

25 November 1963

To:

[REDACTED]

SECRETARY OF THE ARMY

In Accordance with E. O. 12958

From:

[REDACTED]

on NOV 26 1963

Subject: LAUNCH HOUR LIMITATIONS FOR SUNLIGHT SHADING OF 11 3/8" BATTERING Baffle Configuration on "M" Type Systems for North Latitude, North to South, Operations Between 22 Dec. 1963 and 28 Feb. 1964 and Direct Orbit Inclination Angles of 60, 70, 75, 82 and 90 Degrees.

The attached Figure 1 presents a sketch of the M system illustrating the installation of an 11 3/8" baffle door for the stellar camera installation. The geometry illustrates the requirement for limiting the satellite launch conditions to constrain the varying relation between the solar rays and the mid-plane of the vehicle. Since the mid-plane of the vehicle, for the "M" system operation, corresponds to the orbit plane, the angle between the solar rays and the vehicle mid-plane is the solar "Beta" angle, a calculable variable for given launch time and specified orbit parameters.

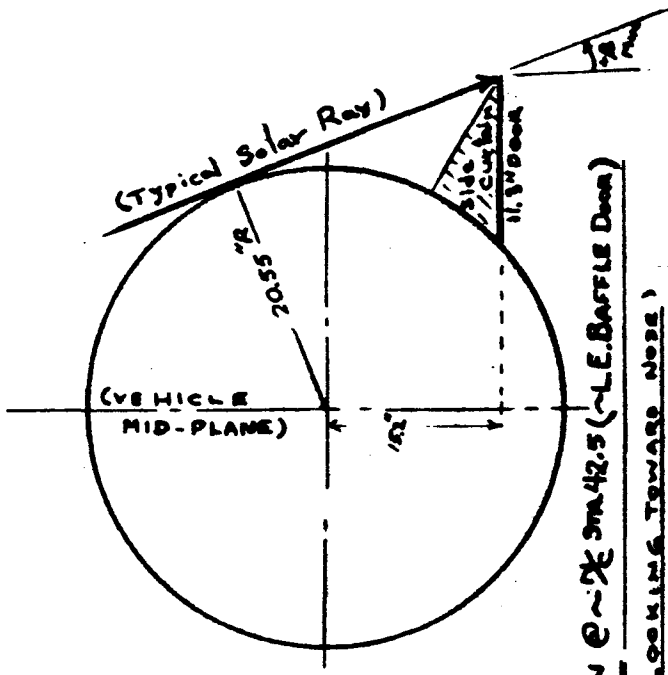
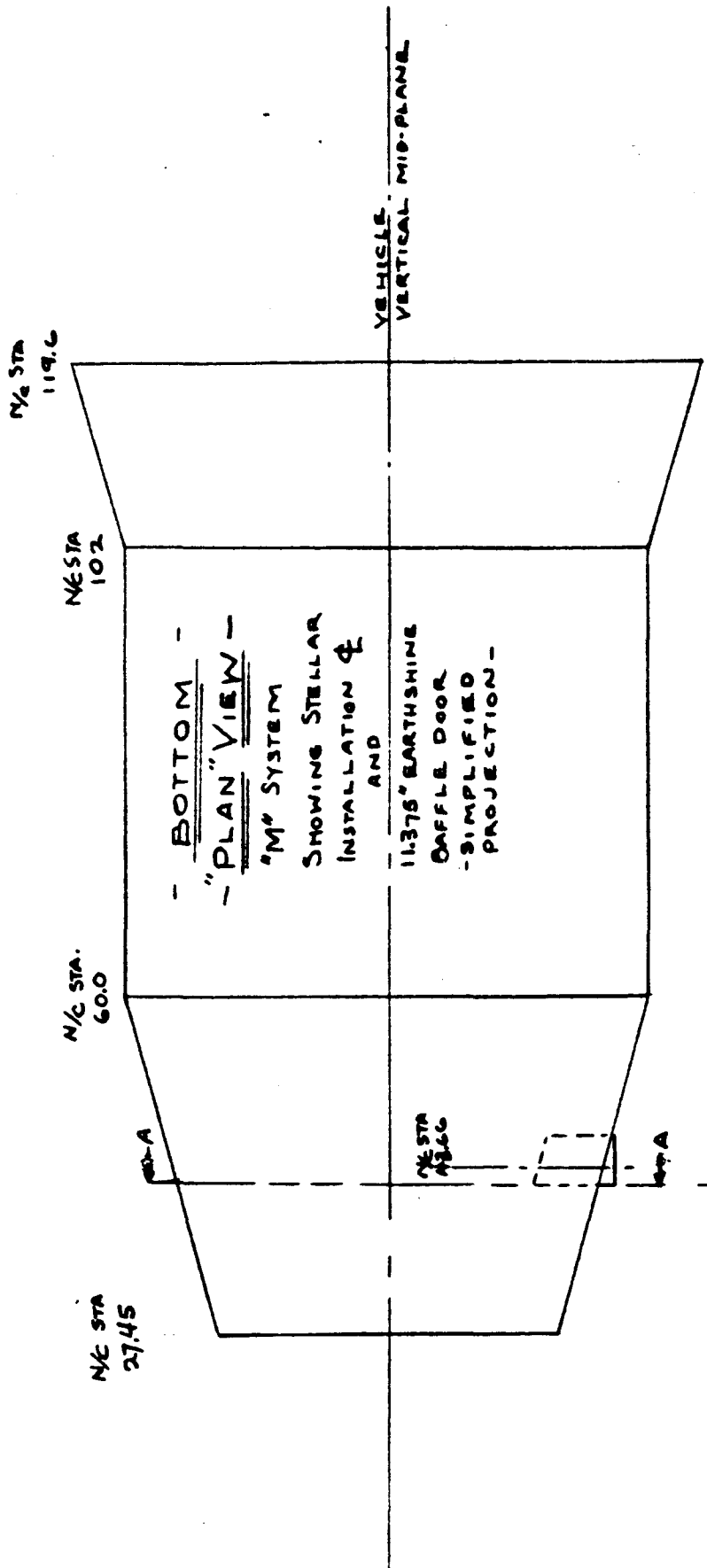
The launch hours for possible M-system orbits (i = 60, 70, 75, 82 and 90 degrees) are indicated on Figures 2-6 for operations between December 22, 1963 and February 28, 1964.

