DAME Group Update February 7th

Mechanical/Motion:

- Parts: Center body, arms, body cap, arm cap
- Center body has a cutout for the LCD screen, with mounting holes measured such that the edge of the screen is flush with the body
- Arms have a wider, ovular hole that offers a greater range of mobility for the actuators to lift, rotate, and extend the arms forward
- Caps allow us to open up the body and do work on the inside
- This is not the final version we will use, but will allow us to prototype more effectively
- We will prototype with the servos offered to us by Professor Schafer

Intelligence/UI:

- Purchased I2S 3W amp, 4ohm speaker, and I2S microphone module from Adafruit
- Researched OpenAI Realtime API and WebRTC
- Confirmed ESP32-S3-WROOM32 meets our requirements
- Tested 7" display from Schafer confirmed working

Power:

- Reviewed datasheets for all our components, paying attention to power specs
- Calculated how much discharge current, battery capacity, and voltage we need for the entire system
- Researched lithium-ion batteries and selected one that might fit out tentative needs
- Researched lithium-ion battery chargers, methods of preventing
 - overcharging/over-discharging
 - Selected a charger that is compatible with most 2S/3S lithium batteries that have a balance charger
 - Still researching how I can prevent over discharging of the batteries. Some battery packs have built in protection circuitry but if they do they usually don't have a balance charger for more convenient wall charging.
 - The battery packs with a balance charger don't seem to have any protection circuitry

- A lot of batteries or protection circuitry lack good datasheets so I don't really know what is going on inside
- Not sure how safe/difficult it would be to design protection circuitry myself
- Selected some LDOs to step down the voltage from 7.4V to each of our components.
 Selected different LDOs depending on the voltage and current a component needs while paying attention to the quiescent current of the LDO.
- Working on updating a new power subsystem block diagram and finalizing the power connections for the entire system
- Need to start working on a schematic once motors are officially selected and start ordering components. (If we need stronger motors then I need to select a different battery, potentially LDOs, charger, etc)