

6 October 1959

FINAL REPORT

STRATO-LAB MIKESELL NO. 1

Prepared for:

Office of Naval Research  
Department of the Navy  
Washington 25, D.C.

Under contract number:

Nonr 1589 (06)

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GMI Report No. B-1077

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## INTRODUCTION

The purpose of the flight was to carry a Navy pilot, LCDR Ross, and a civilian scientist, Dr. A. H. Mikesell of Naval Research Laboratory in an open fiber-glass gondola to approximately 40,000 feet in order to carry out high altitude research. This project was sponsored by ONR under Contract Number Nonr 1589 (06). The flight was planned for 3 May 1958.

## PRE-FLIGHT TESTING

Prior to the flight, approximately one week was spent subjecting flight personnel and equipment to simulated flight conditions in the General Mills environmental test chamber. (Figure 1) During these tests, temperatures and pressures were varied from 10<sup>o</sup>F to -77<sup>o</sup>F and 1000 feet to 41,000 feet exactly duplicating the ascent and descent of the gondola over a time period corresponding to the actual flight.

## BALLOON SYSTEM

The balloon utilized was a 2-1/2 mil, 72 foot diameter, cylindrical balloon of polyethylene designed to carry fairly heavy payloads to altitudes of less than 90,000 feet. The volume of the balloon at the theoretical ceiling was 146,000 ft<sup>3</sup> and the weight approximately 340 pounds. The entire train, including a 64 foot chute in series between the balloon and gondola, weighed 2,675 pounds.

## INSTRUMENTATION

The instrumentation included a barograph and barocoder. The barograph was a Peravia model and the barocoder was a General Mills Model 25, Serial No. 25. Also, while not strictly considered a piece of instrumentation, a 50 candle power rotating airplane-type beacon was utilized during the entire flight for safety and tracking purposes.



Figure 1  
Dr. Mikesell and LCDR Ross preparing  
to enter GMI environmental chamber.

On this flight, three cameras were used to cover three areas of viewing: (1) the gondola interior (2) the horizon, and (3) the ground directly below the gondola. Plus X black and white film was used and pictures were taken once a minute. A photocell controlled the camera so that they did not function during the hours of darkness.

#### ELECTRONIC EQUIPMENT

The barocoder transmitter on 172<sup>4</sup> KC sent out altitude information which was recorded at the GMI flight center, and this altitude information was also used by the tracking aircraft and trucks.

Voice communication was set up on two frequencies, 6700.5KC and 122.8MC, with 6700.5KC being designated as the primary frequency. The gondola carried equipment for transmitting and receiving on both frequencies. Provision was made at the GMI flight center to tape record all transmissions from the gondola on the 6700.5KC frequency so that the pilot and observer could record scientific data merely by speaking rather than by writing it down. After the gondola was airborne and darkness closed in, the 6700.5KC frequency had considerable interference from distant stations that could not be heard during daylight hours. However, the frequency was still usable for voice communications. A few hours after launch, the gondola crew switched over and used 122.8MC for the remainder of the flight. Information about the change in frequencies was not heard at the GMI flight center, nor were they prepared to receive and record on 122.8MC. As a result, some of the gondola transmissions were not recorded. After becoming aware of the change, the flight center personnel set up a receiver on 122.8MC and most of the tape recording was done on that frequency.

#### FLIGHT SUMMARY

The flight was launched under cloudless conditions from the Magnan-Joann open pit

mine near Ironton, Minnesota, at 2001, 6 May 1958. (Figure 2 and 3) Given a free lift of 470 pounds or 17.6 per cent, the balloon ascended at an average rate of 1285 feet per minute with a maximum rate of rise of 1449 FPM up to approximately 25,000 feet. The flight leveled off at 39,600 feet in approximately 30 minutes after launch, remaining at that altitude through sunset until 2220 CDT. The balloon descended at 575 FPM to 10,000 feet by 0040 CDT 7 May and then climbed to 15,000 feet around 0310 CDT slowly descending thereafter through sunrise to a point of impact eight miles ESE of Dubuque, Iowa at 0726 CDT, 7 May. The flight covered 325 miles in 11 hours and 25 minutes.

Tracking was accomplished by visual and radio compass observation from Cessna 170 No. N14330B leased exclusively to General Mills for this purpose. It was equipped with a Narco Omnigator for navigation and civil air communication, an ARC 21 radio compass for tracking balloon, and an Elmac AF-67 mobile transmitter and receiver for command and communication with the tracking center and the recovery trucks on the ground. In addition, a University of Minnesota Beechcraft was utilized as a communications Center, disseminating information concerning the flight to all groups.

No damage was sustained by the gondola or equipment and all items were loaded on the recovery trucks and returned to Minneapolis 7 May 1958.