As illustrated by the sketch in Figure 1, for the projected N-S operations, operating in the Northern latitudes with an east-ward looking stellar camera installation on "descending" passes, the critical point where sunlight first impinges on the inner surface of the baffle door occurs at passage over the equator, with sunlight first incident on the outer tip of the baffle, on the edge nearest the nose section.

To estimate the magnitude of effect of "early" launches, where other considerations over-ride the requirements of baffle shading, several configurations were investigated. For example, it was found that launching at 2100 GMT (1300 PST) into a 60°i - M operation, on December 22, 54 minutes earlier than the recommended 2154 GMT limitation, would effect shaded operation for only 2.4 + days (The baffle beginning to be sunlit in the middle of the 3rd day), with 3.35 inches of the "leading edge" of the baffle in the sunlight at the end of 5 days of operation. For comparison, launching at 1300 PST, 22 December, into a 70°i orbit (39 minutes early) would lead to 3.2 inches of baffle surface sunlit, at passage over the equator, at the end of 5 days. Launch into a 70-degree inclined orbit on the 29 February at 1300 PST (1 hour early) would lead to a situation with 4.7 inches of baffle illuminated at the end of 5 days.

SECRET

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A SECTION @ N/C STA 42.5 (L.E. BAFFLE DOOR)  
 (LOOKING TOWARD NOSE)

FIGURE

PROF. [unclear]

1/21/59  
R. J. G. 9

REQUIRED LAUNCH TIME LIMITS, DEC 22 - FEB 10, TO AVOID SUNLIGHT EXPOSURE  
 OF 1178" MI STELLAR RAFFLE DOOR VERSUS DATE OF ORIENTATION  
 IN NORTHERN LATITUDES (NORTH - SONGS, BESED, MOINT, OPERATIONS ONLY)  
 - WITH ORBIT PLANE INCLINATION = 60° (CONSTANT ORBIT)

