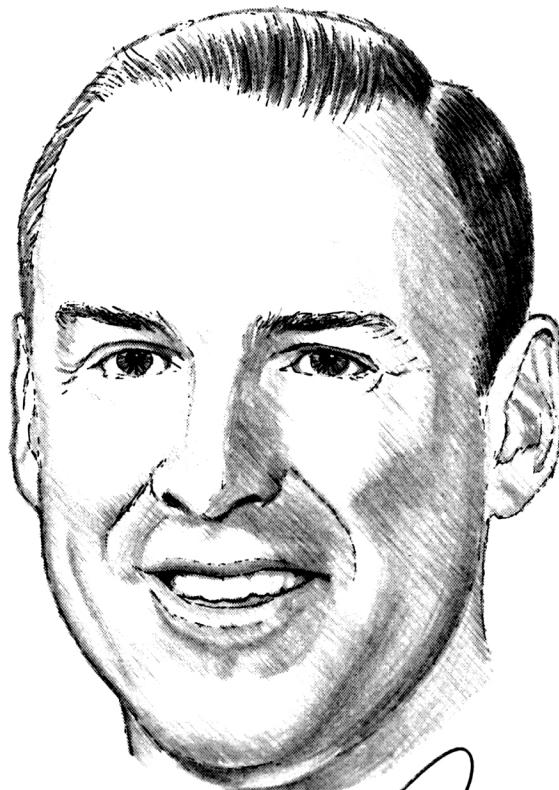


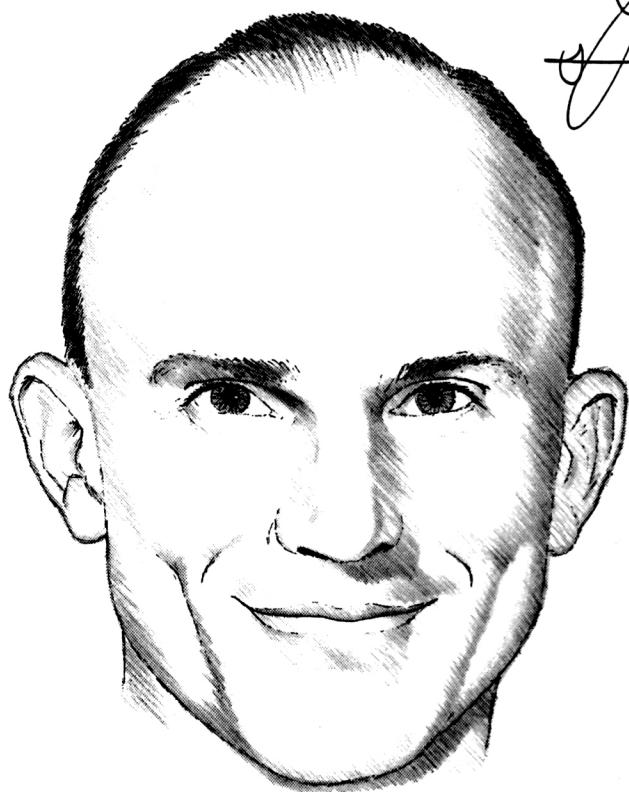
APOLLO 13



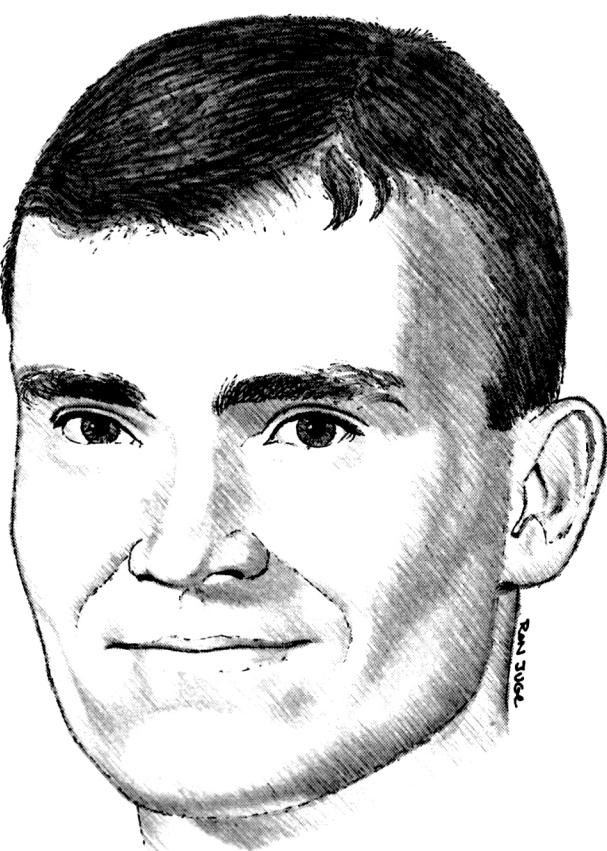
508



A handwritten signature of James Lovell's name, "James Lovell", written in cursive script.