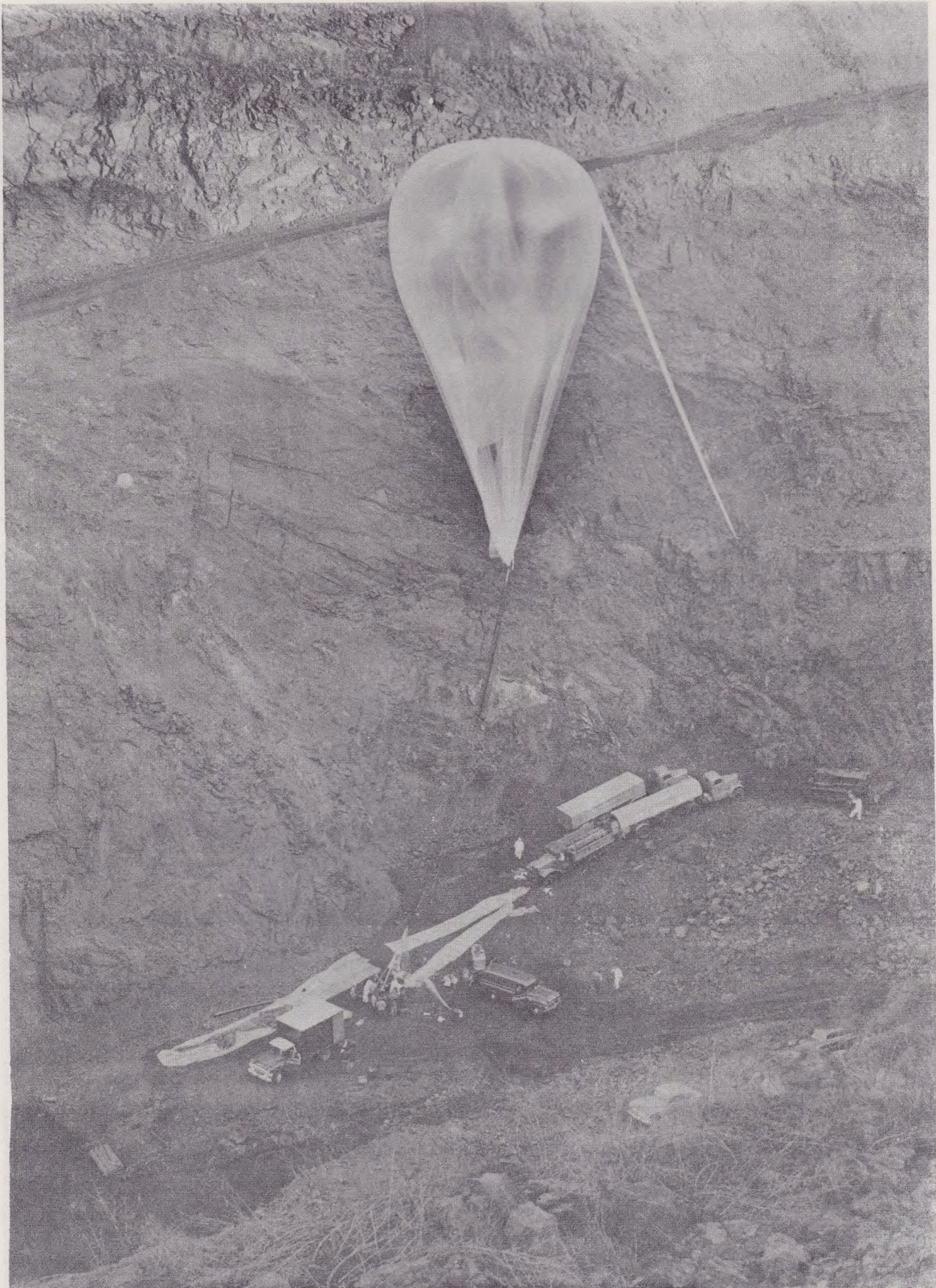


Figure 2  
Magnan-Joan Pit Ironton, Minnesota  
Balloon just prior to launching.  
6 May 1958

