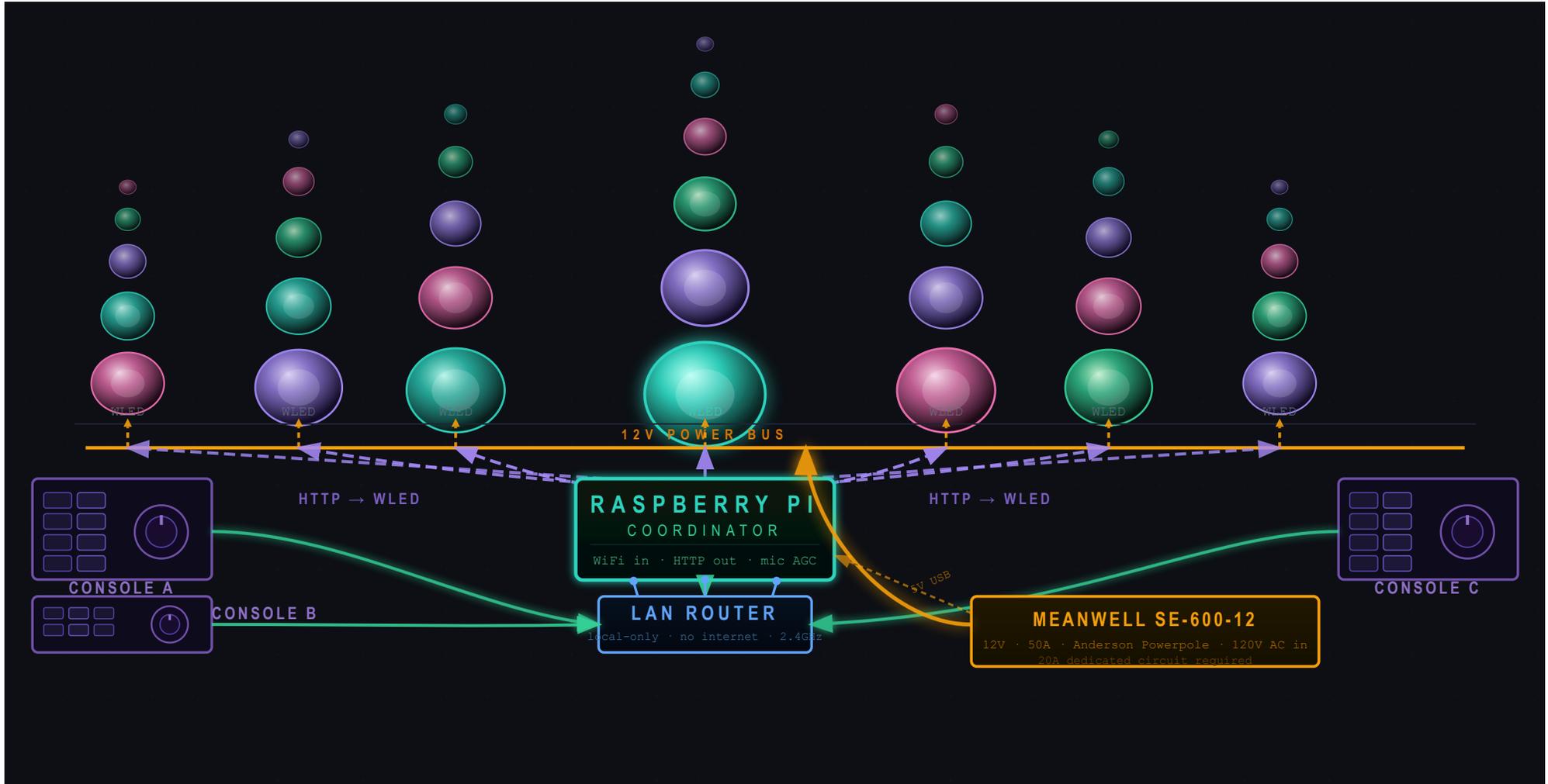# GLORB ORGAN

SYSTEM OVERVIEW — SIGNAL & POWER

Console → Router → Pi (WiFi)	Pi → WLED stems (HTTP)	12V Power (main run)	12V to each stem	*No single operator can reach all 3 consoles — collaboration required*

12V POWER BUS

HTTP → WLED

WLED · WLED · WLED · WLED · WLED · WLED · WLED

RASPBERRY PI
COORDINATOR
WiFi in · HTTP out · mic AGC

HTTP → WLED

LAN ROUTER
local-only · no internet · 2.4GHz

5V USB

MEANWELL SE-600-12
12V · 50A · Anderson Powerpole · 120V AC in
20A dedicated circuit required

CONSOLE A

CONSOLE B

CONSOLE C

GLORB STEMS · WLED

Each stem carries a Sparkle Motion ESP32 running WLED. Glorbs are modular foam-core spheres on an ABS tube core — big chambers at the base, smaller buds toward the top. Each stem operates independently and can run any WLED effect. The Pi sends JSON HTTP commands to each stem's IP address on the local network.

RASPBERRY PI · COORDINATOR

The Pi lives inside the center stem. It is the brain of the installation — receiving input from all three consoles over WiFi, running pattern logic, and dispatching HTTP commands to each WLED stem. A USB microphone feeds a rolling RMS meter for automatic gain control, keeping sound-reactive effects calibrated across different venue volumes.

LAN ROUTER

A dedicated local-area router with no internet connection. All devices — consoles, Pi, and WLED stems — connect to this router. Keeping the network isolated prevents interference, speeds up HTTP dispatch, and means the installation has no dependency on venue WiFi or internet service.

CONSOLES A · B · C

Three freestanding control consoles, each running an ESP32-C3 with a MCP23017 I²C GPIO expander. Each has a bank of repurposed 1970s organ rocker switches (Hall effect sensors, A3144) and a rotary encoder on a cast-iron or ship's wheel shaft. Consoles are positioned so no single person can reach all three — playing the organ requires strangers to collaborate.

MEANWELL PSU · POWER

A SE-600-12 supplies 12V DC at up to 50A via a central Anderson Powerpole distribution block. Each stem receives 12V; a DROK buck converter inside each stem base steps down to 5V for the WLED ESP32 and exterior LED strips. Interior seed pixels run direct 12V. The Pi receives 5V via a separate USB adapter. Estimated peak draw ~600W; a single 20A stage circuit is sufficient.

SIGNAL FLOW SUMMARY

Input: Operator flips lever or turns wheel on a console → ESP32-C3 reads Hall sensor state → sends WiFi packet to Pi via LAN router.
Processing: Pi pattern logic maps console state to WLED effect/palette/brightness parameters.
Output: Pi sends HTTP JSON to each stem's WLED instance → LEDs update in ~50ms.
Sound reactive: Pi mic AGC adjusts WLED gain every 2-4 seconds.

COSMIC BOTANICAL · GLORB ORGAN