LAUNCH HOURS

PST GMT

1000 2000

1200 2200

1400 2400

1600 2600

1800 2800

2000 3000

2200 3200

2400 3400

2600 3600

2800 3800

3000 4000

3200 4200

3400 4400

3600 4600

3800 4800

4000 5000

4200 5200

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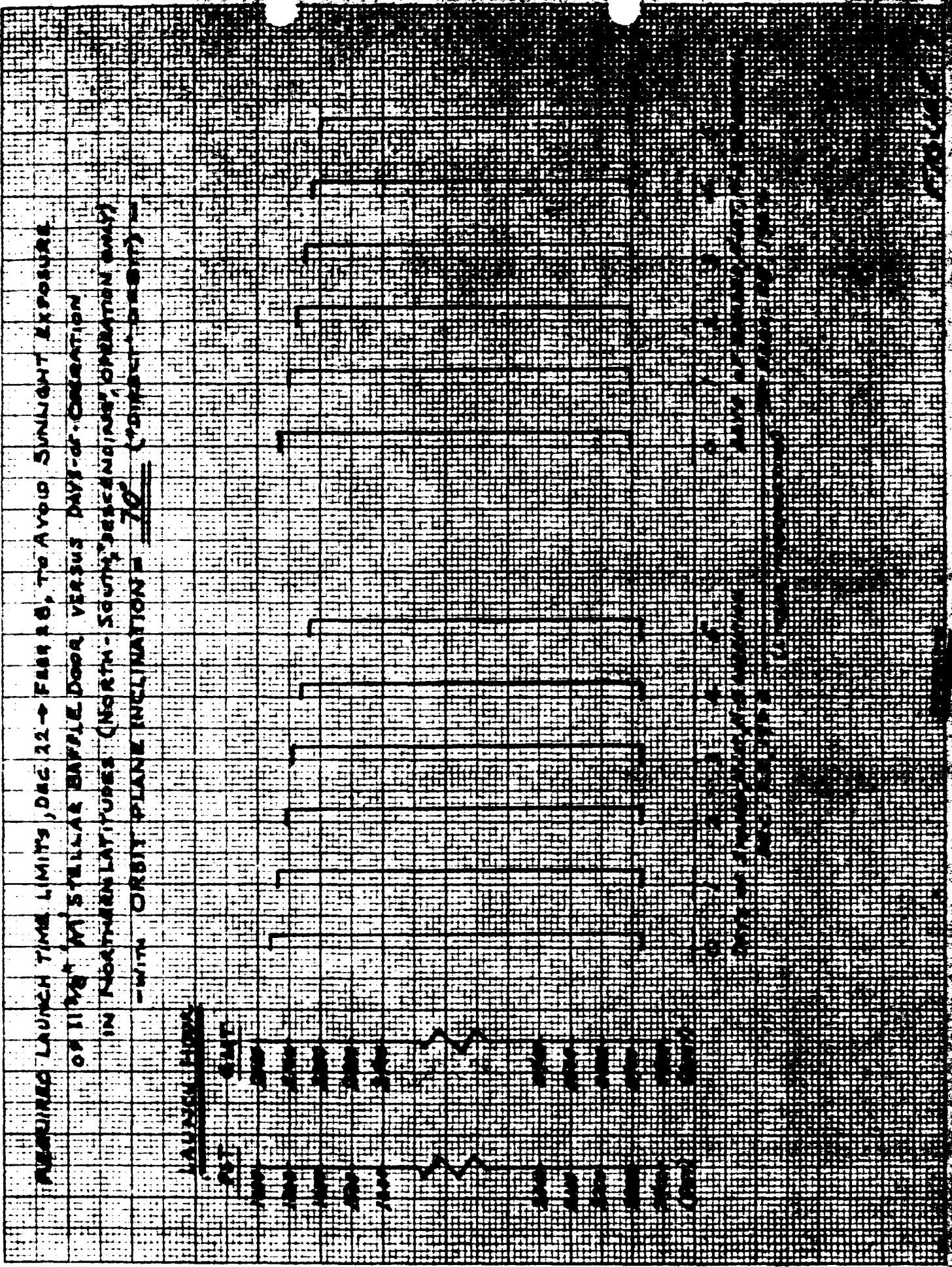
