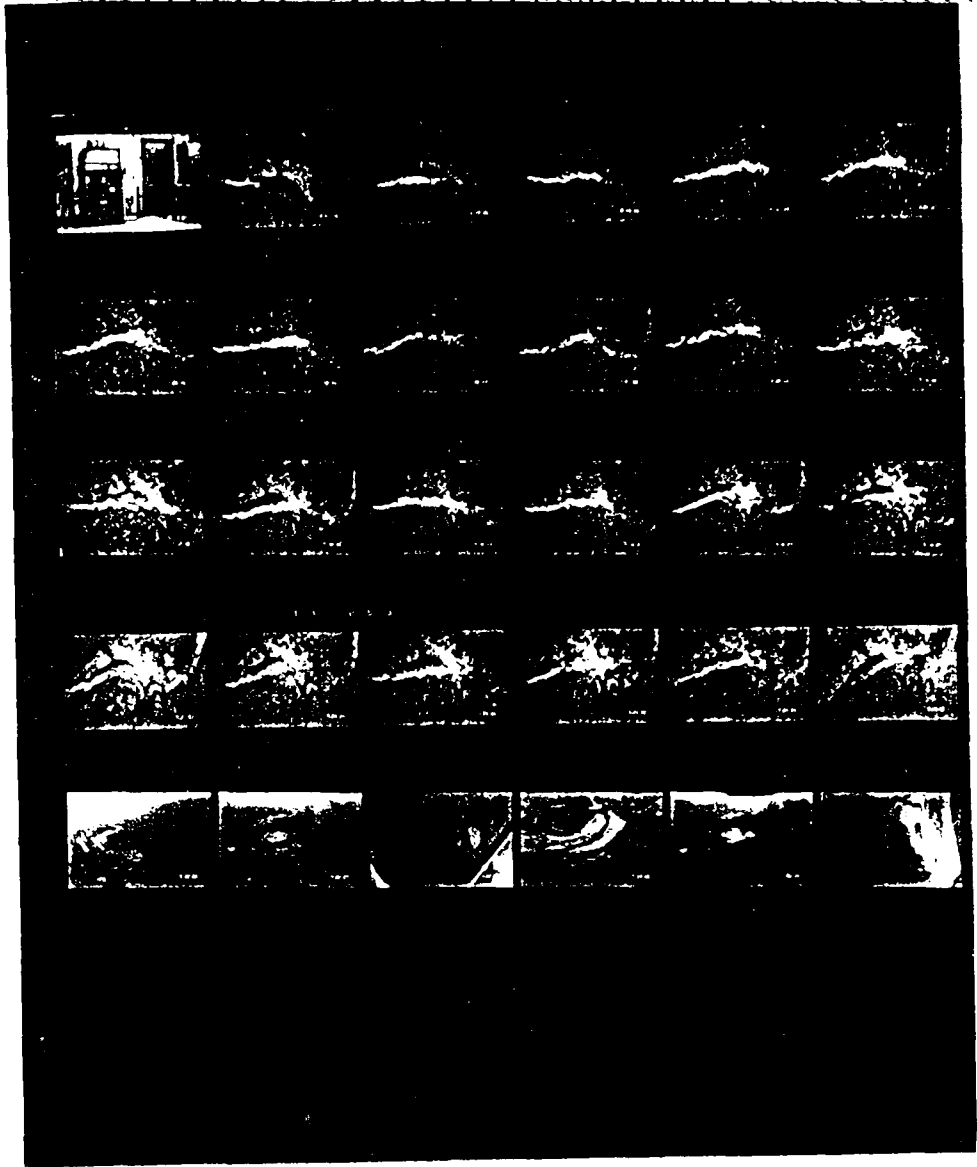


Plate # 12

Log - report

Day : Feb. 1, 63

Metereology :

Sonic station #1	start time :	cont
	stop time :	cont. 2400

Sonic station #2	start time :	%
	stop-time :	%

Tracer-release Run # : 14 (no smol)

FM-tape at st. #1	start time :	1410
	stop time :	2218

<u>Photography (Aerial)</u>	start-time :	%
	stop time :	%
	Pictures taken :	0

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