

# Ground Processing and Launch Facilities

- Historical examples
  - Early Launch Facilities
  - Saturn I
  - Saturn V
  - Russian
- Modern examples
  - Shuttle
  - Delta IV Heavy
  - DC-XA
  - Falcon 9

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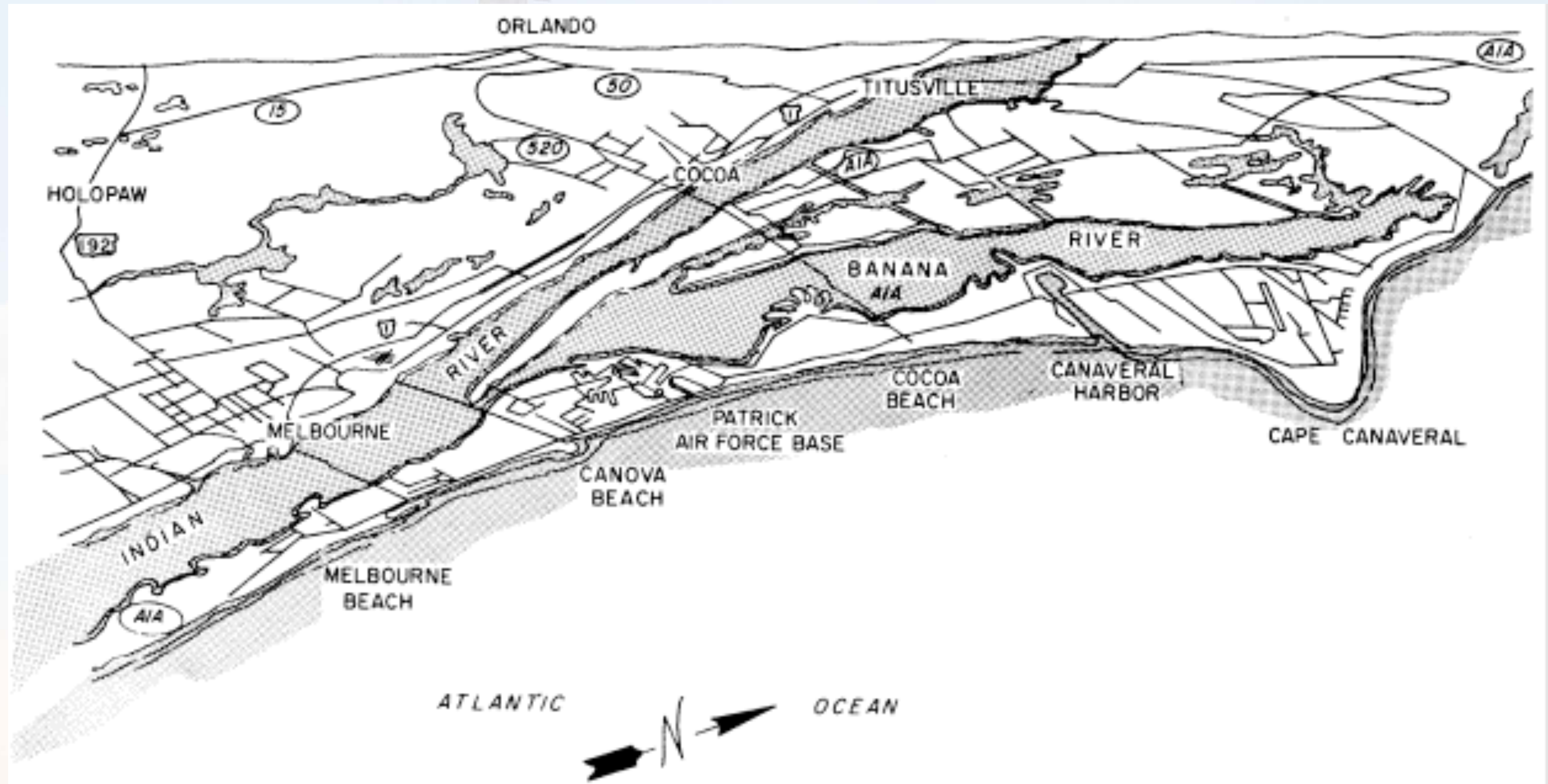


# Cape Canaveral circa 1950





# Map of Cape Canaveral





# “ICBM Row”





# LC-5 – Mercury-Redstone





# LC-5 Emergency Crew Escape System





# Atlas Support Gantry





# LC-14 – Mercury-Atlas



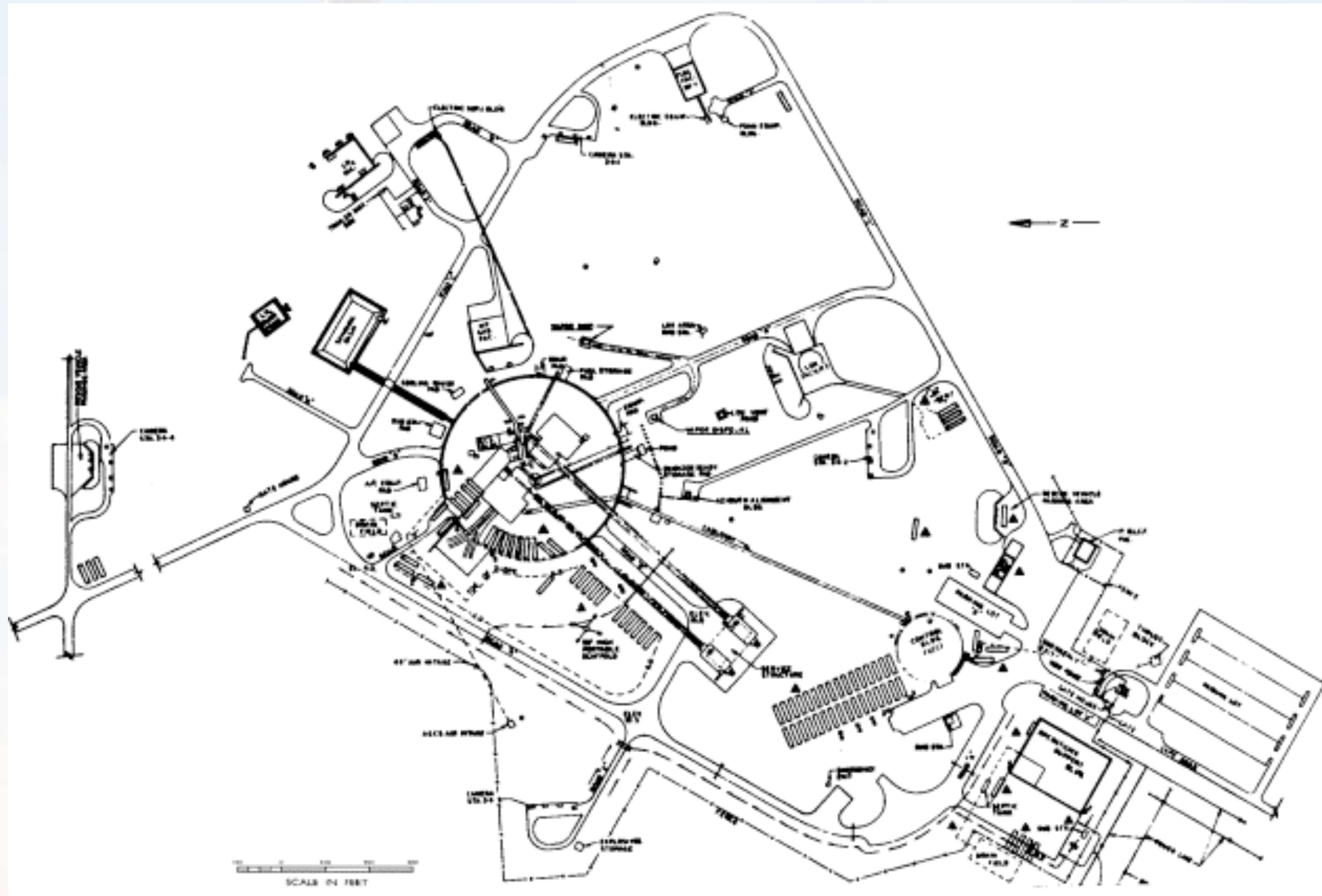


# Titan II Access Tower Operation



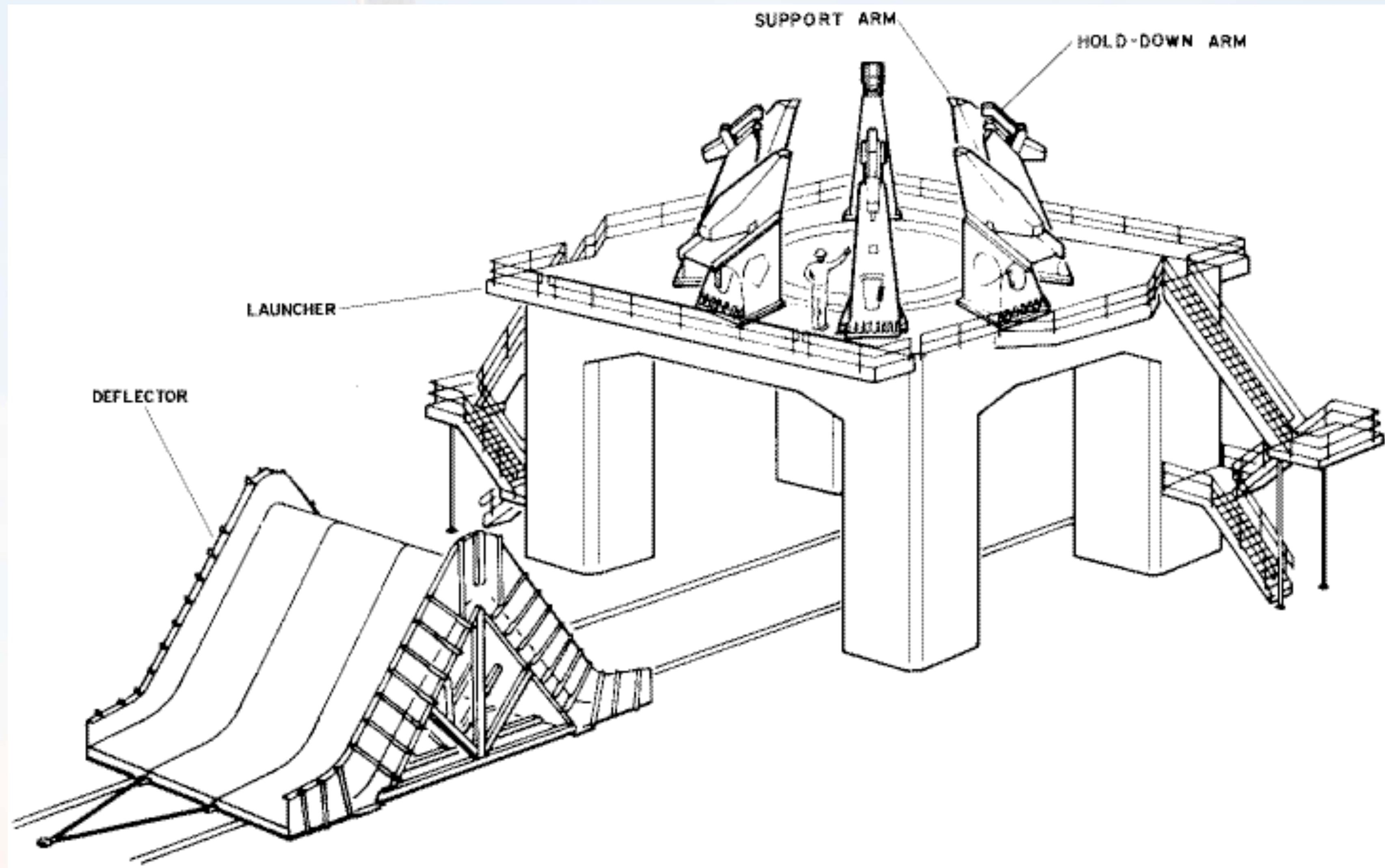


# LC-34 Schematic





# Saturn I Launch Pedestal





# LC-34 Launch Pedestal Under Construction





# LC-34 Flame Deflector



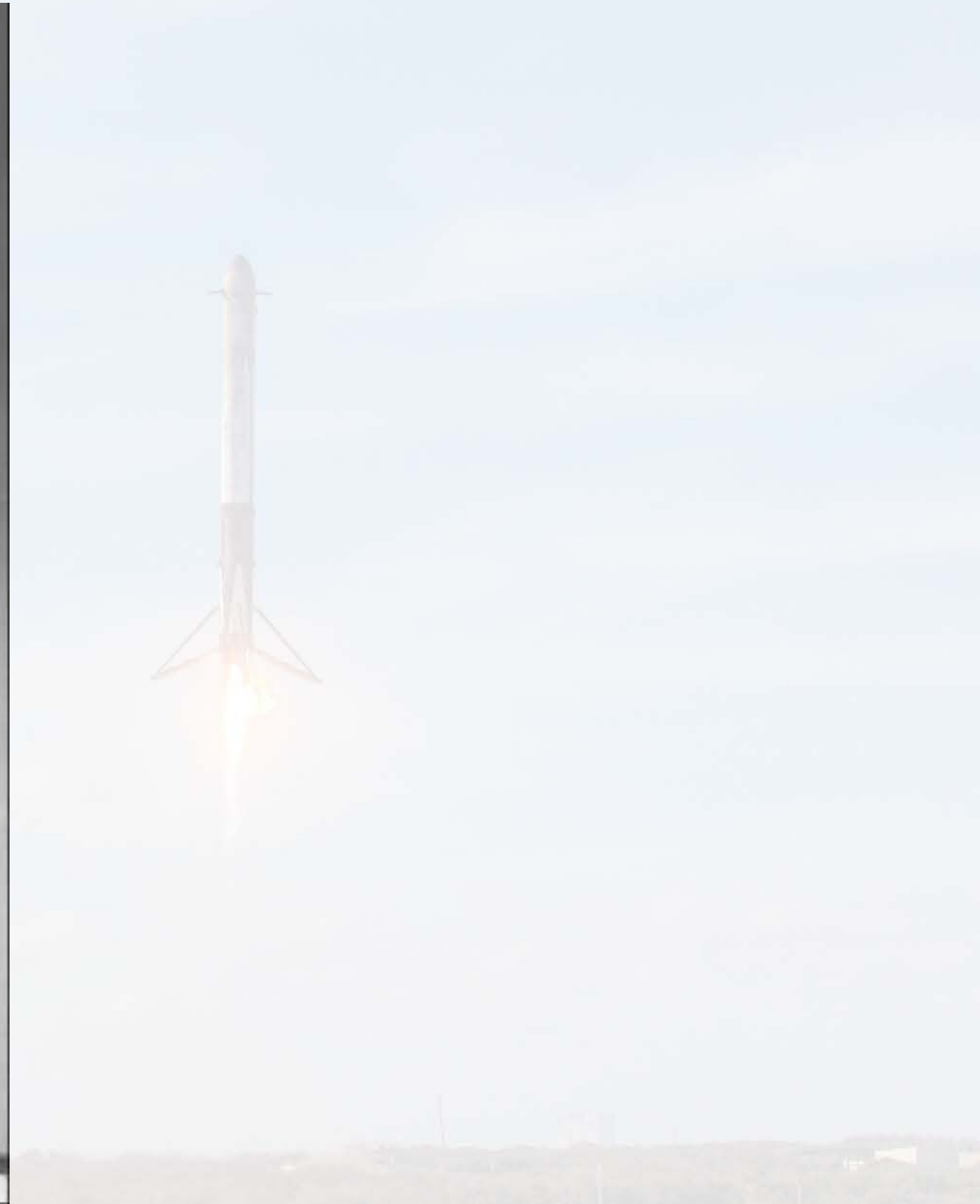
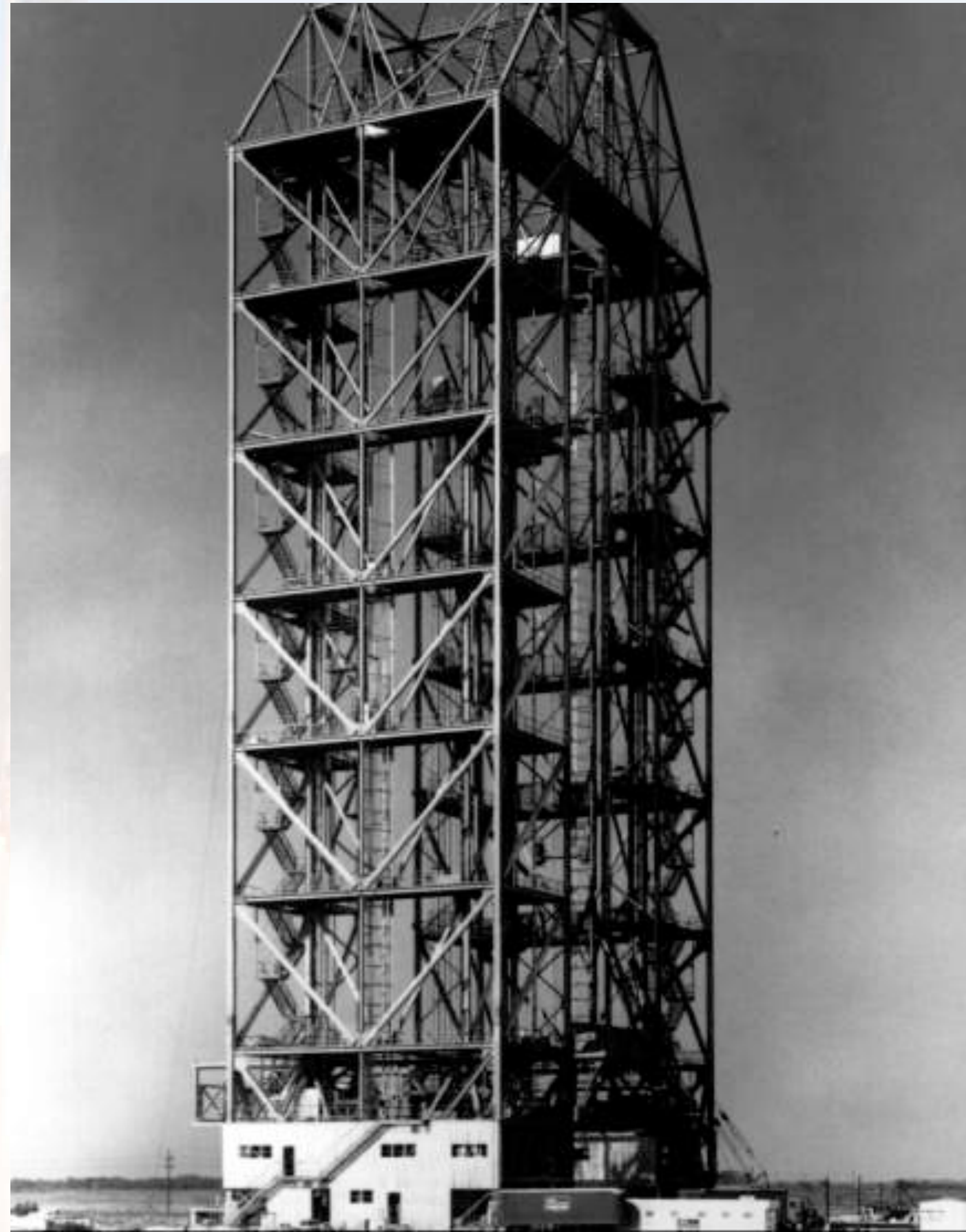