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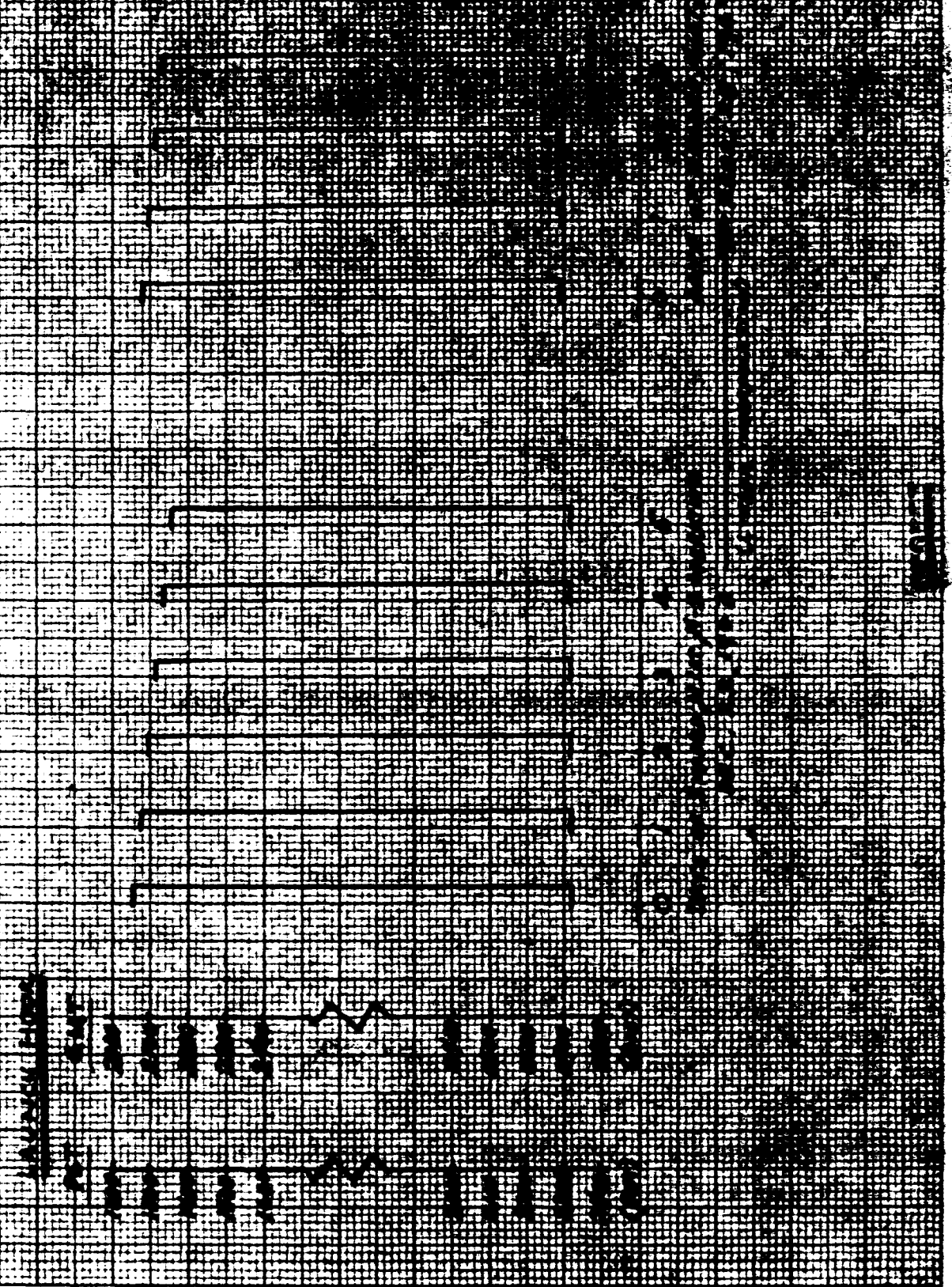
REQUIRES LAUNCH TIME LIMITS, DEC 22 → FEB 20, TO AVOID SUNLIGHT EXPOSURE  
 OF 11 MB MISTILLAR BATTLE DOOR VERSUS DAYS-OF-ORIENTATION  
 IN NORTHERN LATITUDES (NORTH-SOUTH DESCENDING, ORIENTATION ONLY)  
 WITH ORBIT PLANE INCLINATION = 70° (DIRECTION OF ORBIT)

