

Gemini: EVA

HONR 269i

To the Moon and Back: The Apollo Program

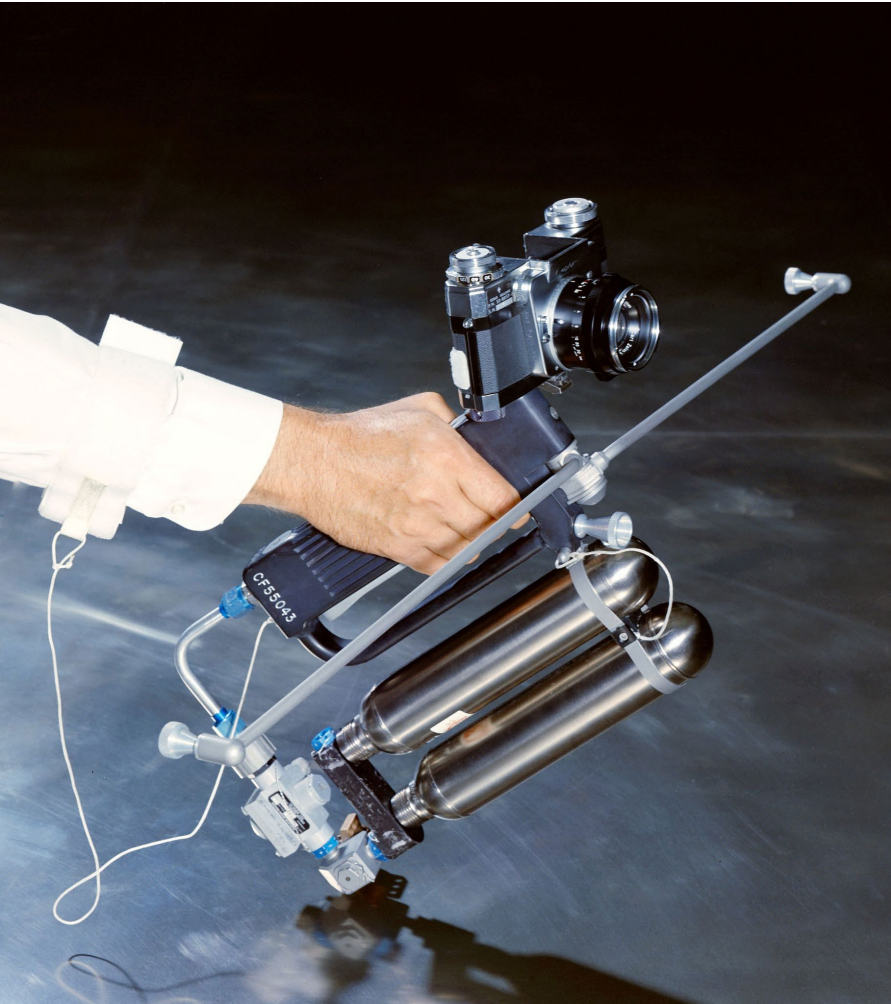
[Gemini XII](#)

Umbilical and Independent EVA (before Apollo 11)

- Gemini 4 (36 minutes): Handheld maneuvering unit
- Gemini 9 (129 minutes): Backpack maneuvering unit **[EVA aborted]**
- Gemini 10 (39 minutes): Proximity operations **[EVA aborted]**
- Gemini 11 (38 minutes): Tethering two spacecraft **[EVA aborted]**
- Gemini 12 (129 minutes): Body restraint tests
- Apollo 9 (46 minutes): No umbilical