# LC-34 Blockhouse





# LC-34 Service Structure





# Aerial View of LC-34





# S-I Stage Rotation





# S-I Stage Rotation



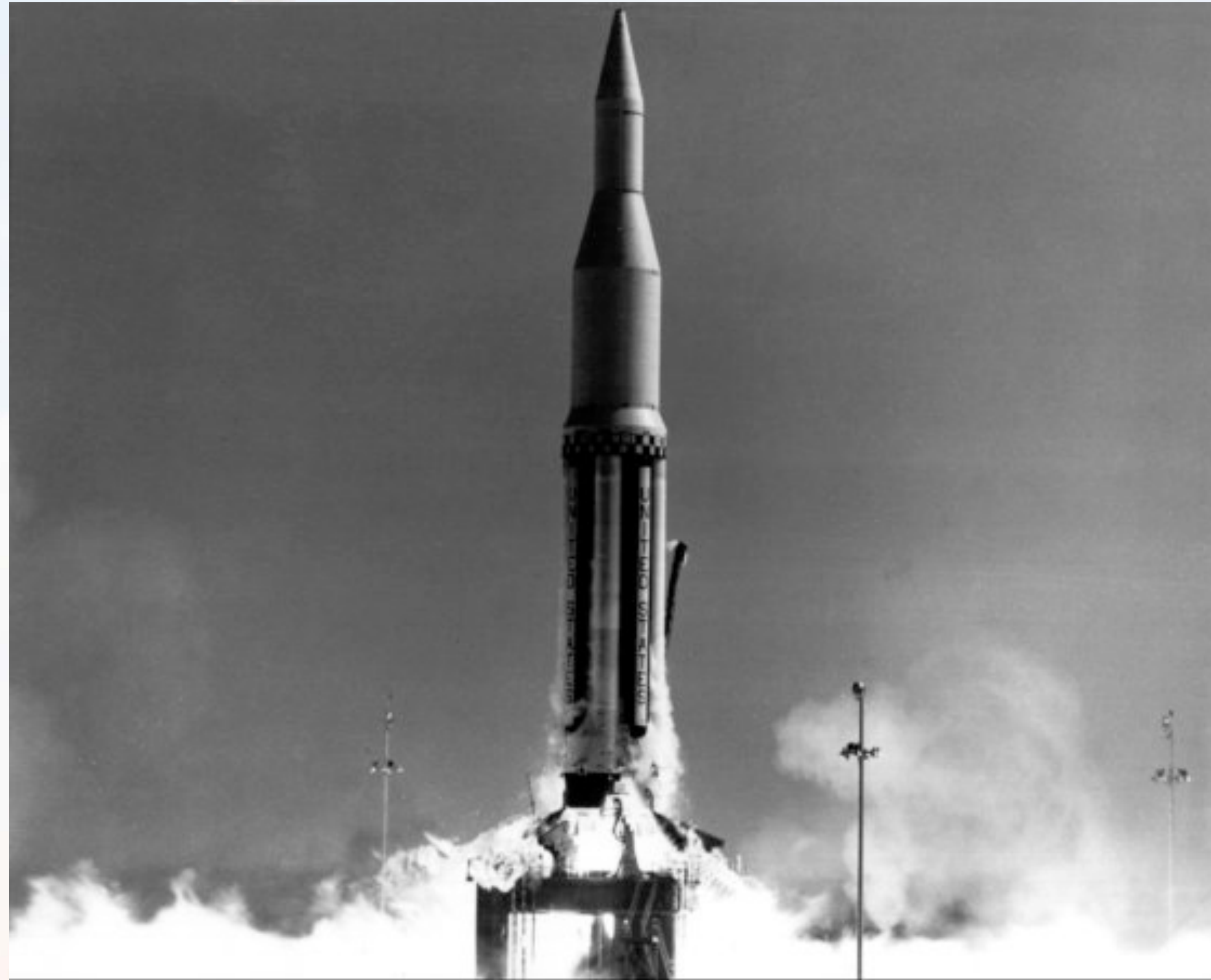


# Assembly of Saturn I



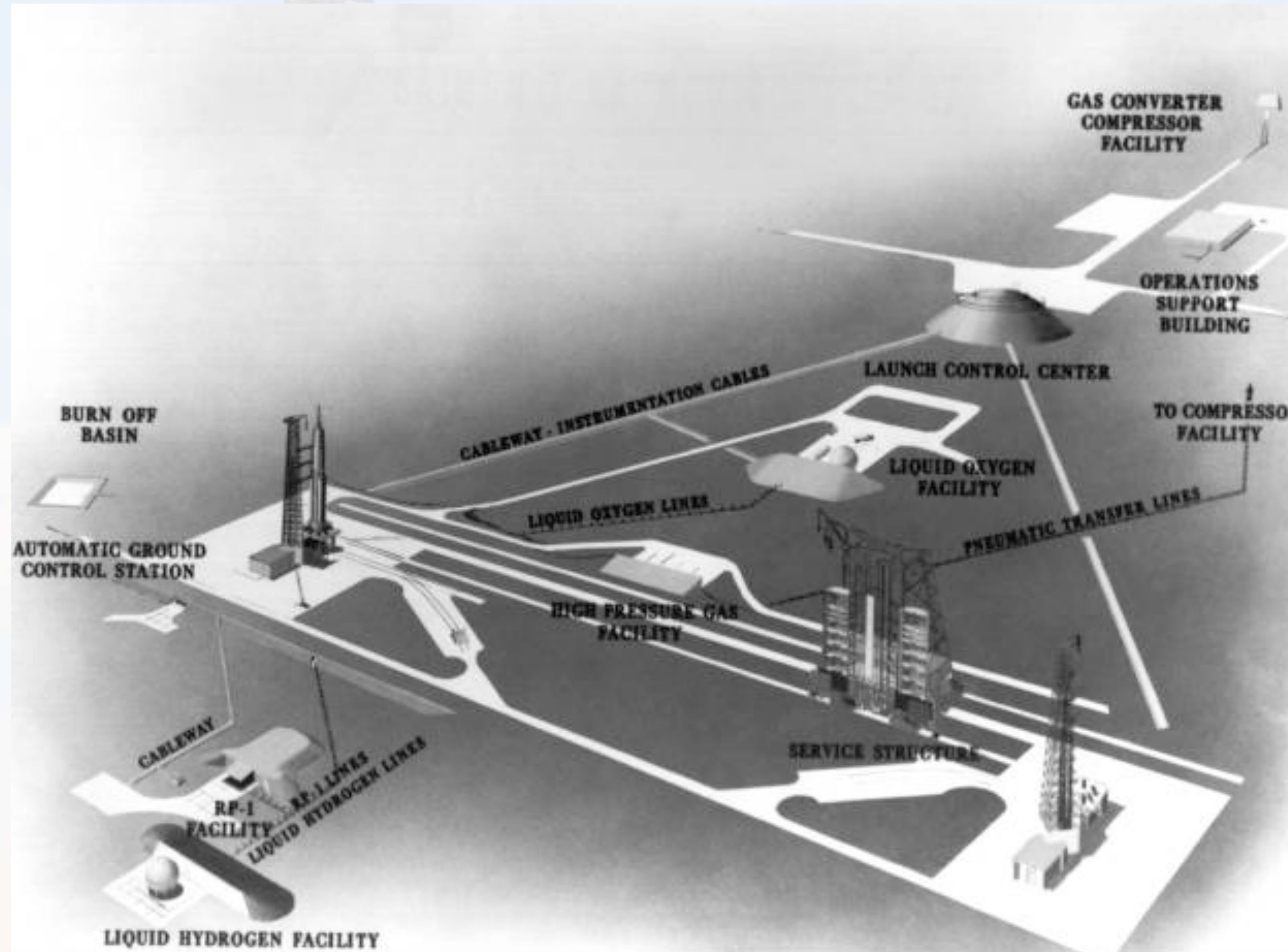


# SA-201 Launch





# LC-37 Concept





# LC-37 Under Construction (1963)



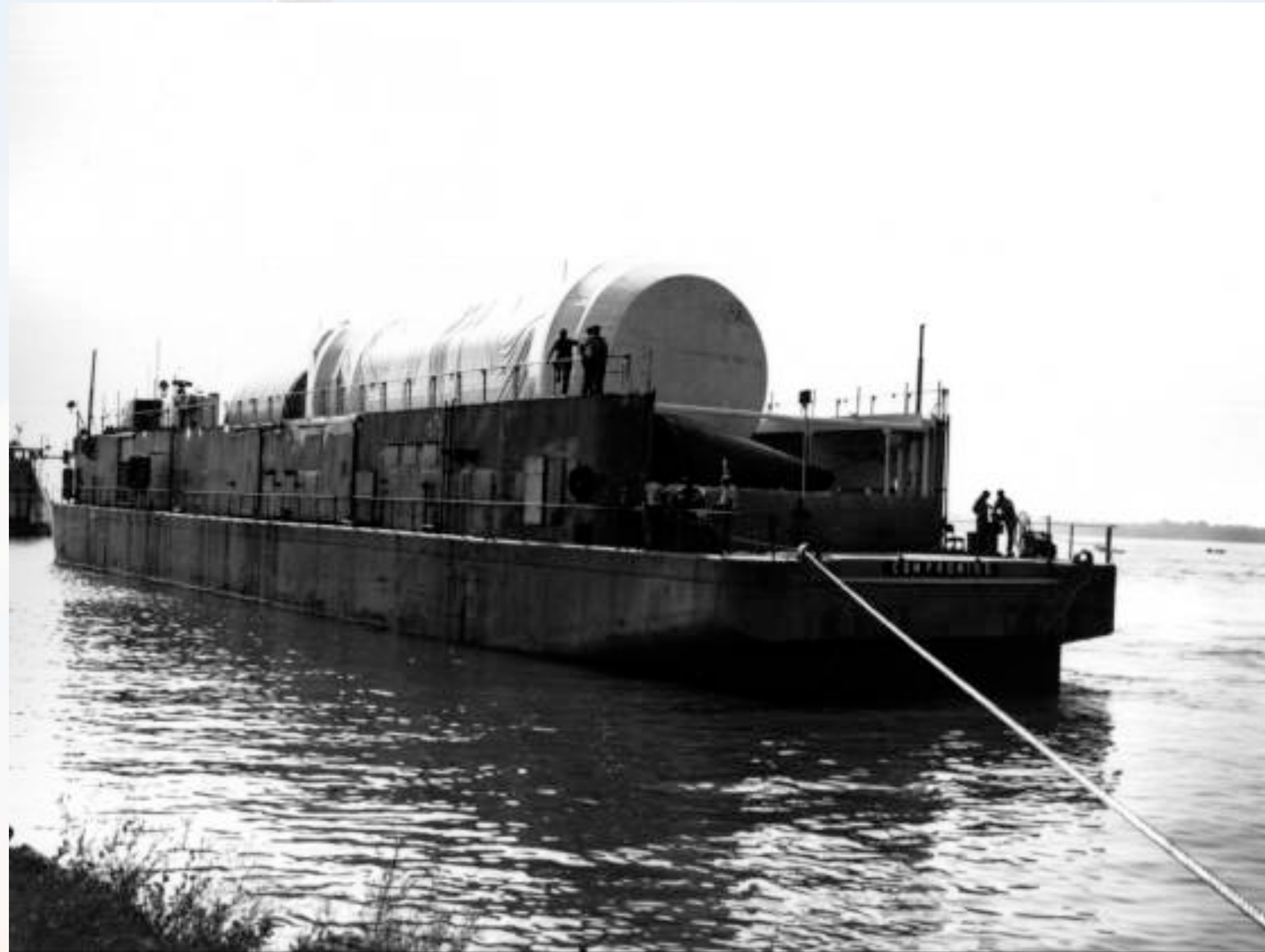


# LC-37 Construction Photo





# Barge Transport of Launch Vehicle Stages



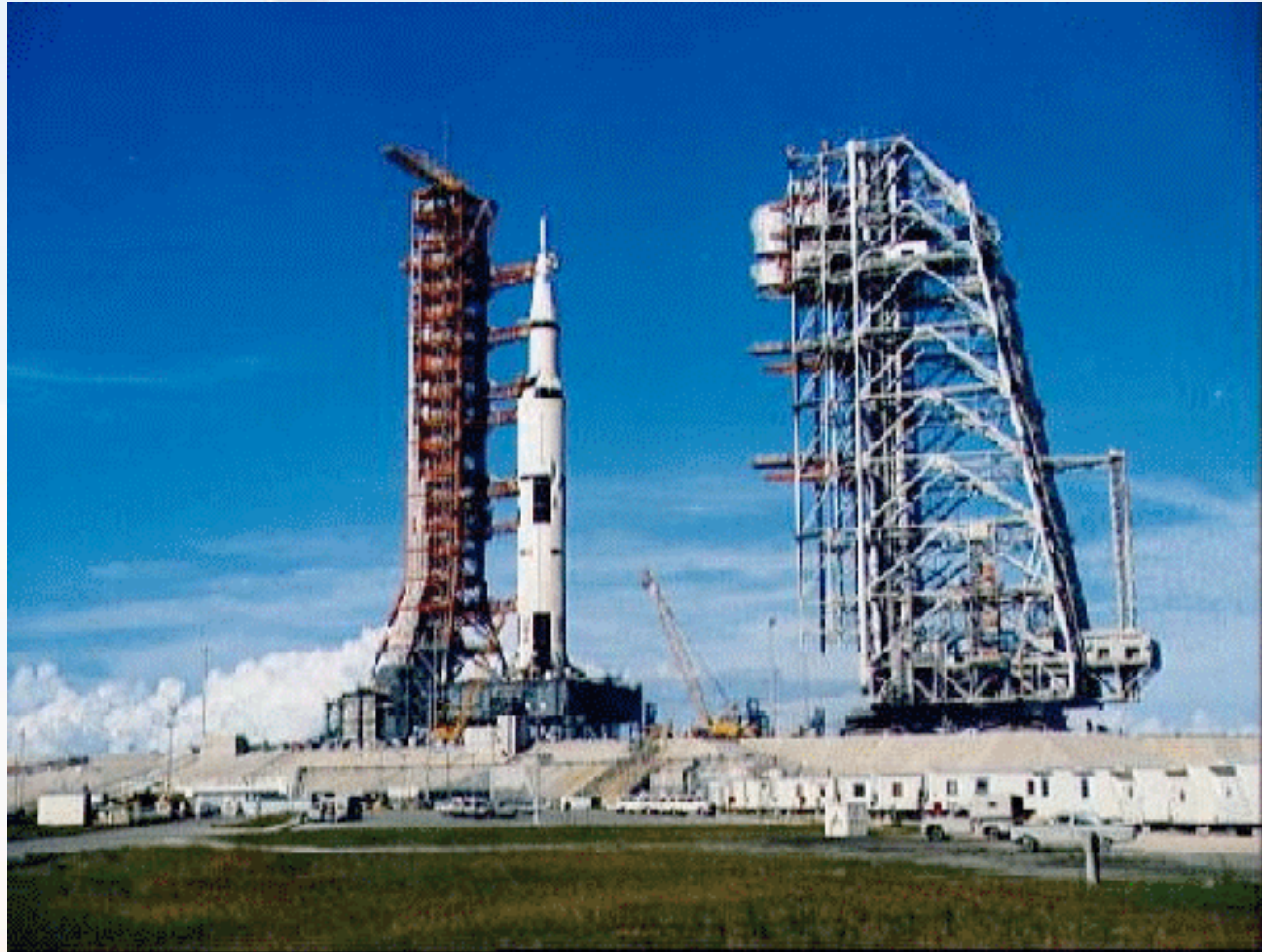


# Aerial Transport of Stages



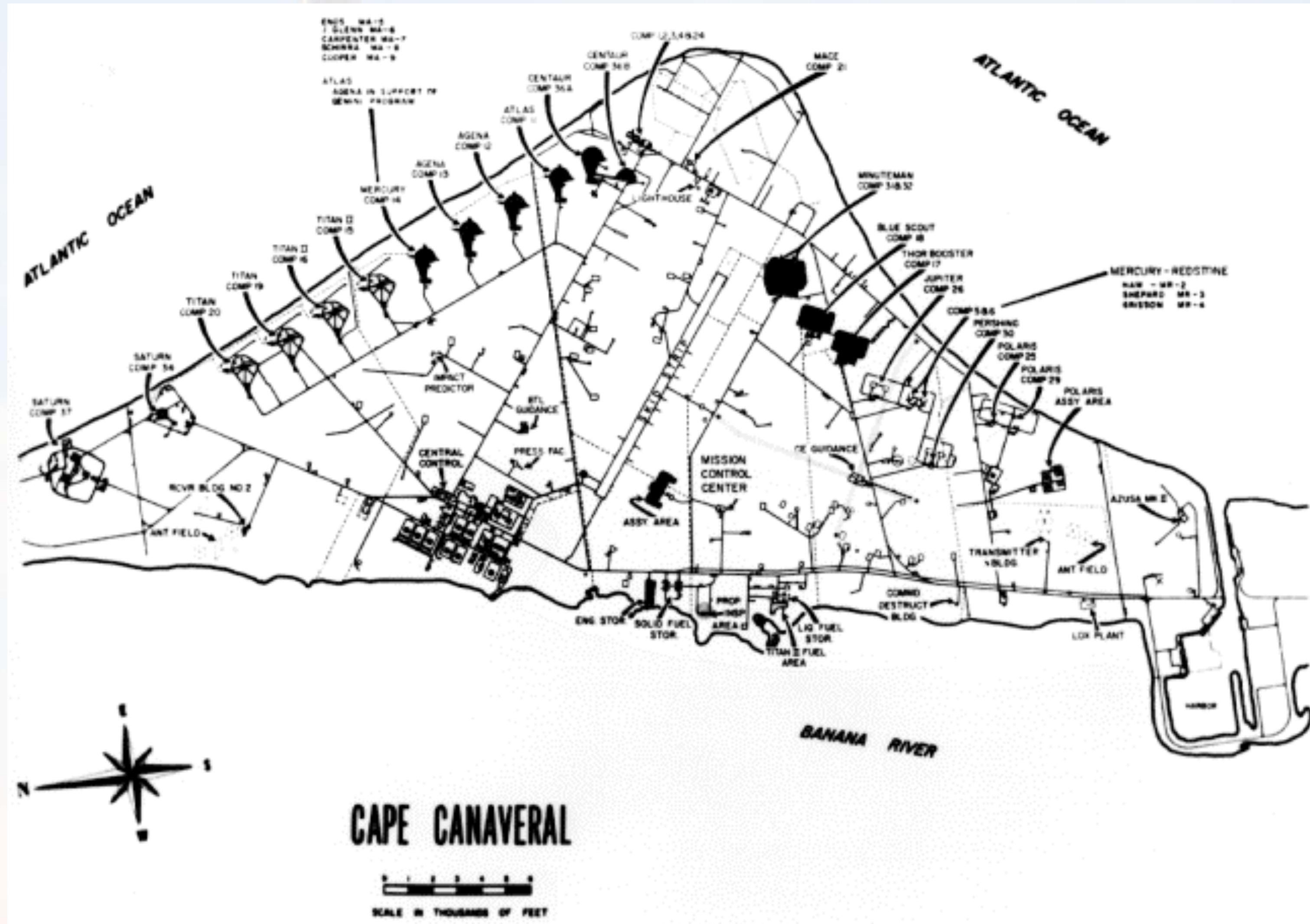


# Saturn V Launch Facility





# Cape Canaveral Siting Map





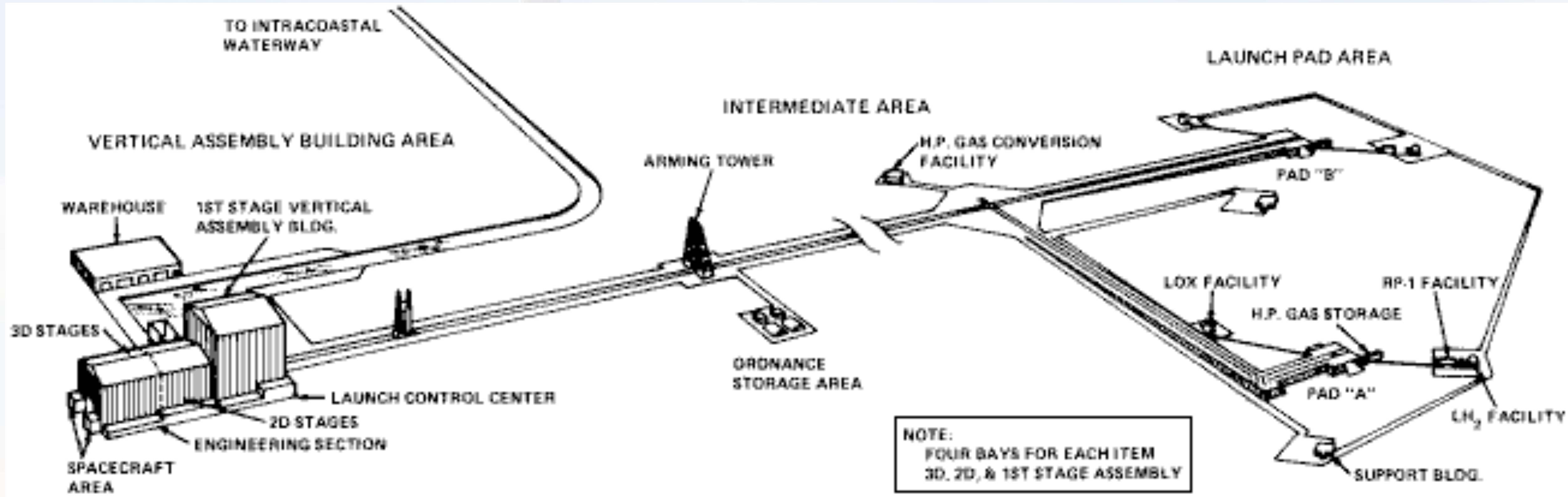
# Launch Sites Considered for Apollo

- Cape Canaveral
- Offshore from Cape Canaveral
- Mayaguana Island in the Bahamas
- Cumberland Island, Georgia
- A mainland site near Brownsville, Texas
- White Sands Missile Range in New Mexico
- Christmas Island in the mid-Pacific south of Hawaii
- South Point on the island of Hawaii



