

A5 Group CAD Project Gemini

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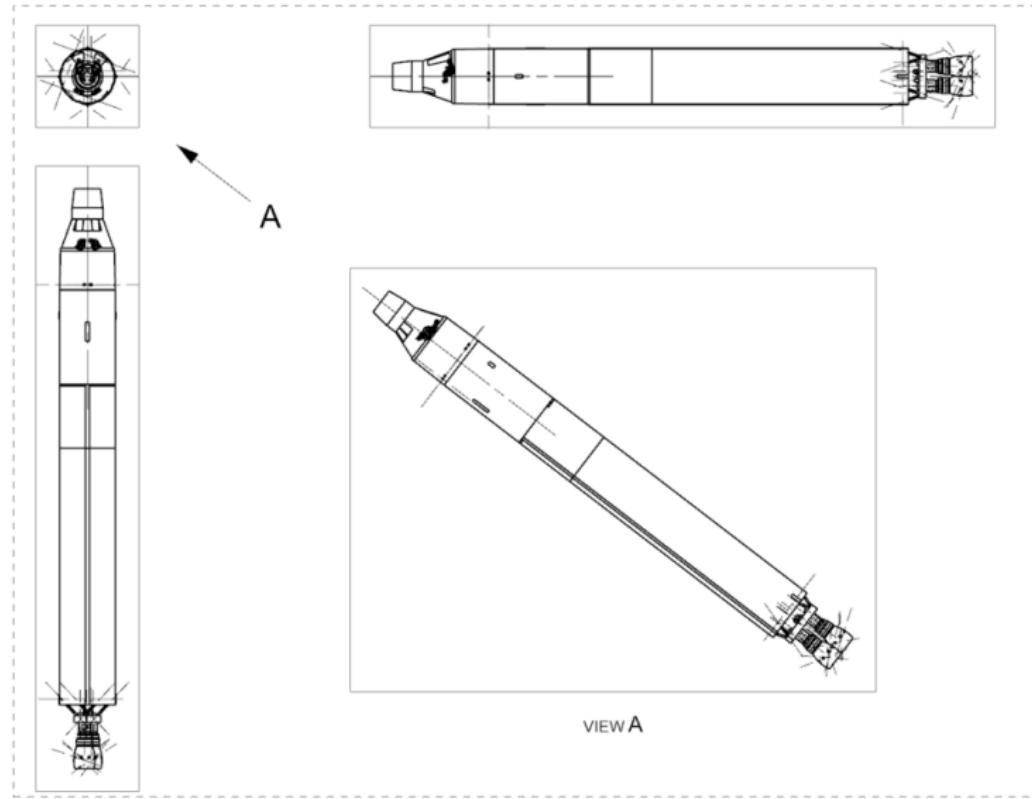
October 8, 2019

Group Beauty Shot

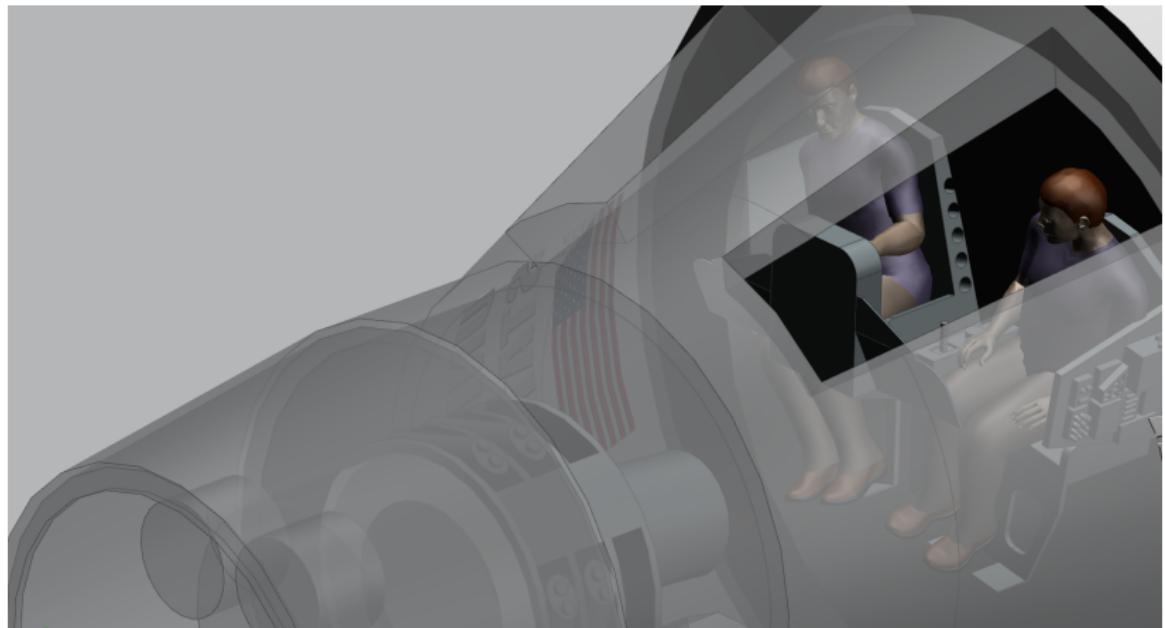
- ▶ Gemini was a 2 crew Apollo proving ground
- ▶ Launch mass was 3.8 MT, with 455 kg of propellant
- ▶ 12 Gemini flights were flown, with duration between 5 hours and 14 days



