

## **Mission**

Experimental farm module on the dark side of Mun



- Bring experimental farm module to Mun
  - Weight: 4000 Kilograms
  - Energy: 0.29 EC/s
- Provide constant communication between Kerbin and Mun
  - An emergency communication interval of 10 minutes
  - A normal communication interval of 30 minutes
  - 3 Mit/s
- No return vessel nor reusability of used components
- No kerbin onboard
- Delta-V of 5672 m/s -> 6523 m/s (+15%)
- Budget -> It is in the name of science! (we want to be faster than the Russians)



#### **Budget**

Given budget by: Chief Financial Officer: Lye G. Batenkaitos

Estimation costs				
Category	Funds (F)			
Farm Module	45 000			
Satellite Network	12 000			
Launch Vehicle	60 000			
Transfer Stage	25 000			
Contingency (15%)	16 000			
Estimation costs	158 000			

**ChatGPT-chat** 



ChatGPT-chat antenna

ChatGPT-chat EC

#### **Farm Power - Decisions**

Given energy consumption by: Chief Agricultural Scientist: Regulus G. Corneas

Farm module energy EC/day

39 765

Module Energy Consumption					
Item	EC/Sec	Number	duration/s	Total (Energy) / day	
Communotron 16	18	1	231,64	4 169.52	
Farm Module	0,28611207	1	138 984,00	39 765	

Total EC Consumption 43 934.52 EC/day

Total EC Consumption 0.31611207 EC/day



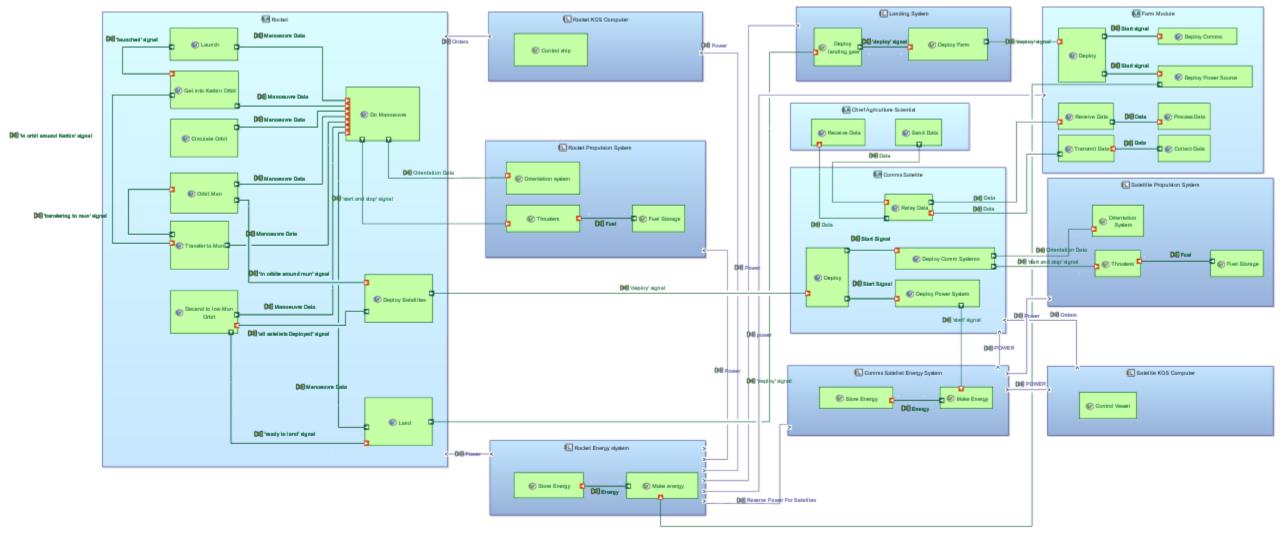
#### **Farm Power - Decisions**

Module Energy Storage				
Item	Energy storage (EC)	Number	Total capacity (EC)	
Big round battery	4 000	6	24 000	
Battery Load (%)		91.53025		
Total charge needed i	in daytime:	43 934.52		

Module Energy Harvesting					
Item	EC/sec	Number	Duration/day (s)	Total harvested energy (EC)	Charge of battery (%)
Gigantor XL Solar Array	24,4	1	69 492	1 695 604,8	3 819,118965
OX-STAT-XL Photovoltaic Panels	2,8	1	69 492	194 577,6	438,2595534
OX-STAT Photovoltaic Panels	0,35	<mark>3</mark>	69 492	<mark>729 66,6</mark>	166,0803396
SP-L 1x6 Photovoltaic Panels	1,64	1	69 492	113 966,88	256,6948813