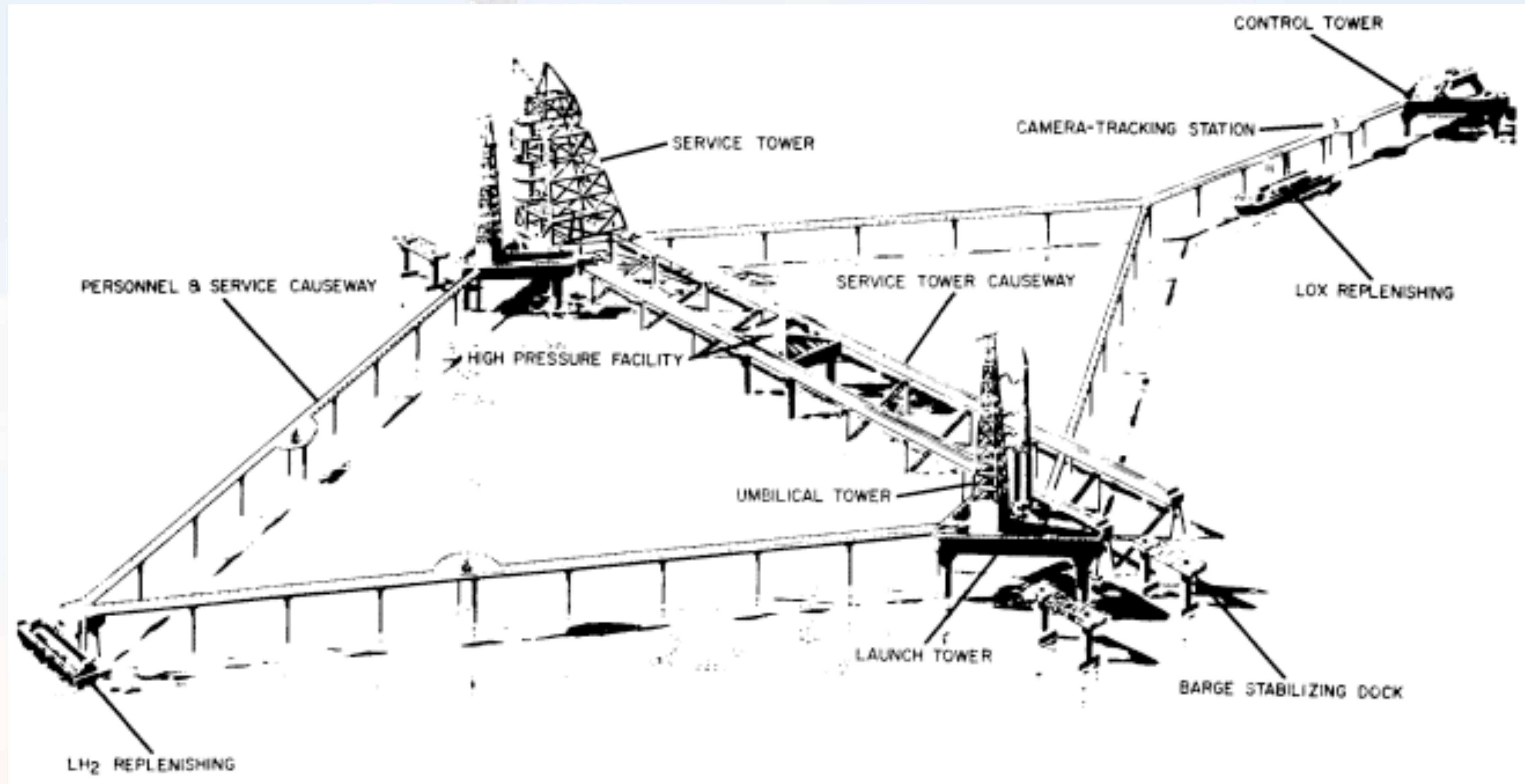


# Early Mobile Launch Complex Concept



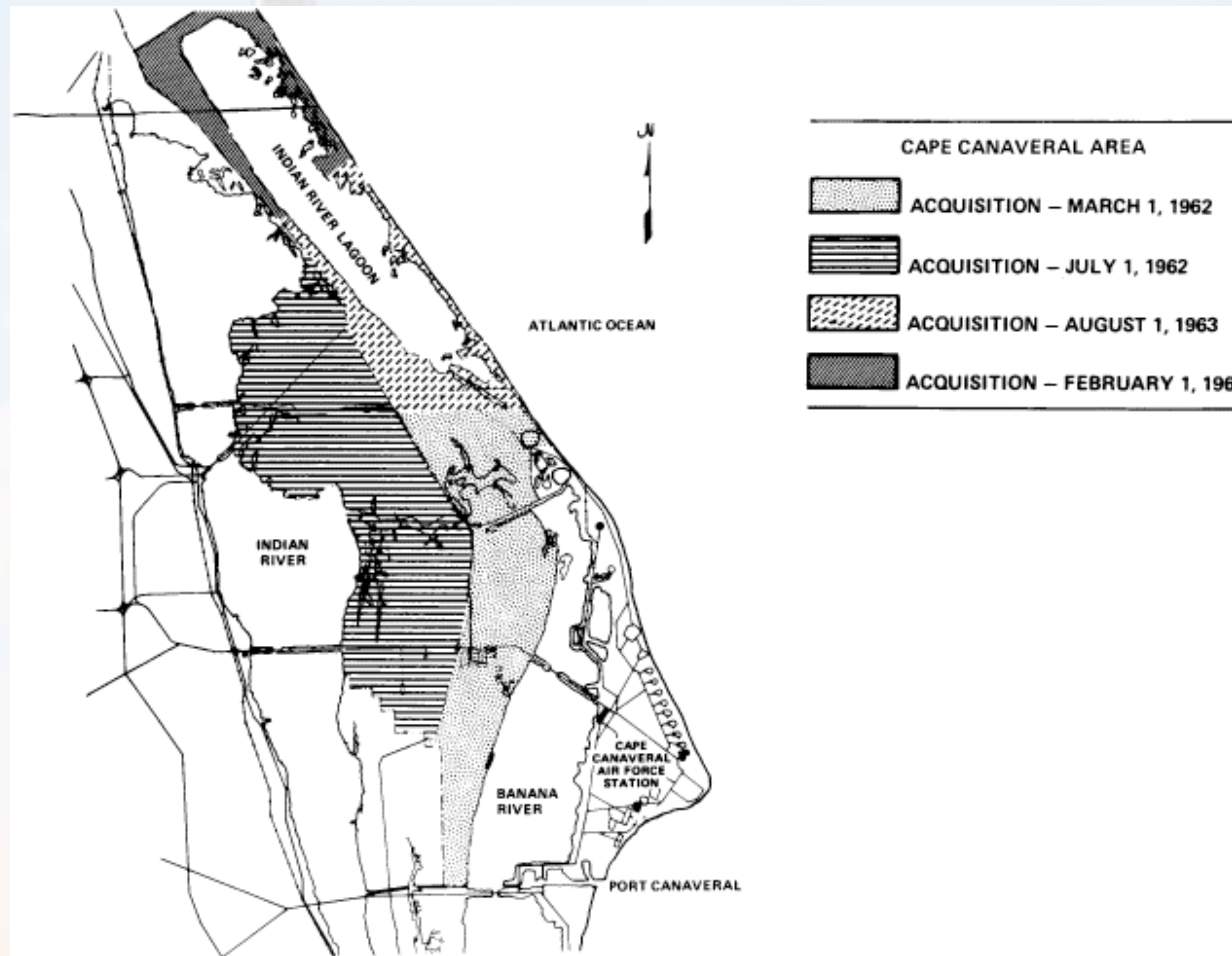


# Concept of an Off-Shore Launch Facility





# Merritt Island Launch Area (MILA)



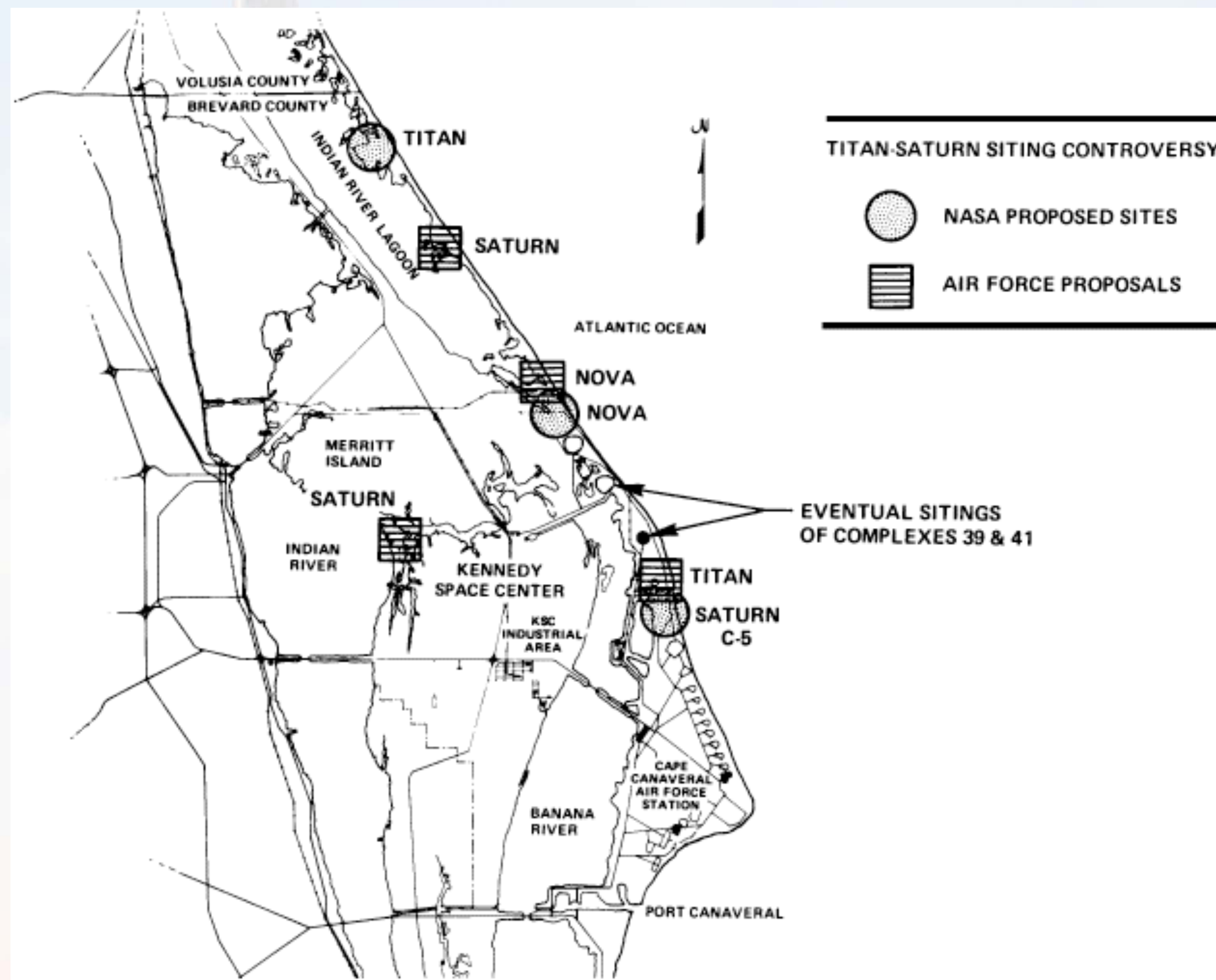


# Map of KSC and CCAFS



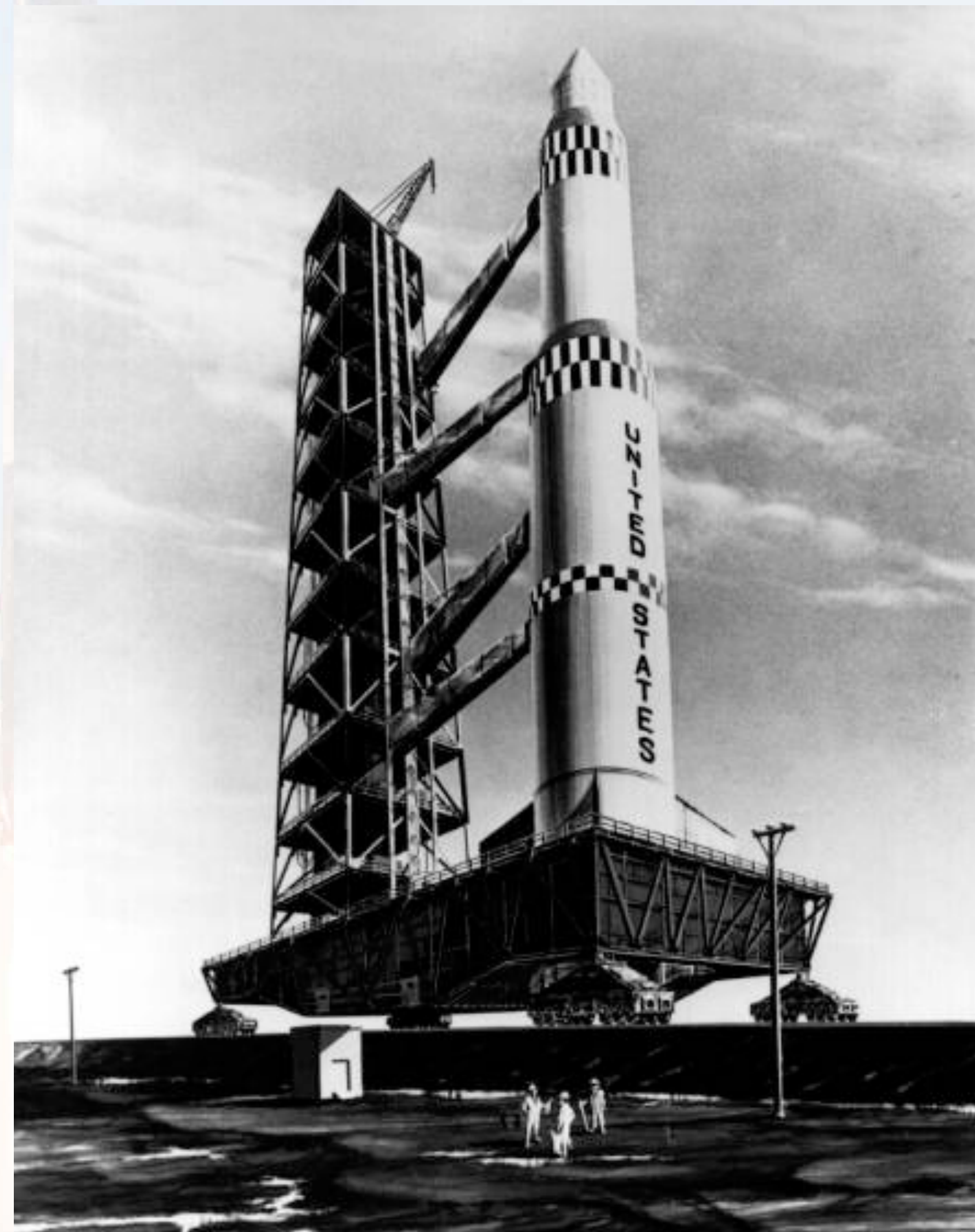


# Competition for MILA Launch Sites



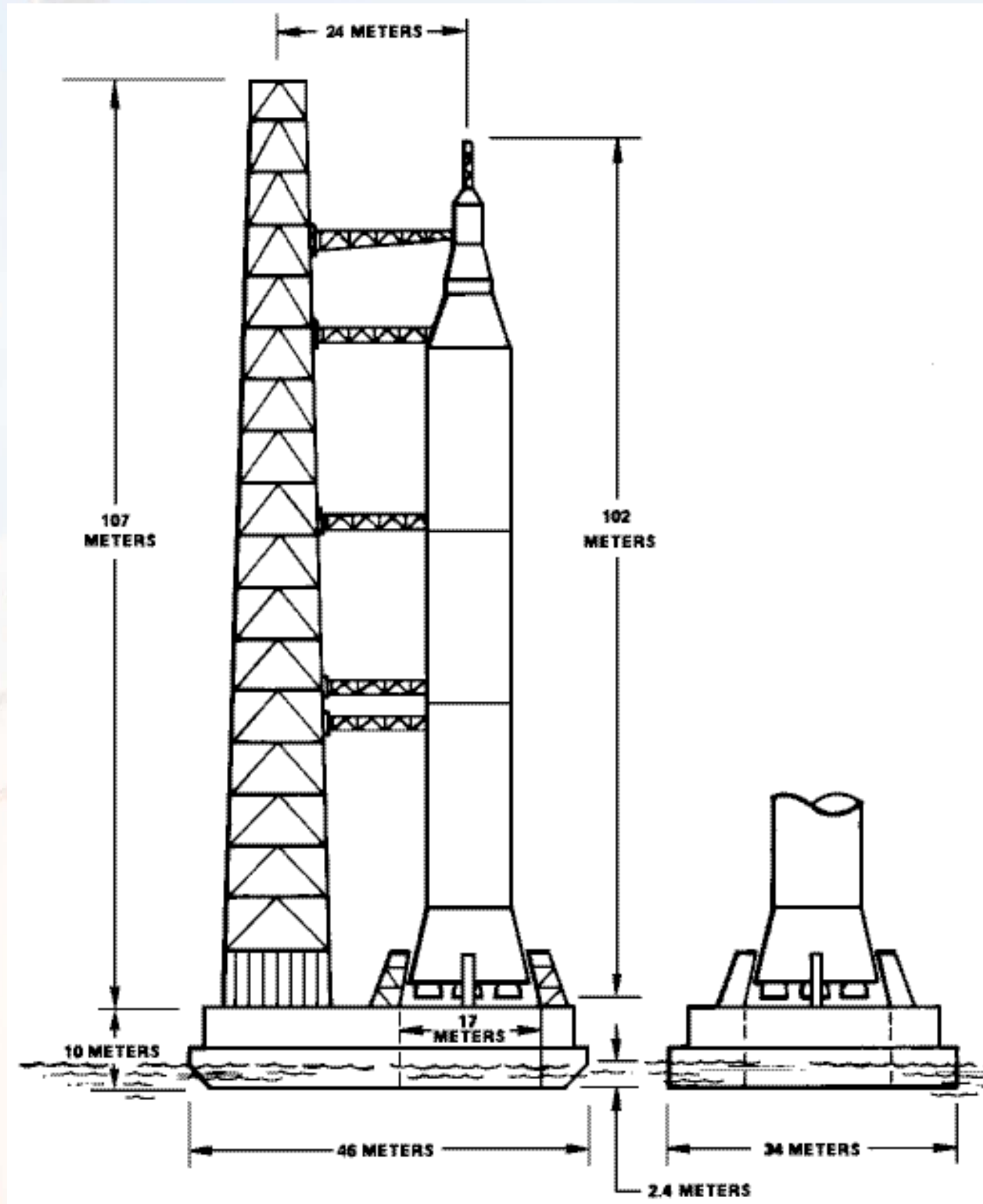


# Rail-Based Nova Launch Concept



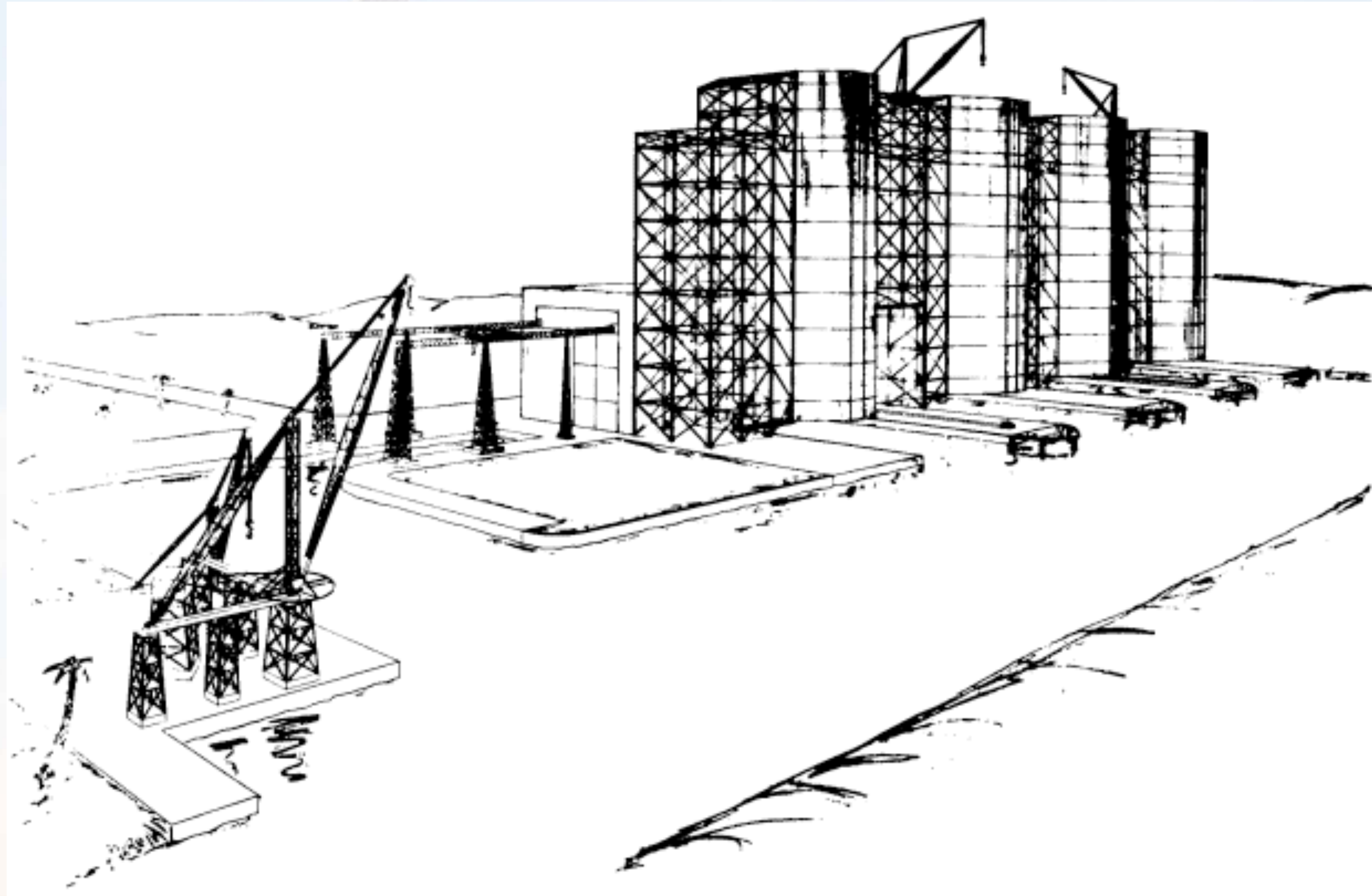


# Barge-Based Saturn V Launch Concept



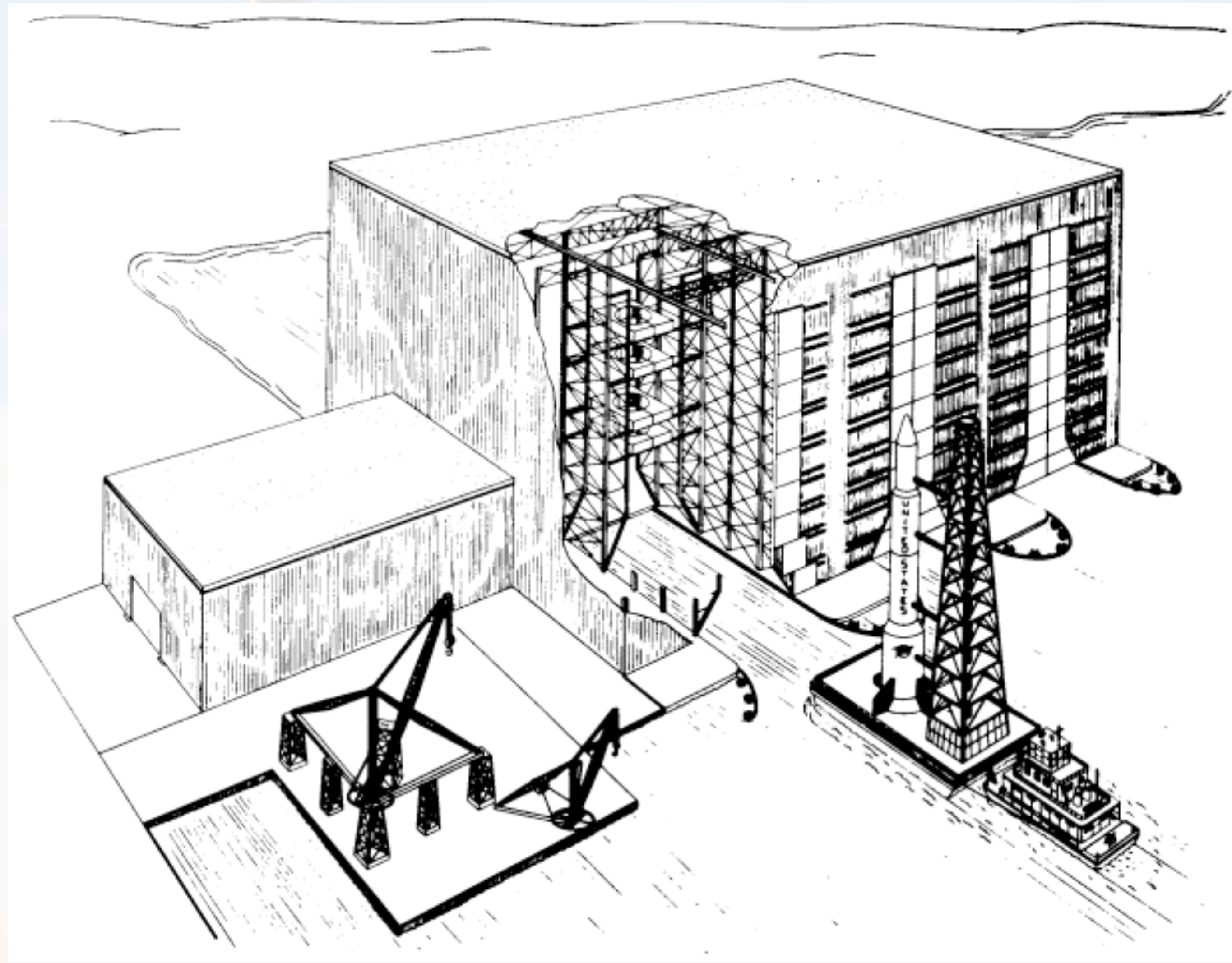


# Barge-Based Vertical Assembly Building



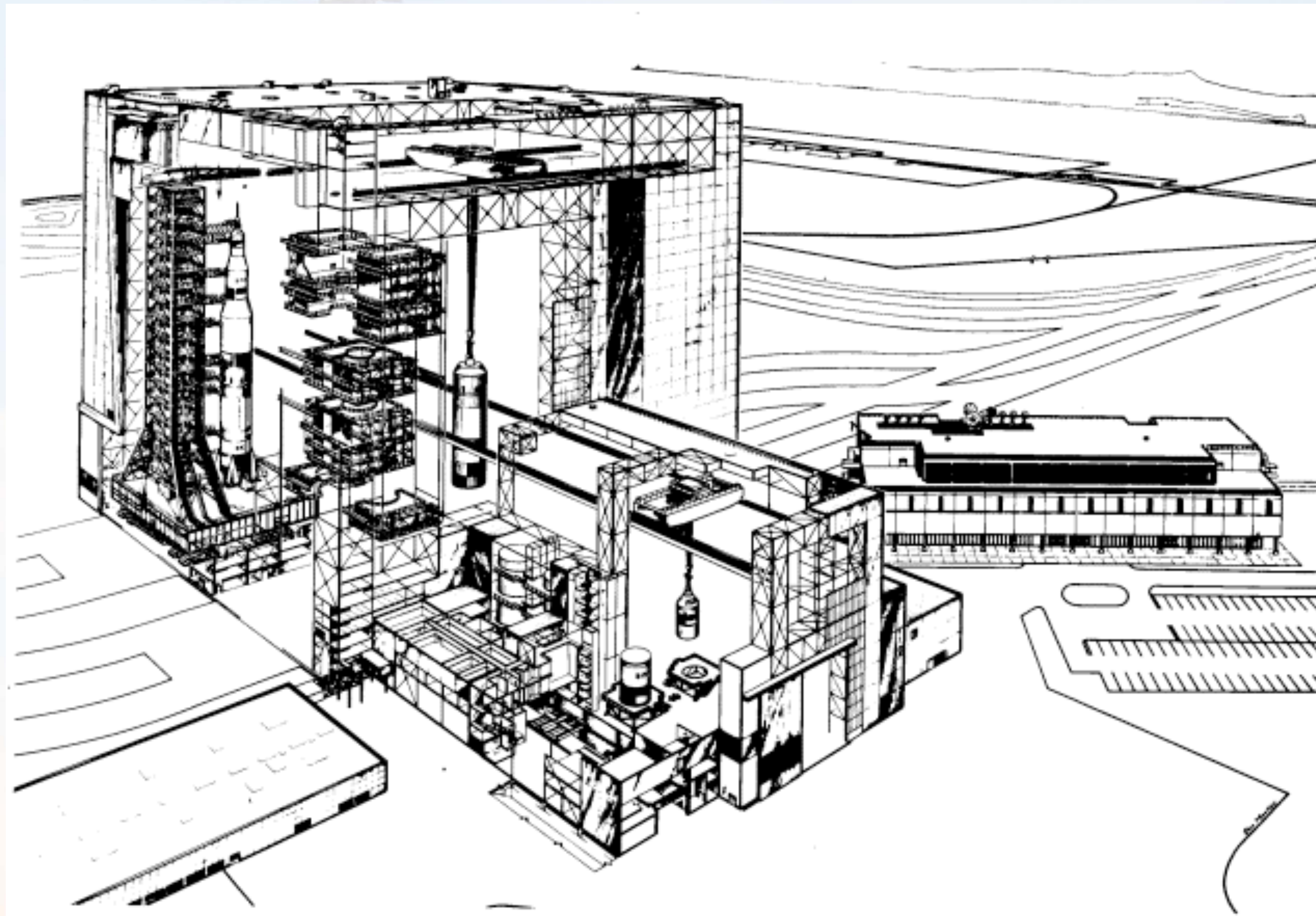