11-21 11:00 AM TO THE LUNCH 359-120

Grand  
11-21-11

REQUIRES LAUNCH TIME LIMITS, DEC 22 → FEB 26, TO AVOID SUNLIGHT EXPOSURE  
 OF 11 MB<sup>2</sup> IN STELLAR Baffle DOOR VERSUS DWT-20 ORIENTATION  
 IN NORTHERN LATITUDES (NORTH-SOUTH Baffle DOOR ORIENTATION)

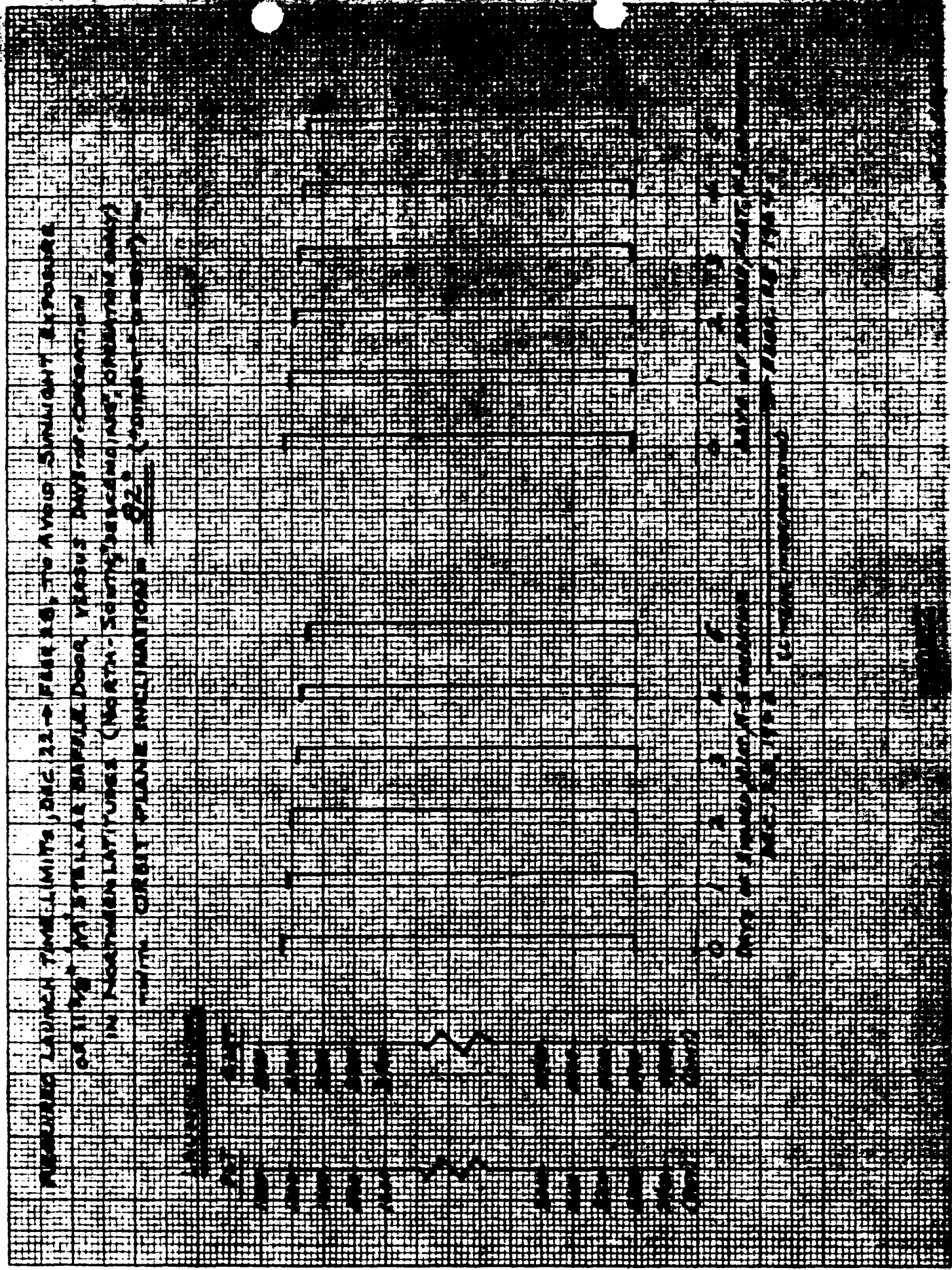
WITH ORBIT PLANE INCLINATION = 7.6°





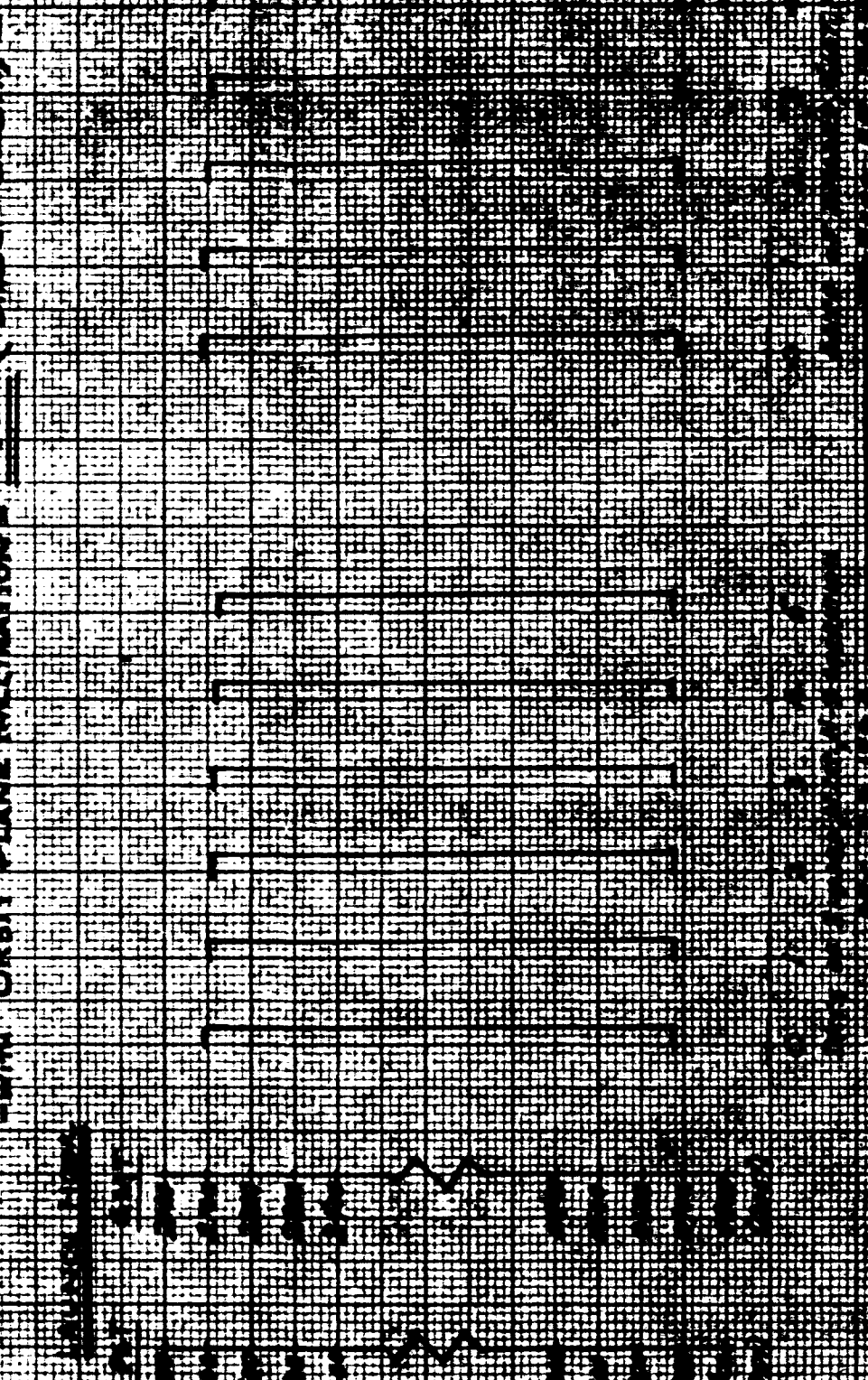
1/2 10x10 TO THE 1/4 INCH 350-12G  
K&E PHOTO ENGRAVING CO. NEW YORK

11/24/79  
Bart  
K/11



2081

REQUIRED LAUNCH TIME LIMITS, DEC 22 - FEB 26, TO AVOID SUNLIGHT EXPOSURE  
 OF 1170 (M) STELLAR RAFFLE DOOR VERSUS DAYS OF ORIENTATION  
 IN NORTHERN LATITUDES (NORTH-SOUTH, DEPENDING ON ORIENTATION AND  
 TIME OF ORBIT PLANE INCLINATION) 20 (MINUTE SLOTTED)



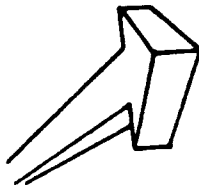
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M-26 STELLAR + LIGHT RESULTS