A handwritten signature of Kenneth Mattingly's name, "Ken Mattingly", written in cursive script.



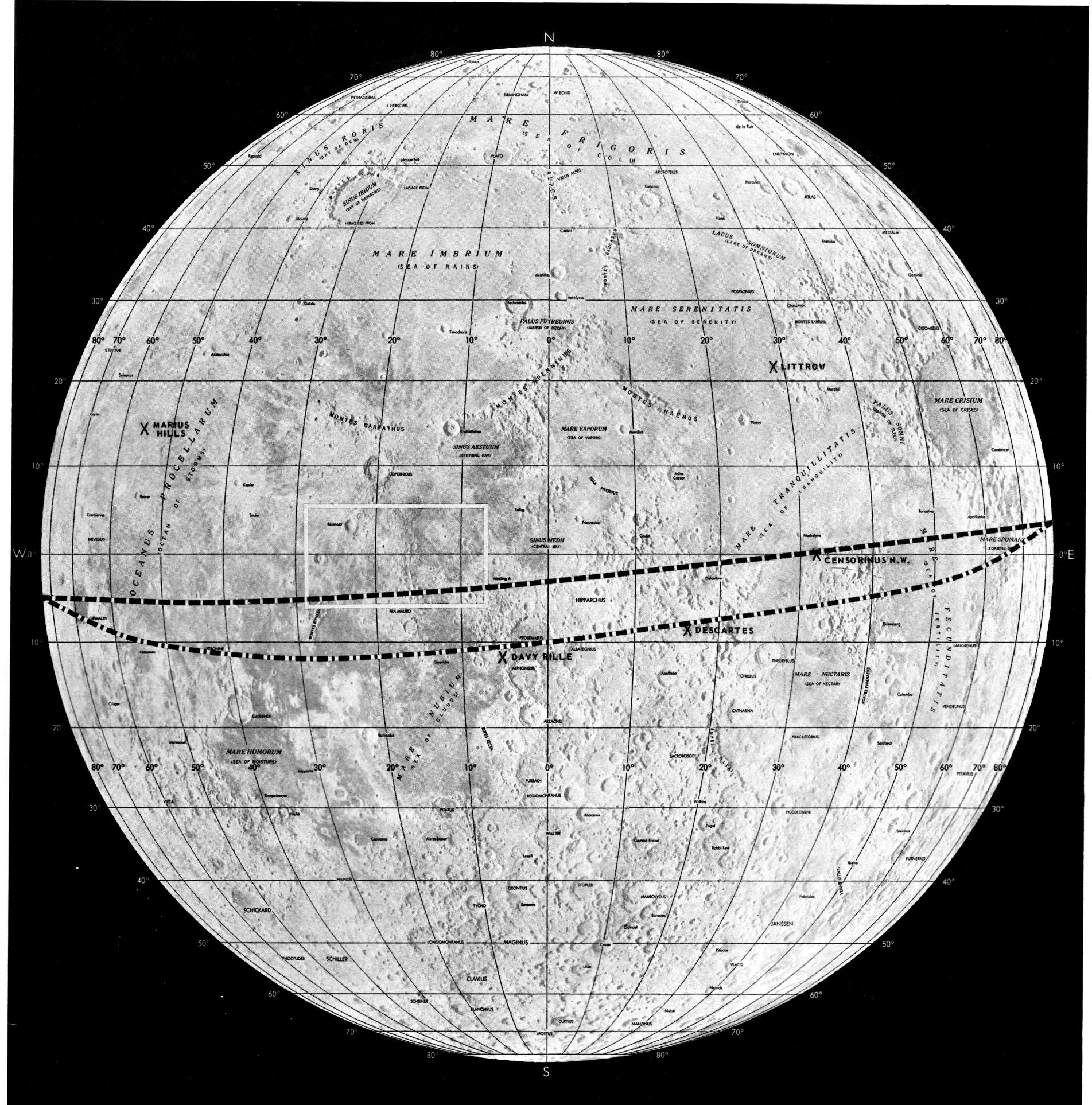
A handwritten signature of Fred W. Haise's name, "Fred W. Haise", written in cursive script. A small "RON JONES" is printed near the bottom right of the drawing.