# Barge-Based VAB (Enclosed)





# Interior Concept of VAB





# Early Construction of VAB



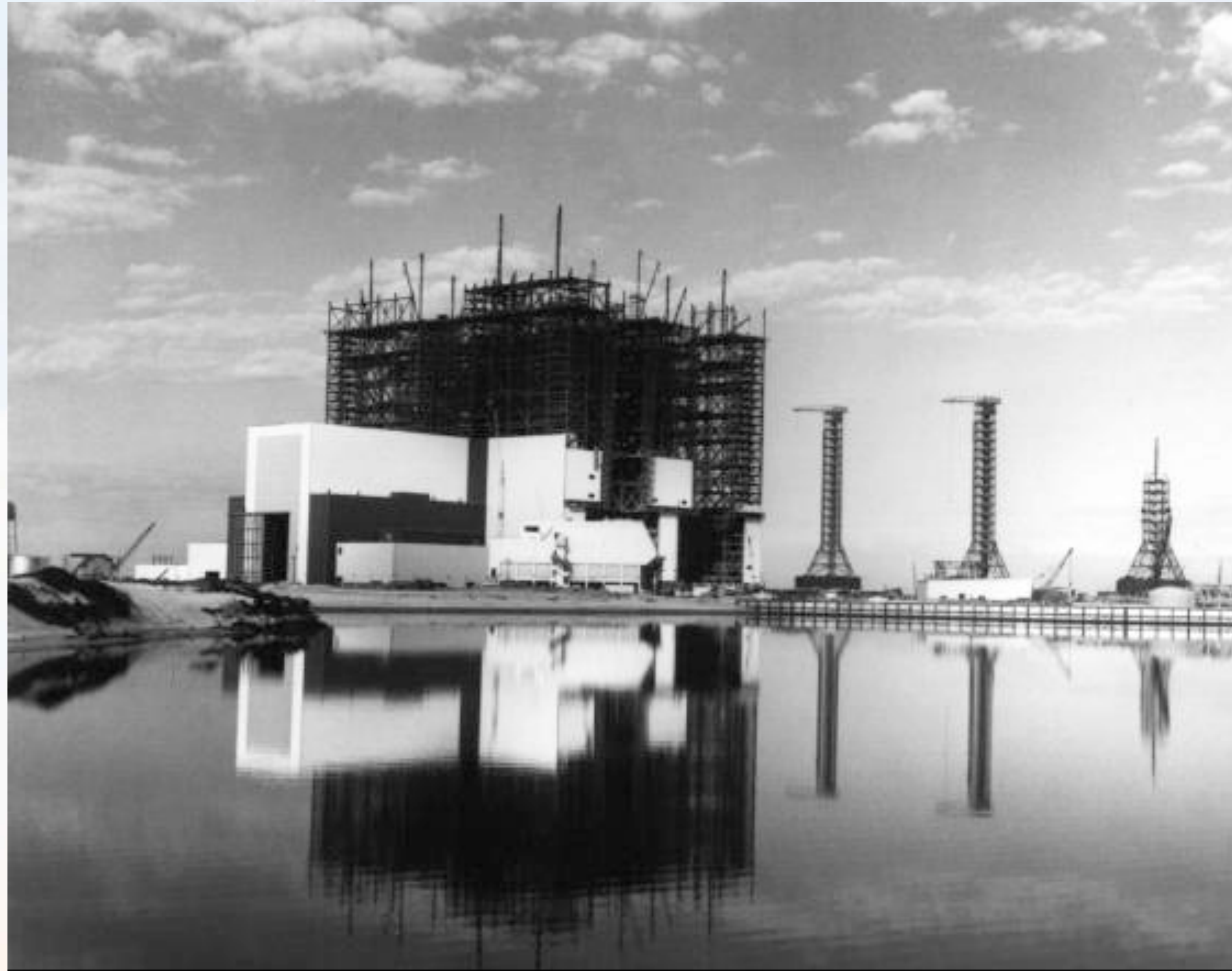


# VAB and LCC Under Construction





# VAB from Turning Basin





# Interior of Launch Control Center



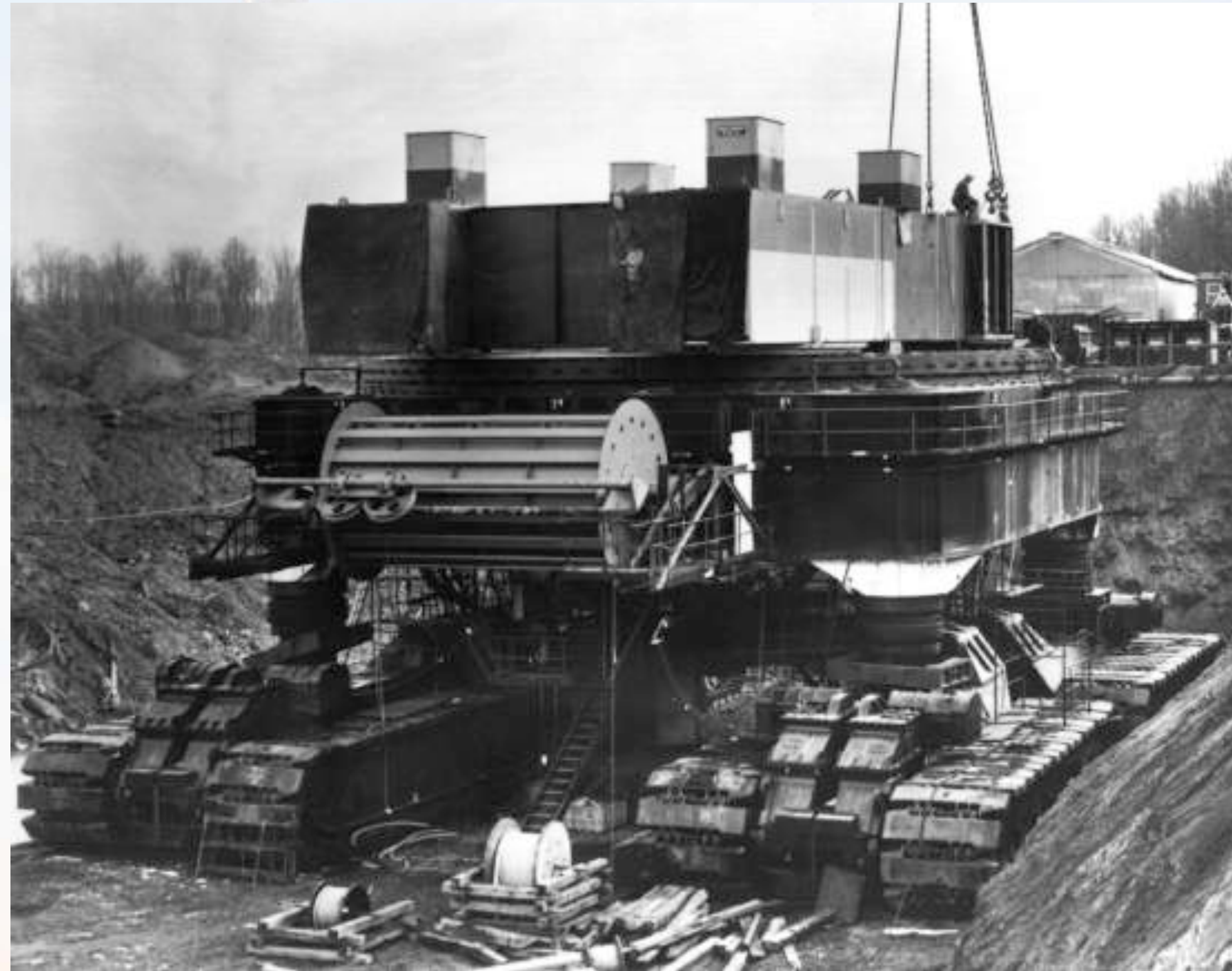


# Interior of Launch Control Center





# West Virginia Strip-Mine Coal Shovel



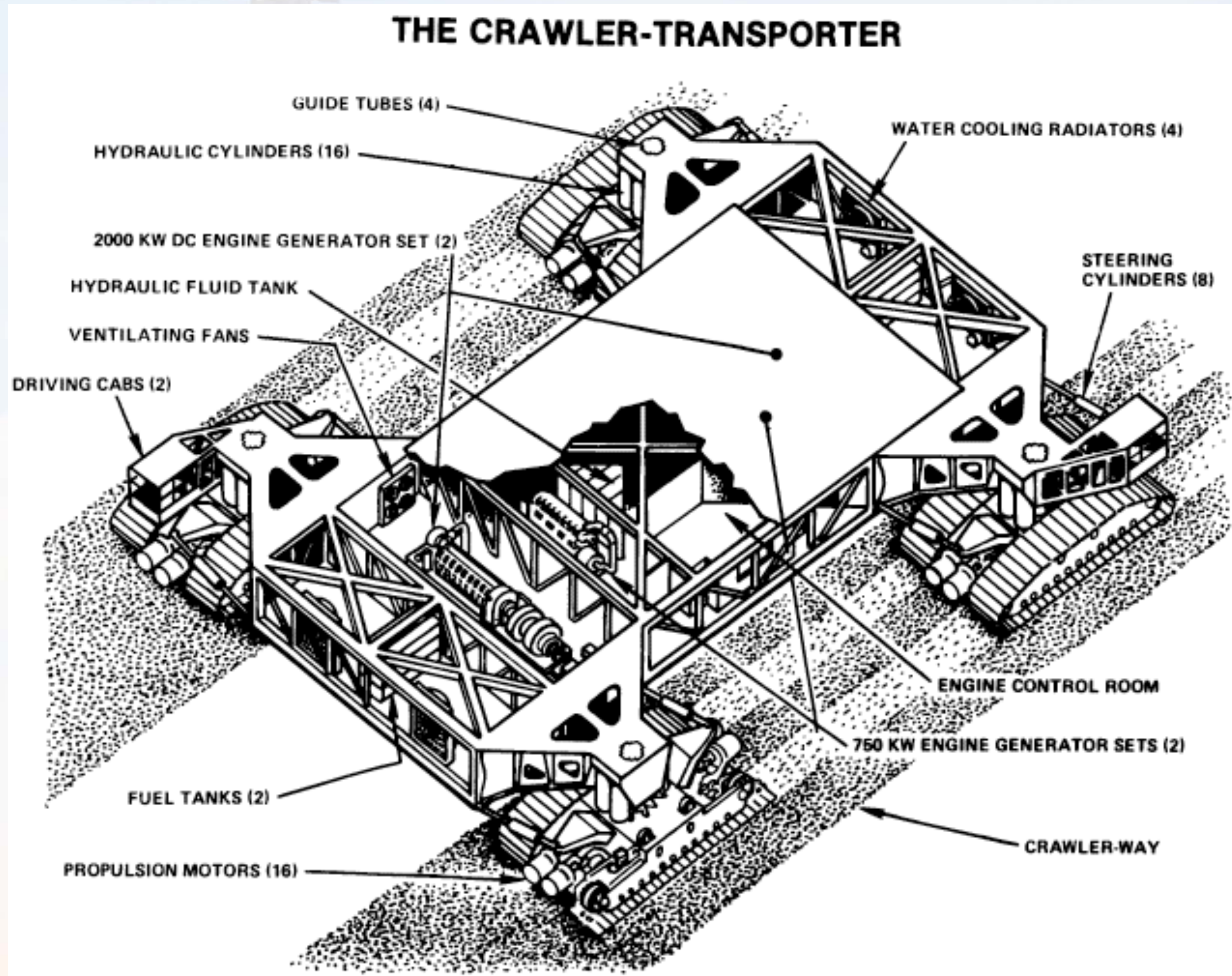


# Crawler-Transporter



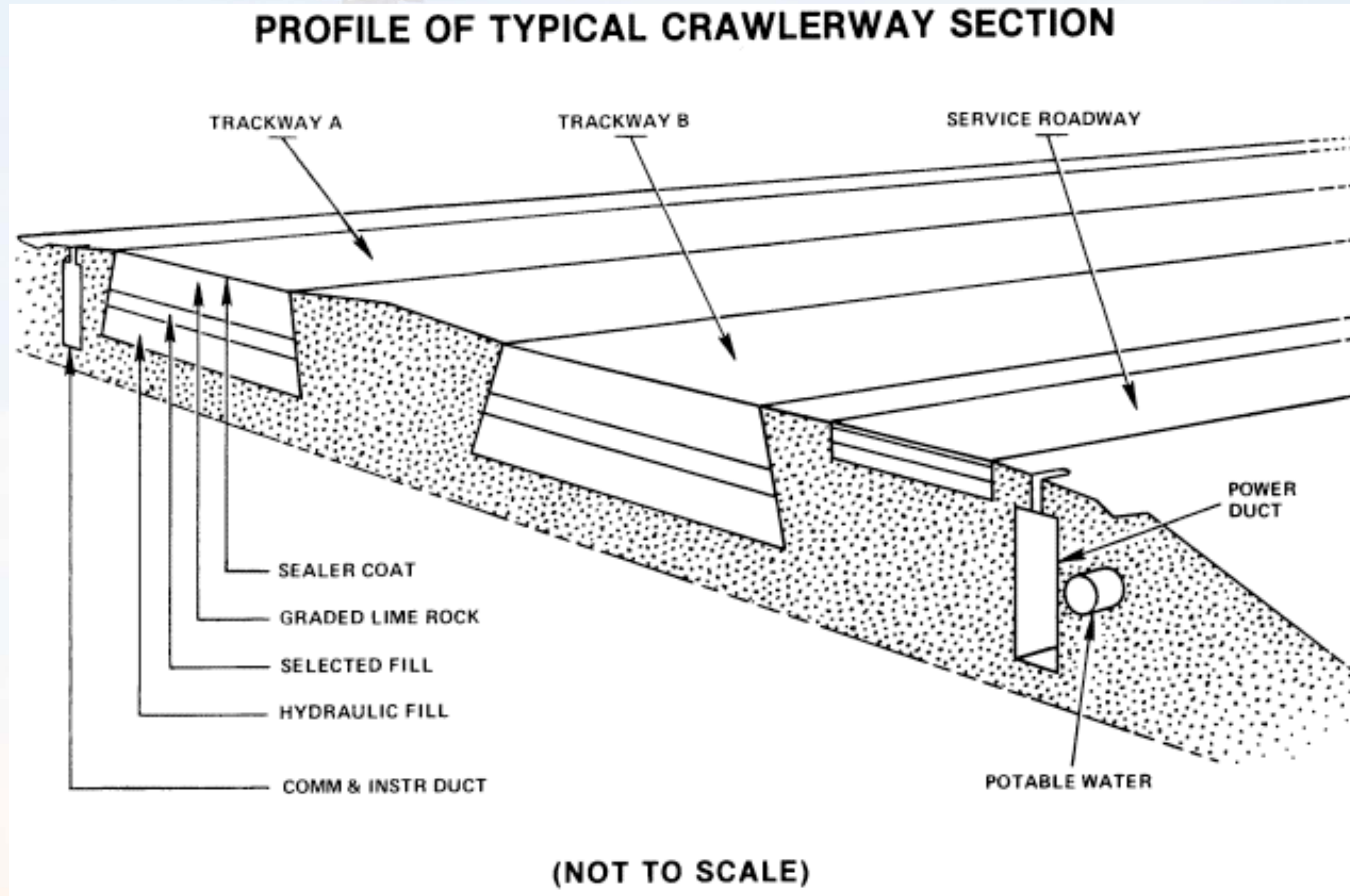


# Cutaway of Crawler-Transporter





# Complex 39 Crawlerway



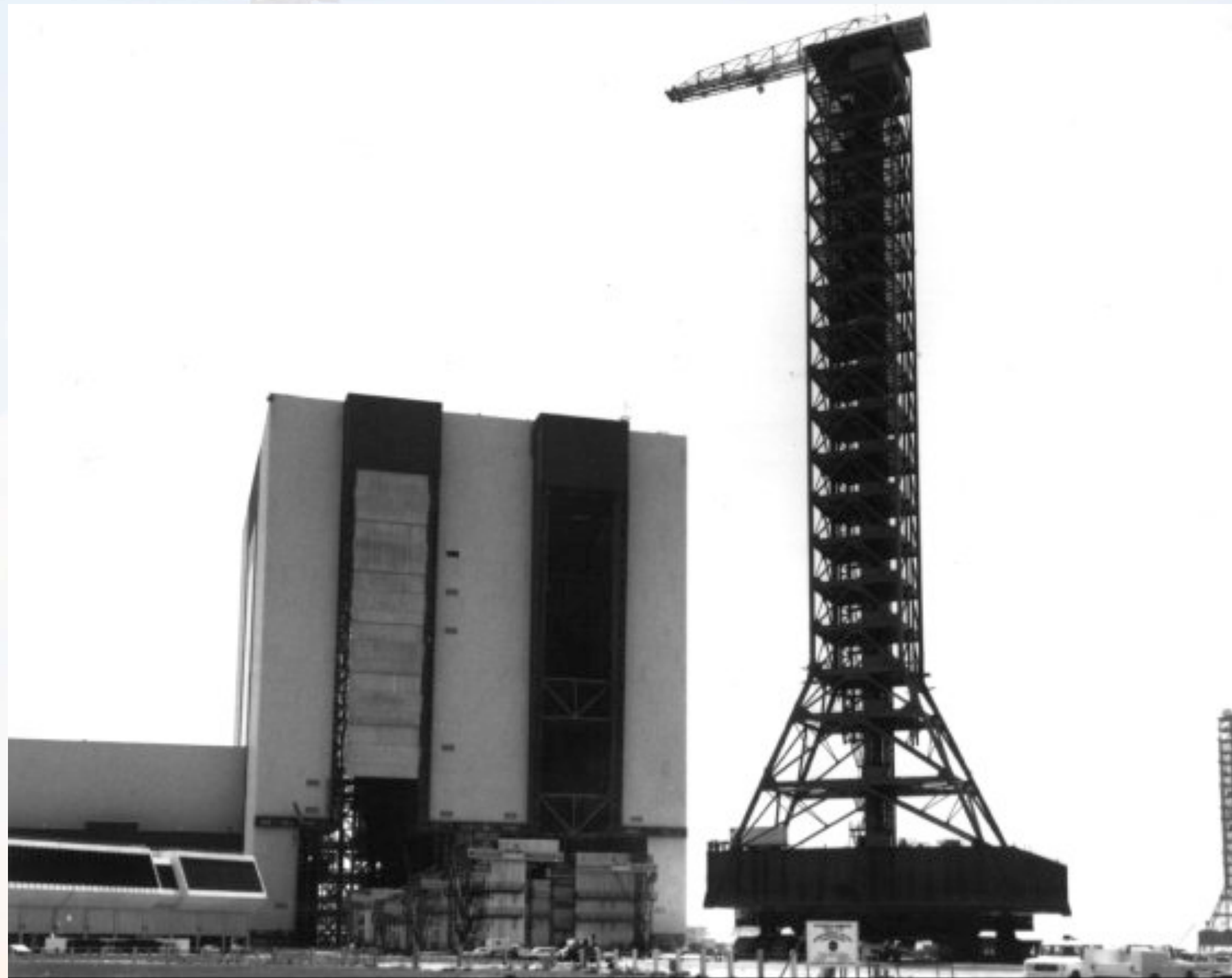


