INSPECTOR BOTS
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The Super Mega Bot

Operator's Manual

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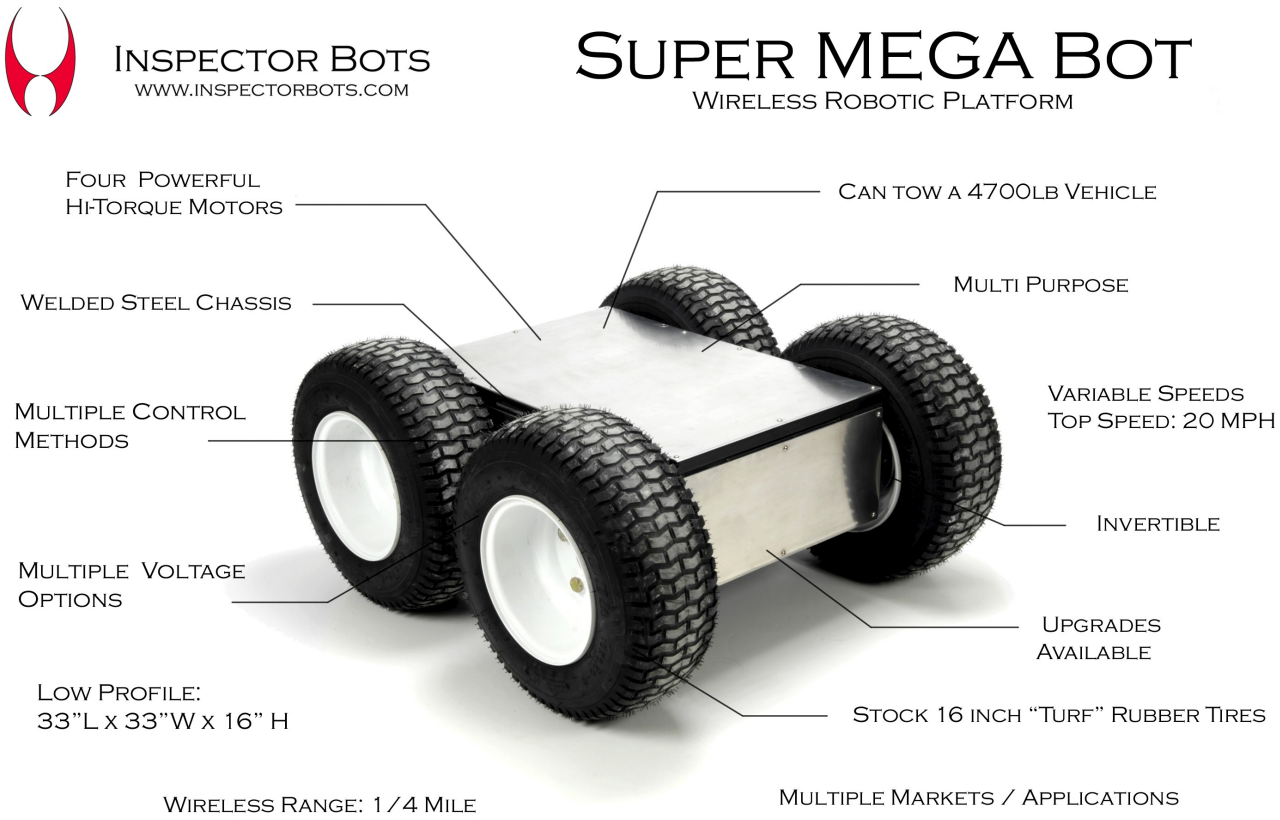
Congratulations on purchasing the Inspectorbots Super Mega Bot! The Super Mega Bot is a Wireless, Rugged, 4-Wheel-Drive Robotic Platform. Some of its capabilities include the ability to traverse mud, snow and debris. It can breech a wall and pull a vehicle! The Super Mega Bot is a modular, reconfigurable, rugged platform designed for a variety of applications such as law enforcement, security, robot wars, surveillance, transporting heavy loads, performing various scientific experiments and a variety of industrial and educational applications.

