

Taking Control: Droid Nervous System

•••

Jim Butts: Modular Droid Electronics

@myartoobuild

Jim Butts, @myartoobuild



Just a simple man trying to make my droids in the universe.

Presentation Goals

Make electronics less intimidating

Show the value of modular design

Offer real examples from my journey

Spark new ideas and collaboration

How it started: The Mess

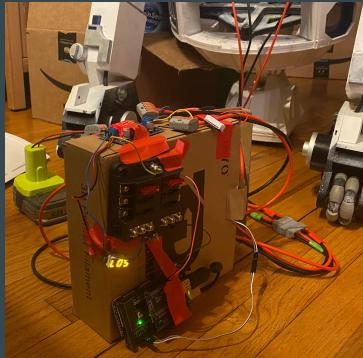
Tangles of wires, no clear layout

Unreliable connections & shorts

Hard to troubleshoot & upgrade



How it went: The iterations



trash

→

wood

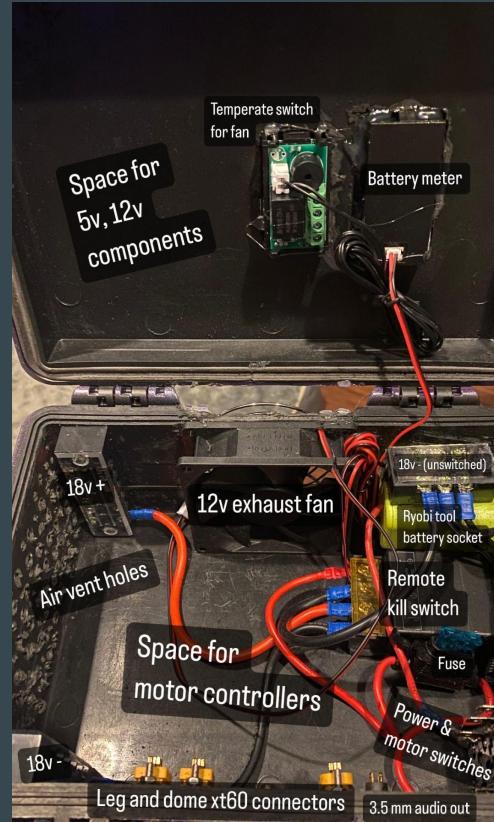
→

cutting boards

→

v1 box

How it's going: Control Box v2



Control Box V2 Live Demo

I had 1100011 problems



Safety
Reduced chance of shorts
Remote power cutoff
Emergency stop / interrupt
Safer for handoffs & demos
Fuse protection per subsystem



Troubleshooting
Swappable boxes = isolate faults
Clear cable routing
Easier access to internals
Simplified testing per box
No spaghetti = no guessing



Design & Learning
Taught me electronics
Reinforced 3D design skills
Less panic



Cost & Access
Cheaper parts per subsystem
No need to overbuild early
Allows low-barrier starter boxes
Works with budget parts and name-brand
Encourages reuse of components



Thermal & Physical
Temp-controlled fan
Vented designs
Airflow by design, not accident
Smaller enclosures = less heat buildup
Doesn't trap wires under boards



Organization & Physical Design
Cable paths planned
Layered stack = easy servicing
Panels slide in, not screwed in
Compact footprint, but accessible
Looks Swarzy