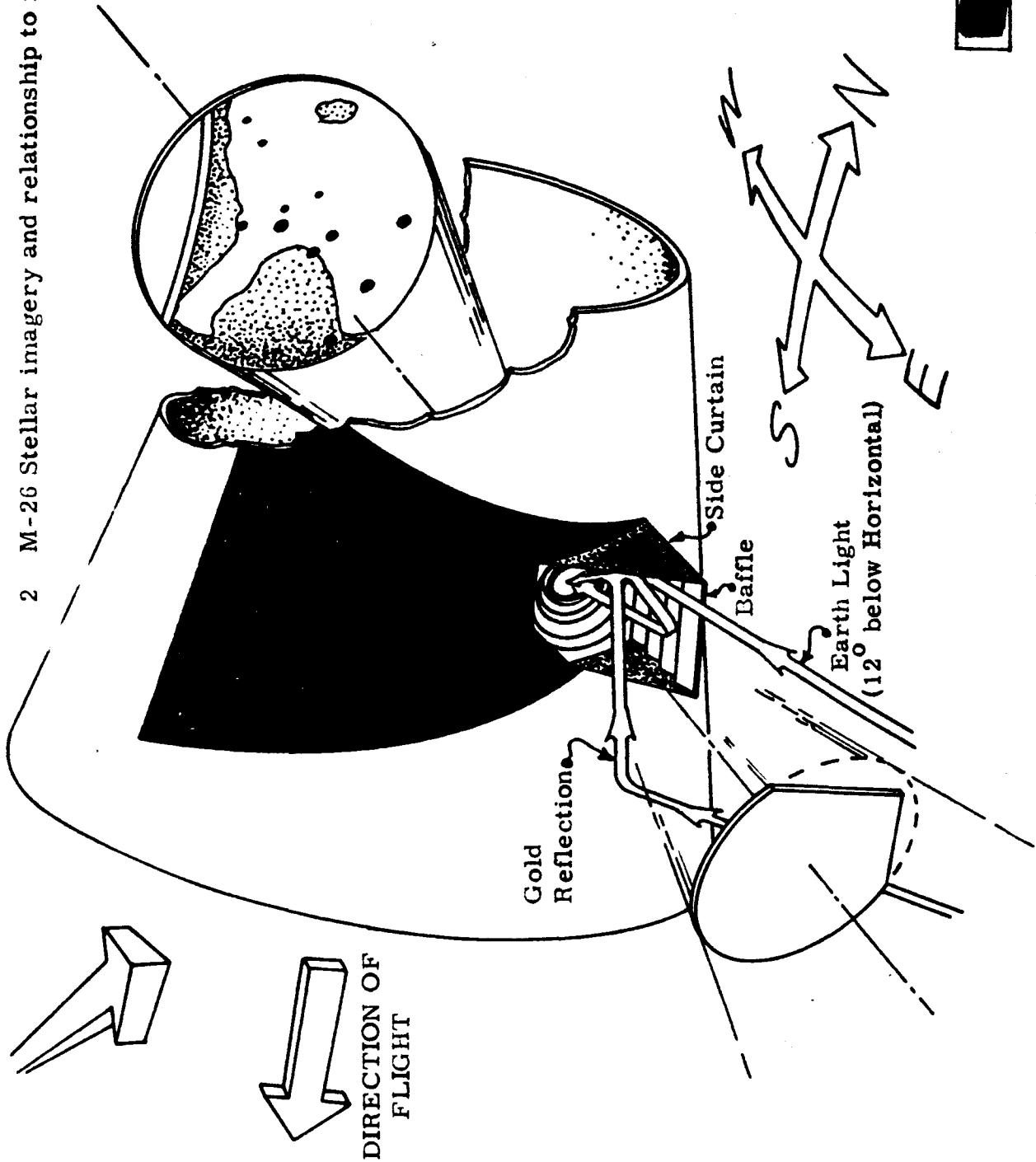
S/S # D-3311

1. Stellar baffle installation M-27 and J-3 (Corrected prior to flight). Suspected installation on M-26.
2. M-26 Stellar imagery and relationship to flight hardware.