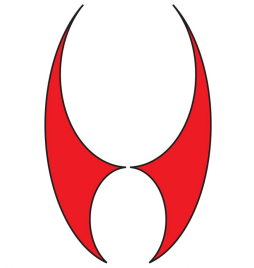


Rules for Safe Operation

- The Super Mega Bot is not a toy. Follow all safety warnings
- Use common sense and caution when operating.
- Do not operate around children or pets.
- Do not operate inside your house.
- Remove the main switch key when not in use and store it in a safe place.
- Operators should wear safety glasses when assembling and operating the Super Mega Bot.
- Turn on the Radio First before starting up the Super Mega Bot.
- Turn off the Radio after shutting off the Super Mega Bot. This prevents loss of the radio signal and having the robot run free.
- Avoid shorting out the batteries and electronics. Make it a habit not to place anything extraneous inside the Super Mega Bot. You don't want metal objects flying around loose inside the platform during operation. This includes tools, pieces of metal, wire, nuts, bolts etc. Inadvertently laying a wrench down inside the Super Mega Bot may cause a short circuit, send sparks flying and your heart rate soaring and doing so will void the warranty.
- Never use in an explosive atmosphere. Sparking from grinding metal could ignite fumes.
- Stand back when starting up the Super Mega Bot.
- Make sure the radio control sticks are in a neutral position before starting up.
- Do not operate in water or rain.
- Do not operate the Mega Bot while under the influence of drugs or alcohol.
- Inspectorbots is not responsible for damage due to neglect, abuse or failure to follow warnings and use common sense.

Terms of Sale

By purchasing robotic platforms and equipment from Inspectorbots, the buyer assumes all responsibility for operating the equipment in a safe manner. Inspectorbots is not liable for any damages or injury, which may occur as a result of using this equipment. The buyer or end user may not reverse engineer any part of the robotic platform or equipment. Modifying the robotic platform or equipment immediately voids the warranty.



Features

- 1200 Ft Range
- 250 Lb Payload Capacity
- Accepts On-Board Camera
- Battle Tested Components
- Can Climb 35 Degree Inclines
- Can Tow a Vehicle
- Climbs a 6” Curb
- Easy Maneuvering
- Fits through a 33” Doorway
- Four Wheel Drive
- High Torque Motors
- Invertible
- Long Runtime
- Low-Profile Design
- Made in the USA
- Modular Design
- Multiple Battery Configurations
- Powerful Electric Vehicle
- Precision Engineering
- Rechargeable Batteries
- Rotates in Place
- Rugged Outdoor Tires
- Traverses Mud and Snow
- Upgradeable
- Variable Speed
- Weighs 240 Lbs
- Welded Steel Chassis

Stock Super Mega Bot

Packing List

Quan.		Item Description
1		Super Mega Bot
4		16” Super Turf Tires
4		12 Volt 20 AH Sealed Lead-Acid Batteries
1		35 V Re-charger
1		12V Re-charger
2		RoboteQ VDC2450 Speed Controllers
1		SMB Operators Manual
1		Radio Owners Manual
1		Spare Parts Bag
1		RS-232 Computer Serial Interface Cable
2		36V 10Ga. Jumper Cables