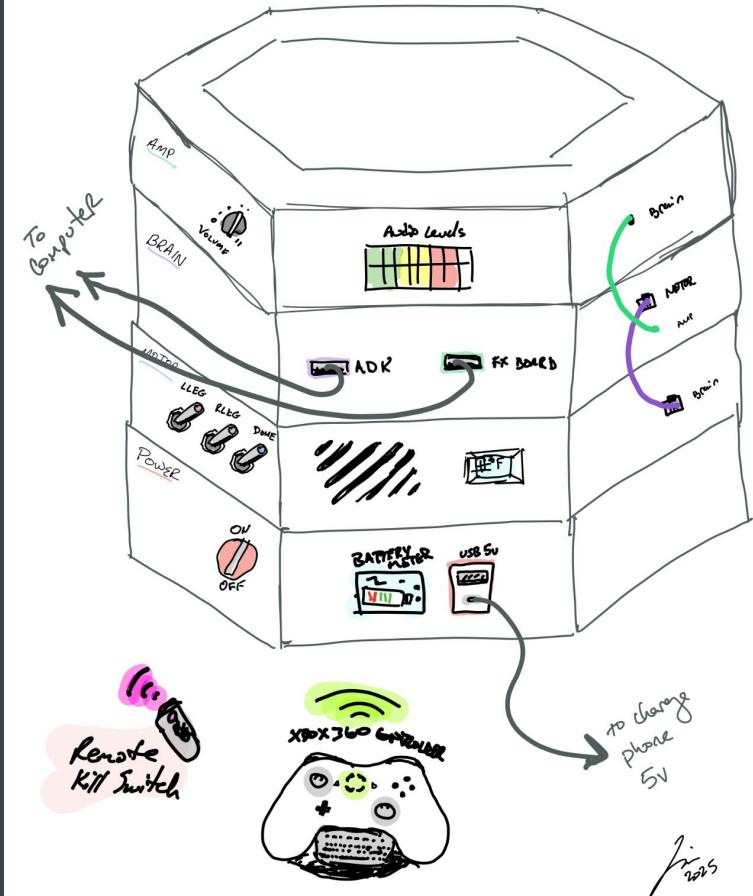
Connectivity
Barrel jacks and XT60s
Logical I/O mapping
No daisy-chaining chaos
Easy to document and explain
Clear signal + power separation



Modularity & Upgrade Path
Replaceable parts per box
Tool-free assembly design
Extensible system
Upgradable
Interfaces abstracted

Where it's going: Modular Concept

- Stackable boxes:
power, brain, motors, audio
- Future layers:
tools, batteries, storage
- Tool-free assembly & easy swapping



Key Concepts

Single Responsibility:

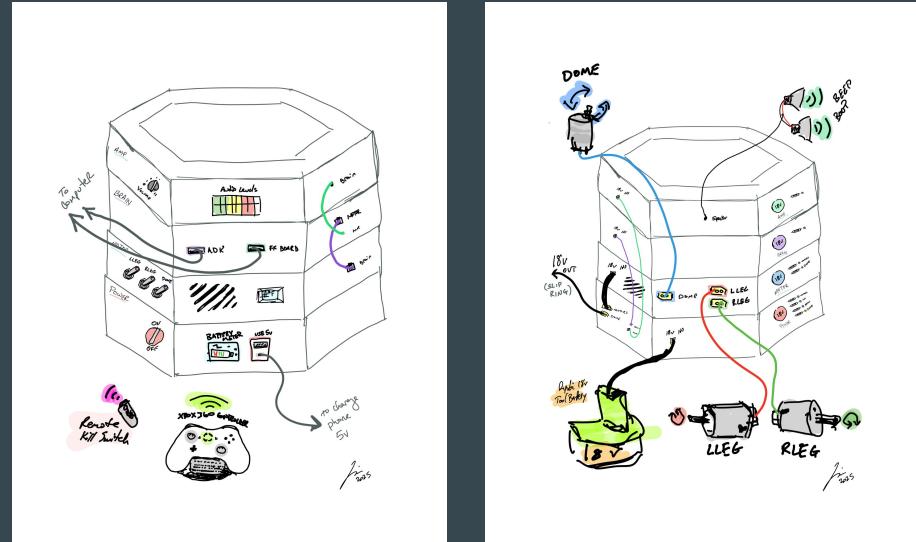
Each box has one job — power, control, motors, audio. Easier to build, debug, and replace.

Separation of Concerns:

Boxes don't interfere with each other. I can work on one without touching the rest.

Interfaces over Internals:

I care more about *how* a box connects (voltage, protocols, plugs) than what's inside. That makes swapping easy and future-proof.



Modular Live Demo



AMP

BRAIN

MOTOR
CONTROL

POWER



Next Steps

Designs not sharable yet.

What would you like to see?

Questions?

Thank You!

Jim Butts

Takeaways

Beginners:

Start simple (amp box is a great first step)

Veterans:

Create your own modules & customize to your needs

instagram.com/myarttobuild