# Saturn V Mobile Launch Platforms



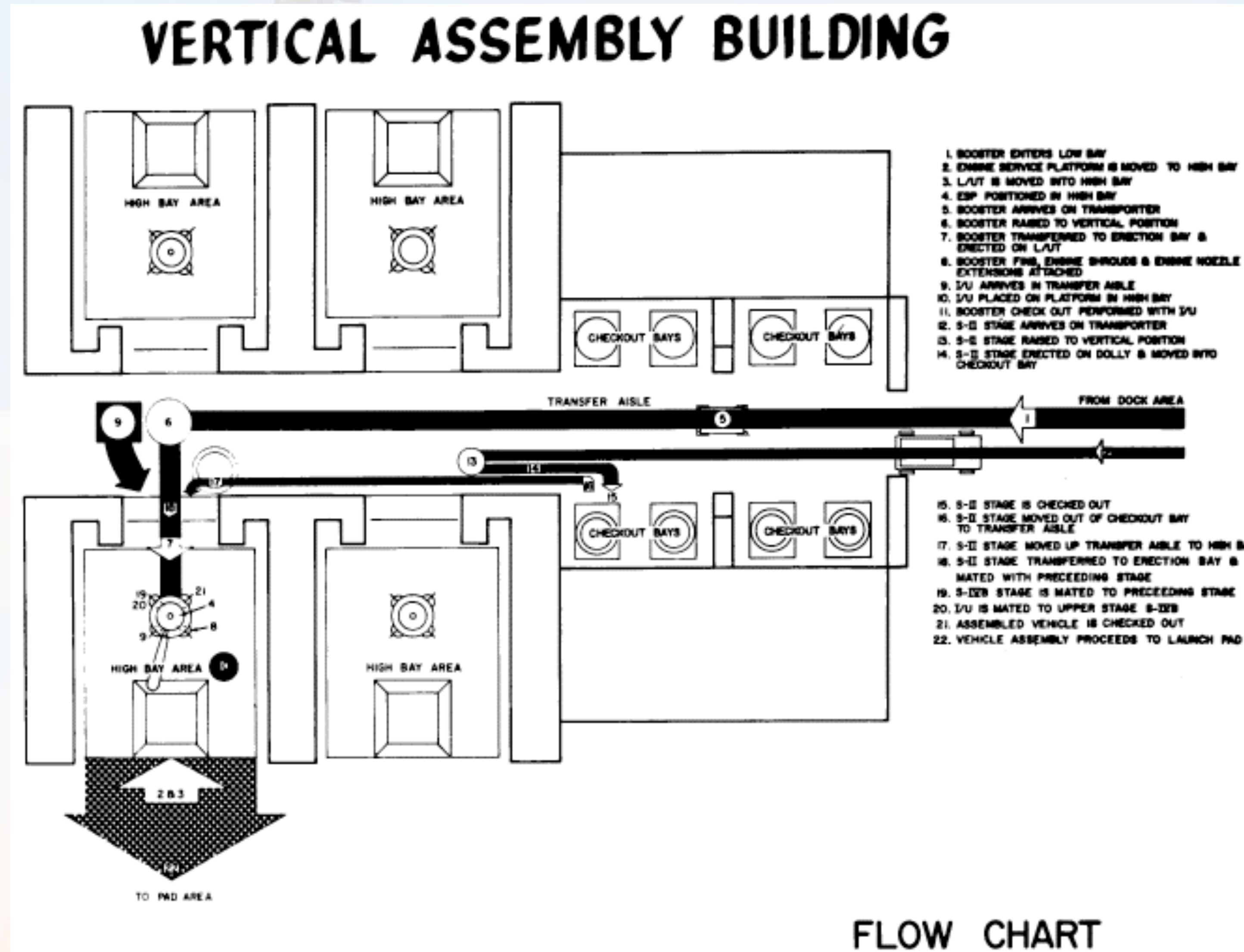


# MLP Transport Tests





# Interior of VAB



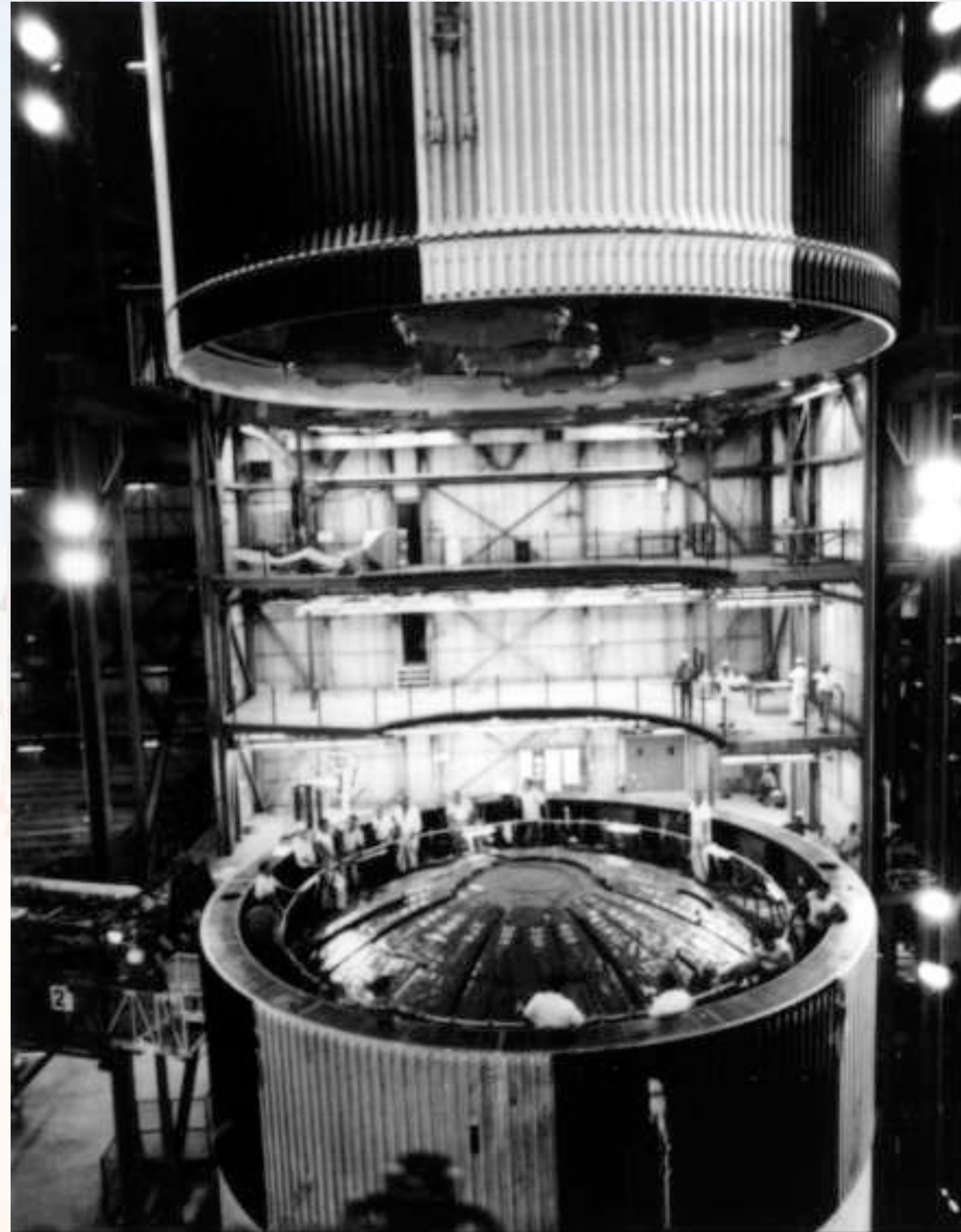


# S-IC Stage in VAB Transfer Aisle



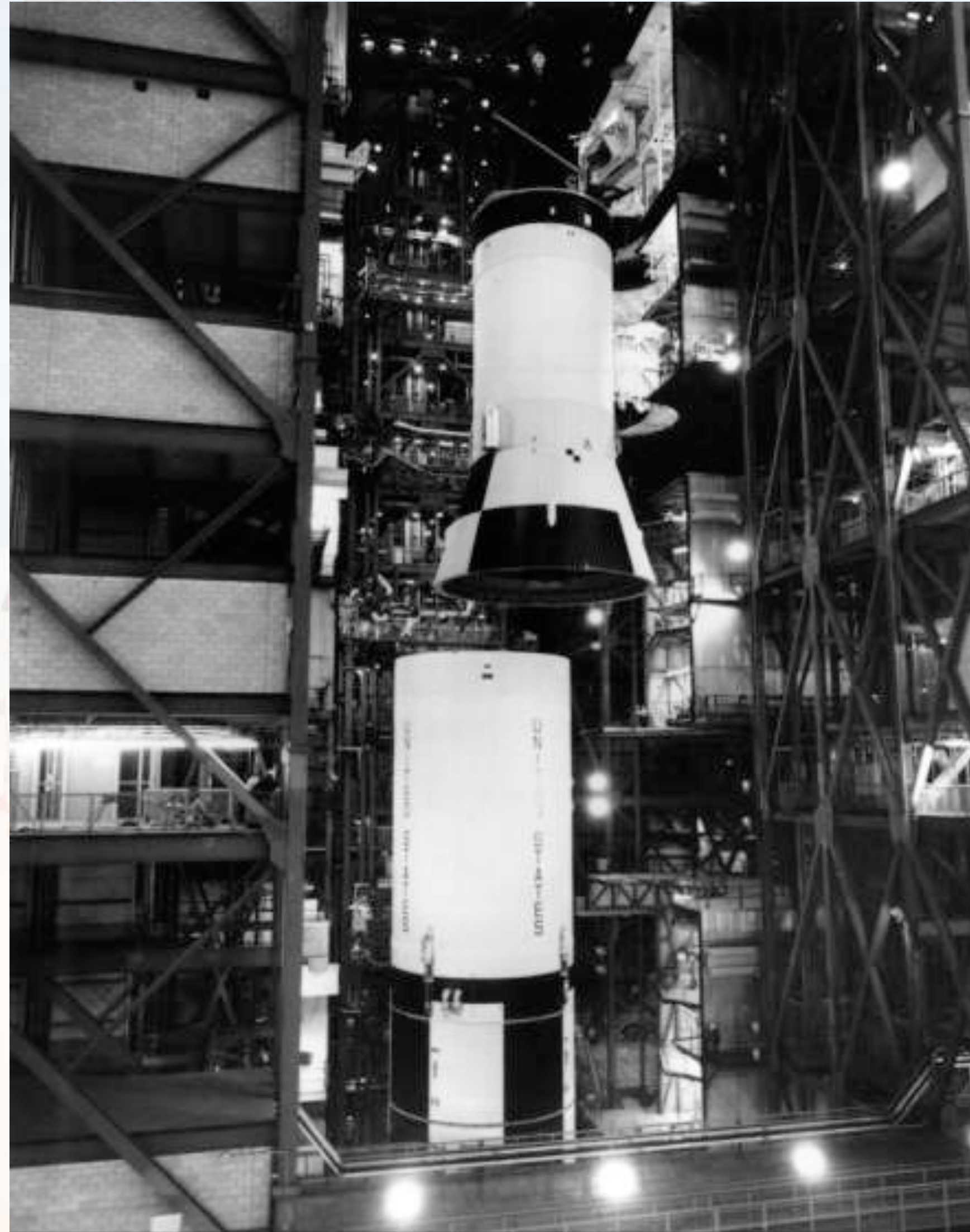


# S-IC – S-II Stacking



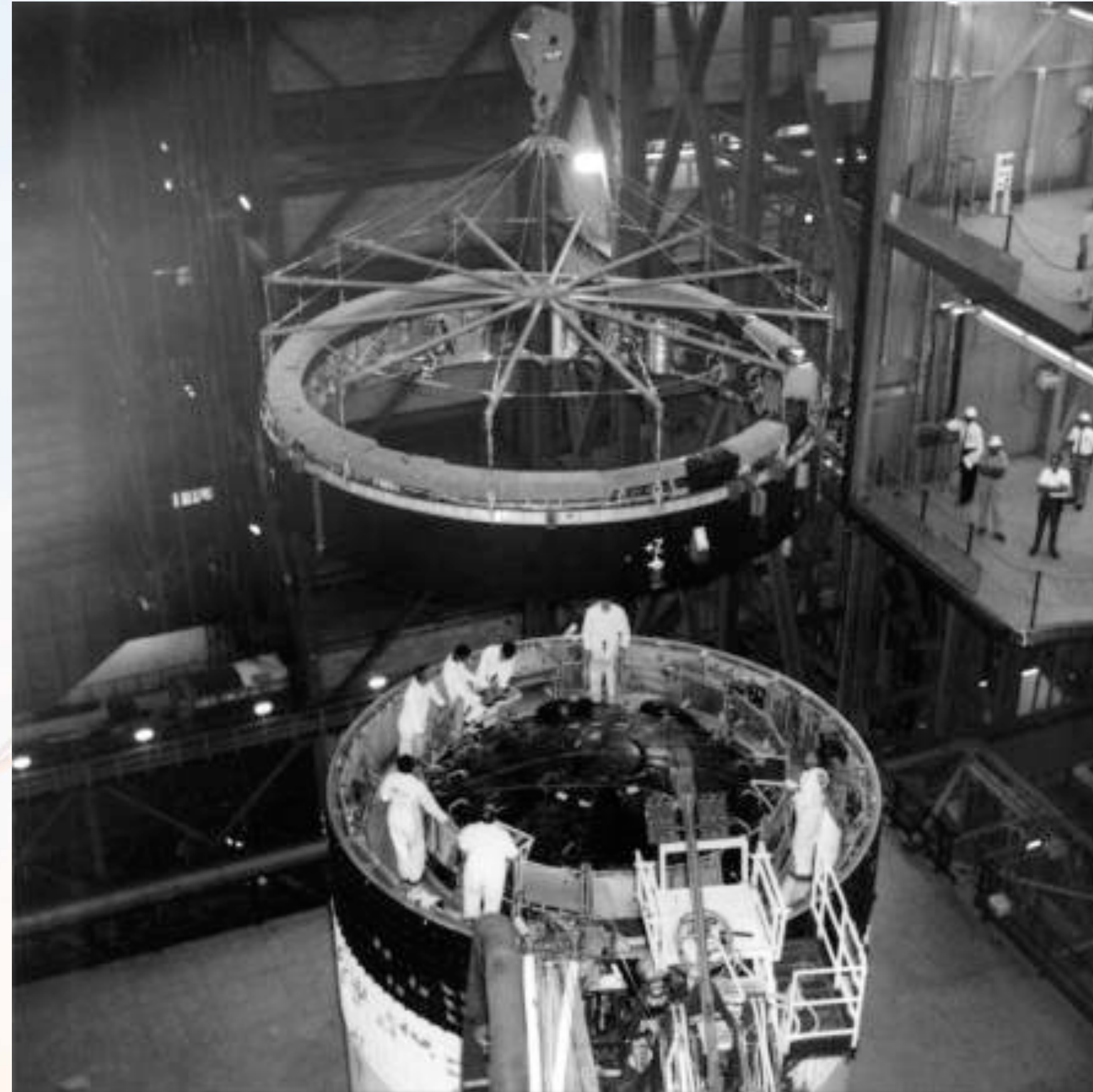


# S-II – S-IVB Stacking





# S-IVB – Instrument Unit Stacking



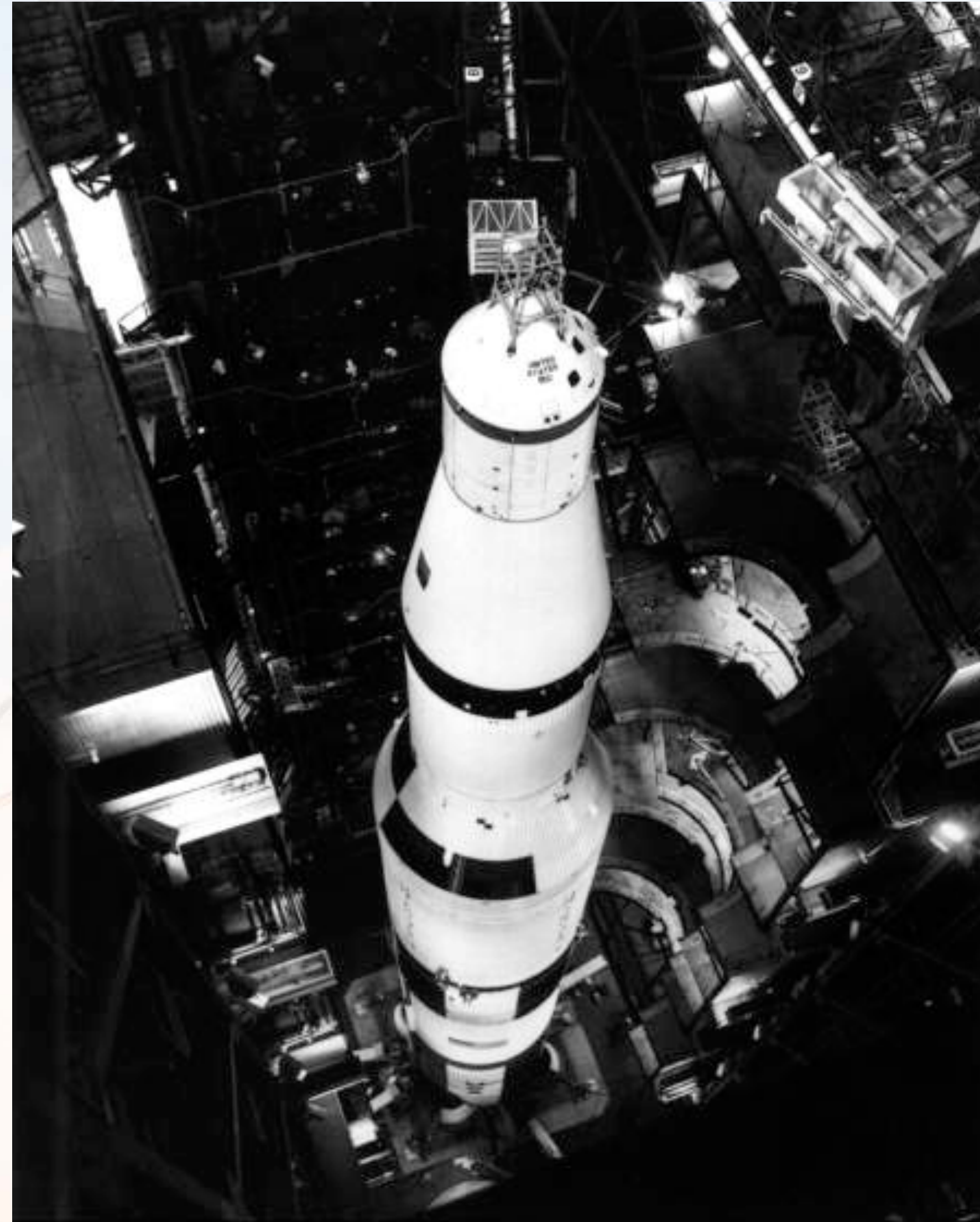


# IU – Apollo Spacecraft Stacking



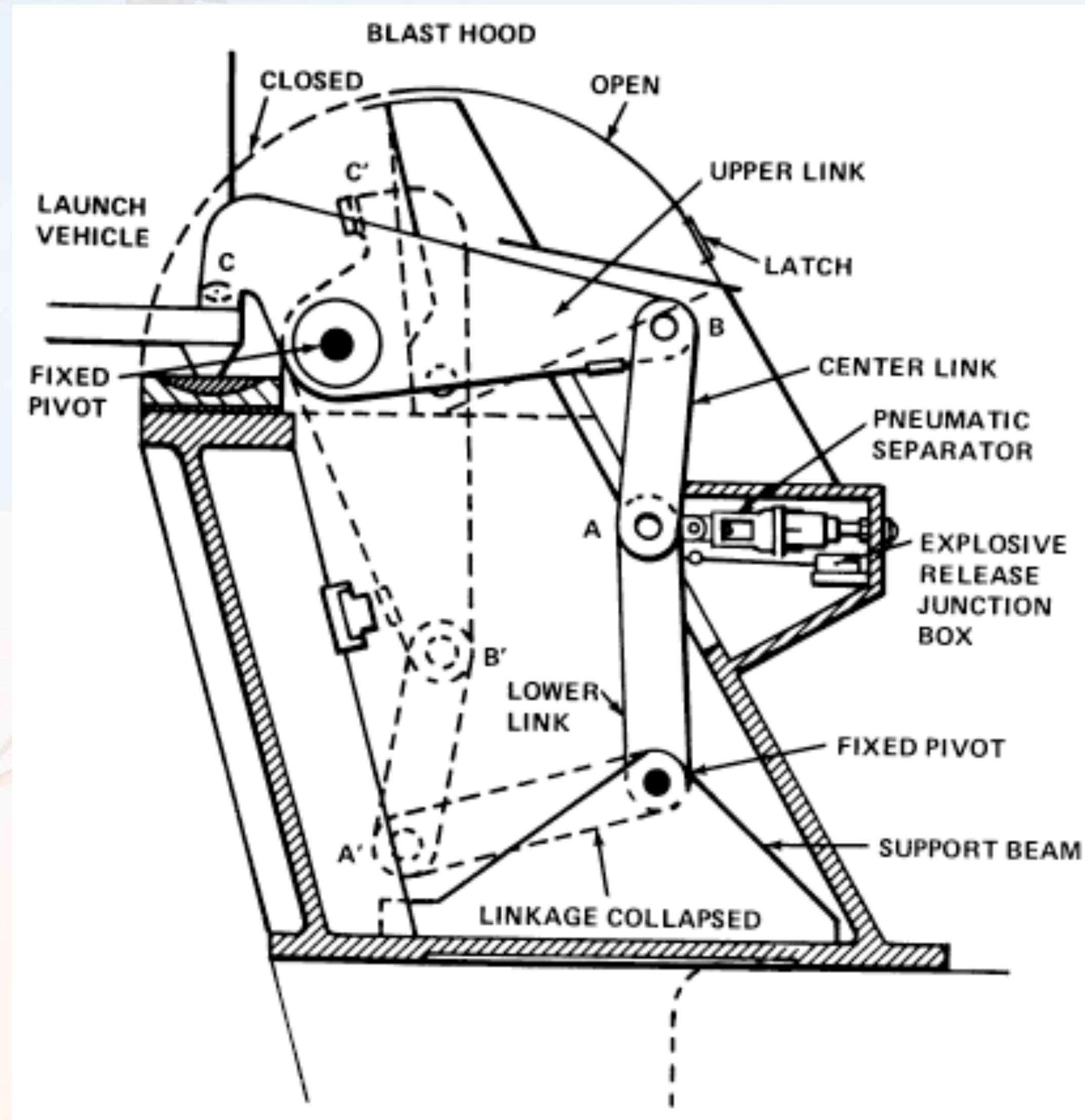


# Apollo–Saturn V Completed Stack in VAB



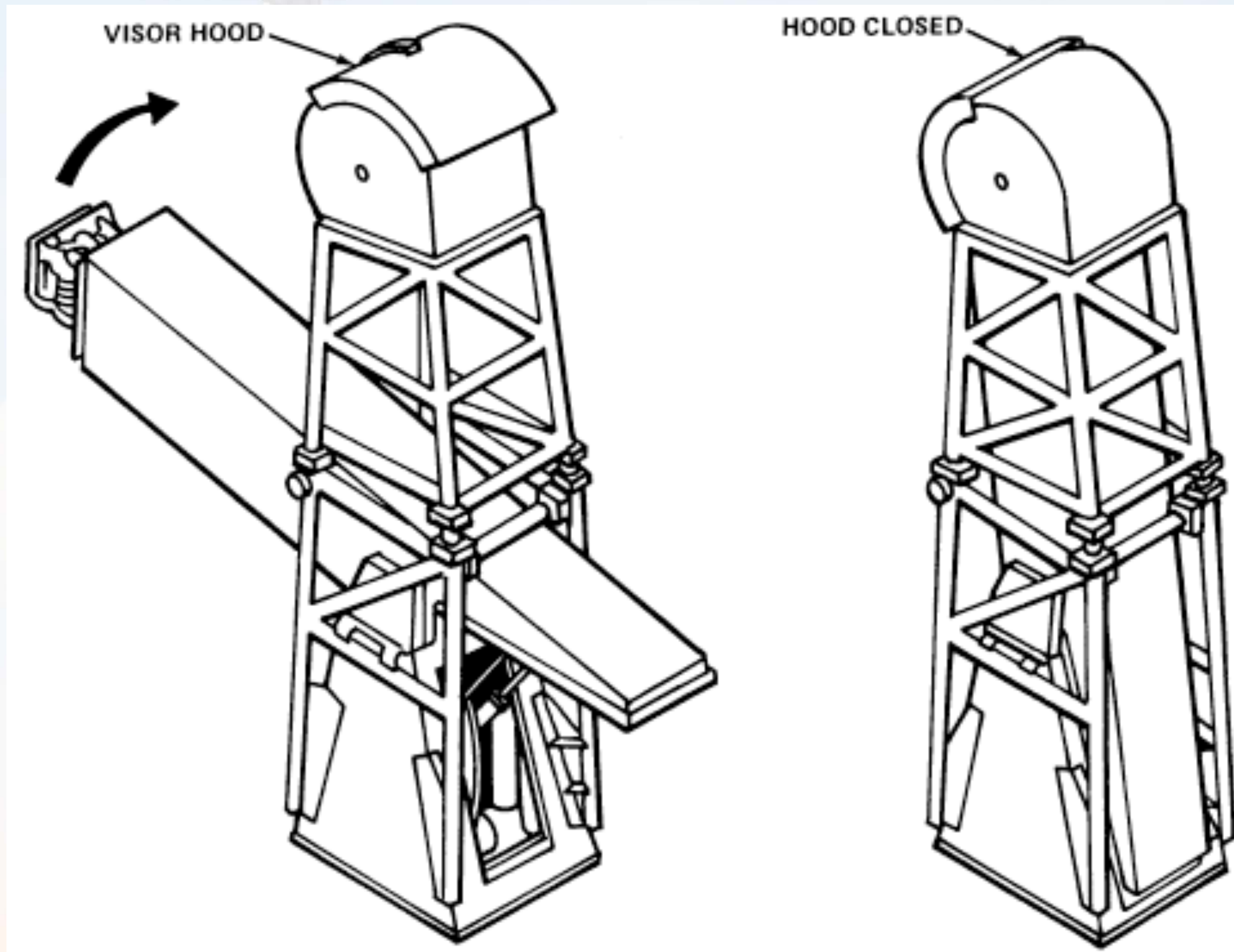