DIRECT  
SUNLIGHT



DIRECTION OF  
FLIGHT



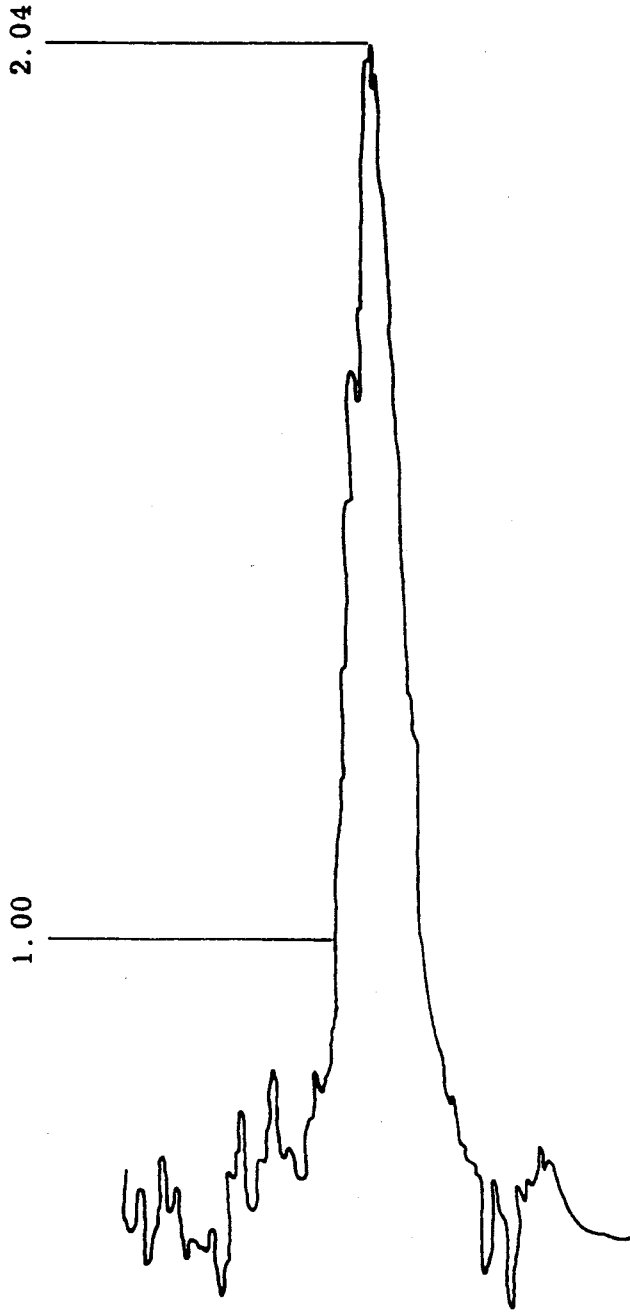
SECRET





MICRO - DENSITOMETER TRACE - Star A

M-26 S/I #D 28 34



Pass 55  
Frame 286



~~SECRET~~