NerdBot Steam Controller
Quick Reference Guide

Analog Controls

Control	Function	Details
Left Analog Stick	Camera Pan/Tilt	• X-axis (Left/Right): Pan camera • Y-axis (Up/Down): Tilt camera • Fine control for precise aiming
Left Touchpad (with groove)	Robot Movement	• Y-axis: Forward/Backward • X-axis: Strafe Left/Right • WASD-style movement • Supports simultaneous strafe + rotation
Right Touchpad (circular)	Robot Rotation	• X-axis: Rotation direction & speed • Distance from center = rotation speed • Left: Rotate counterclockwise • Right: Rotate clockwise

Button Controls

Button	Function	Notes
A Button	Center Camera	Resets pan/tilt servos to default position
B Button	Emergency Stop	Immediately stops all motor movement
X Button	Cycle Robot Modes	Switches between operational modes
Y Button	Random Meme Sound	1 second cooldown between plays
Right Shoulder	Welcome Message	Plays TTS welcome greeting
Button 10	Toggle Headlights	500ms cooldown
Button 11	Toggle Laser	500ms cooldown

Pro Tips

■	**Combined Movement**	You can strafe, move forward, and rotate simultaneously for complex maneuvers
■	**Deadzone**	Small movements near center are ignored to prevent drift (15% deadzone)
■	**Debouncing**	Button cooldowns prevent accidental double-presses and audio overlap
■	**Zero Latency**	Joystick service directly controls motors/servos without HTTP overhead
■■	**Safety First**	B button (Emergency Stop) immediately halts all motor activity

Technical Details

Service: nerdbot-joystick.service
Update Rate: 100Hz (10ms polling interval)
Control Type: Mecanum wheel mathematics for omnidirectional movement
Architecture: Direct hardware integration (bypasses Flask API)
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NerdBot Integrated Joystick Service | Raspberry Pi 5 + Steam Controller