Maneuvering Units



Gemini 4
6 ft/sec

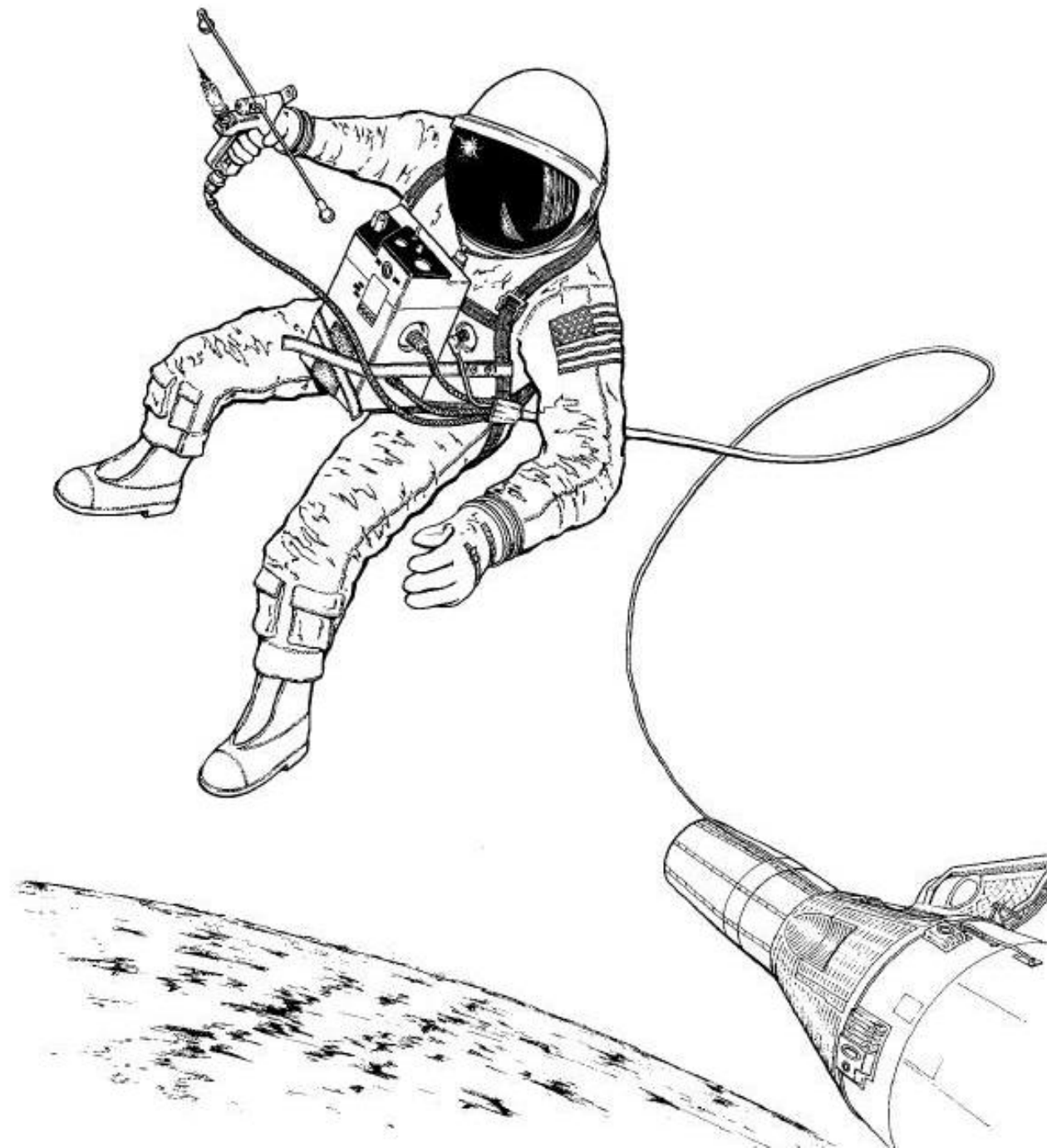


Gemini 9
250 ft/sec



Gemini 10 and 11
84 ft/sec

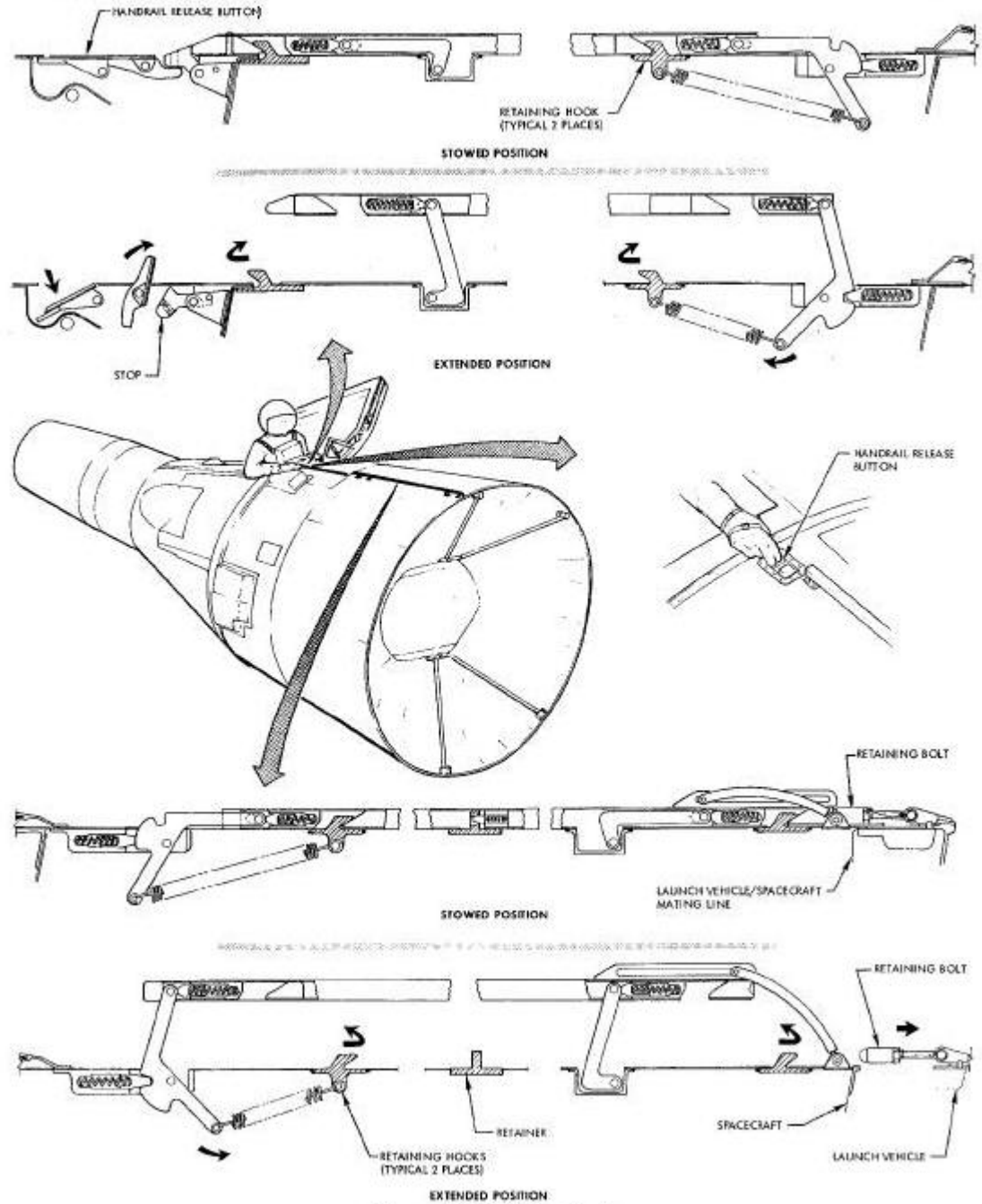
Gemini 10/11 Handheld Maneuvering Unit



Air-Bearing Floor EVA Trainer (Gemini 8)

