

Budget Robotics TankBot Assembly Instructions

The Budget Robotics TankBot kit is a low-cost tracked vehicle designed as a flexible base to construct a treaded robot.

The TankBot uses the Tamiya Twin Motor Gear Box (70097) and the Tamiya Track and Wheel Set (70100). These products are included in the deluxe TankBot kit. If you purchased the basic TankBot kit (body and hardware only), you can purchase the Twin Motor Gear Box and Track and Wheel Set separately from many hobby stores and mail order/Internet outlets. A list of Internet sources is provided at the end of these instructions. Assembly of the TankBot is easy, and takes less than 15 minutes.

The Tamiya Twin Motor Gear Box comes in kit form, and is composed of two independent motors and gear trains. The Track and Wheel Set contains plastic drive sprockets and idler wheels, as well as lengths of rubber tracks that are linked together to make the treads for the TankBot.

Two "levels" are provided, for mounting the motors, batteries, sensors, microcontroller, and other components. The finished robot measures approximately 6.75" in length, 4.25" wide, and 3" high.

Note that the TankBot kit lacks circuitry for controlling the Twin Motor Gear Box. The Dual Motor Controller, from Pololu (<http://www.pololu.com/>) is one of many low-cost controller boards that can be used with the TankBot.

The TankBot body/hardware kit contains the following parts:

Quantity	Description
1	Base measuring 5" x 2".
1	"Top deck" measuring 4.5" by 2.5". The base and top deck are separated by risers.
2	Left and right track mounting rails.
1	Motor board, pre-drilled for the Tamiya Twin Motor Gear Box.
2	90° corner brackets, for attaching the motor board to the base.
4	4-40 x 1/2" machine screws.
2	4-40 x 7/16" flat head machine screws
6	4-40 machine screw nuts.
4	Risers consisting of: (4) 6-32 x 1 1/2" machine screws, (8) 6-32 hex nuts, (4) sleeves.
4	#6 x 3/4" self-tapping screws
2	#4 washers

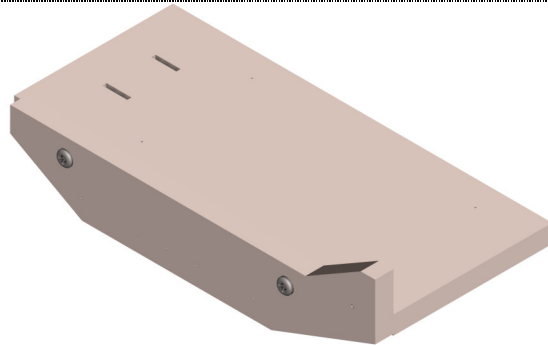
Additional materials needed (not included in basic body/hardware kit): Tamiya Twin Motor Gear Box (70097), Tamiya Track and Wheel Set (70100).

Assembly Steps

Step 1

Orient the base so that the two long slots are toward the back.

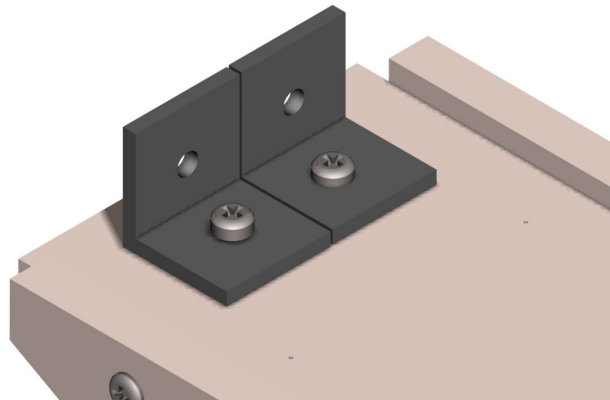
Using two #6 x 3/4" self-tapping screws, attach the left track mounting rail as shown. Do not over-tighten the screws, or the plastic may become deformed.



Step 2

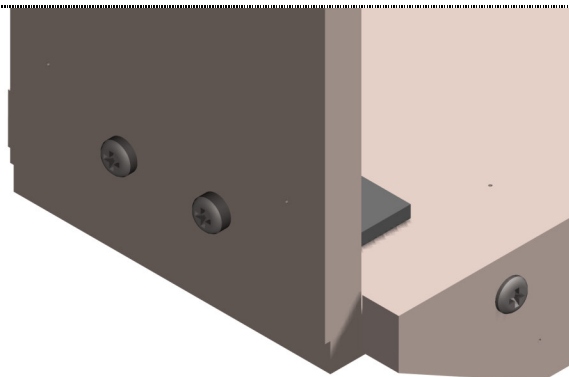
Mount the two corner brackets to the base using two 4-40 x 1/2" machine screws, two #4 washers, and two 4-40 hex nuts. The washers and hex nuts are fastened on the underside of the base. The corner brackets fit over the two long slots in the base.