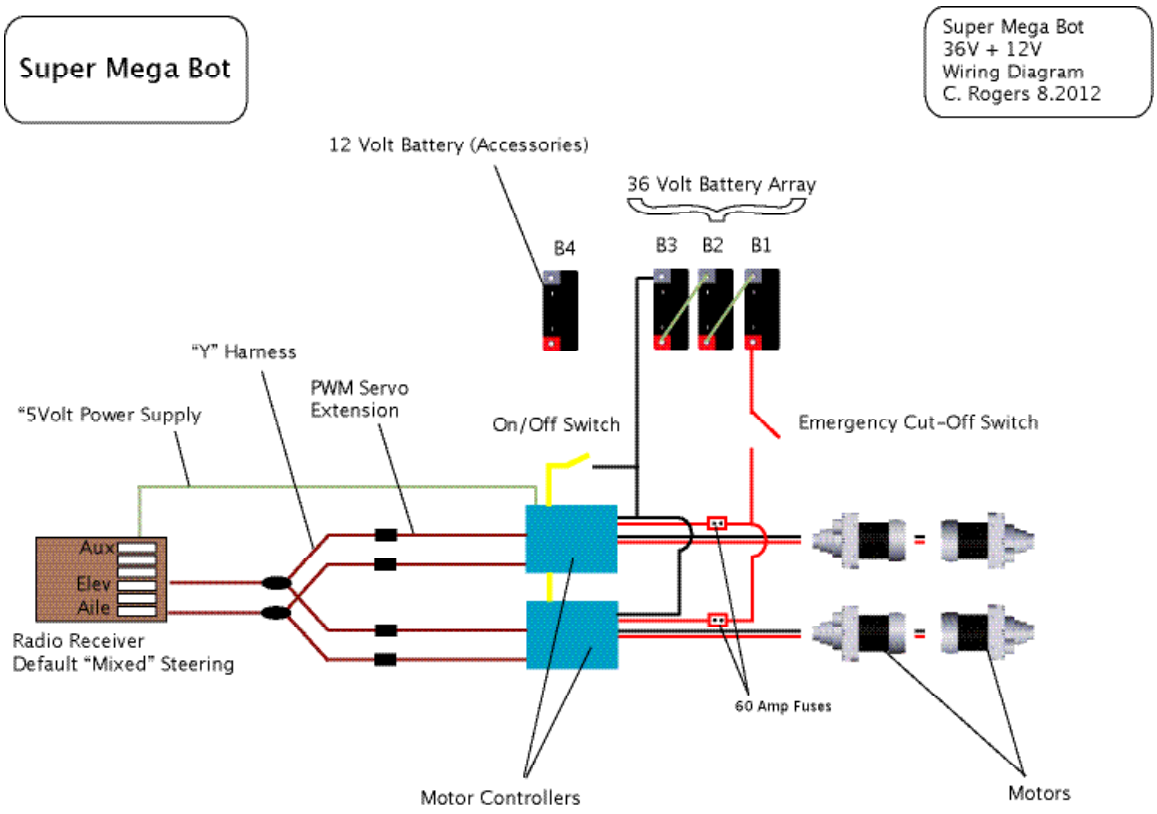
Introduction

The Super Mega Bot is a precision crafted, high-performance machine. The Super Mega Bot, or SMB for short, is a powerful Robotic platform, which may be used in a variety of industrial applications.

There are several methods available to control the SMB including: RC radio, Analog Joystick, Wireless Modem, or Microcomputer. The SMB is shipped with RC Radio control as the default control method. Technical support is provided by Inspectorbots for systems running this RC control method only. Other control methods are supported by RoboteQ. Information regarding the Roboteq Speed Controllers can be found online at: http://www.roboteq.com You will find many articles, and downloadable documents related to the speed controllers online including a free program used to test and troubleshoot the controllers.

Before You Begin:

Look over all of the radio instructions and this operator's manual before beginning the battery installation and wiring process. Familiarize yourself with the wiring process and sequence. Gather all the necessary tools. If available, it is helpful to use a motorcycle jack to lift the platform up to a comfortable height. Remove the wheels before beginning to work for better access and to prevent injury. Be advised the unit will weigh about 240 lbs when finished. It is also helpful to consult a qualified electrician or engineer for the assembly process.



Battery Installation &Wiring

The SMB is shipped fully assembled or partially assembled without batteries. To operate the SMB you need to have batteries installed. To install the batteries please see the instructional video on basic battery wiring online at:
http://youtu.be/wdgq1-o1_8g
The Roboteq Speed controllers may be powered by either a 12, 24 or 36 Volt Battery configuration. A wide range of batteries may be used in the Super Mega Bot. It normally ships with four 18 or 20 Amp/hr 12 Volt AGM Batteries, which may be wired in series to produce 24 or 36 Volts. When 3 batteries are wired in series to produce 36 Volts, a spare 12 Volt battery is available for accessories.
The SMB battery bay can accommodate a maximum of four of these large Lead-Acid batteries. Other options include running the Speed controllers at 24 Volts and leaving room inside the battery bay for electronics or other equipment or setting up two banks of 24V battery arrays in parallel to increase runtime. Below are the instructions for wiring the Super Mega Bot in the default 36 +12 Volt configuration.