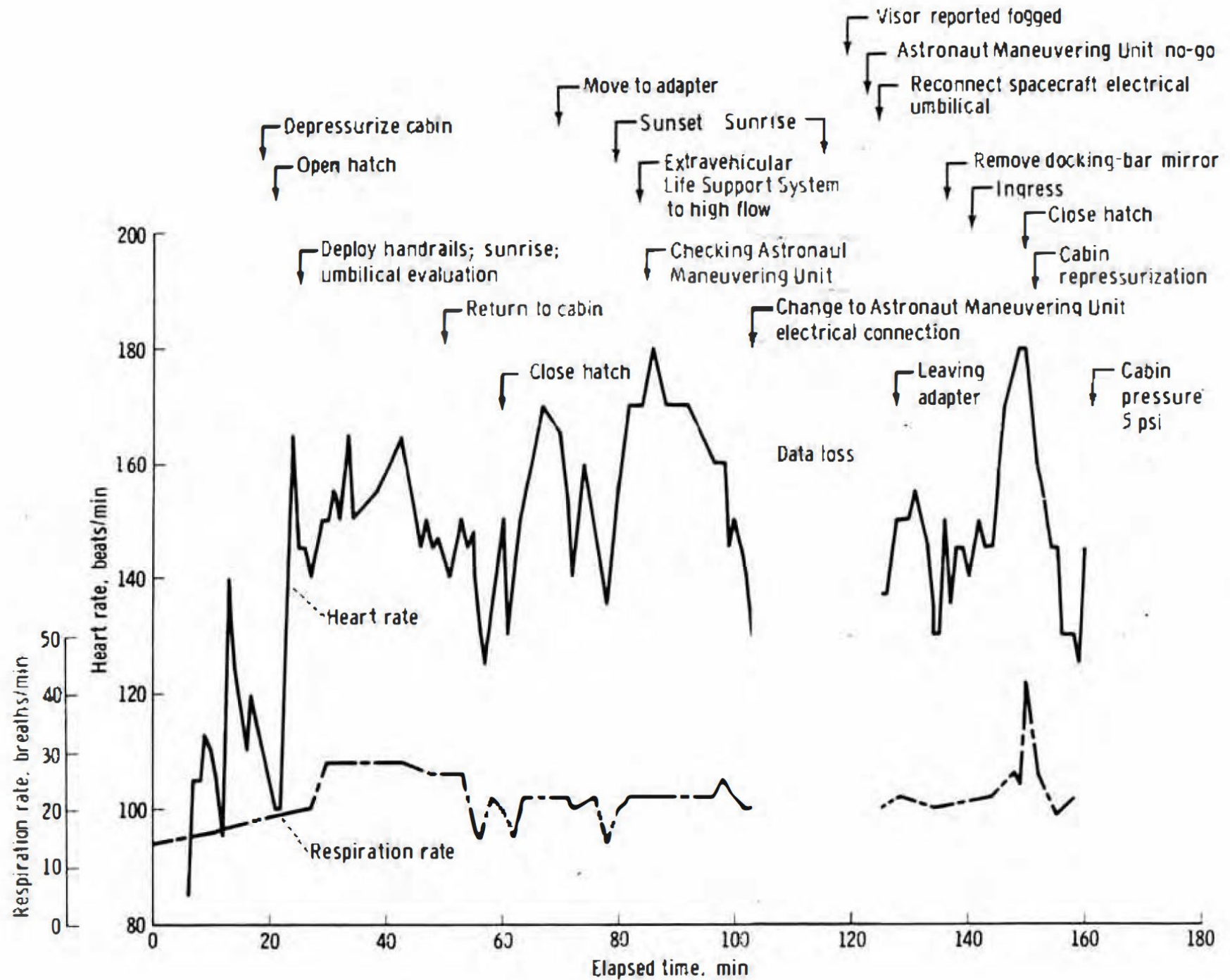


Adapter Section Handrails





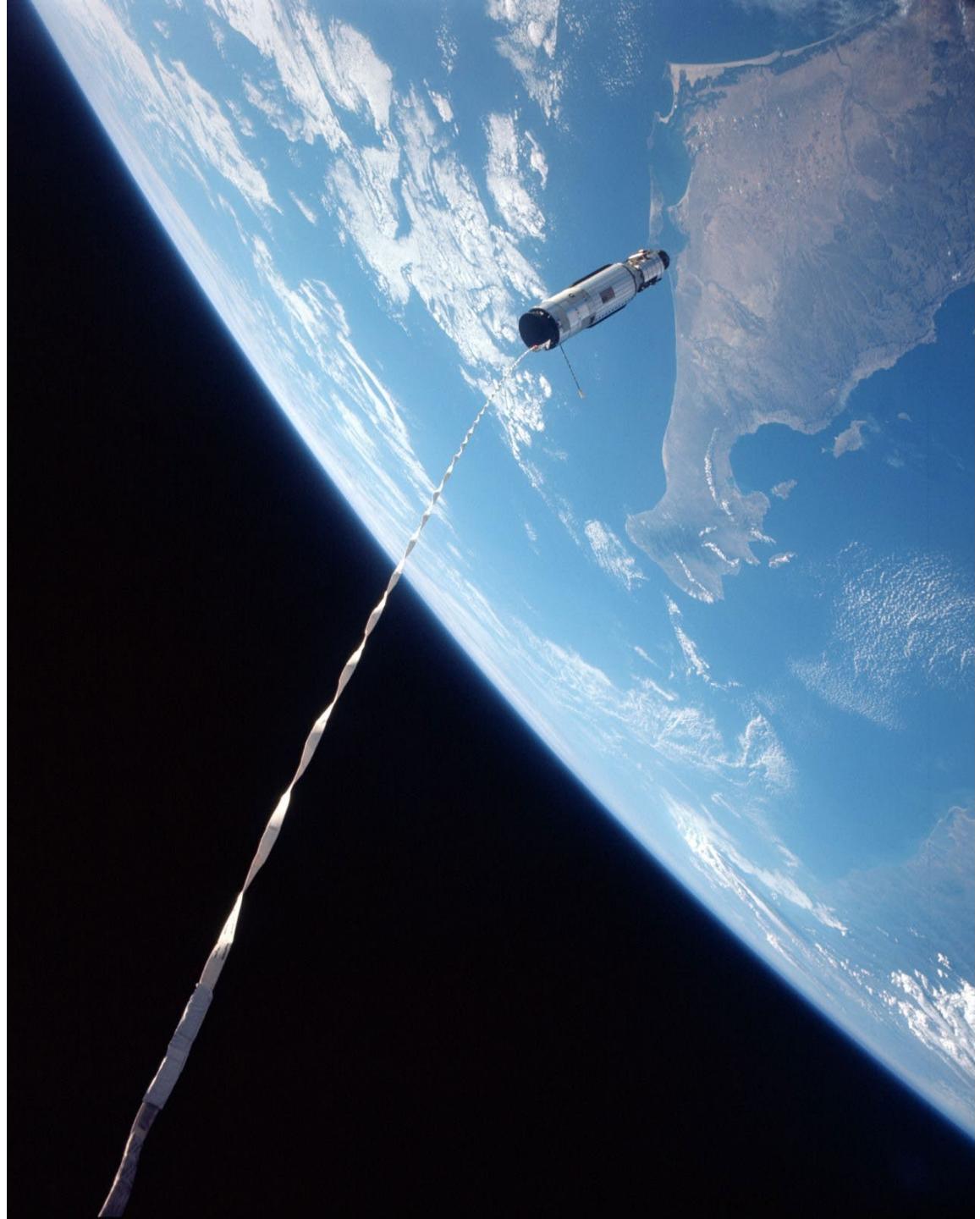