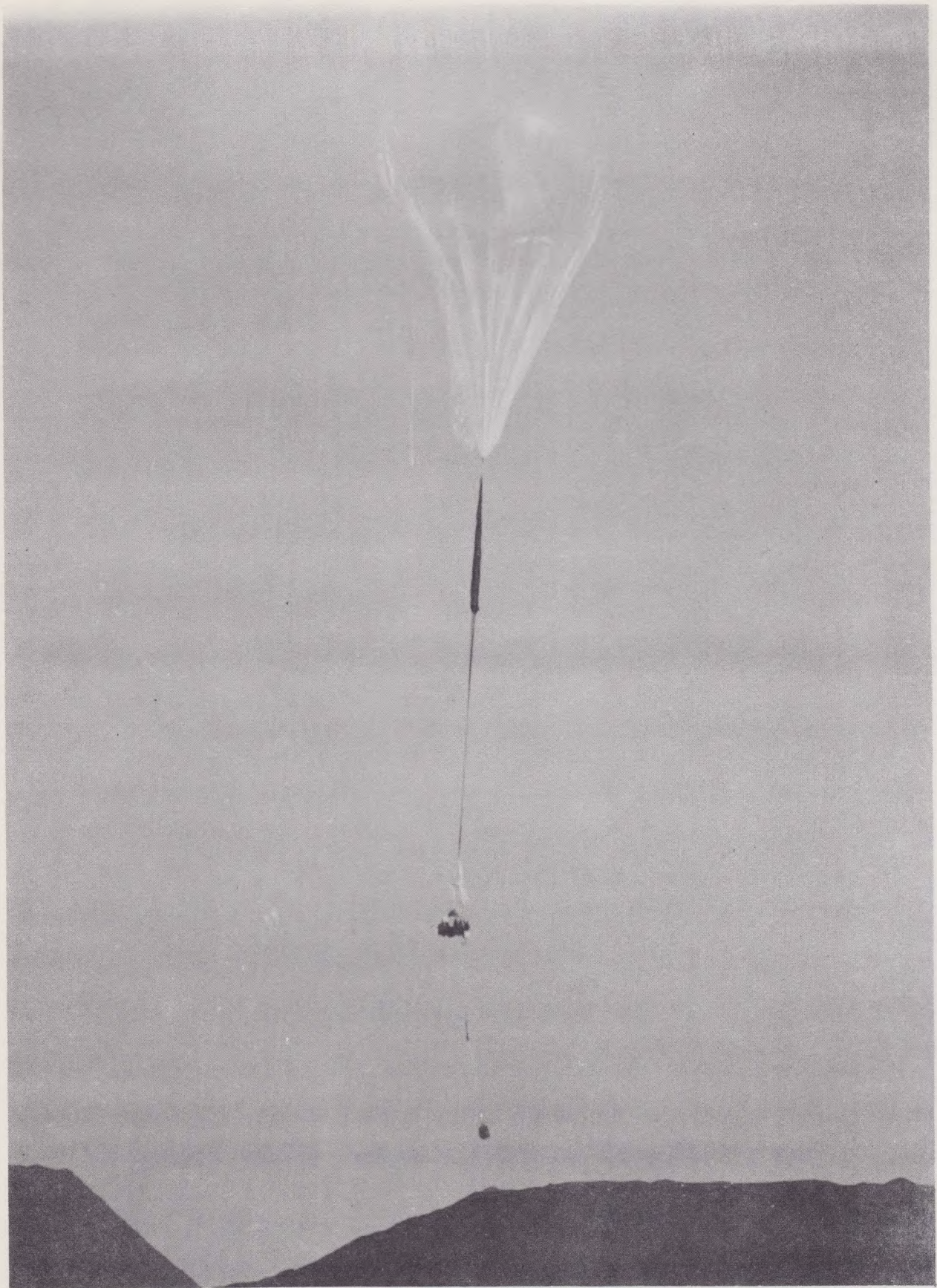


Figure 3  
Balloon and Stratolab clearing rim of  
open pit mine. 6 May 1958.