External 3 View



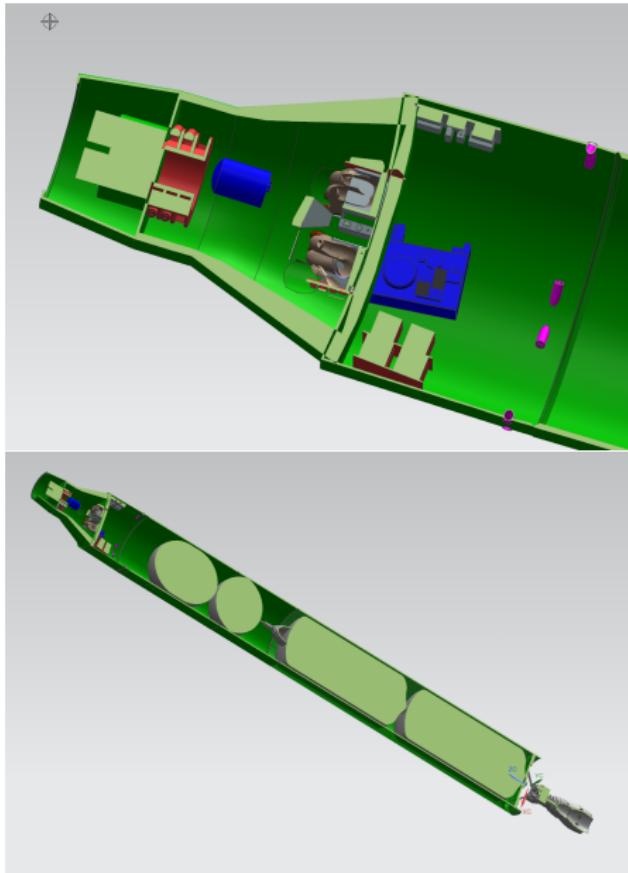
Interior View



Color Coded

Person	Color
Ahmed Woodson	Blue
Mark DeVince	Magenta
Charles Hanner	Green
Blaire Weinberg	Grey
Hyunsoo Chun	Red