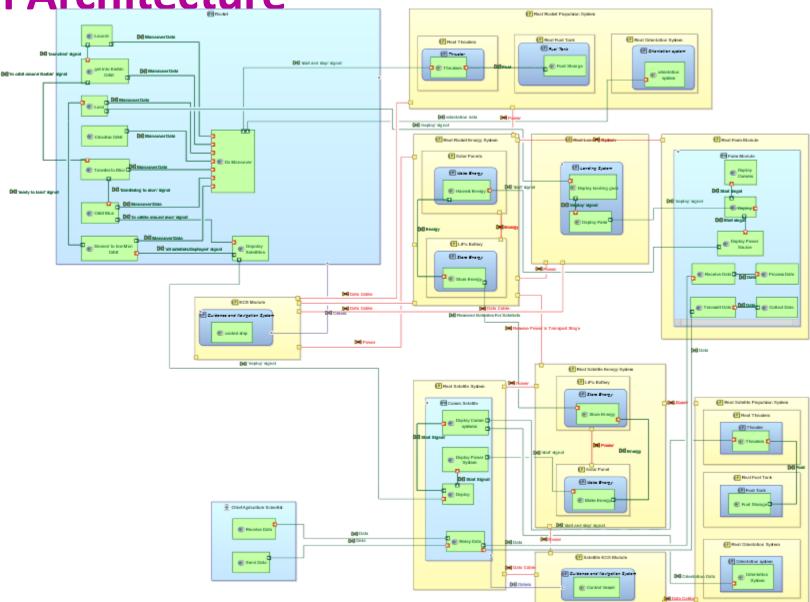


# **Logical Architecture**



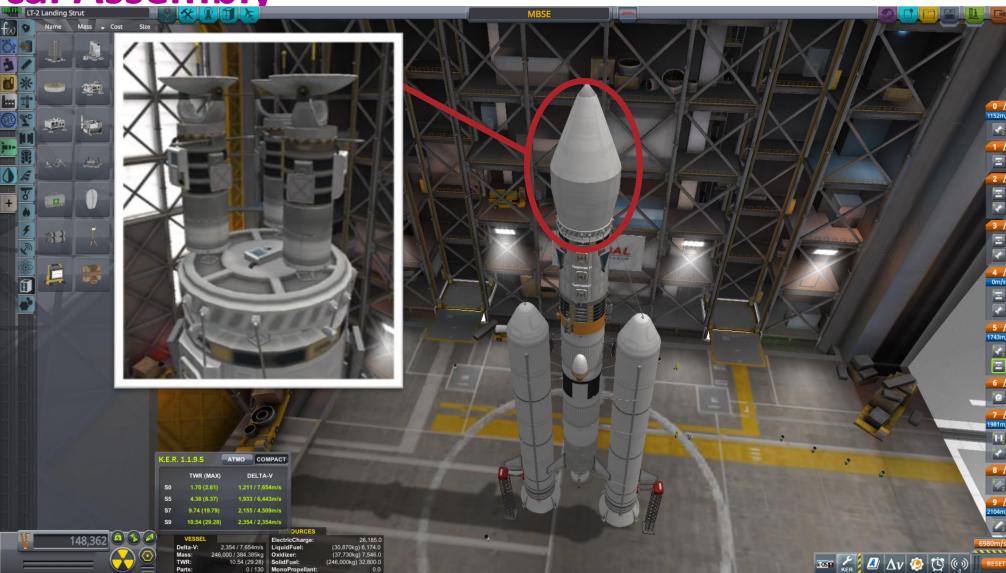


**Physical Architecture** 



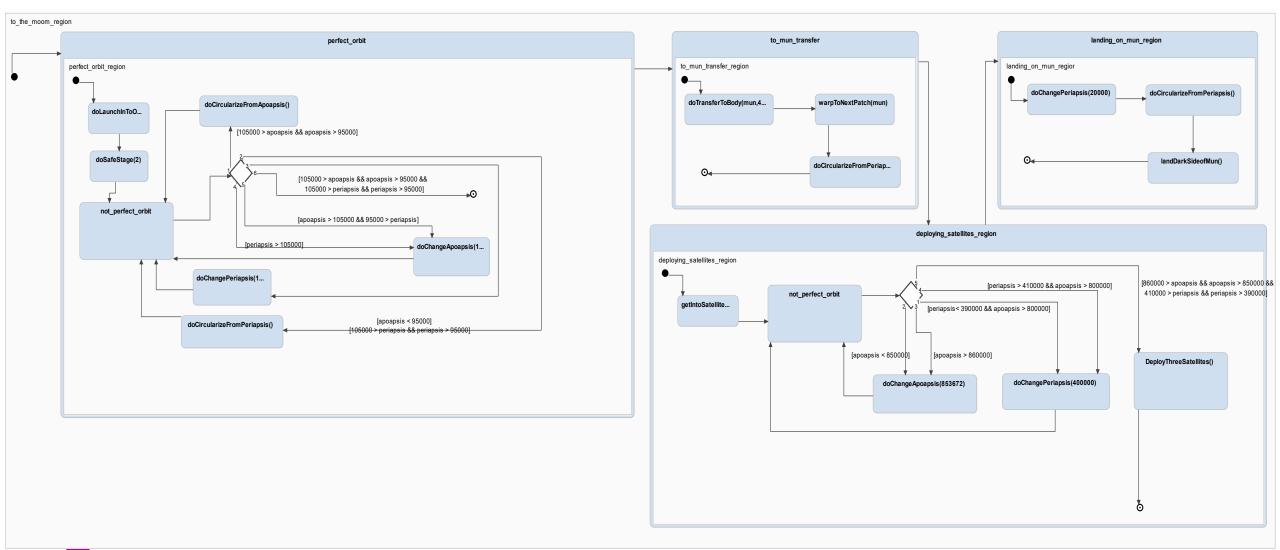
Physical Assembly

| Cost | Size | Mane | Mass | Cost | Size | Mane | Mass | Cost | Size | Mane | Mass | Cost | Mass | Mass | Cost | Mass | Ma





### **Controller Architecture**



# **Demo**



# Budget - Outcome

Category	Funds (F)	difference with estimation
Farm Module	43618,8	1381,2
Satellite Network	28916,92	-16916,92
Launch Vehicle	43532,8	16467,2
Transfer Stage	6170	18830
total dry parts cost	122238,52	

Resources	Weight(kg)	price per kg (F/kg)	price (F)
MonoPropolent	0	0,3	0
LiquidFuel	30870	0,16	4939,2
Oxidizer	37730	0,04	1509,2
SolidFuel	246000	0,08	19680
			26128,4