# APOLLO 13



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NASA-MICHOUD ASSEMBLY FACILITY - 1970  
NEW ORLEANS, LOUISIANA 70129

## SIGNIFICANT EVENTS

11 April 1970 Launch Date

VEHICLE	EVENT	LUNAR REVOLUTION	G.E.T.
(CM-Command Module)	(LM-Lunar Module)	hrs	min
CM/LM	Launch . . . . .	0 . . . . .	00
	Translunar Injection (TLI) . . . . .	0 . . . . .	36
	Lunar Orbit Insertion (LOI) . . . . .	0 . . . . .	77
	Descent Orbit Insertion (DOI) . . . . .	2.18 . . . . .	82
	CM/LM Separation . . . . .	11.16 . . . . .	99
CM	Lunar Orbit Circularization . . . . .	11.96 . . . . .	35
LM	Powered Descent Initiation (PDI) . . . . .	13.45 . . . . .	103
	Lunar Landing . . . . .	13.53 . . . . .	103
CM	Lunar Orbit Plane Change (LOPC-1) . . . . .	18.63 . . . . .	113
LM	LM Ascent Stage Lift-Off . . . . .	30.56 . . . . .	137
CM/LM	CM/LM Docking . . . . .	32.39 . . . . .	140
	LM Jettison . . . . .	33.61 . . . . .	143
CM	Lunar Orbit Plane Change (LOPC-2) . . . . .	39.25 . . . . .	154
	Transearth Injection (TEI) . . . . .	46.00 . . . . .	167
	Landing-Pacific Ocean . . . . .	0 . . . . .	241
	(10 days 1 hr 02 min)		

## MISSION DESCRIPTION

This chart displays a polar view of the lunar mission profile for the Apollo 13 Mission, scheduled to be launched on 11 April 1970 and targeted to Lunar Landing Site Fra Mauro.

The Apollo 13 Command and Lunar modules will be launched from the Kennedy Space Center Launch Pad 39A and inserted into a 100 nautical mile earth parking orbit. During the earth parking orbit the space vehicle systems will be checked out and made ready for the Translunar Injection maneuver.

The Translunar Injection maneuver will place the Command and Lunar modules into a translunar trajectory that will last approximately 75 hours.

The Lunar Orbit Insertion maneuver will occur on the far side of the moon and place the Command and Lunar modules into a 60 nautical mile by 170 nautical mile elliptical orbit. Approximately four hours later, during the third revolution, a second maneuver, the Descent Orbit insertion, will be performed to place the Command and Lunar modules into an approximate 8 nautical mile by 60 nautical mile elliptical orbit.

The Lunar module will separate from the Command module during the 12th revolution and land at the Fra Mauro site during the 14th revolution.

Subsequent to separation from the Lunar module the Command module will perform two additional maneuvers. The first maneuver will occur during the 12th revolution and will place the Command module into an approximate 60 nautical mile circular orbit. The second maneuver, Lunar Orbit Plane Change-1, will occur during the 19th revolution and be performed to establish a coplanar orbit with the Lunar module ascent trajectory and rendezvous orbit.