36V+12 Volt Battery Wiring

1. Remove the top deck by removing the four large countersunk 1/4-20 bolts in the top deck. Remove the Aluminum Battery Strap by removing four more countersunk 1/4-20 bolts. This process provides access to the battery bay and wires.
2. Install the 4 batteries as shown in photo 1 below.
3. To create the 36Volt battery array- install one of the 36V jumper cables from Battery 1 Ground (Negative) and the other end to Battery 2 + Red (Positive) using the supplied fasteners.
4. Install one of the other 36V jumper cables from Battery 2 Ground (Negative) and the other end to Battery 3 + Red (Positive)

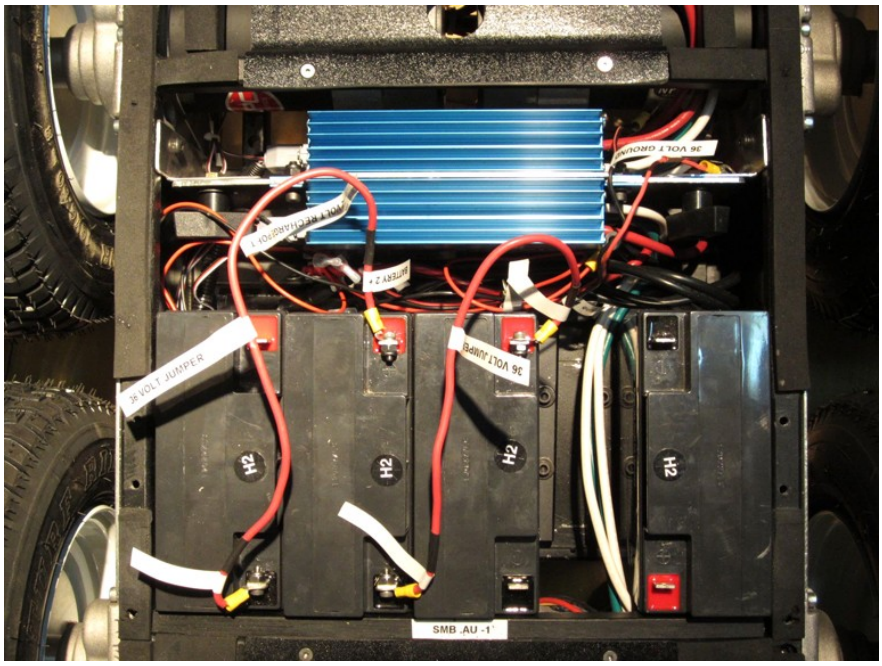


Photo 1. Batteries and Jumpers Installed.

5. Install the two large 8 Ga. sets of black ground wires coming from the speed controllers and the black 18 Ga. wire coming from the 36 Volt recharge port to the Ground (Negative) of battery 3 (The 36 Volt array)

Note: there is a gap between batteries 3 and 4. Run the high voltage wires in this gap. Avoid running the 3-wire servo signal wires alongside the high voltage wires to minimize noise and signal interference.

6. Hook up the large Red 8 Ga. Wire, labeled 36 V+ to the Red (Positive) terminal of battery 1 (The positive terminal of the 36V array). Also attach the smaller 18 Ga. Red Wire from the 36 Volt Recharge Port to this battery 1 Red (Positive) terminal.

7. Attach the small 18 Ga. Wires from the 12 Volt recharge port to the single 12 Volt accessory battery. Be careful to connect the red (Positive) wire to the Red (Positive) terminal. And likewise, connect the 12 Volt Black wire from the 12 Volt recharge port to the black Ground (Negative) terminal of the single 12 Volt accessory Battery 4.
8. Clean up the wiring by tucking in the jumper cables and wires between the batteries, as shown in the photo 2 below. You may want to use wire-ties to bundle the wires together.