Gemini 9

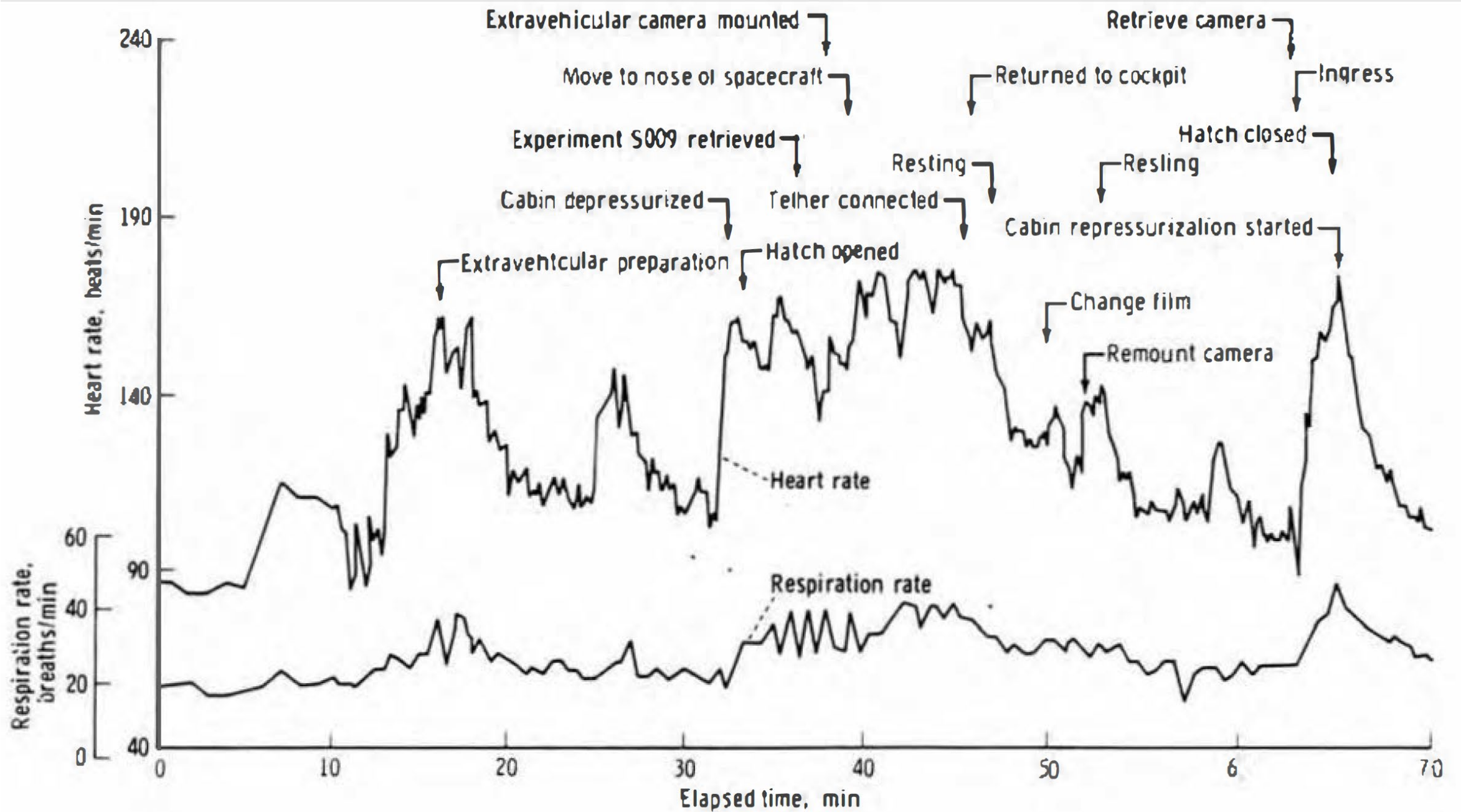




Beyond My Grasp
series of two
by James Dean