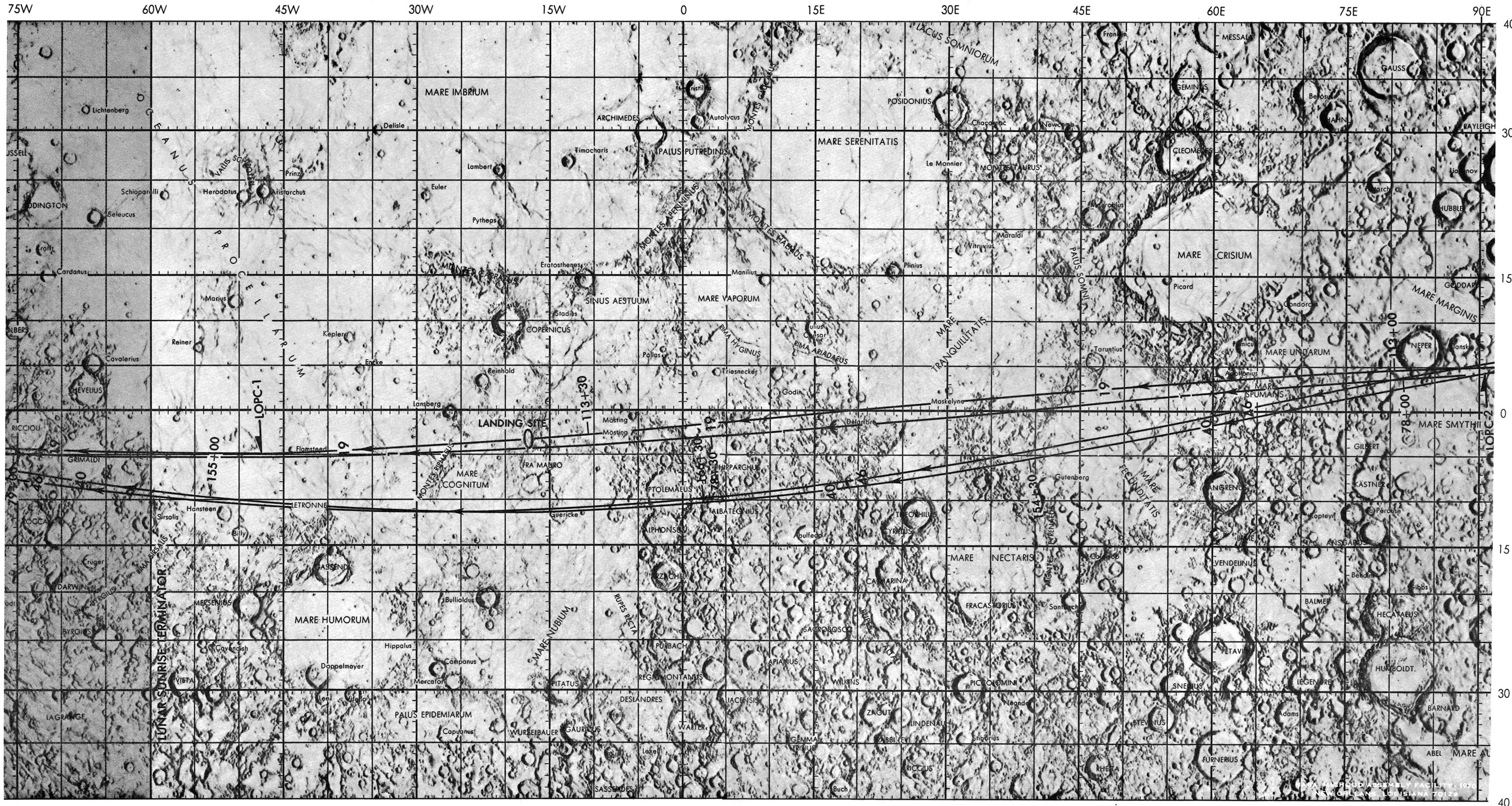
Following Command module and Lunar module rendezvous and docking the Lunar module crew will transfer into the Command module, along with lunar scientific samples, and the Lunar module jettisoned.

The second Lunar Orbit Plane Change-2 will be made during the 40th revolution and will be made in order that the Command module can fly over and photograph future lunar landing sites.

The Transearth Injection maneuver will be performed during the 46th revolution and place the spacecraft in a transearth trajectory which will last for approximately three days. Re-entry into the earth's atmosphere and landing in the Pacific Ocean will occur approximately 10 days after launch.