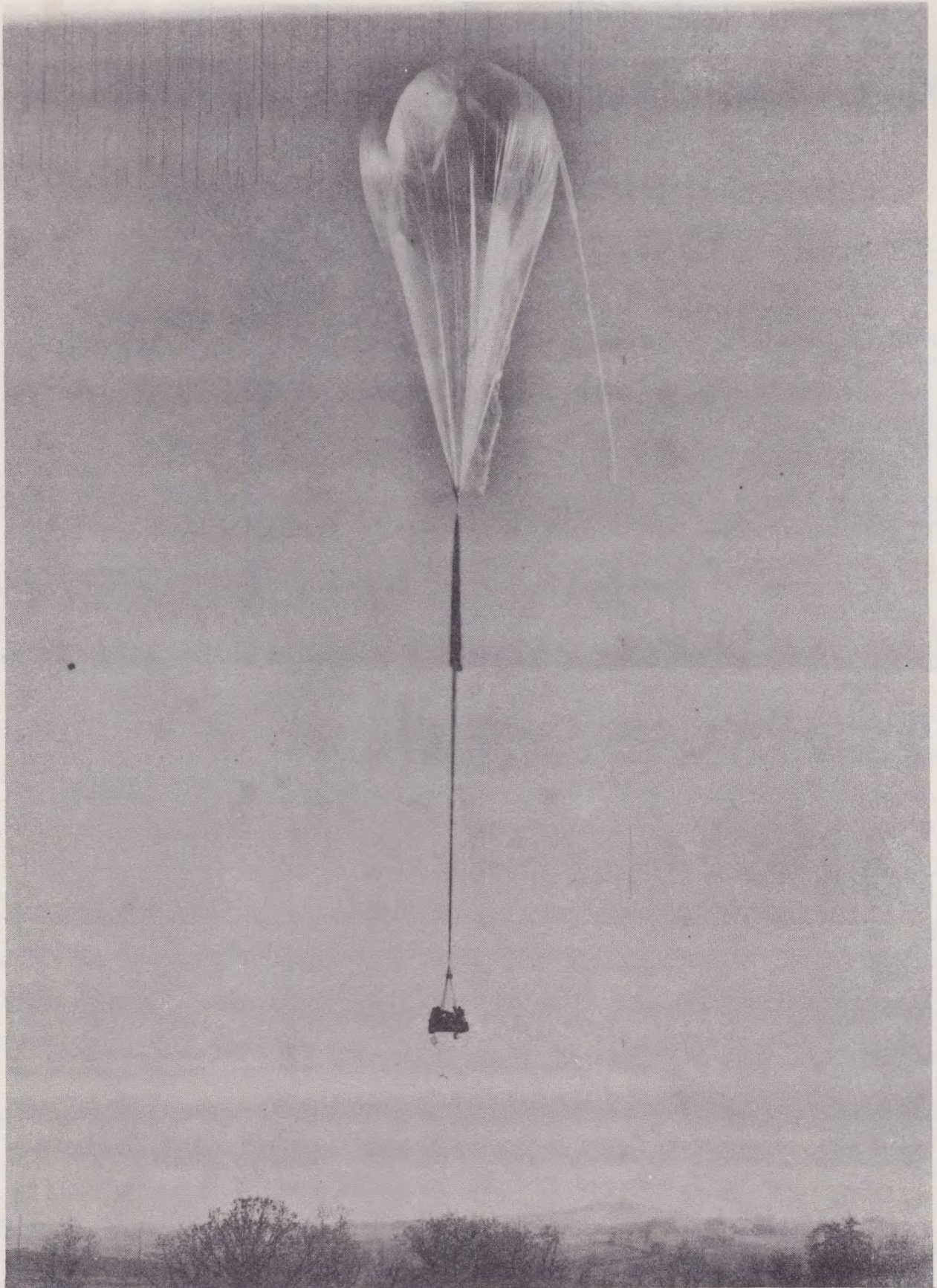
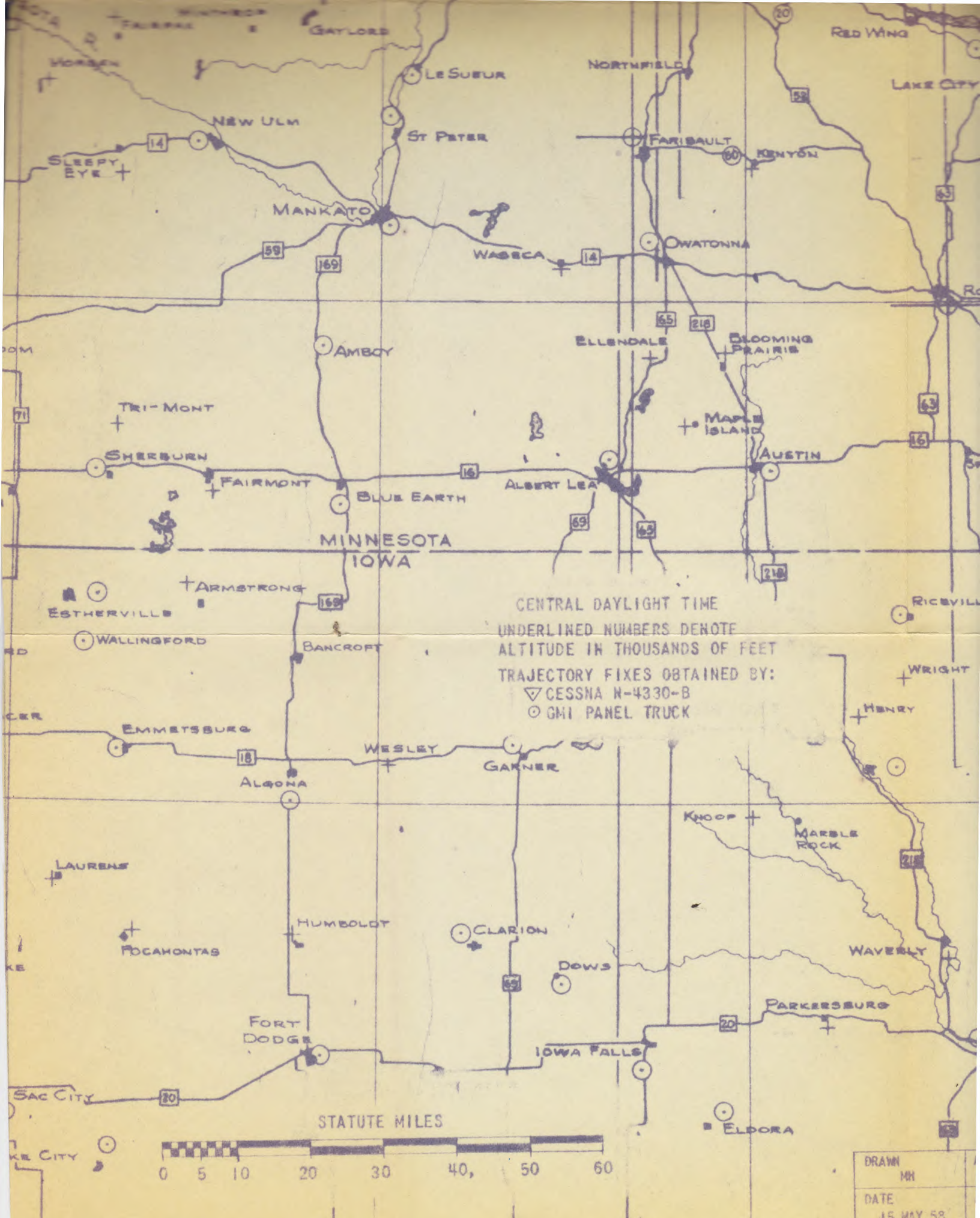
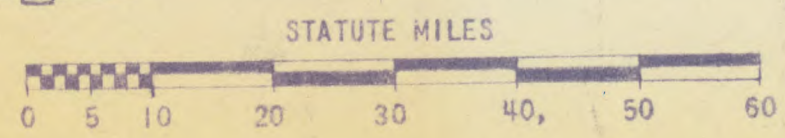


Figure 4  
Stratolab descending to earth near  
Dubuque, Iowa morning of 7 May 1958.