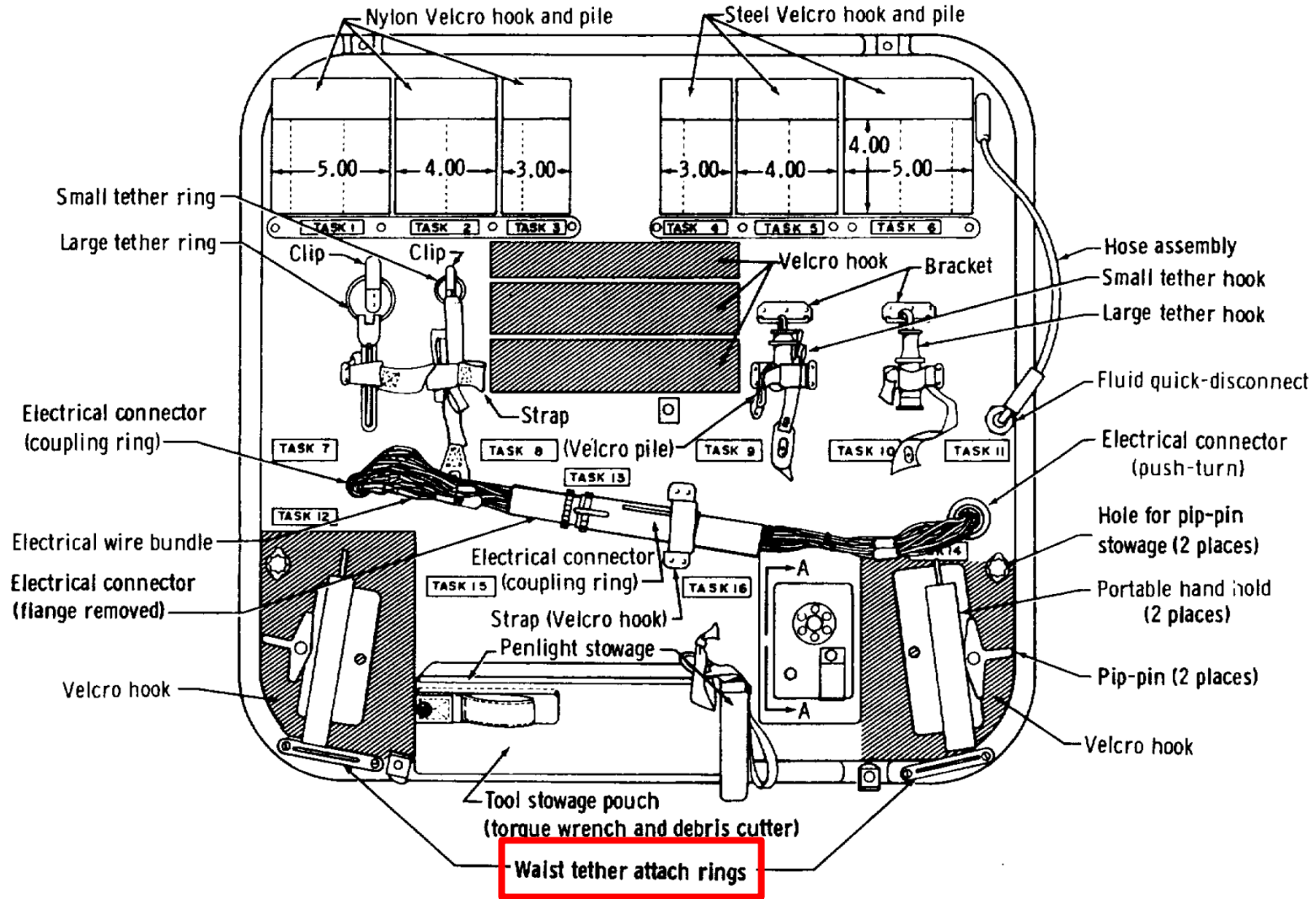
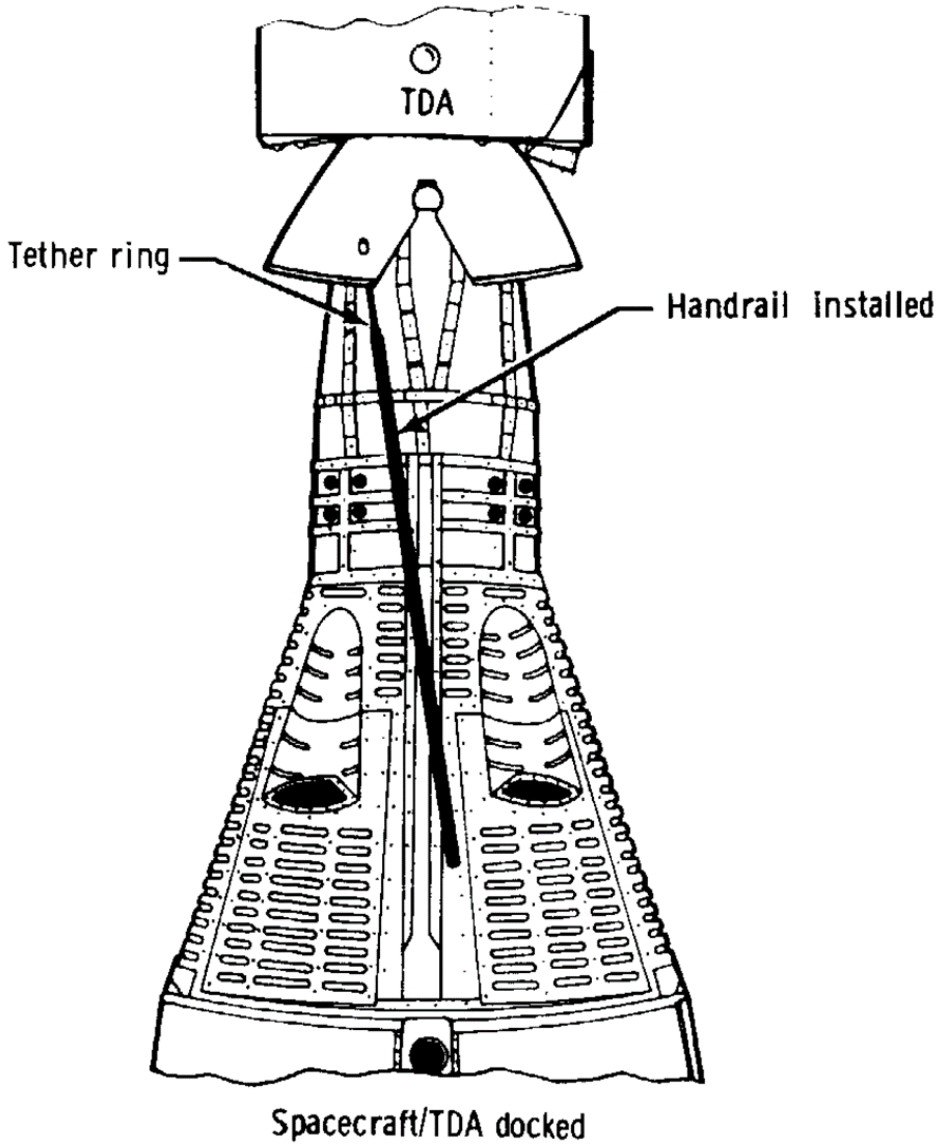
Gemini 11 Tethered Stationkeeping