→ DIRECTION OF LUNAR ROTATION →  
Approximate rate  $\frac{1}{2}^{\circ}$  per hour



AREA IN AREA IN  
DARKNESS EARTHSHINE

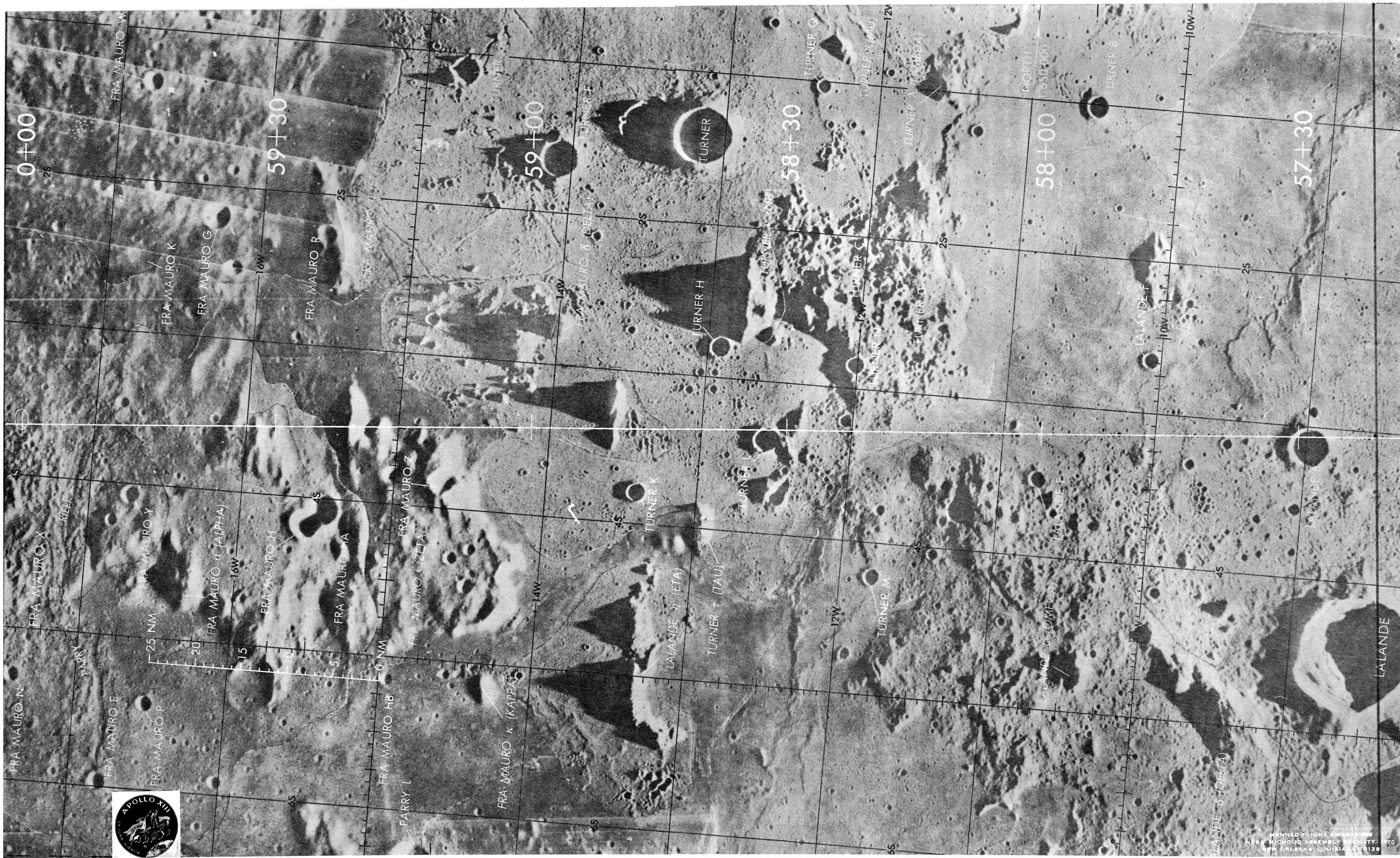
round Elapsed Time, from launch, is shown in hours and minutes along the ground track. Direction of spacecraft flight is indicated by arrows on the ground track.