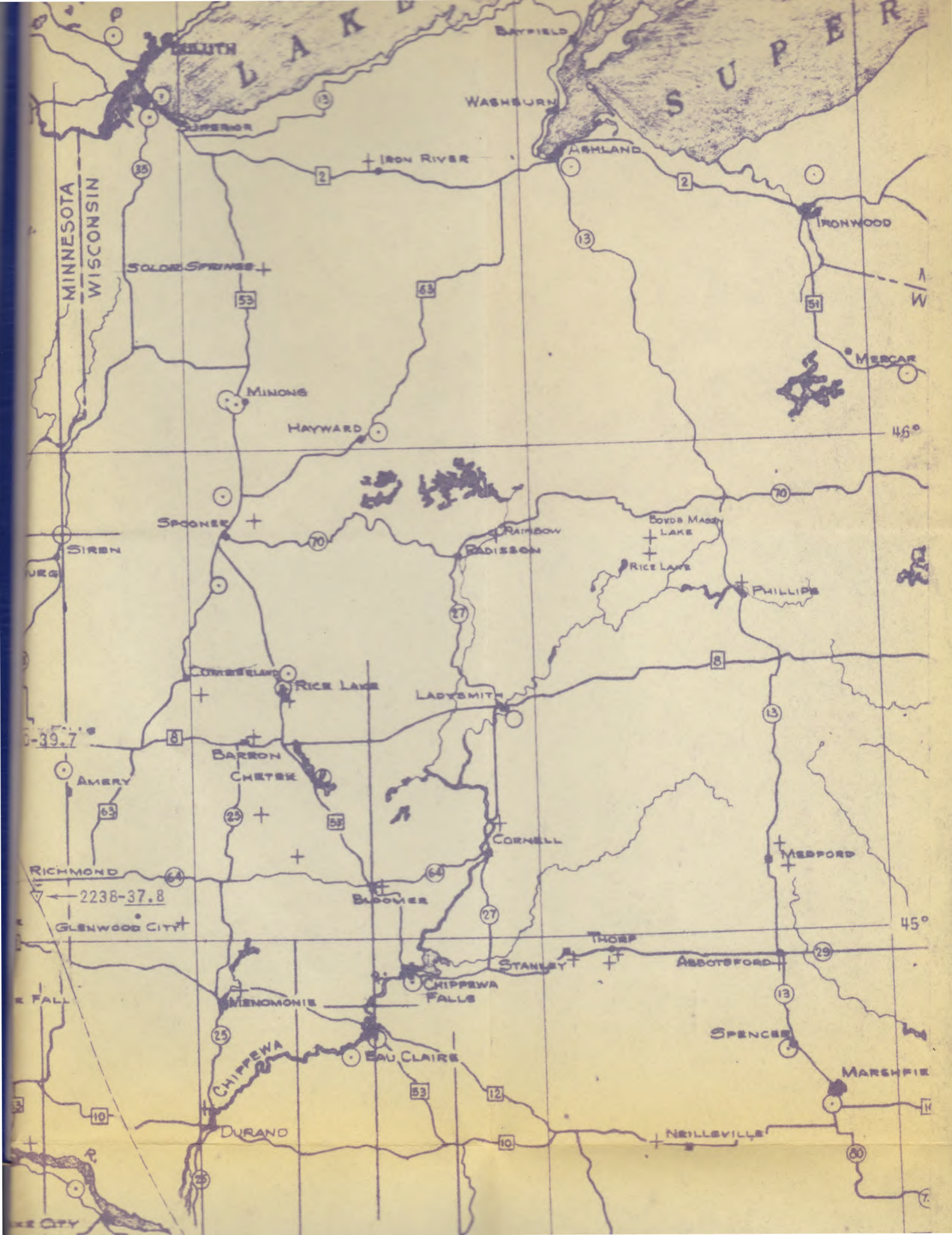




CENTRAL DAYLIGHT TIME  
 UNDERLINED NUMBERS DENOTE  
 ALTITUDE IN THOUSANDS OF FEET  
 TRAJECTORY FIXES OBTAINED BY:  
 ▽ CESSNA N-4330-B  
 ○ GMI PANEL TRUCK



DRAWN	MH
DATE	15 MAY 58





APPROVED	SCALE	BALLOON TRAJECTORY, FLIGHT NO	2340
APPROVED	1:1,000,000	FLOWN	6 MAY 1958
APPROVED	PROJECT		
	56031		

VISION, GENERAL MILLS, INC.; MINNEAPOLIS, MINN.