(c) Gemini XI pilot.

Gemini 12 Body Position Aids



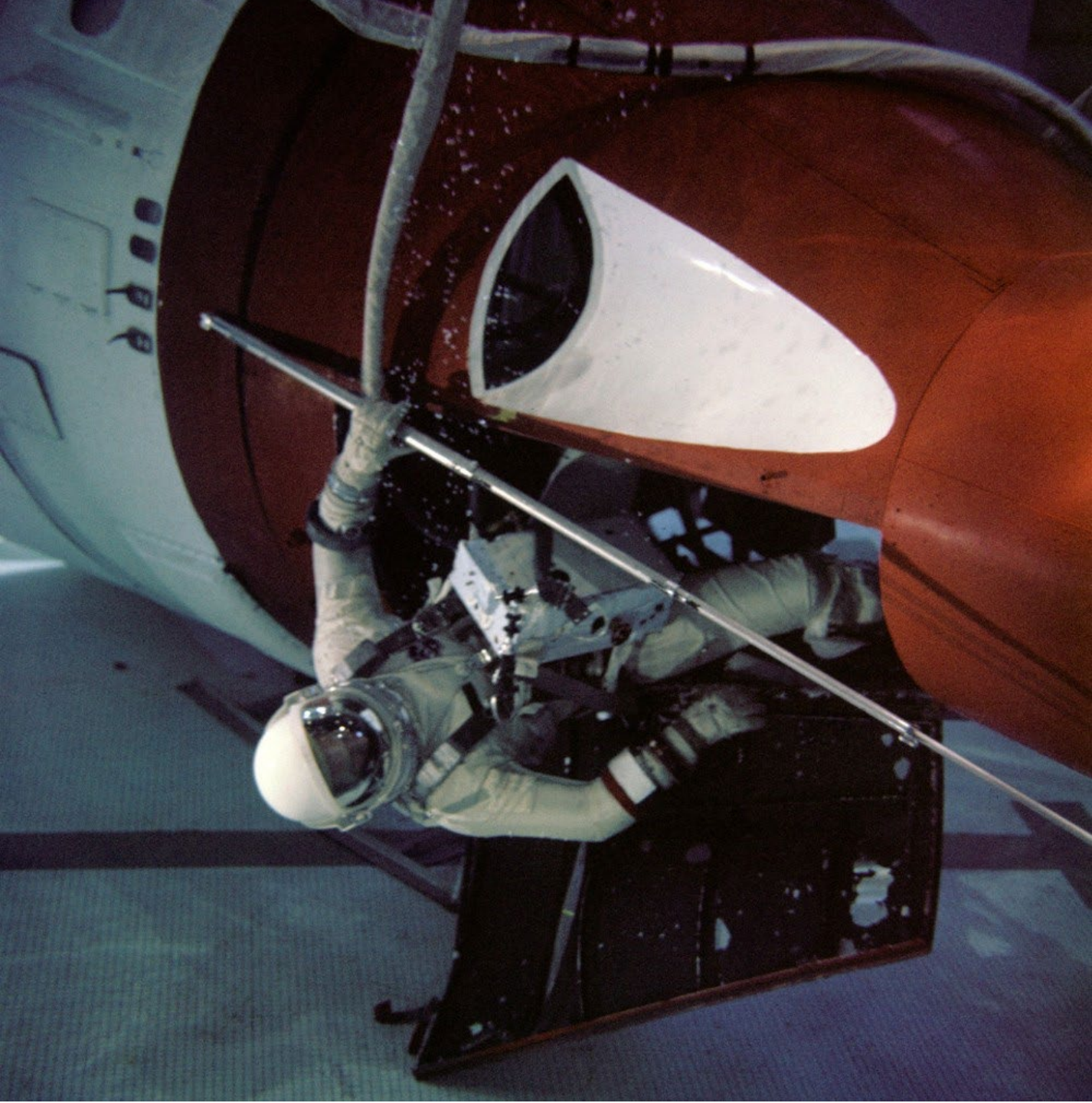
Neutral Buoyancy Experimentation

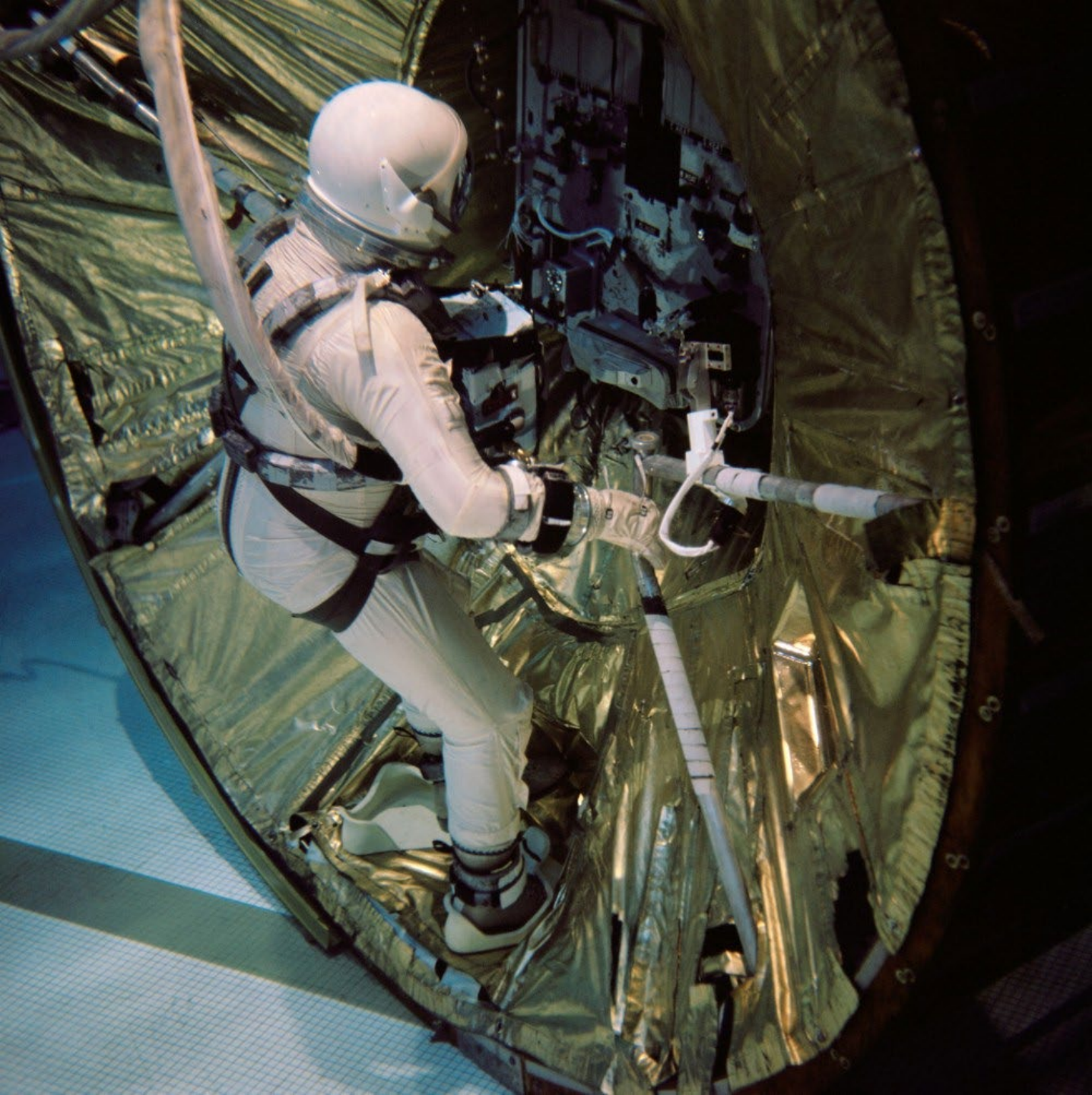
- Boeing Bioastronautics Division: 1963 [water pressurized]
 - Air Force X-20 DynaSoar (cancelled December 1963)
- Mattingly and Loats (“Environmental Research Associates”): 1964 [air pressurized]
 - Langley Manned Orbiting Research Laboratory (study ended 1966)
 - Gemini
- Marshall Space Flight Center: 1964 [air]
 - Wet Workshop (alternative to Skylab)
- General Electric Space Technology Lab: 1964 [water]
 - Air Force Manned Orbiting Laboratory
 - MSFC Wet Workshop
- Convair: 1964 [water]
 - Air Force (Manned Orbiting Laboratory?)