**NOTE:** Ground tracks for the selected revolutions are depicted by a solid continuous line and labelled accordingly.  
Revolutions 1 and 19 (to LOPC-1) are shown  
Revolutions 19 (from LOPC-1) and 40 (to LOPC-2) are shown  
Revolutions 40 (from LOPC-2) and 46 are shown  
Revolutions between 1 and 19; 19 and 40; 40 and 46 would be positioned approximately one degree westward per revolution.

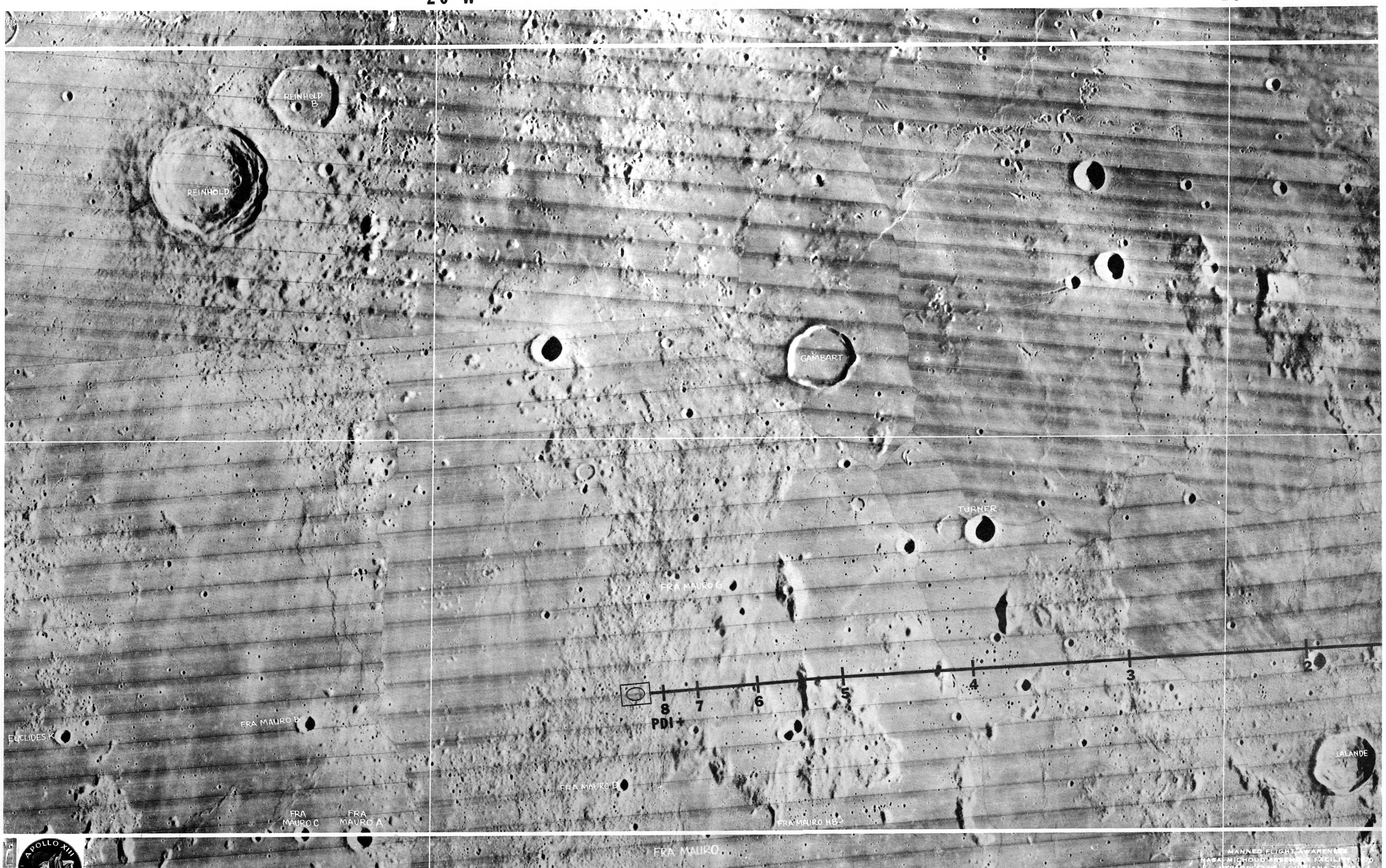
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
APOLLO LUNAR ORBIT CHART (ALO)  
APOLLO MISSION 13  
REVOLUTIONS 1, 19, 40 and 46  
11 APRIL 1970 LAUNCH DATE