-23107-C

ALTITUDE DATA  
◦ CODESONDE #104 1724 KC

ST CLOUD STATION REPORT  
070000Z

ALTITUDE IN THOUSANDS OF FEET

TEMPERATURE IN °C

RATES OF RISE  
IN FT/MIN

1449

1285

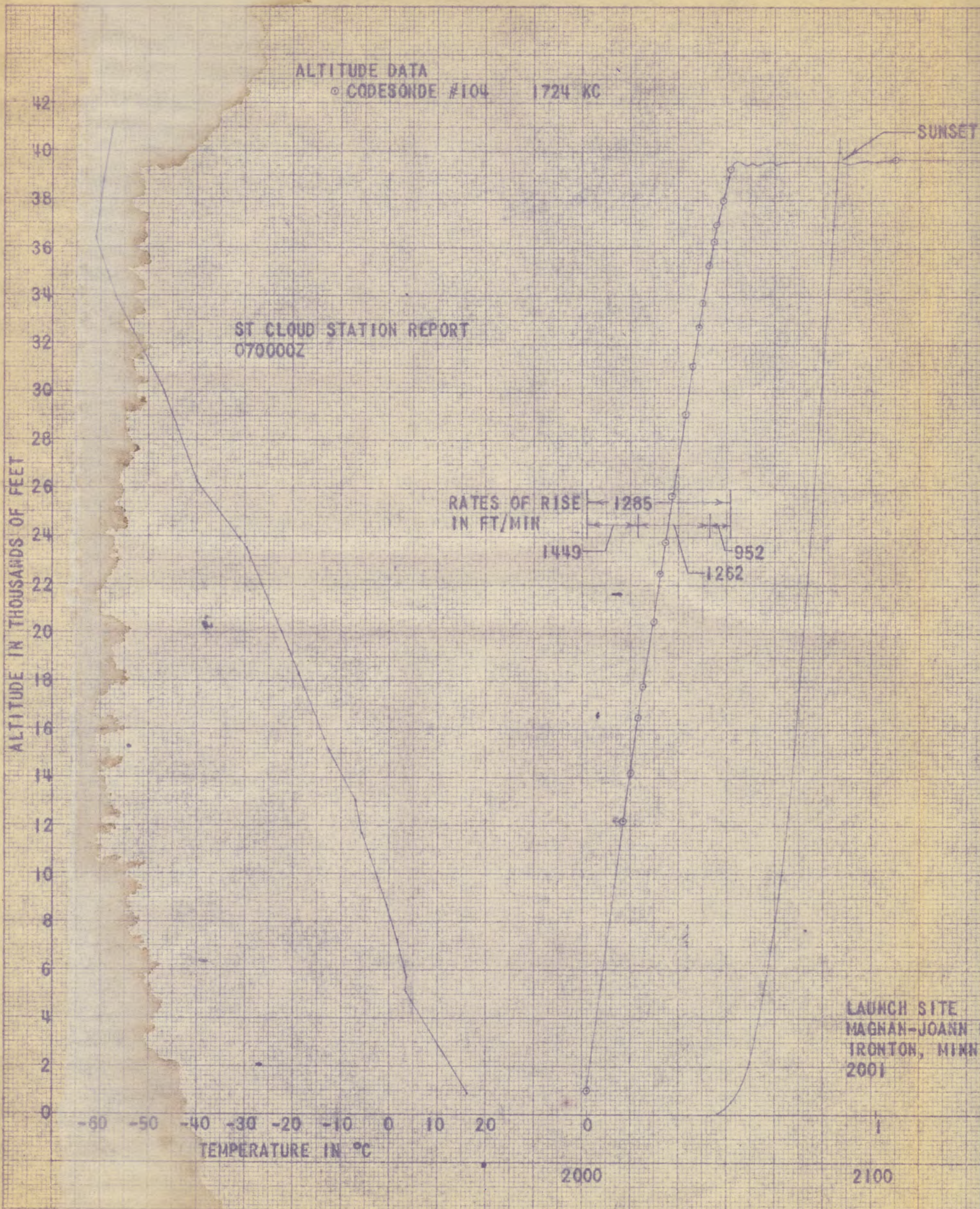
1252

SUNSET

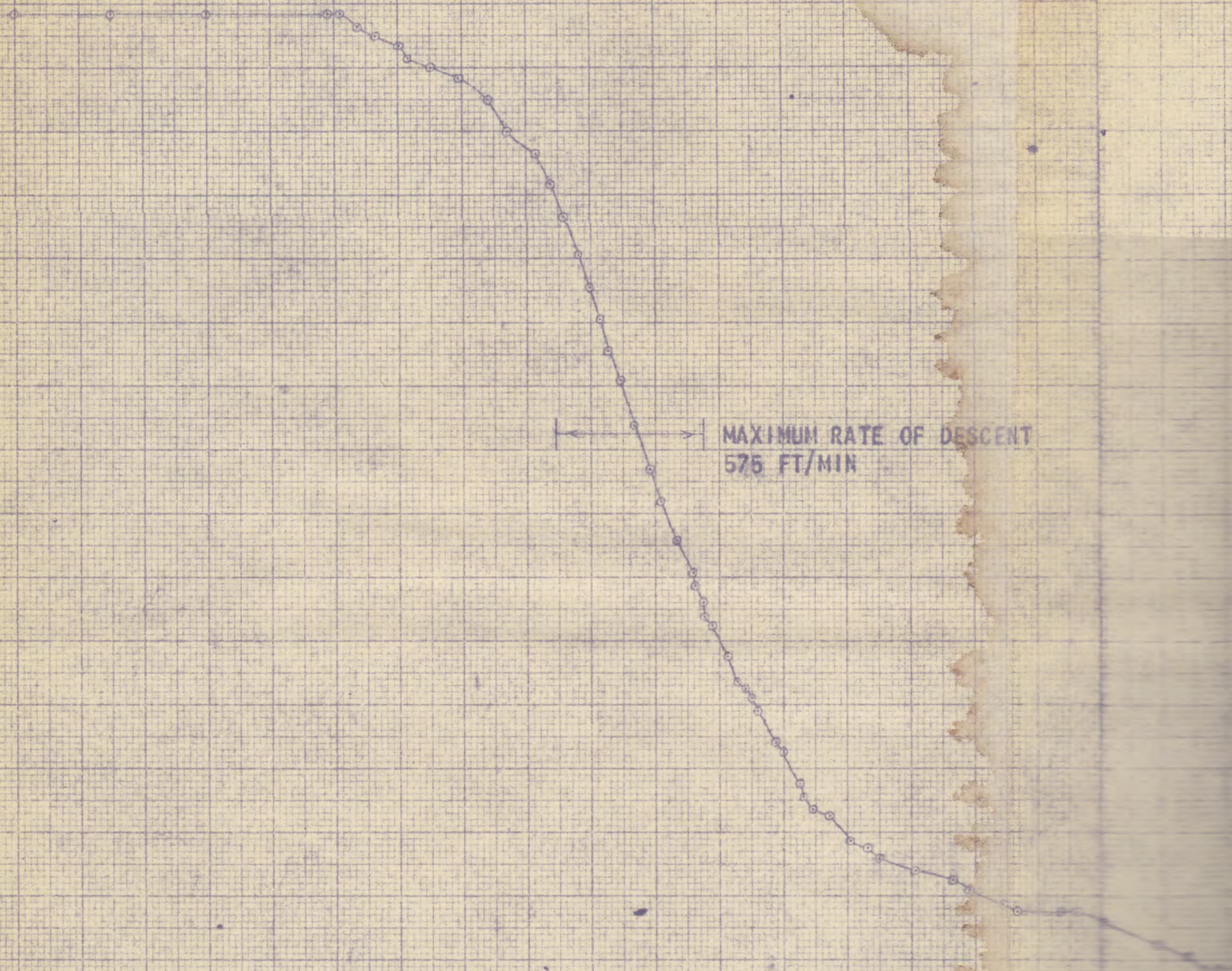
LAUNCH SITE  