For a full list of parts, please see the last slide



Launch Vehicle



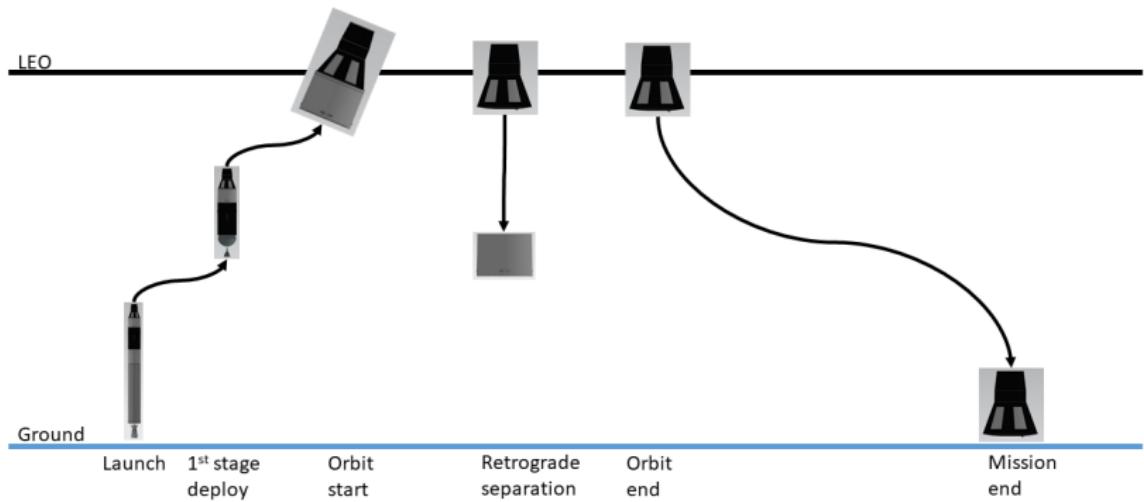
Baseball Card



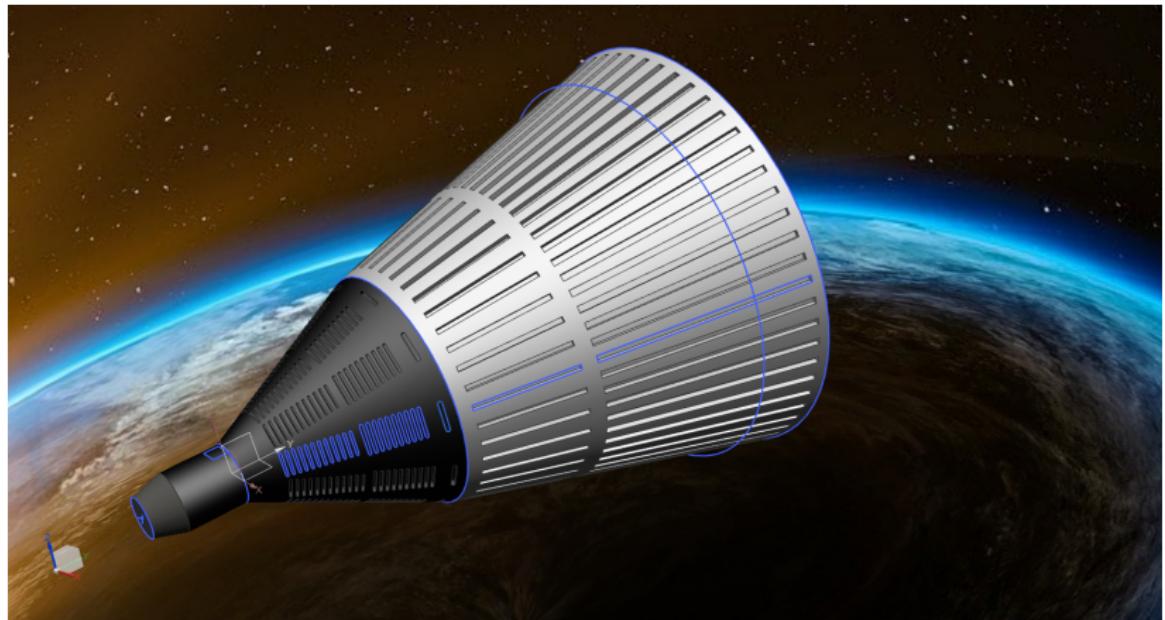
The Gemini Program hosted by NASA between 1961 and 1967 had an estimated value of 1.3 \$B (7.6 \$B in 2018 value) and launched a total of twelve missions, of which ten were manned missions. Gemini was a precursor test program for the rapidly developing Apollo mission, and allowed Michael Collins (Gemini 10), Buzz Aldrin (Gemini 12), and Neil Armstrong (Gemini 8) to get to the moon. Additionally Pete Conrad (Gemini 5, 11), David Scott (Gemini 8), John Young (Gemini 3, 12), and Eugene Cernan (Gemini 9A) were also Apollo astronauts selected from this program. Gemini longstanding is viewed as a testbed and foundational program for modern spaceflight by experimenting with docking and EVAs.