11 APRIL 1970 LAUNCH DATE









20°W

APOLLO 13 FINAL APPROACH

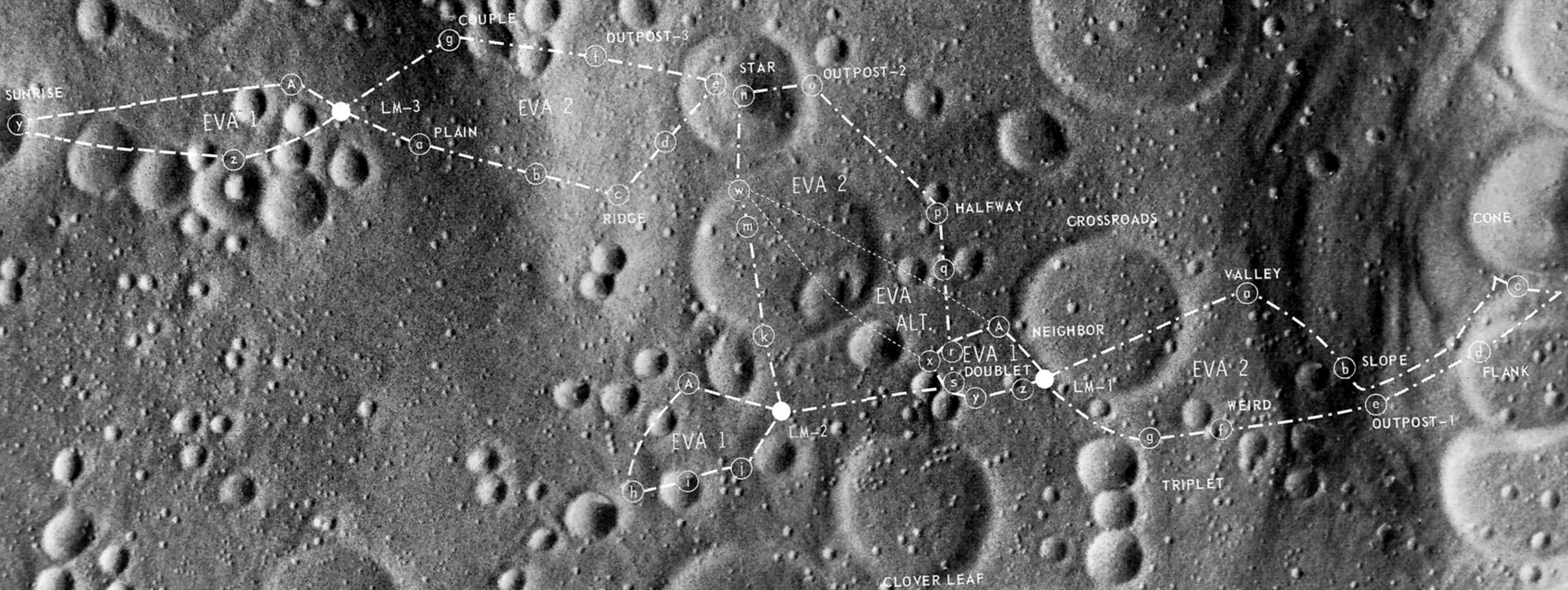
10°W

MANNED FLIGHT AWARENESS  
NASA MICHoud FACILITY  
MORNINGTON, LOUISIANA 70453



# FRA MAURO

N



## APOLLO 13 PRIMARY LANDING SITE

NASA-MICHoud ASSEMBLY FACILITY, 1970  
NEW ORLEANS, LOUISIANA 70128