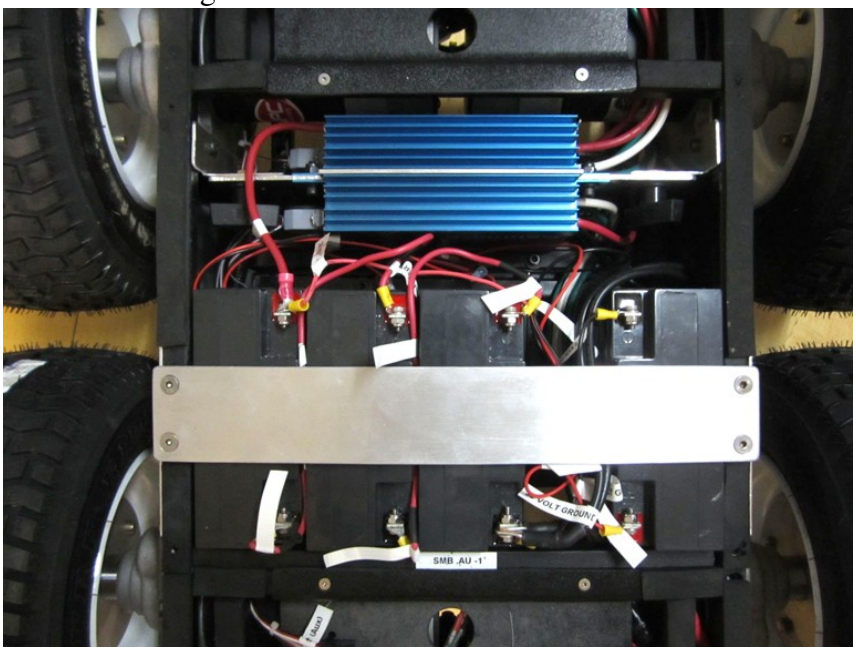
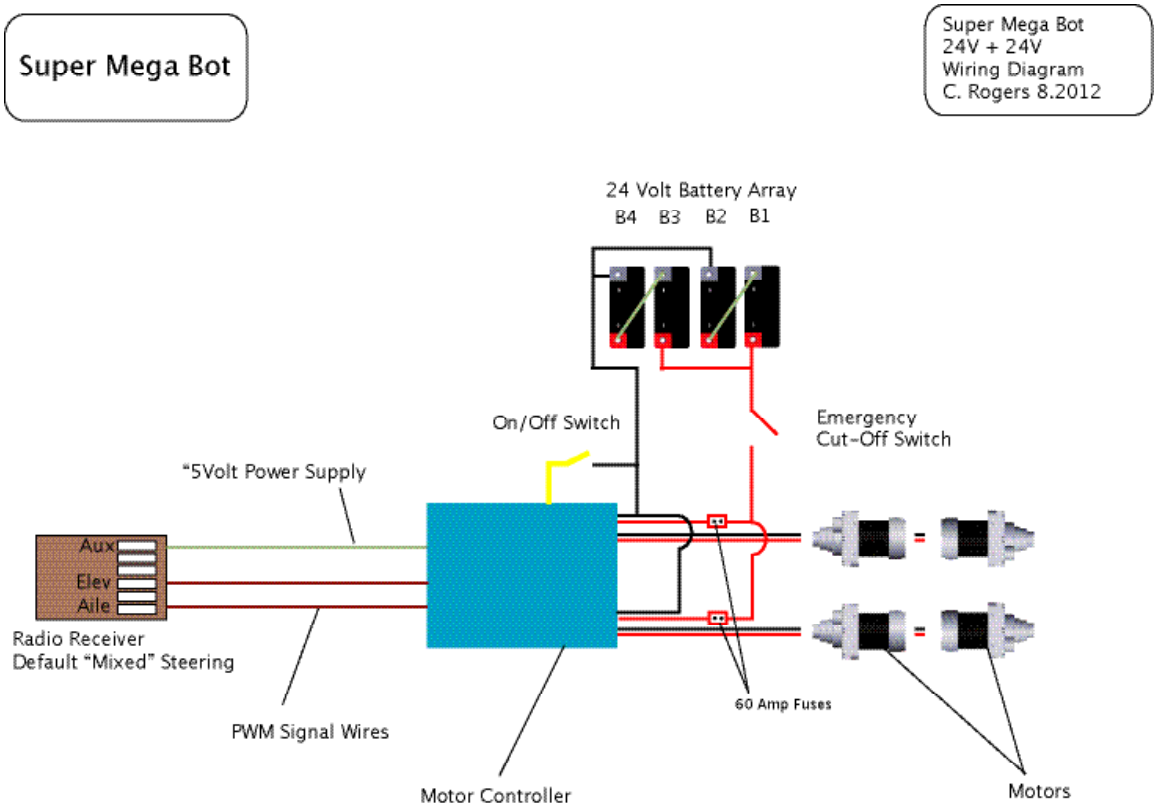


Photo 2. Batteries, Wiring and Battery Strap Installed.