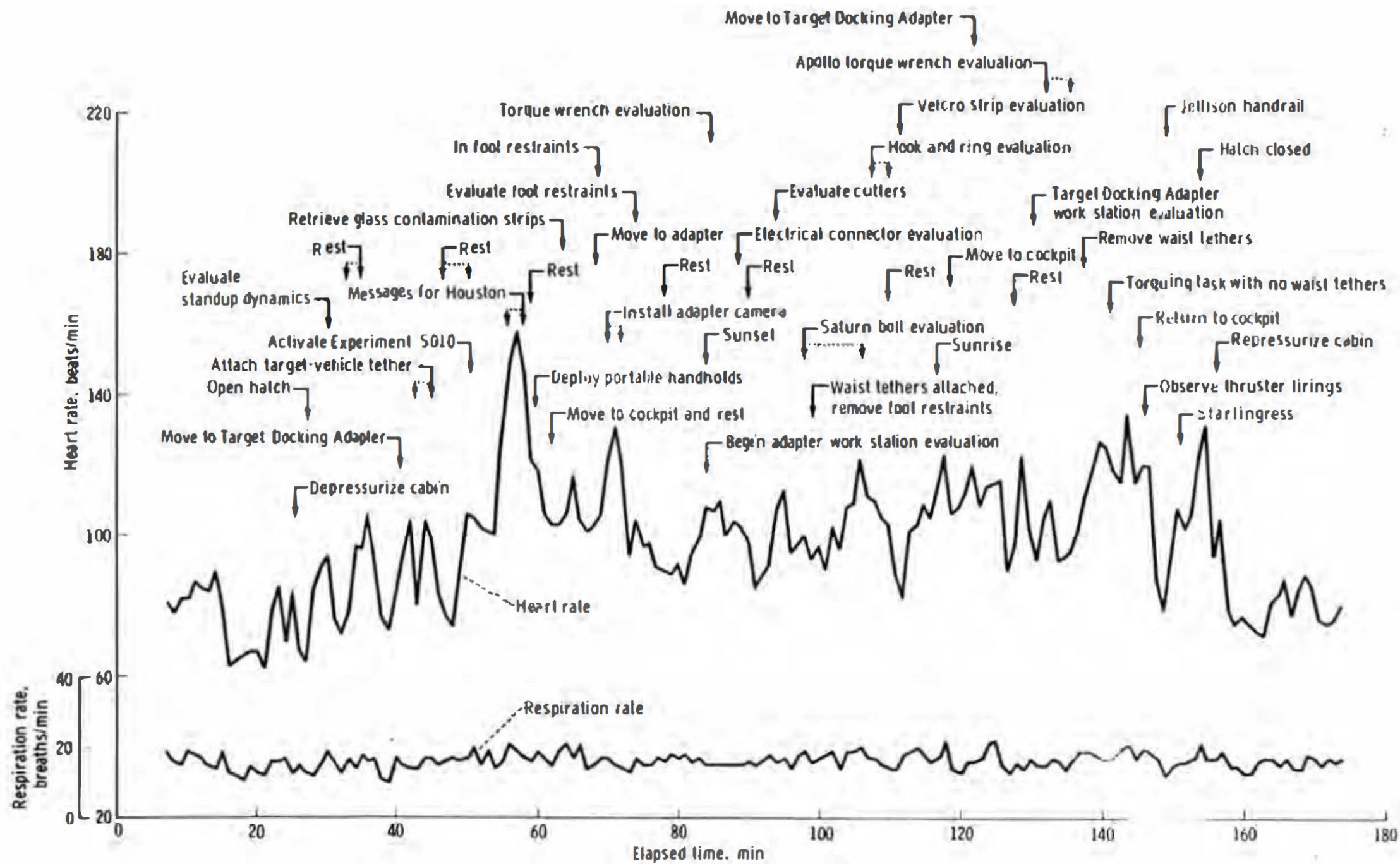


Gemini Neutral Buoyancy Simulations (1966)

- Gemini 9A: June 3-6
- ERA Wet Workshop demo to MSFC and MSC: June 15
- June 30/July 1: Gemini 10 procedures development
 - Gemini 10: July 18-21
 - Gilruth letter directing neutral buoyancy training: July 25
- July 28/29: Gemini 9 postflight evaluation (Cernan)
- August 10: Gemini 11 procedures development
- August 22: Gemini 12 procedures development
- September 11/12: Gemini 12 training (Aldrin)
 - Gemini 11: September 12-15
- September 14: Gemini 12 procedures development
- October 16/17/29: Gemini 12 training (Aldrin)
 - Gemini 12: November 11-15
- December 1: Gemini 12 postflight evaluation (Aldrin)







(c) Gemini XII pilot.

Gemini Accomplishments

- Long duration flight
- Rendezvous and docking
- EVA
- Precision landing
- Tethered stationkeeping
- Flight experience
- Mission operations experience
- Training experience
- Launch operations experience
- Responsive planning experience
- Hardware maturation

Discussion Groups

- Portree (“Spacewalks that Never Were: The Gemini EVA Planning Group”)
 - The original plans for Gemini EVA – no plan survives first contact with reality!
- Gemini Summary chapter 9 (“Body Positioning and Restraints during EVA”)
 - A description of what was learned during the Gemini “EVA crisis”
- Neufeld (“Practicing for Space Underwater: Inventing Neutral Buoyancy Training”)
 - A nicely nuanced treatment of the development of the invention of underwater training
- Gemini 12 Mission video
 - An excellent documentary on the Gemini XII underwater training and the mission