Finger-tighten only at this point.



Step 3

Attach the motor board to the corner brackets using two 4-40 x 7/16" flat head machine screws and two 4-40 hex nuts. The heads of the screws should be on the side *opposite* the corner brackets. Be sure the heads of the screws are flush with the motor board.

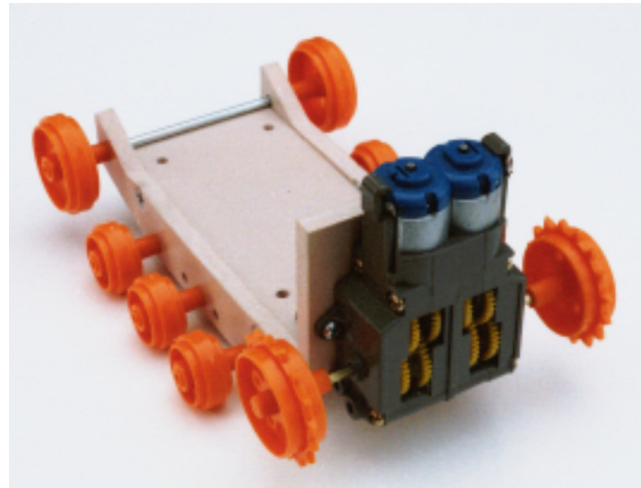
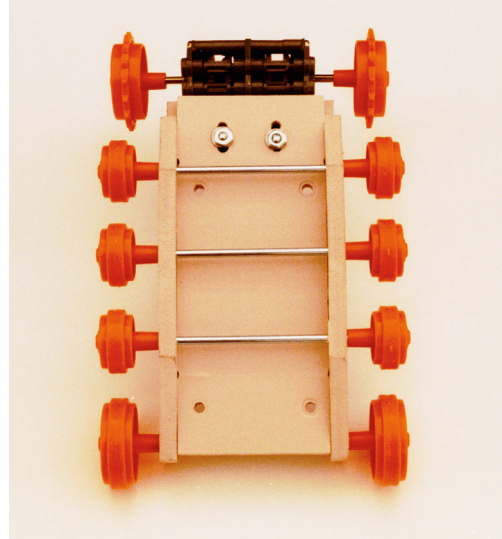


Step 4

Assemble the Tamiya Twin Motor Gear Box as detailed in the instructions that come with the product.

Mount the Twin Motor Gear Box so that the shafts are oriented at the bottom of the motor board. The Twin Motor Gear Box is mounted to the motor board using two 4-40 x 1/2" machine screws and nuts.

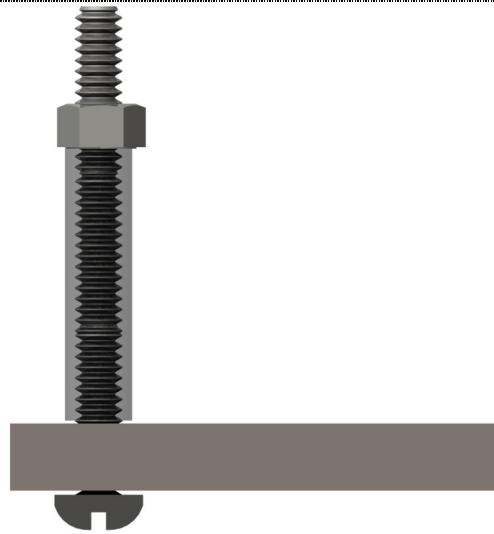
Assemble the sprockets and idler wheels from the Track and Wheel Set to the left and right track mounting rails, as shown.



Step 5

Assemble the risers to the base as follows:

1. Push each of the 6-32 x 1 1/2" machine screws into the four holes in the base. The screws are inserted from the bottom.
2. Slip a sleeve over each of the screws.
3. For each riser, thread a 6-32 hex nut over the sleeve.



Step 6

Assemble the treads from the Track and Wheel Set using the following lengths for each tread:

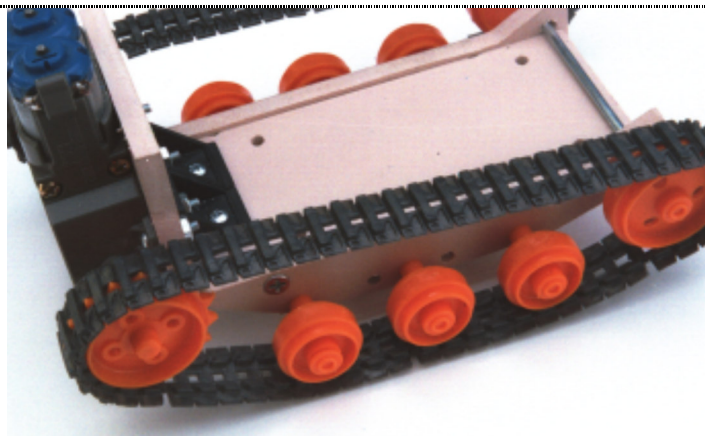
- 1 7 1/2"
- 1 2"
- 2 2 1/2"

The overall length of each tread should be approximately 15".