9. Test the system with a voltmeter -if available. The 36 Volt Array should read a nominal 36 Volts DC and the single accessory battery should, of course, read a nominal 12 Volts DC. Continue to test the system by following the Startup Procedure.
10. Secure the batteries to prevent movement by re-attaching the battery strap and top deck cover using the 1/4-20 machine screws you removed in step 1 above

24V+24Volt Battery Wiring

Follow the illustration below to wire the platform for 24Volt wiring. Instead of creating a 36 Volt array, create two sets of 24 Volt arrays and then wire them in parallel to increase runtime. Attach the leads from this 24 Volt battery array to the speed controller through the emergency cut-off switch and fuses.



Operational Overview

Here is an overview of how the Super Mega Bot works: To simplify things, there are 4 wheels each connected to 4 motors, each connected to 1-4 speed controllers, each controlled by a signal from the radio. The Super Mega Bot moves by what is known as

skid steering or tank steering: The two wheels on the left side always move in unison as do the two right wheels-their speed and direction are controlled by the speed controllers. The operator controls the speed and direction of the two "sides" of the Super Mega Bot by moving the sticks on the radio controller. The Forward speed controller controls the two forward motors, while the rear speed controller controls the two rear motors.

High Speed Mode

The Super Mega Bot is shipped with the steering in "mixed" mode and is controlled by using a single (right) stick on the radio controller. A high-speed option is available by rewiring the radio receiver to "Tank" steering mode. In this mode the left stick, (which is called Thro on the receiver) controls the left two motors/wheels and the right stick on the radio controls the right two motors/wheels. To switch to "Tank" steering mode follow the steps below. Be aware the Super Mega Bot in High Speed mode can be difficult to control, especially with larger wheels, 36 Volts and a high-speed gearbox.

Conversion to "Tank" Steering

Mode	Channel	Normal/Reverse	Wingtail Mix
Tank	**Thro**	**N**	**INH (Inhibit)**
	Elev	**R**	
Mixed	**Elev**	**N**	**ACT (Activate)**
	Aile	**R**	

Note: Before attempting to rewire the steering mode, turn off the platform and remove the red key.

1. Pull the small servo signal wire labeled ELEV from the slot labeled ELEV and insert it into the slot labeled THRO. (This is the channel, which is controlled by the Left stick of the radio controller.)
2. Pull out the small servo signal wire labeled AILE from the slot labeled AILE and insert it into the slot labeled ELEV (This is the channel which is controlled by the Right stick of the radio controller.)
3. Read the information in the radio owner's manual about programming and changing the menu settings. Using the menu buttons on the radio, get into the Setup list. Scroll down to Wingtail mix. Select Elevon and choose INH (Inhibit). Go back to list.
4. In the Setup menu, scroll to reverse. In the Reverse menu scroll down and highlight ELEV. Set ELEV to R (Reverse). This changes the direction of the wheels.

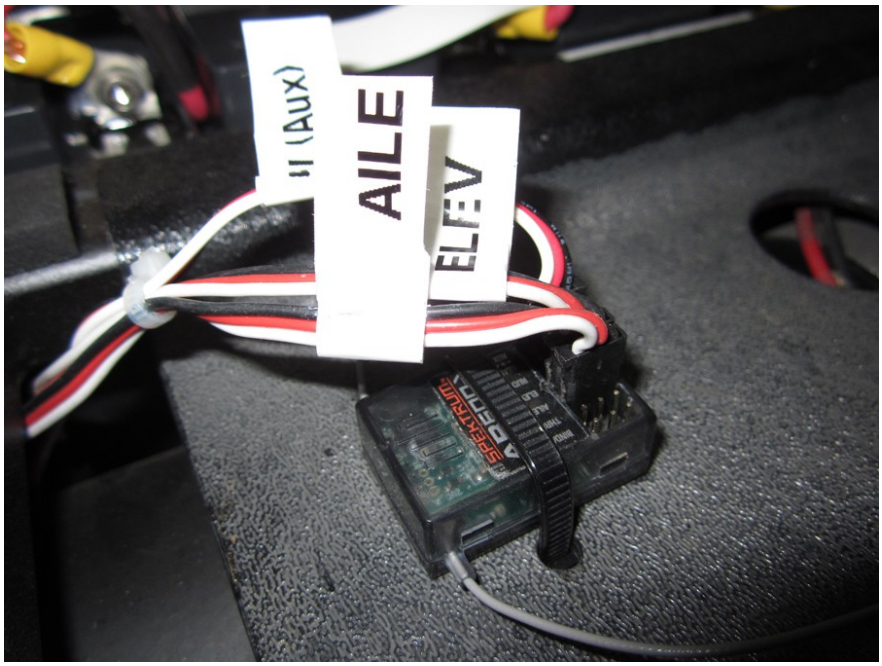


Photo 3. The Radio Receiver in the normal “Mixed” Steering Mode.

