ASSEMBLY KIT

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S, 2017

LUNAR FLAG ASSEMBLY KIT

KYLE FLEMMER

NO PRESS, 2017

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i.

July 20, 1969 – Apollo 11's Lunar Module (LM) *Eagle* performs the first manned landing on the Moon – 384,400 km away - in the Sea of Tranquility - though an Outer Space Treaty signed by the United Nations (UN) in 1967 forbid national claims of sovereignty over celestial bodies – a flag is planted 8.2 m from the LM - the Lunar Flag Assembly (LFA) kit - designed by NASA engineer Mr. Fix It – contains telescoping tubes of anodized aluminum & a standard American flag – red fabric reflects light with a $\lambda \approx 700$ nm – but the first Moon flag is blown over by exhaust during *Eagle*'s takeoff

ii.

US Congress proclaims lunar flags to be "symbolic gesture[s] of national pride" in November of '69 – as the lightning-struck Apollo 12 precision-lands in the Ocean of Storms – a flag 0.91 m x 1.52 m is wedged in the dust of Mare Cognitum – its horizontal latch pole failing to latch at a 90° angle – the apparent weight of the LFA kit is 4.3 kg on Earth - only 0.7 kg on the Moon – the lunar television camera is damaged by exposure to the sun – emitting a steady blast of electromagnetic radiation: – radio waves with a $\lambda > 10^{12}$ nm – cosmic rays with a $\lambda < 10^{-6}$ nm – & everything in between

iii.

When an oxygen tank explodes on Apollo 13 - crippling the Command & Service Module (CSM) – the Moon landing must be aborted – no LFA kit can be deployed - instead it remains strapped to the external ladder of the LM inside an expensive thermal tube – protected from exhaust gas temperatures reaching 1,090 °C - with a $\lambda \approx 10^9$ nm – the astronaut's S-band communication system uplinks & downlinks in the microwave spectrum – as the failed flight takes a circumlunar trajectory – passing 254 km around the Moon's black side – 400,171 km from Earth - & the farthest any human has ever strayed from home

iv.

Despite docking problems & a faulty abort switch - Apollo 14's LM lands successfully at Fra Mauro – transmitting color images from the Moon for the first time – blue fabric reflects light with a $\lambda \approx 460$ nm – the nylon flag is unaltered with exception to a sleeve sewn in its top hem to accommodate the horizontal latch pole – 500 tree seeds are brought up & returned – (Moon trees now grow around the world) - while the Commander's golf swing sends a ball "miles & miles & miles" - experts agree the flags must deteriorate over time – thanks to radiation & damage sustained from micrometeorites

v.

Three J-Series missions put emphasis on scientific investigation & the rocketeers of Apollo 15 - more than mere test pilots – are trained to describe their lunar environment – they perform Galileo's hammer & feather experiment – & in Hadley–Apennine they leave the Fallen Astronaut – an aluminum statuette honoring the 14 (then) dead in space exploration – left without air - the surface of the Moon fluctuates between 100 °C in direct sunlight and -150 °C in the shade – white fabric reflects most light in the visible spectrum – the assembly kit flags cost $5.50 from a government supply catalog

vi.

Apollo 16's backup CSM yaw gimbal servo loop malfunctions en route to the Moon – later in the mission there are delays in television coverage – the steerable antenna on the LM is broken – ultraviolet radiation with a $\lambda < 380$ nm breaks down chemical bonds in dye molecules – the lunar flags are bleached to white from exposure to the sun - & from frequent oscillations in temperature – our star frees fifty from each flag raised – (300 in total) – the blank flags reveal a perfect statelessness in their abandonment – they symbolize the journey to & retreat from the frontier of human resourcefulness

vii.

The last Moon flag – which hung in the Mission Operations Control Room (MOCR) through all prior lunar landings – now sticks in the regolith of Taurus–Littrow – 20% larger than the other flags - it requires a horizontal latch pole 1.8 m long – electromagnetic waves propagate through space at a steady rate – the speed of light (c) - regardless of λ or frequency – $c \approx 3 \times 10^8$ m/s - images of the Apollo landing sites - taken by the Lunar Reconnaissance Orbiter camera (LROC) – prove five of six Moon flags are standing upright - casting a shadow - black against the moondust in white starlight

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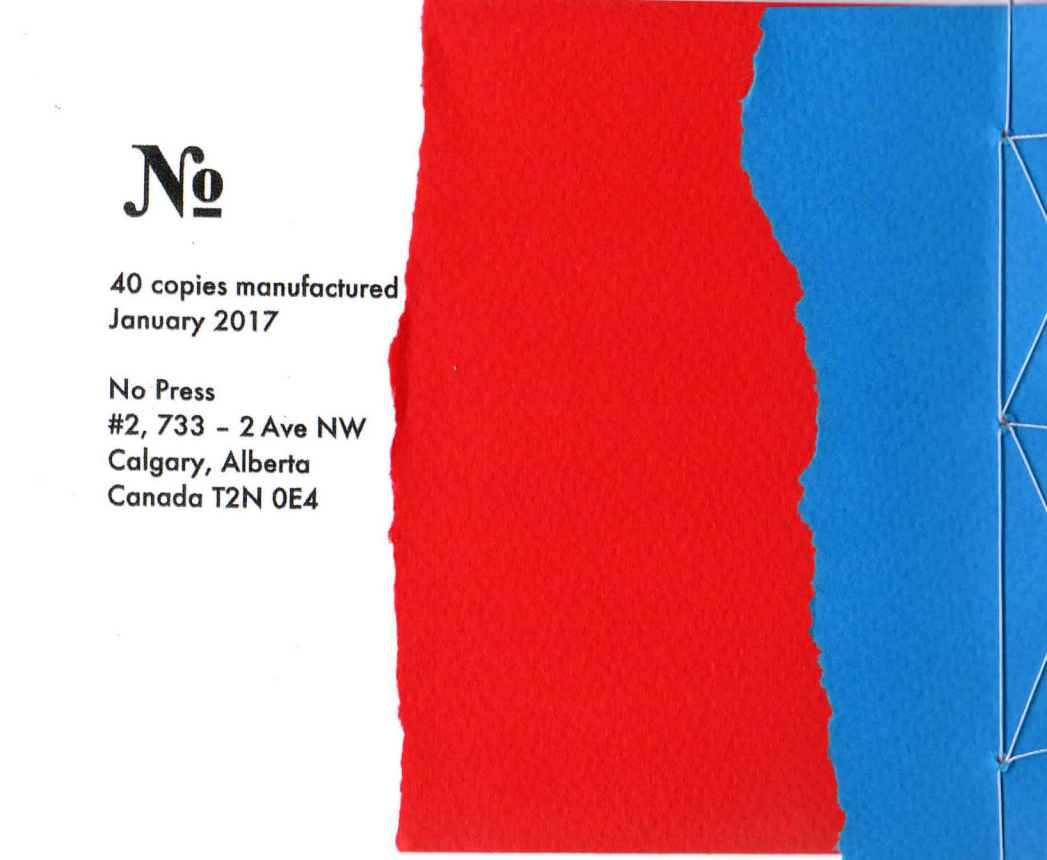

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