Total: 148 366,92 F budget leftover 14 933,08 F

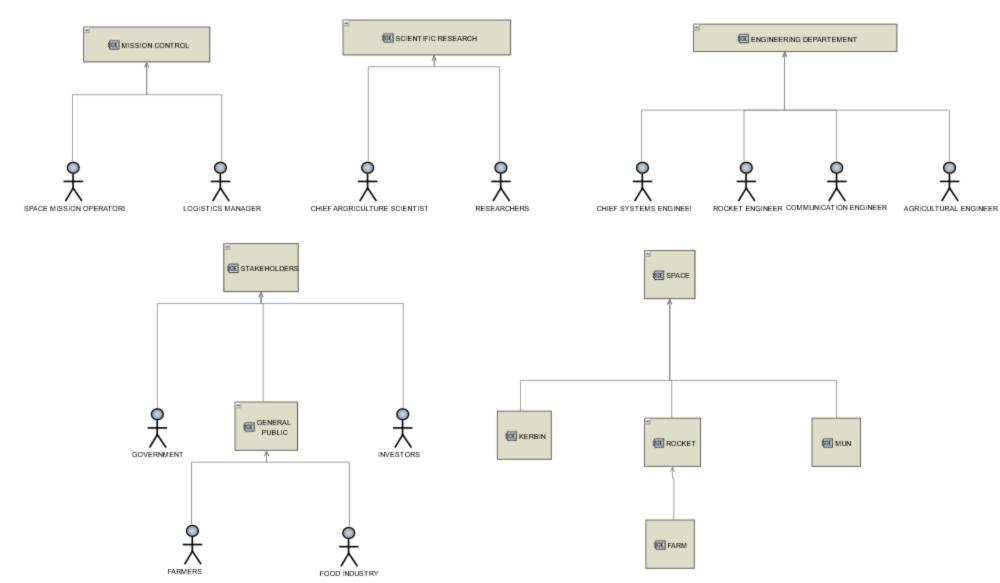


#### Excel workdocument

Excel workdocument						
Cost per used part (dry)						
Part	Am( ✓ C	ost	Category	Sub-tota		
24-77 "Twitch" Liquid Fuel Engine	2	230	Farm Module	460		
Communotron 16	1	300	Farm Module	300		
LT-2 Landing Strut	3	340	Farm Module	1020		
Mk2 Lander Can	3	3202	Farm Module	9606		
OX-10C Photovoltaic Panels	4	1200	Farm Module	4800		
Rockomax X200-8 Fuel Tank	1	432,8	Farm Module	432,8		
Z-4K Rechargeable Battery Bank	6	4500	Farm Module	27000		
<u>Delta-Deluxe Winglet</u>	5	600	Launch Vehicle	3000		
EAS-4 Strut Connector	39	42	Launch Vehicle	1638		
Protective Rocket Nose Cone Mk7	2	450	Launch Vehicle	900		
RE-M3 "Mainsail" Liquid Fuel Engine	1	13000	Launch Vehicle	13000		
Rockomax Jumbo-64 Fuel Tank	1	2812,4	Launch Vehicle	2812,4		
Rockomax X200-32 Fuel Tank	2	1531,2	Launch Vehicle	3062,4		
S2-33 "Clydesdale" Solid Fuel Booster	2	8660	Launch Vehicle	17320		
TT18-A Launch Stability Enhancer	2	200	Launch Vehicle	400		
TT-70 Radial Decoupler	2	700	Launch Vehicle	1400		
48-7S "Spark" Liquid Fuel Engine	3	240	Satellite Network	720		
AE-FF2 Airstream Protective Shell (2,5m)	1	600	Satellite Network	600		
Communotron 16-S	3	300	Satellite Network	900		
CompoMax Radial Tubeless (kOS)	4	2200	Satellite Network	8800		