In “Tank” Mode the left stick controls the left motors and the right stick controls the right motors. In Mixed Mode the right stick controls all the motors the left side channel is mixed with the right side.

For example in “Tank” mode: As the operator moves the right stick forward, a wireless signal is sent from the radio to the on-board receiver. The receiver relays that signal, splitting it into two identical signals, sending it to two speed controllers. The more the operator moves the right stick forward, the faster the two right motors spin. The same thing happens with the left stick and left side. Move both sticks back, the platform moves back. Move both sticks forward; the platform moves forward. If the right stick moves forward while the left stick back: the Super Mega Bot rotates in place, counterclockwise. The control is intuitive and easy to master.

Turning On and Off

There are two switches on the Super Mega Bot: an emergency disconnect switch with a removable red key and a smaller toggle switch located below the larger red key. The red key supplies 36V to the system and the smaller toggle switch turns on/off the controller. Always turn on the Super Mega Bot and the Roboteq Speed controllers by using the toggle switch rater than the Big Red emergency disconnect key. The Red key must be turned on before startup and turned off- after shutting off the Controller Remove the Red Key to prevent unauthorized use of the Robot.

Startup Procedure for RC Control

In order to operate the Super Mega Bot, make sure there are batteries in the Robot and in the Radio. Center the sticks on the radio and then turn on the radio. Insert the red key into the black key port, which may be located on the front or rear of the robot then turn the key a 1/4 turn to the right until it locks in place. Then flip the on/off toggle switch up or on to turn on the robot. Slowly advance the control sticks to operate the robot. To shut down- reverse this process.

High Speed Gearboxes

Hi-Speed gearboxes are available as an upgrade option. They are used to increase the top speed of the SMB. Hi-Speed gearboxes are identified by the label: 14:1 HS written on the top of the gearbox between the tires and the Robot.

Note using the 14:1 Hi-Speed gearboxes puts extra strain on the motors and gearing so avoid high-speed starts and overloading the platform. Slowly increase speed to avoid stripping the gearing. Maximal Hi-speed is accomplished by wiring the batteries in a 36 Volt Array, using these 14:1 gearboxes, 16" diameter tires and the "Tank" steering mode. With this configuration, top speeds close to 25 MPH are possible on level terrain. Note, however, since the platform has such a short wheelbase, controlling the platform at this speed can be challenging.

Recharging

Recharge Ports are located on the side of the platform and are very easy to use. Simply plug in the appropriate charger to a wall outlet and the charging pin into the correct charge port. These are slow chargers. Recharge time takes several hours. It is normal to leave the SMB plugged in to the chargers overnight for a full charge. Turn off the SMB before recharging.

Troubleshooting

So you've got the Super Mega Bot assembled and it is still not working, right?

Here are some guidelines to help you troubleshoot what's wrong.

Consult the diagrams, instructions and photos. Recheck ALL your connections.

Set your radio sticks to neutral. Make sure there are batteries in the radio. Turn on the radio then, turn on the Mega Bot. The LEDs on the Controllers should light up.

You should be able to rotate the motors with a slight nudge of the sticks either forward or backward. Make sure everything is wired correctly. Reversing the polarity to the speed controllers or a short on the motor terminals will quickly burn out a speed controller. If

not, follow these steps or call tech support where you purchased the Super Mega Bot. Or Call Roboteq for support with the motor controllers: www.RoboteQ.com
Note: It is a good idea to remove the wheels while troubleshooting to keep the tires from grabbing pieces of clothing and creating a hazardous condition.

Do you have power?
Attach the probes of your Voltmeter to the battery terminals. Each battery fully charged should read about 12V. Three batteries together about 36V
When the switch is on, the power to the controller should also read 36V
Do you have batteries in the radio? Are they fully charged?

Check your fuses
There are two 60 Amp Fuses located behind the front panel near the switches. Check to see if your fuse is still intact. If it is blown, determine why, correct the problem and replace the fuse with an **EQUAL** Amperage. NEVER REPLACE A BLOWN WITH A HIGHER AMPERAGE, OR YOU ARE LIKELY TO BLOW THE ELECTRONICS IT PROTECTS!