MAGNAN-JOANN  
TRONTON, MINN  
2001

2000

2100

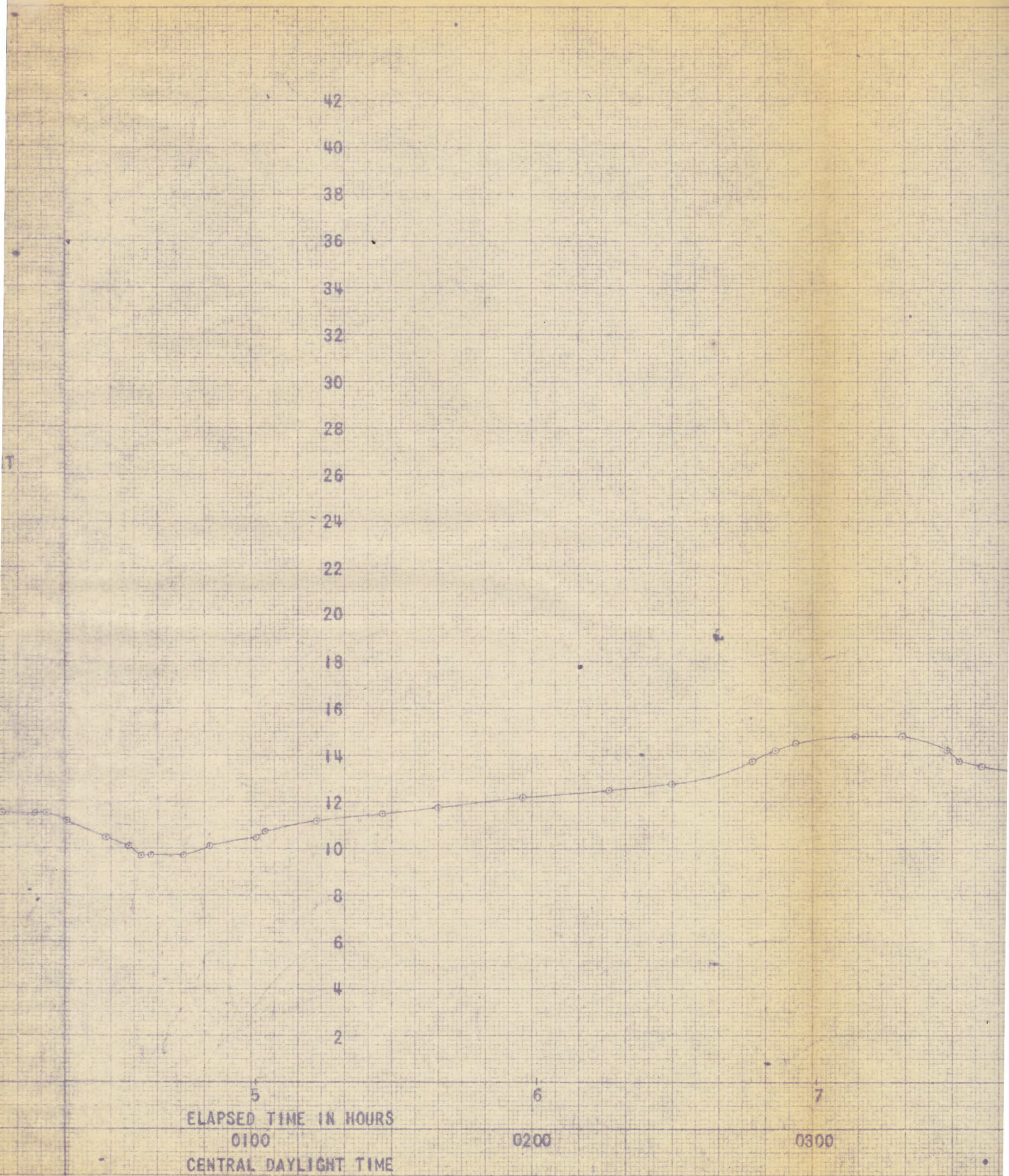


INSET



SITE  
JOANN PIT  
MINN

2 2200 3 2300 4 0000



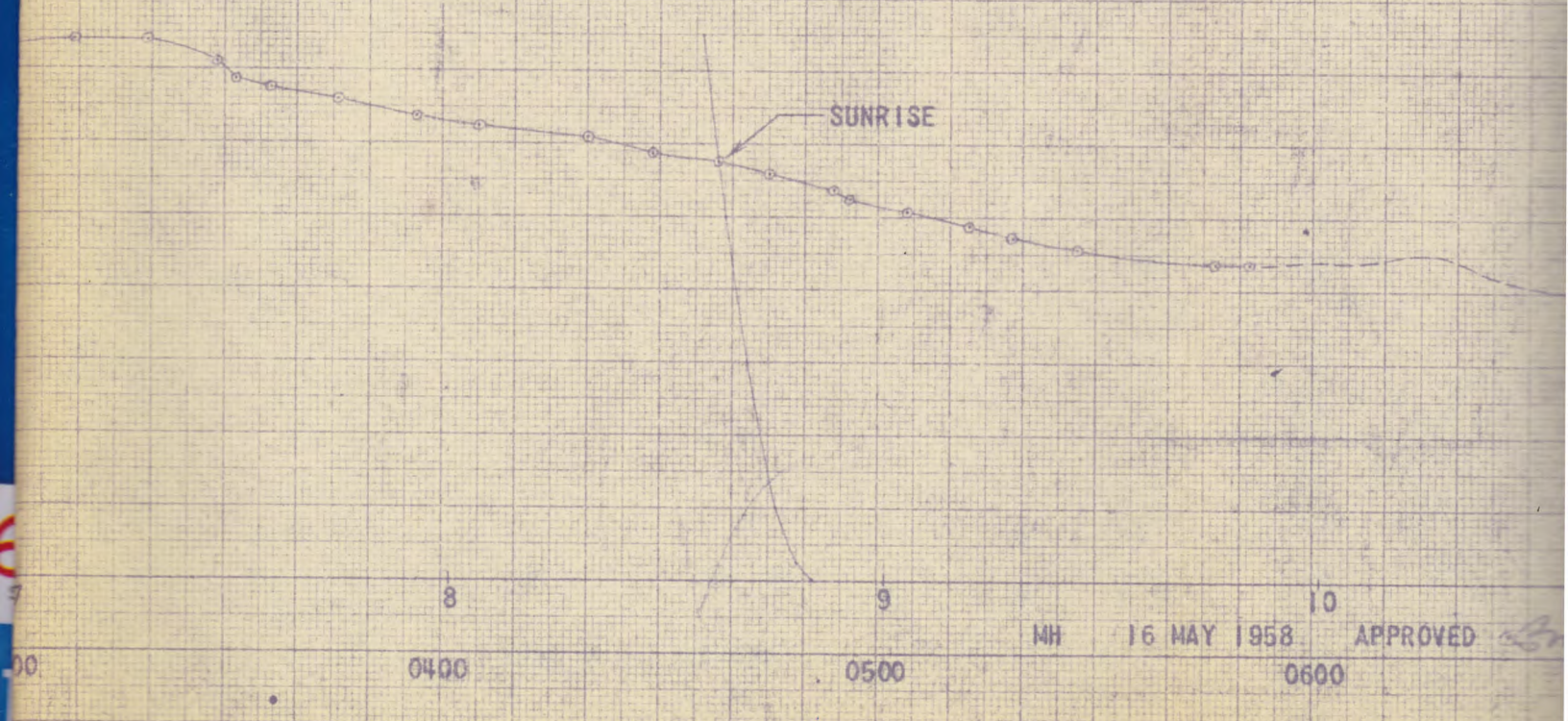
ELAPSED TIME IN HOURS  
 0100  
 CENTRAL DAYLIGHT TIME

0200

0300



FLIGHT NO	2340		
FLOWN	6 MAY 1958		
FOR	55031 STRATOLAB		
LOAD ON BALLOON	2336 LBS		
FREE LIFT	470 LBS = 17.6%		
BALLOON TYPE	NUMBER	MATERIAL	WEIGHT
72-2-2	270-1	2.5 MIL	339 LBS



MH 16 MAY 1958 APPROVED

IMPACT 8 MJ ESE  
DUBUQUE, IOWA  
0726

MAY 1958 APPROVED *cm*  
0600

11  
0700

A-23106-X