Programmatic	
Program Dates:	1962-1966
Launches:	19
Crewed Missions	10
Mission Duration:	5-336 hours
Cost (1967):	1.3 \$B
Launch Complex:	LC-19 Kennedy
Titan II - GLV	
Payload	7900 lbs LEO
Rocket Platform	Titan
Stage 1	
Engines	1 LR87-AJ-7
Thrust	430,000 lbf
ISP	258 s
Burn Time	156 s
Fuel/Propellant	N2O2 & Aerozine 50
Stage 2	
Engines	1 LR91-AJ-7
Thrust	100,000 lbf
ISP	316 s
Burn Time	180 s
Fuel/Propellant	N2O2 & Aerozine 50
Spacecraft	
RCS System	16 Attitude Control Thrusters
Max Diameter	120"
Cabin Diameter	90"
Parachute & RCS Housing	36.66"
Retrograde Thrusters	4
Launch Mass	3850 kg
Crew Size	2
Re-entry Module	1982 kg
Retrograde Module	591 kg
Equipment Module	1278 kg

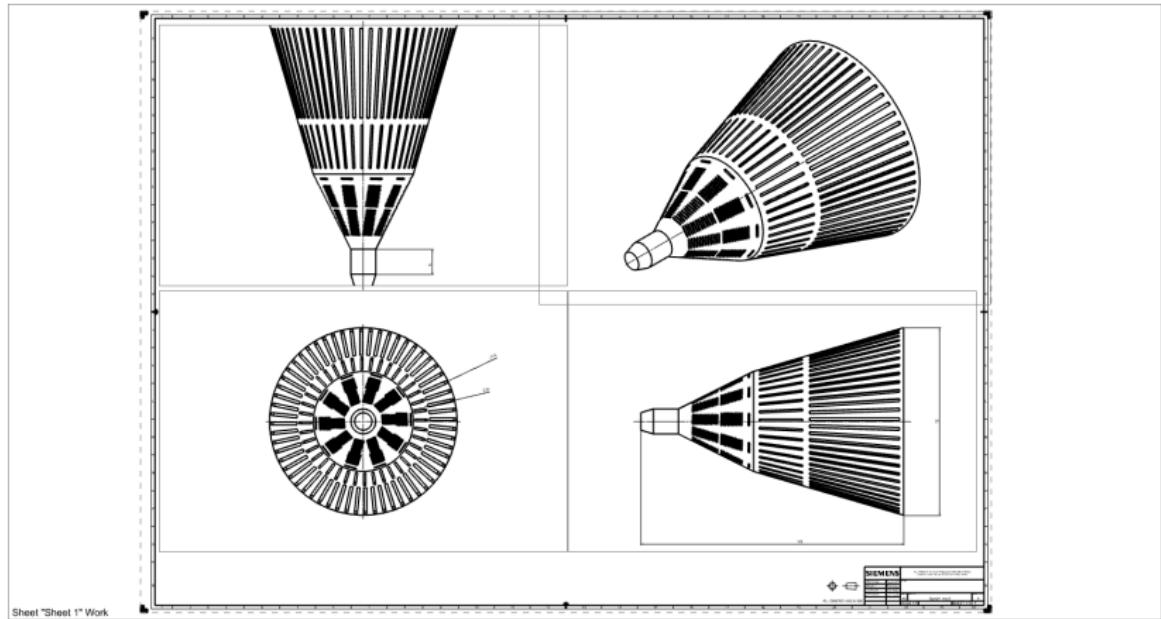
Mission Profile



Woodson: Beauty Shot

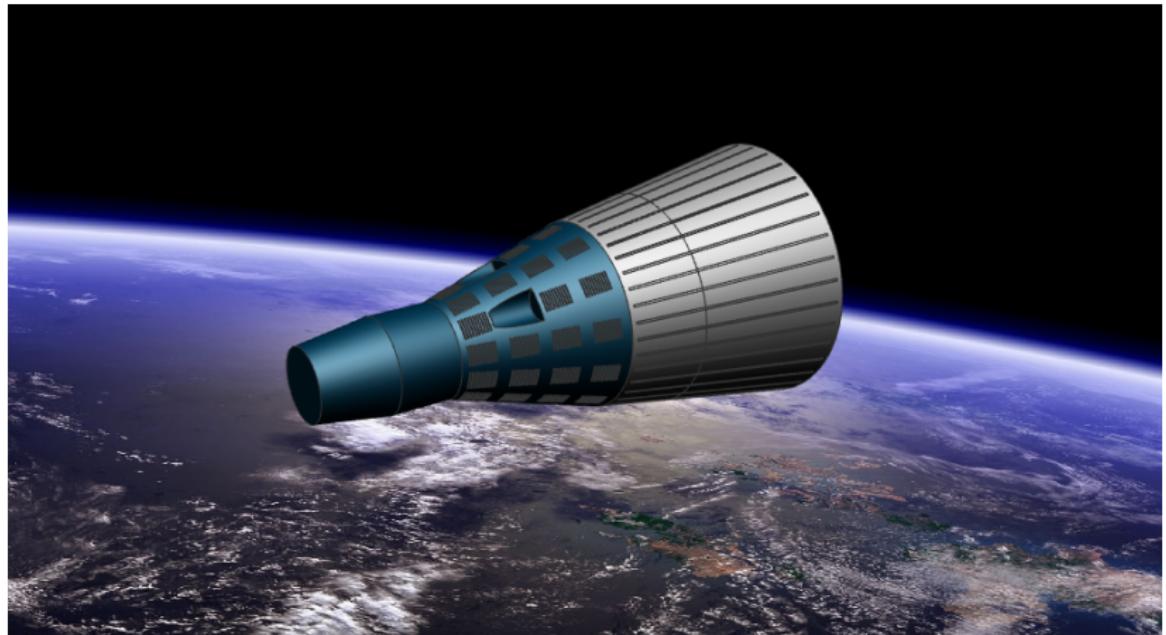


Woodson: 3 View

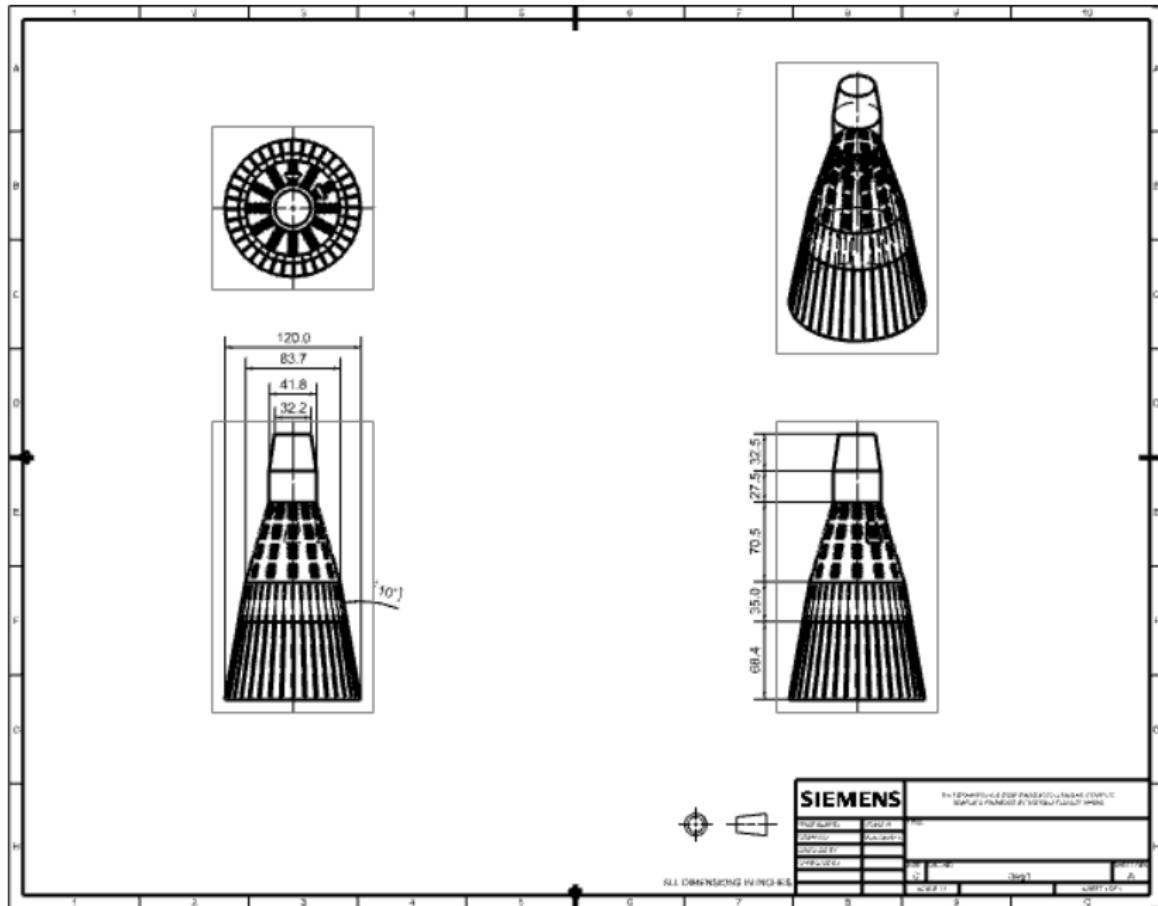


Sheet "Sheet 1" Work