$10^{\circ}$  W

$5^{\circ}$  N

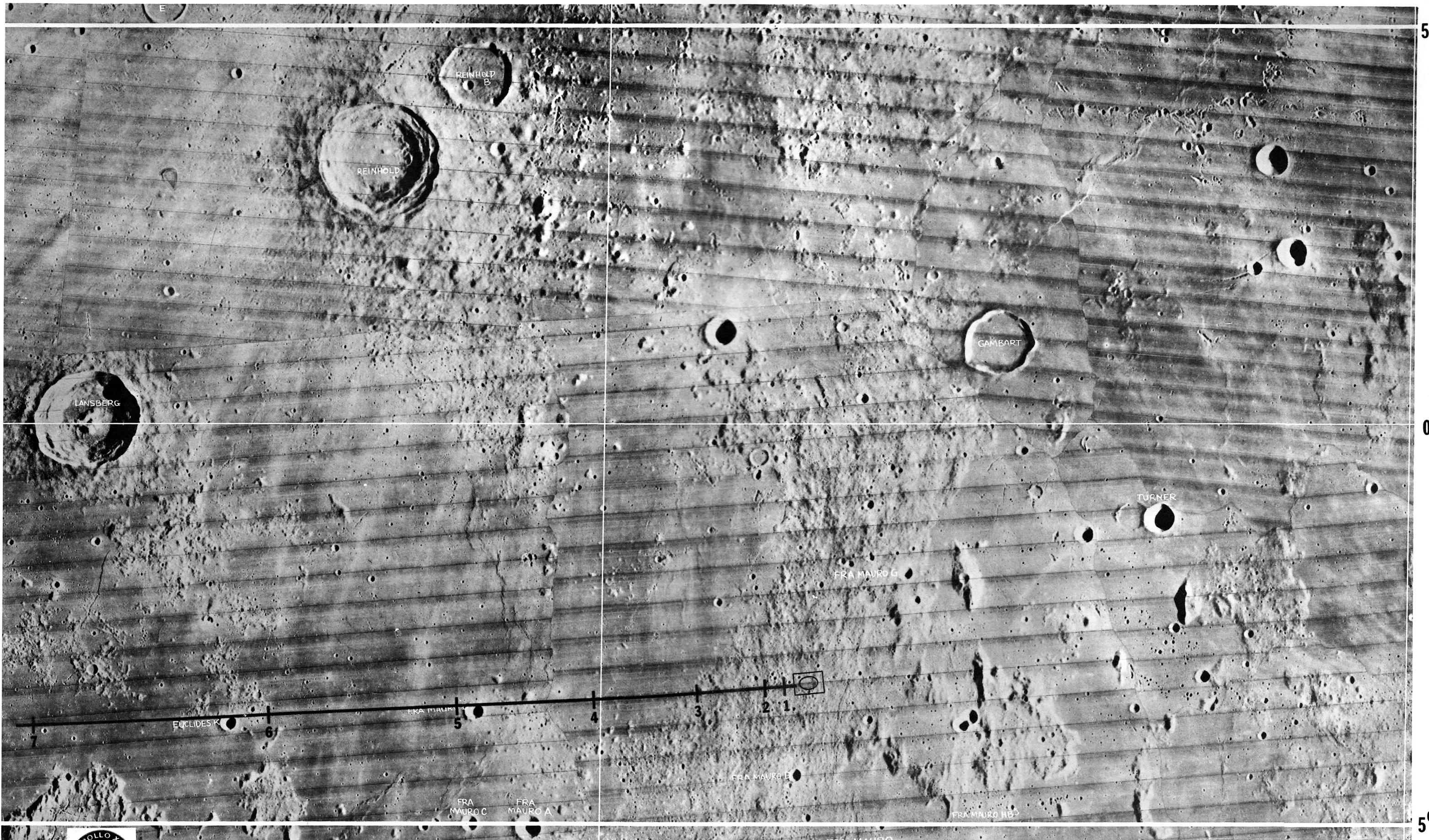
$20^{\circ}$  W

$0^{\circ}$

$5^{\circ}$  S

$10^{\circ}$  W

E



APOLLO 13 ASCENT

$20^{\circ}$  W

MANNED FLIGHT AWARNESS  
NASA - MICHAUD ASSEMBLY FACILITY - 1970  
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