# Saturn V Hold-Down Restraints





# S-1C T-0 Disconnects





# Building the LC-39 Launch Pads



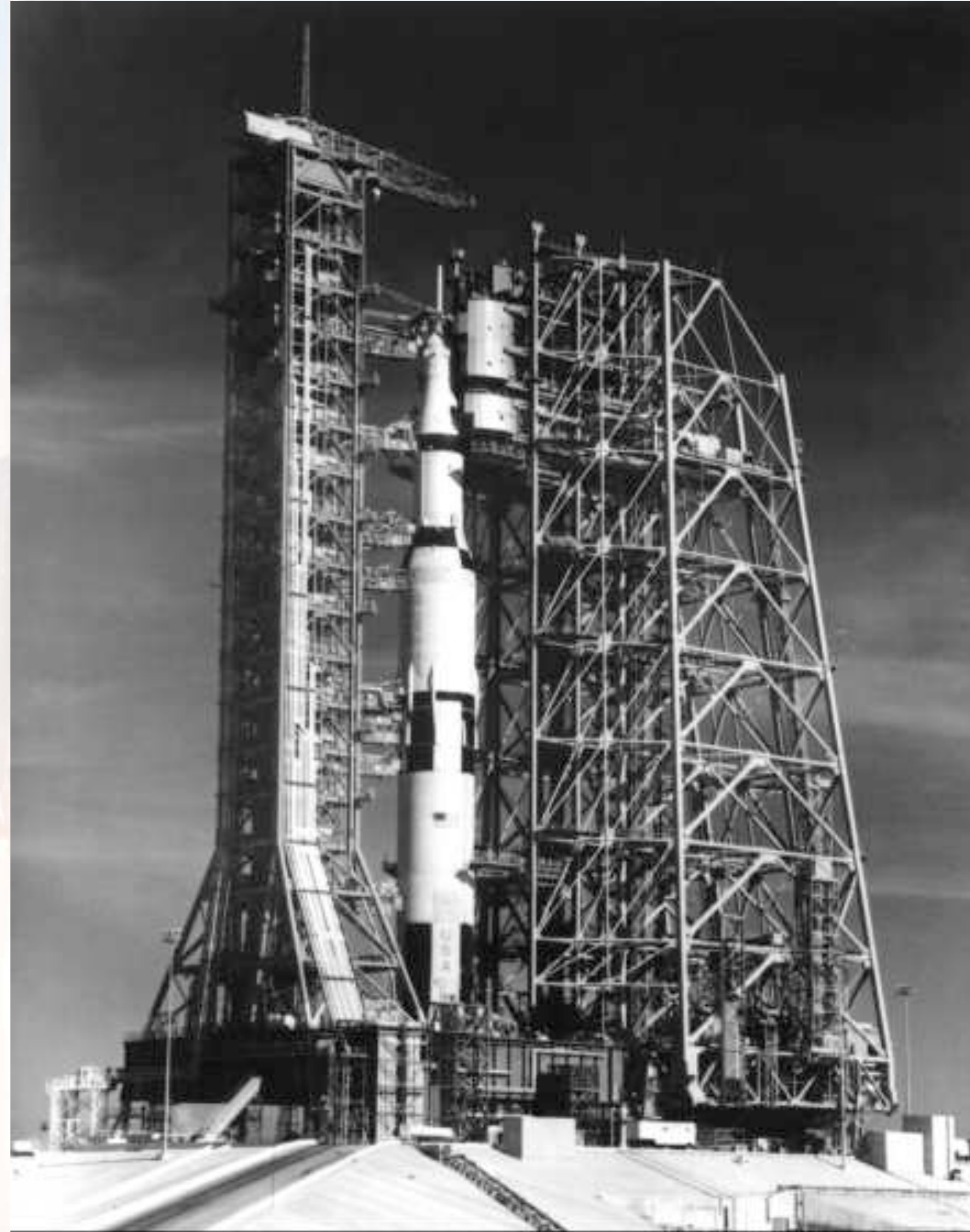


# LC-39 Crawlerway and Stacks



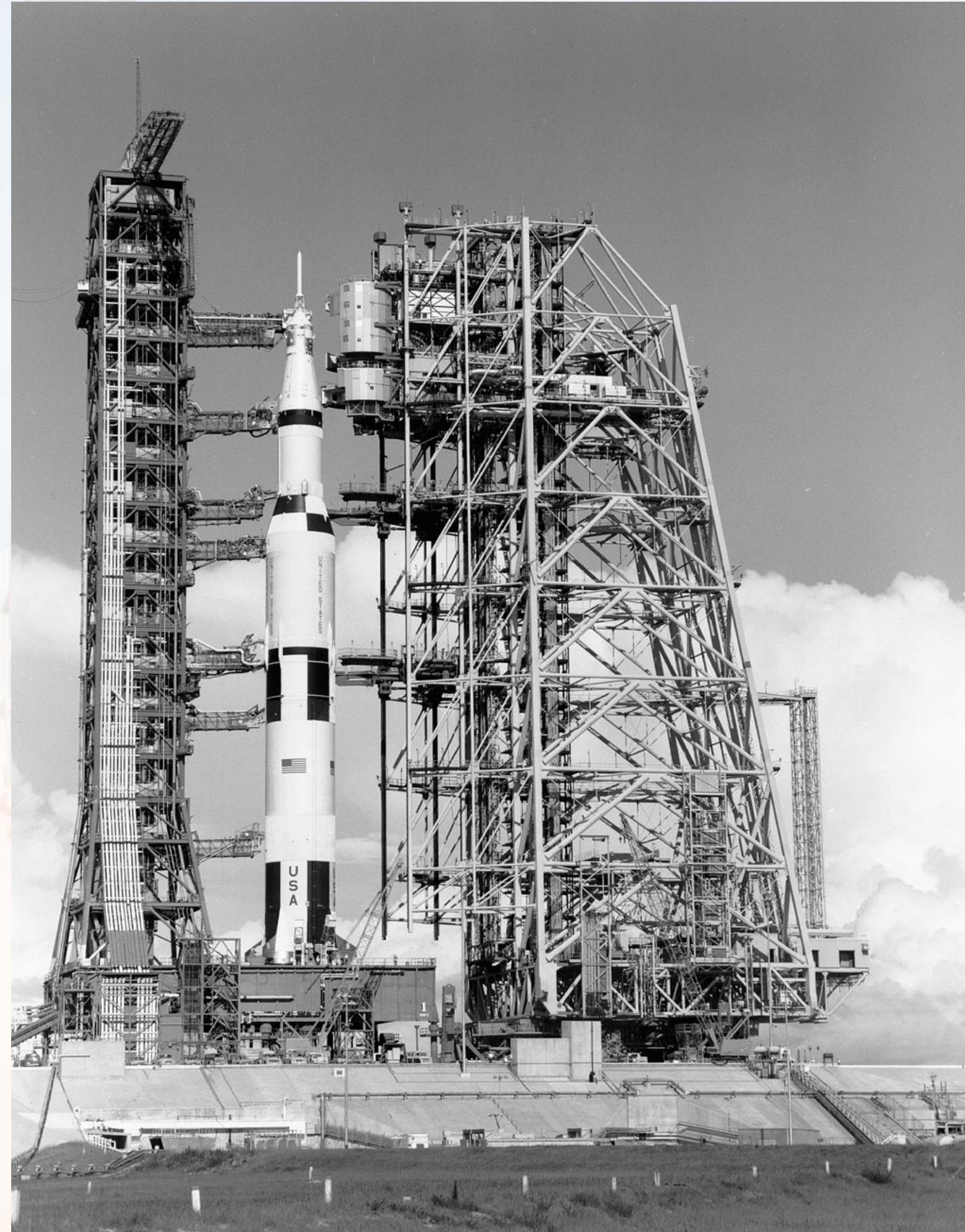


# SA-501 at LC-39A



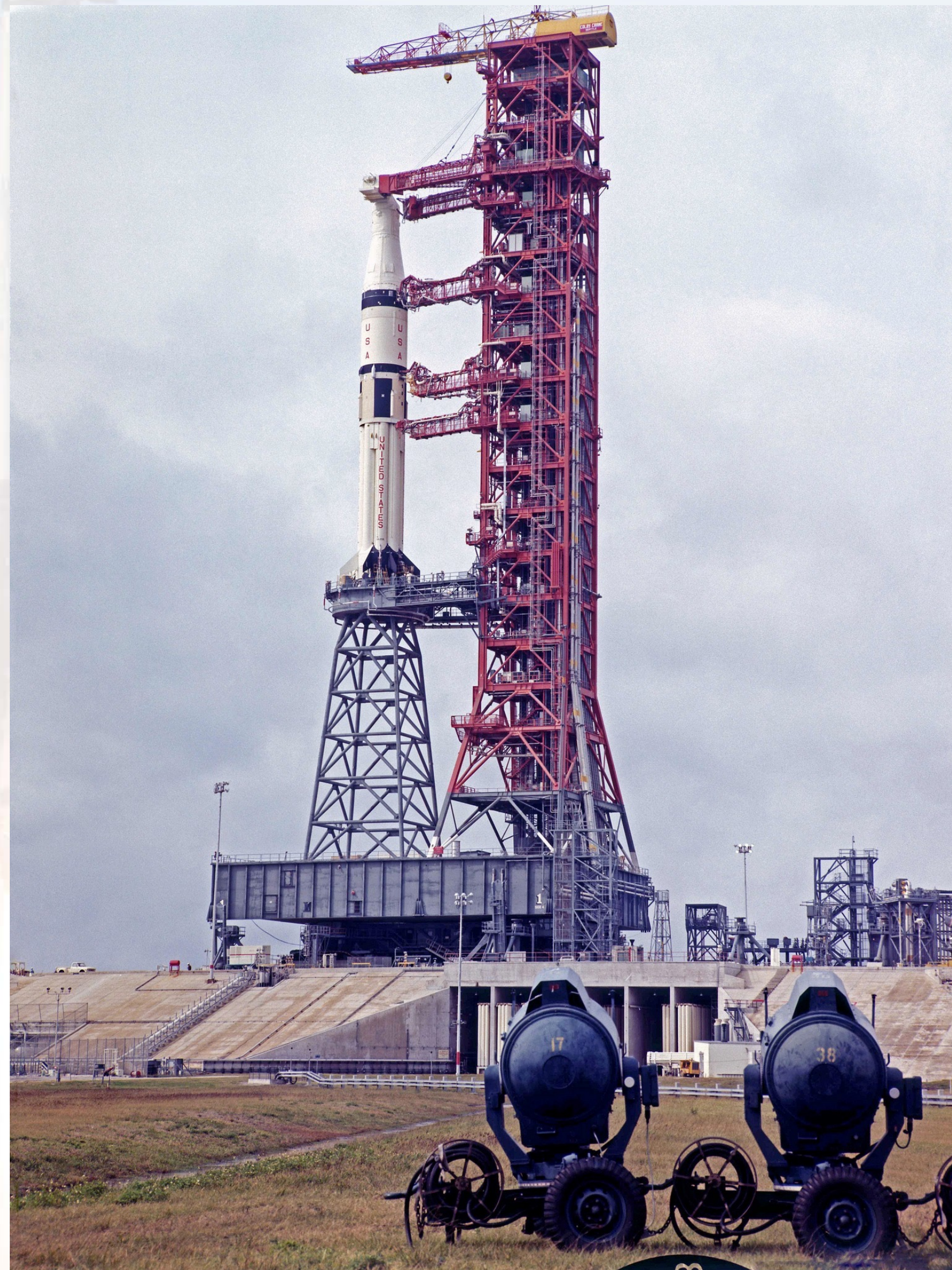


# Mobile Service Structure with Saturn V





# Saturn IB and "Toadstool" Launch



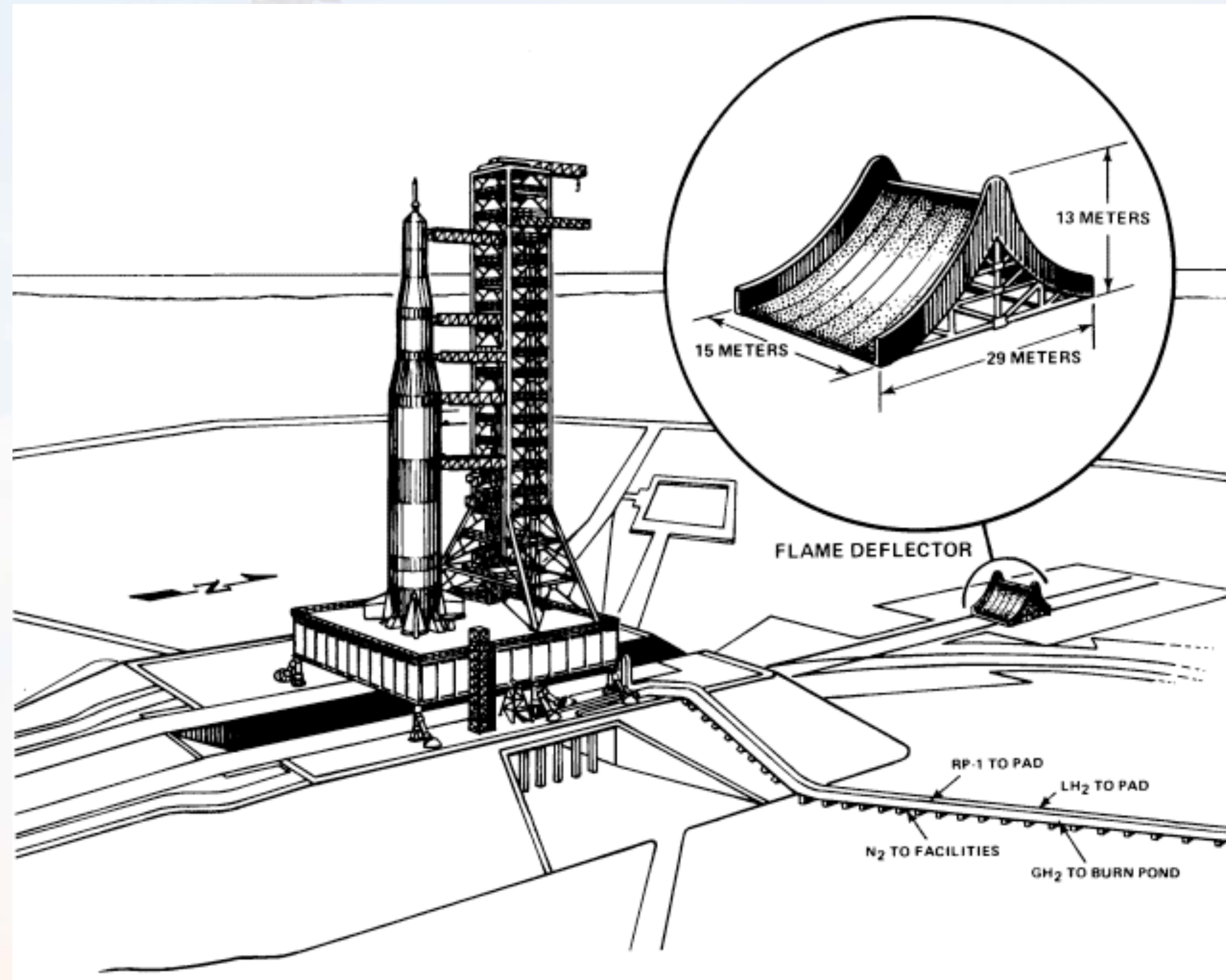


# STS Fixed and Rotating Service Structure





# Complex 39 Launch Mounts





# KSC LC-39 (Modern Era)



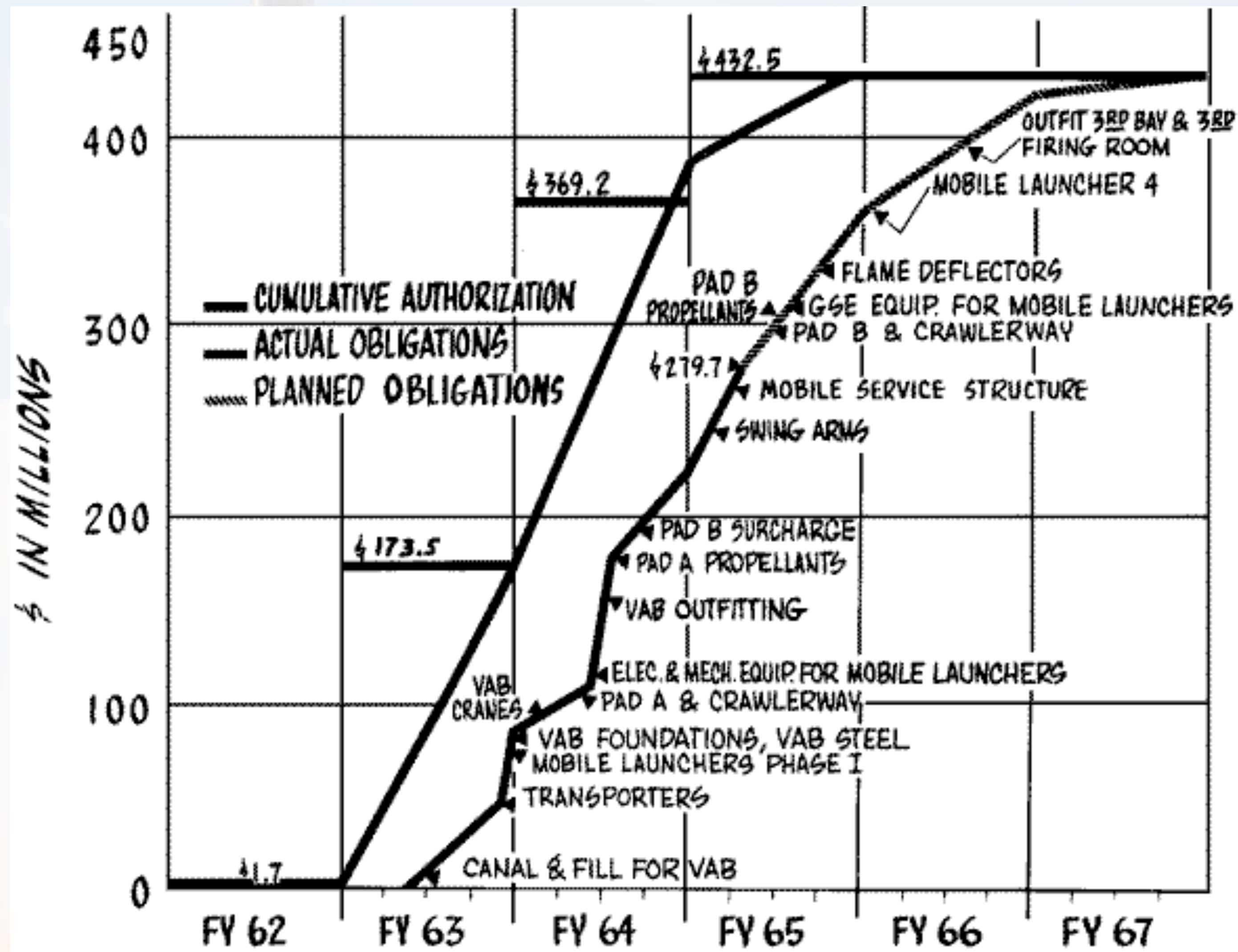


# Details of LC-39 Pads



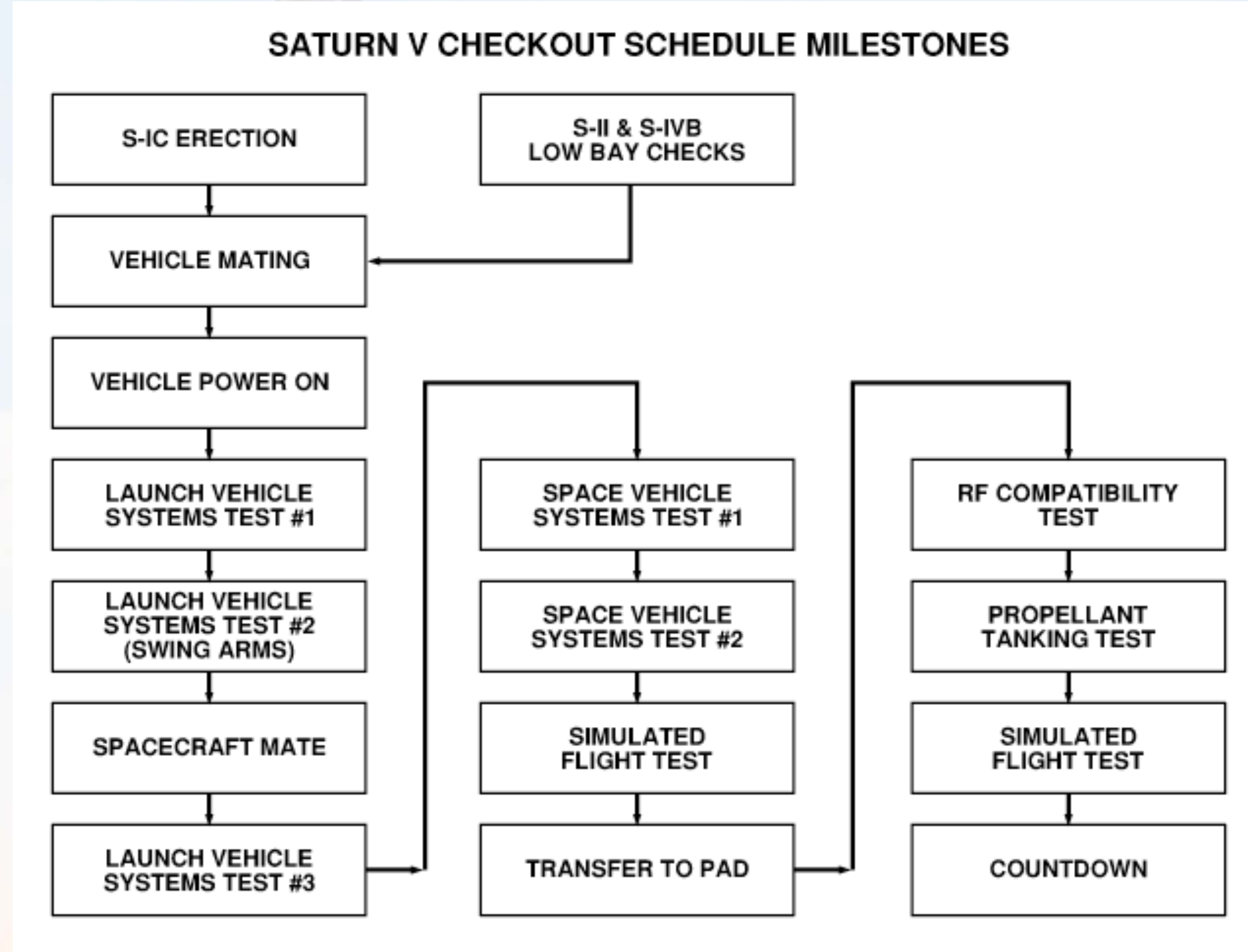