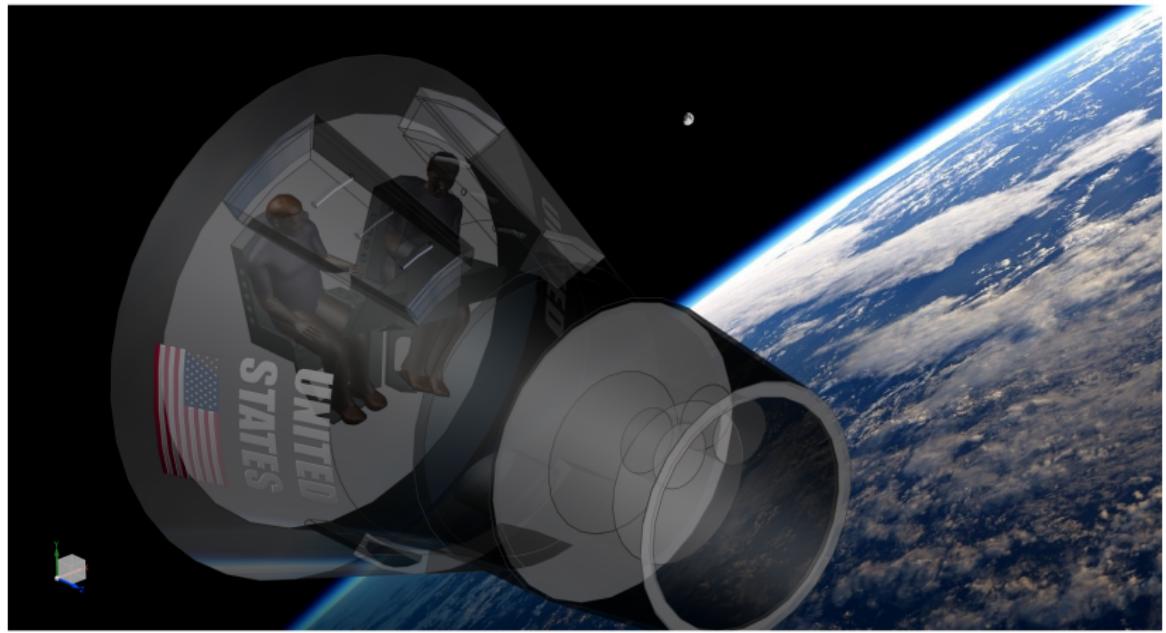
DeVince: Beauty Shot



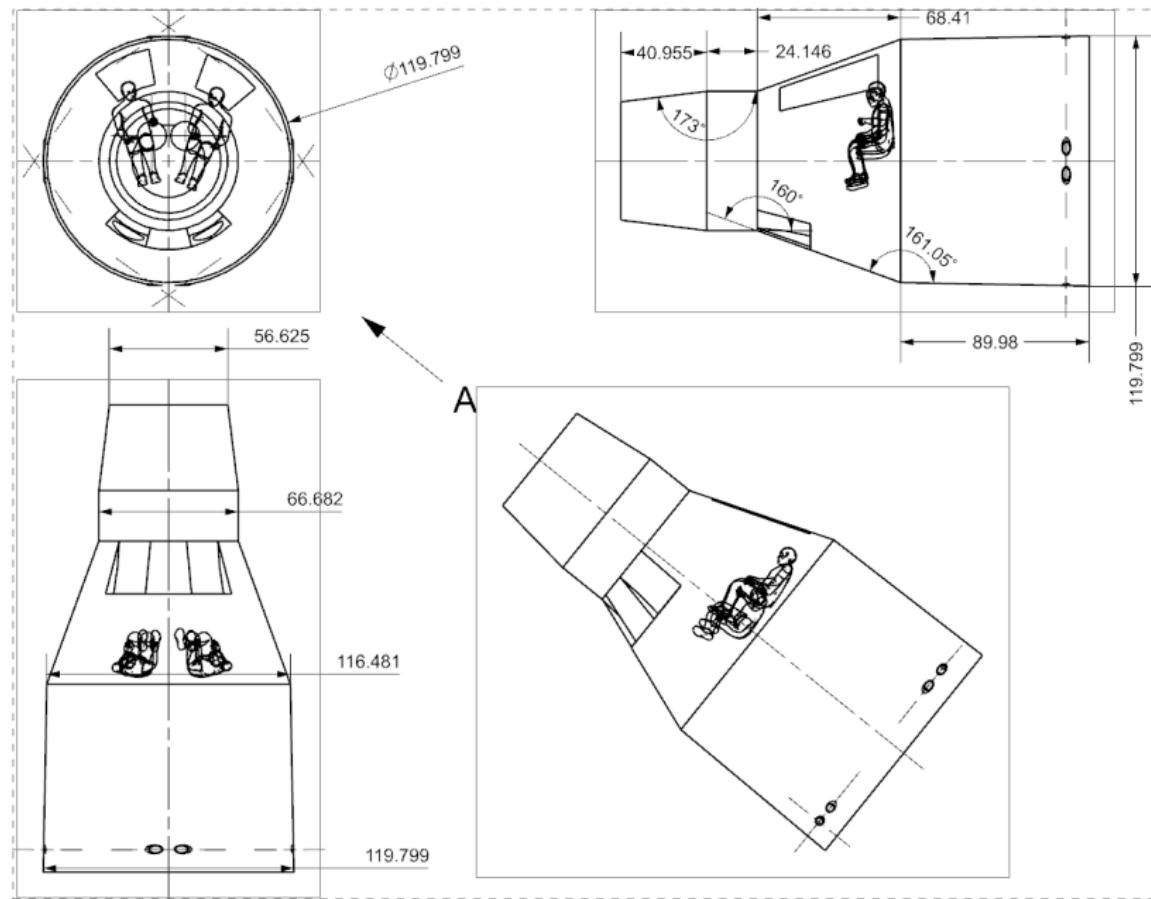
DeVince: 3 View



Hanner: Beauty Shot



Hanner: 3 View



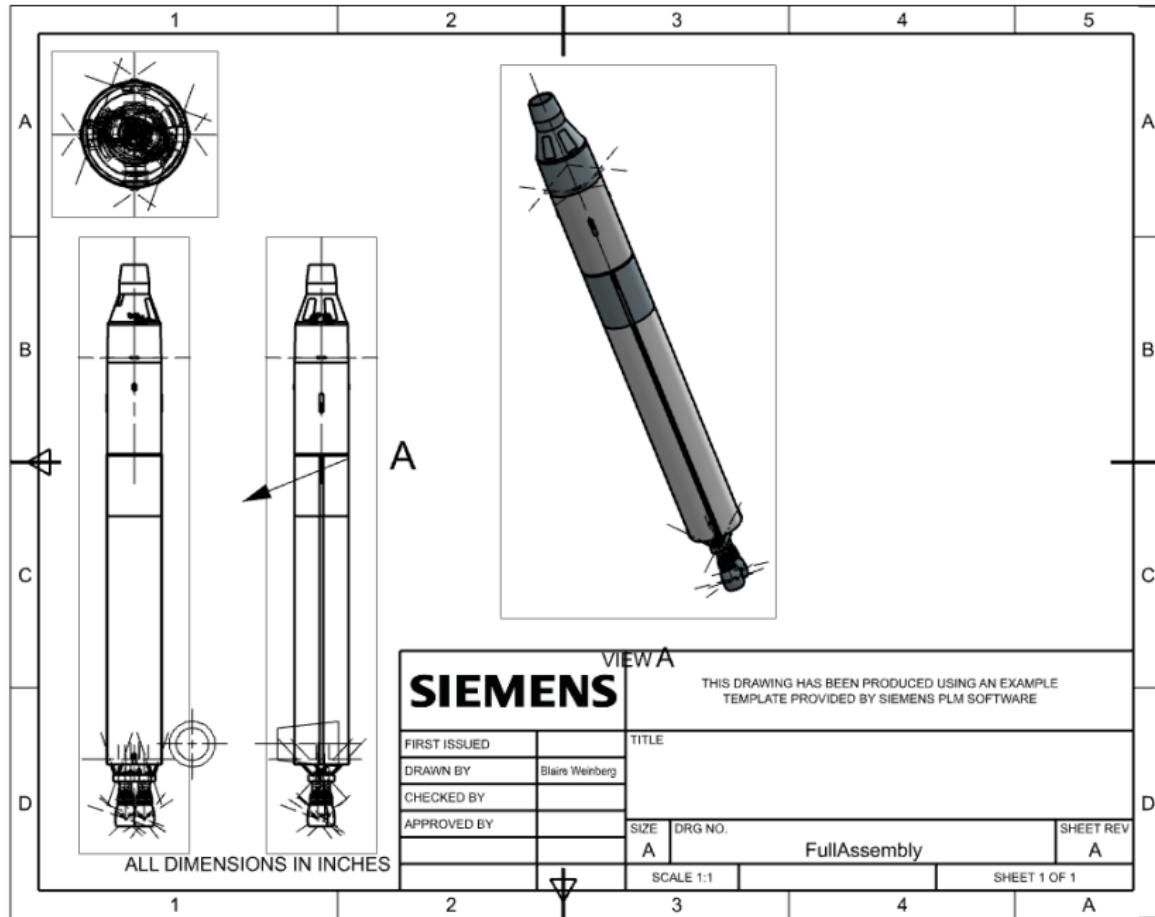
VIEW A



Weinberg: Beauty Shot



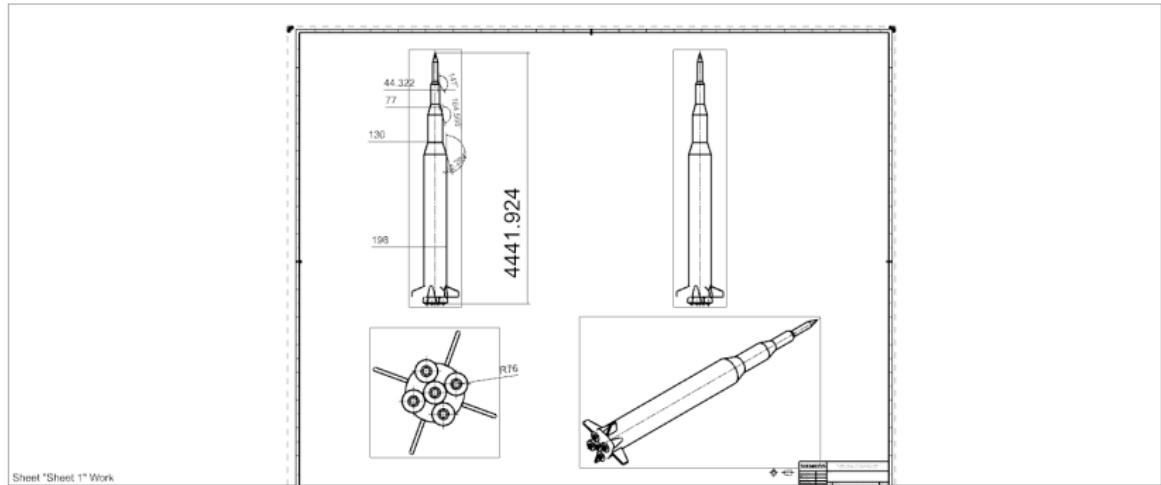
Weinberg: 3 View



Chun: Beauty Shot



Chun: 3 View



Sheet "Sheet 1" Work

List of Parts

Due to the incompatibility issue between VLC and PC NX, there were a few