To attach the treads to the TankBot:

1. Push the motor board as far toward the front of the base as possible.
2. Remove the sprockets from the motor drive shafts.
3. For each side, loop the tread over the four idler wheels. Wrap the tread around the teeth of the drive sprocket, and carefully push the sprocket onto the motor shaft.

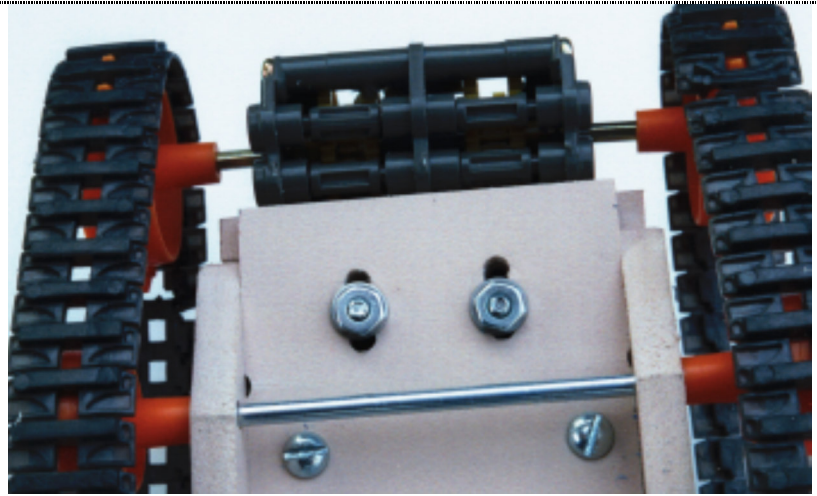
Note: Do not overstretch the tread or it may become unlinked.



Step 7

Adjust the tension of the treads by pushing the motor board toward the back of the robot. The treads should be "springy" but not overly stiff.

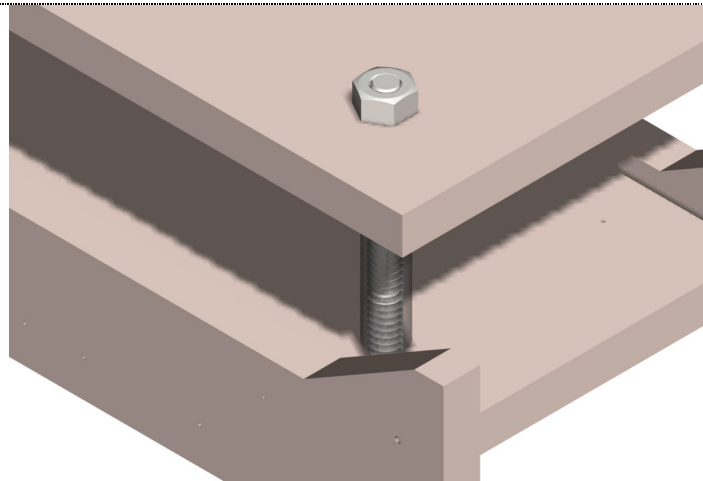
Tighten the screws and nuts to secure the motor board position.



Step 8

Mount the top deck by aligning its four holes with the riser.

Secure the top deck to the risers with four 6-32 hex nuts.



Sources

Following are some Internet sources for the Tamiya Twin Motor Gear Box and Track and Wheel Set:

Tower Hobbies

<http://www.towerhobbies.com/>

HVW Technologies

<http://www.hvwtech.com/>

Robot Store

<http://www.robotstore.com/>

Notes

1. The TankBot is naturally heavy on the motor-end. For best weight distribution, mount the batteries toward the front of the base.
2. To avoid "skipping" in turns, reverse the motor on the side you wish to turn to (that is, to turn right, reverse the right motor while keeping the left motor going forward).
3. If the track pops off the idler wheels or drive sprocket, check the links between each length of track. Adjust the tread tension as necessary.
4. The Tamiya Twin Motor Gear Box provides several gearing ratios from which to choose. The higher ratio will cause the TankBot to travel more slowly, but it will have more power to roll over objects. Conversely, the lower ratio causes the TankBot to travel more quickly, but have less power. Chose the gear ratio that best suits your needs.

The TankBot is available from:

Budget Robotics

PO Box 5821

Oceanside, CA 92056

<http://www.budgetrobotics.com/>

orders@budgetrobotics.com

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