Cubic Octagonal Strut	7	16	Satellite Network	112		
Octagonal Strut	1	20	Satellite Network	20		
Oscar-B Fuel Tank	3	51,64	Satellite Network	154,92		
OX-4W 3x2 Photovoltaic Panels	6	380	Satellite Network	2280		
Probodobodyne OKTO2	3	1480	Satellite Network	4440		
RA-2 Relay Antenna	3	1800	Satellite Network	5400		
Small Inline Reaction Wheel	3	600	Satellite Network	1800		
TD-06 Decoupler	3	150	Satellite Network	450		
Z-200 Rechargeable Battery Bank	9	360	Satellite Network	3240		
Fairing Construction Estemate	1	530	Transfer Stage	530		
Mk-55 "Thud" Liquid Fuel Engine	2	820	Transfer Stage	1640		
RC-L01 Remote Guidance Unit	1	3400	Transfer Stage	3400		
TD-25 Decoupler	2	300	Transfer Stage	600		
			dry part total	122238,5		



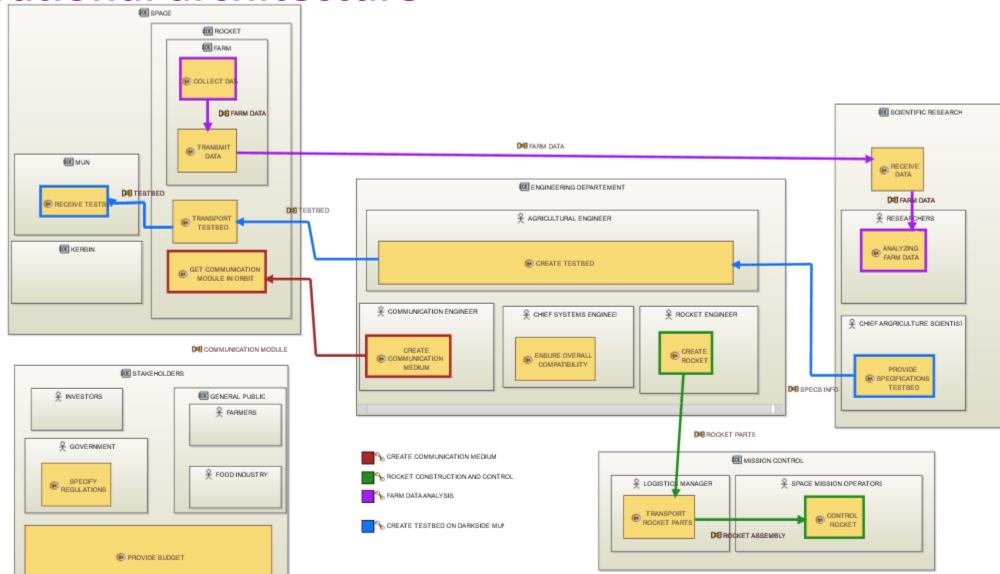
# **Operational entities**



**Operational capabilities** SPACE **®** STAKEHOLDERS ROCKET. & INVESTORS **■ FARM 吴 GOVERNMENT** OC MPROVE FARMING TECHNOLOGY EE MUN PROVIDE BUDGET @ GENERAL PUBLIC £ FOOD INDUSTRY KERBIN CREATE TESTBED ON DANGEDE MUIT ♀ FARMERS SATELITE OC CONSTANT COMMUNICATION ENGINEERING DEPARTEMENT 옷 CHIEF SYSTEMS ENGINEE SCIENTIFIC RESEARCH RESEARCHERS OC ♀ ROCKET ENGINEER € CHIEF ARGRICULTURE SCIENTIS IMPROVE SPACE DELIVER A AGRICULTURAL ENGINEER IMISSION CONTROL ₽ SPACE MISSION OPERATORS € LOGISTICS MANAGER



**Operational architecture** 



# **System architecture**