# Expenditures for LC-39





# Saturn V Vehicle Checkout Flow





# Soyuz Launch Vehicle Moving to Pad



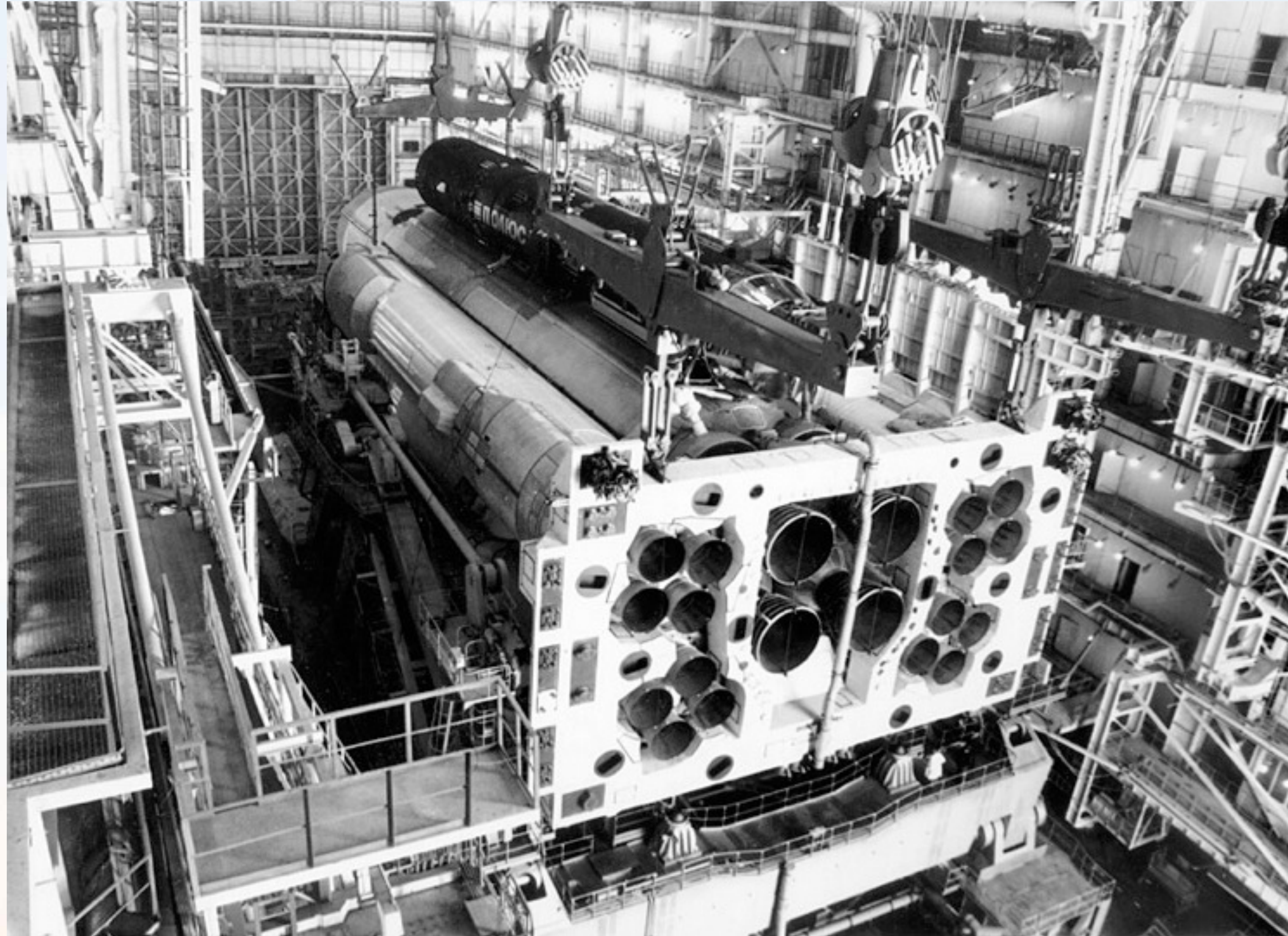


# Soyuz Launch Site





# Energia in Horizontal Integration





# Energia Transported to Pad





# Energia at Pad





# Energia Erection





# Energia on Pad





# Shuttle Landing Facility





# Transport to Orbiter Processing Facility





# Payload Bay Inspection in OPF





# SSME Removal/Installation





# Transfer to Vehicle Assembly Building





# Attaching Hoisting Fixtures





# Attaching Orbiter to Shuttle Stack





# Shuttle Rollout





# Delta IV Heavy Horizontal Integration





# Delta IVH Horizontal Integration Facility





# Delta IV Heavy Transporter





# Delta IV Heavy at LC34 Blockhouse





# Delta IV Heavy Arrives at LC-34





# Delta IV Heavy Module Interconnects





# Delta IV Heavy at Pad





# Delta IV Heavy Rotation





# Delta IV Heavy Rotation





# Delta IV Heavy at Pad





# DC-XA on Launch Pad





# DC-X Flight Profile





# LC40 at KSC - SpaceX Falcon 9





# Falcon 9 v1.1 – SpaceX





# KSC Landing Complex 1





# Falcon 9 First Stage Landing





# Falcon Heavy and Starman (SpaceX)





# SLS/Mobile Launcher/LC-39B





# Starship/Super Heavy Launch Facility





# Starship Access Arms





# Starship and Tank Farms