Receiver
The digital 2.4 GHz RC Radio receiver continually analyzes the radio signal and "locks on" to provide a stable signal free from interference normally associated with AM and FM radios. The radio and RC receiver are linked before shipping. The receiver is linked to only one radio. If the receiver is placed in a position which is susceptible to interference /noise such as hi-voltage power cables, too close to a BEC or too close to metal objects, try repositioning the receiver.
Set your radio sticks to neutral. Turn on the radio then, turn on the Super Mega Bot. Wait for the receiver led to stop flashing and remain solid. If it does not stop flashing you may need to re-link or bind it again. Also check for loose connections between the speed controller and the signal wire going into it. See the Roboteq controller instruction manual available online at www.RoboteQ.com. Also read the radio owner's manual. Make sure the 3-wire servo cables and extensions are routed away from the 24V power cables. Its OK if they cross, Its NOT good if they run parallel or are bundled together.

Speed Controllers
Set your radio sticks to neutral. Turn on the radio. Then turn on the Super Mega Bot. Wait for the receiver led to stop flashing and remain solid. If the LED on the speed controllers are on, you have power to them. See the Roboteq instruction manual online to

determine the status of the speed controllers. Often the problem is a loose connection of the servo extension cable in the speed controller. Power- down the Mega, remove the 3 wire servo extension and plug it back in snugly. Turn the Super Mega Bot back on. If your sticks are in the center neutral position you are looking for a rapidly flashing of the LEDs on the Controller to indicate its status. Recheck all the connections. Make sure the wires are connected properly.
You can also temporarily use the servo extension cable from another speed controller if one of them (speed controllers) is working. Just remember to replace it in the original position when done.

Motors Turn Backward

Make sure everything is wired correctly. Reversing the polarity to the speed controllers or a short on the motor terminals will quickly burn out a speed controller. If the motors are turning the wrong direction consult the radio owners manual section on "reverse". Switch the direction of the THRO or the ELEV channel. You can reverse the direction of the motor this way.

Specifications

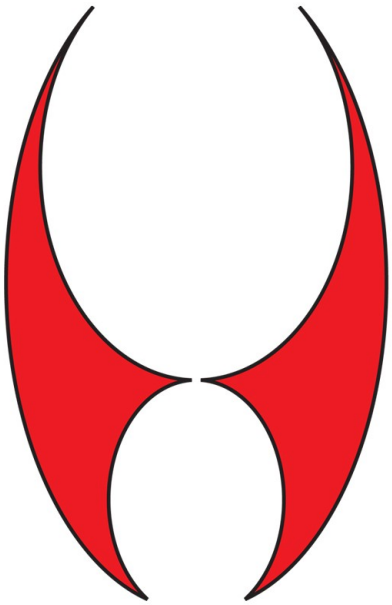
Base Model Vehicle Specs:

- Chassis: Powder Coated Steel and Aluminum
- Batteries Four 20 Amp/Hr 12V Batteries
- Current: 2x150 Amp Motor Controllers
- Dimensions: 33"L x 33" W x 16"H
- Drive: Four Electric Motors
- Ground Clearance: 5.5''
- Horsepower: 4 x 1.7 Horsepower Motors
- Load Capacity: 250Lbs
- Max incline: 35 Degrees (no load)
- Speed Controllers: RoboteQ 2x VDC2450
- Programming: User Defined - Tele-operated Platform
- Radio: 2.4 GHz Technology
- Range: 1200 ft.
- Runtime: 1-3 Hrs. Depending on Driving, Payload, Terrain etc.
- Speed: 0-10 MPH
- Suspension: Rigid
- Tires: Interchangeable, Pneumatic, 16 inch Diameter Turf Tires
- Towing Capacity: 2000 lbs rolling load
- Transmission: Full-Time 4WD
- Vision System: None- User Defined
- Weight 240 lbs. Wheelbase: 16.5 "

Available Upgrades

- 16” Bar Lug Tires.
- Max Load Tow Package
- High-Performance Battery Tie Down
- Solar Panel: On-Board Solar Recharging Panel
- High Speed Re-charger
- Vision System: Tele-operated Camera kit with Monitor

Super Mega Bot with 16” Bar Lug Tire Upgrade



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