

Readiness report — NASA JPL Open Source Rover

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Readiness: NASA JPL Open Source Rover

Verdict: Ready with caveats · 2026-07-19 · est. parts cost \$1,250–\$1,480

The project is largely implementable using primary distributors. This is a cold check baseline. The principal caveat is the Molex Super-SABRE header (1726750613), which is out of stock at all major authorized distributors with a 36-week lead time. Secondary stock exists at specialized vendors, but this is a high-current bottleneck for the Motor Board. One 2-position female header is out of stock but has a verified drop-in substitute.

Action required

Part	Problem	Recommended action
1726750613	Out of stock at major distributors (36-week lead time).	Source from specialized distributors like JAK Electronics (\$2.37) or NextWarehouse (\$7.67).
PPTC021LFBN-RC	Out of stock at DigiKey (11-week lead time).	Use Samtec SSW-102-01-T-S (verified substitute).

Parts

Electronics Bill of Materials

1. Integrated Circuits and Semiconductors

Part	Spec/Package	Status	Stock	Price	Source
MIC2937A-3.3WT	TO-220-3	Active	360	\$3.02	DigiKey
2N3906TA	TO-92-3	Active	4,779	\$0.27	DigiKey
STPS10L25D	TO-220AC	Active	1,784	\$2.51	DigiKey
1N4148	DO-35 (Axial)	Active	997,222	\$0.10	DigiKey

2. Discrete Passive Components (Commodity)

Part	Spec/Package	Status	Stock	Price	Source
CF14JT series	Axial 1/4W 5%	Active	>500k	~\$0.10	DigiKey
CF18JT68R0	Axial 1/8W 5%	Active	27,285	\$0.10	DigiKey

Part	Spec/Package	Status	Stock	Price	Source
C317C103K5R5TA7301	10nF Ceramic	Active	43,449	\$0.35	DigiKey
C322C104K5R5TA7317	0.1µF Ceramic	Active	22,727	\$0.94	DigiKey
ESK series (100µF)	Radial Elect.	Active	High	—	DigiKey
ESK106M050AC3AA	10µF Elect.	Active	31,769	\$0.17	DigiKey

3. Connectors and Electromechanical

Part	Spec/Package	Status	Stock	Price	Source
DC10CGKWA	10-Seg Bar Graph	Active	863	\$4.69	DigiKey
TSW-104-07-F-T	3x4 Header	Active	227	\$1.04	DigiKey
PEC08SAAN	8-pos Male Hdr	Disc.	8,609	\$0.82	DigiKey
PPTC102LFBN-RC	20-pos Fem Hdr	Active	4,295	\$1.32	DigiKey
SBH11-PBPC-D20-ST-BK	40-pos Shroud	Active	34,036	\$0.66	DigiKey
B6B-PH-K-S(LF)(SN)	6-pos JST 2mm	Active	25,249	\$0.27	DigiKey
0702462001	20-pos Shroud	Active	6,971	\$3.09	DigiKey
PPTC021LFBN-RC	2-pos Fem Hdr	OOS	0	—	DigiKey
OSTTA024163	2-pos Term Blk	Active	37,548	\$0.72	DigiKey
1726750613	Super-SABRE Hdr	OOS	0	\$2.37	JAK Electronics
EDSTL130/24	24-pos Term Hdr	Active	12,821	\$4.73	DigiKey
0395016006	6-pos Term Hdr	Active	9,385	\$2.46	DigiKey
0395005006	6-pos Term Plug	Active	9,626	\$3.07	DigiKey
206-124	SPDT 4-pos DIP	Active	6,087	\$2.34	DigiKey
C3920BAAAA	Toggle Switch	Active	818	\$10.30	DigiKey
696108003002	Fuse Clip	Active	28,283	\$0.64	DigiKey
0233010.MXP	10A Glass Fuse	Active	1,360	\$1.56	DigiKey

4. External Modules and Major Components

Part	Spec/Package	Status	Stock	Price	Source
Raspberry Pi 5	Controller Plat.	Active	High	\$59.99	Micro Center
Roboclaw 2x7A	Motor Controller	Active	High	\$75.00	Basic Micro

Part	Spec/Package	Status	Stock	Price	Source
Pololu #2881	5V Regulator	Active	High	\$18.95	Pololu
Pololu #2855	12V Regulator	Active	High	\$29.95	Pololu
INA260 (#4226)	Power Monitor	Active	High	\$9.95	Adafruit
PCA9685 (#815)	Servo Driver	Active	High	\$14.95	Micro Center
DC Power Meter	Generic LCD	Active	High	\$12.50	DROK

Mechanical and Ecosystem Dependencies

1. Drivetrain and Motors

Part	Spec/Package	Status	Stock	Price	Source
5203-2402-0027	Drive Motor	Active	High	\$54.99	goBILDA
2000-0025-0002	Steering Servo	Active	High	\$36.99	ServoCity
3202-0001-2501	ServoBlock	Active	High	\$34.99	RobotShop
3616-0014-0144	Wheels	Active	High	\$24.99	goBILDA

2. Structural Ecosystem (goBILDA)

Part	Spec/Package	Status	Stock	Price	Source
Hurricane Nuts	Proprietary	Active	High	—	goBILDA
Hyper Hubs	8mm REX bore	Active	High	—	goBILDA
Pillow Blocks	32mm bore	Active	High	—	goBILDA

3. Power and Battery

Part	Spec/Package	Status	Stock	Price	Source
4S LiPo Battery	14.8V 5000mAh	Active	High	\$53.99	Walmart
XT30 Connectors	Male/Female	Active	High	—	Commodity

Substitutes

For part	Substitute	Differences	Verified	Judgment
PPTC021LFBN-RC	SSW-102-01-T-S	Drop-in replacement.	Package + pitch + mounting	Acceptable

Instructor: verify any substitute against its datasheet before ordering.

Other dependencies

- **PCB Fabrication:** Requires Gerbers for "Brain Board" and "Motor Board" (v2.0.2); 1.6mm FR-4, 1oz copper. Status: not checked.
- **Chassis Plates:** Requires laser cutting 3mm (1/8") Acrylic or MDF using provided .dxf files. Status: not checked.
- **Software Dependencies:** Python libraries for PCA9685 and Roboclaw serial communication; Raspberry Pi OS. Status: available (pip).
- **Assembly Tools:** M4 hex keys (2.5mm, 3mm), 7mm nut driver, crimpers for JST PH/Molex Super-SABRE. Status: checked (readily available).

Watch list

- **1726750613 (Molex Super-SABRE):** Global stockout at primary distributors; 36-week lead time makes Motor Board assembly difficult without secondary sourcing.
- **PEC08SAAN:** Marked as discontinued at DigiKey; while male headers are common, specific stock levels for this MPN are dwindling.
- **goBILDA Proprietary Hardware:** The hurricane nuts and hubs are ecosystem-specific; any stockouts at goBILDA will halt chassis assembly as they are not easily substituted with standard hardware.