components that could not be placed in the assembly. To show fair consideration to all members' work, we have attached a list of what parts individuals made.

- ▶ Ahmed Woodson
 - ▶ Cryogenic O2 Tank
 - ▶ Drinking Water Tank
 - ▶ ECS Coolant Module
 - ▶ Retrograde Rockets
 - ▶ Retrograde Rocket Support
- ▶ Mark DeVince
 - ▶ Parachute System
 - ▶ Orbit Attitude Control Thrusters
 - ▶ Seats
 - ▶ Center Console
 - ▶ Communications Panel
 - ▶ Instrumentation Panel
- ▶ Charles Hanner
 - ▶ First Stage Fairing 1
- ▶ First Stage Fairing 2
- ▶ Second Stage Fairing
- ▶ Upper Capsule
- ▶ Doors
- ▶ Lower Capsule
- ▶ Blaire Weinberg
 - ▶ First Stage Engine
 - ▶ Second Stage Engine
 - ▶ First Stage Fuel Tank
 - ▶ Second Stage Oxidizer Tank
 - ▶ Second Stage Fuel Tank
- ▶ Hyunsoo Chun
 - ▶ Inertial Guidance Units
 - ▶ Electrical Instrument
 - ▶ Electrical Power System
 - ▶ Reentry Controls System