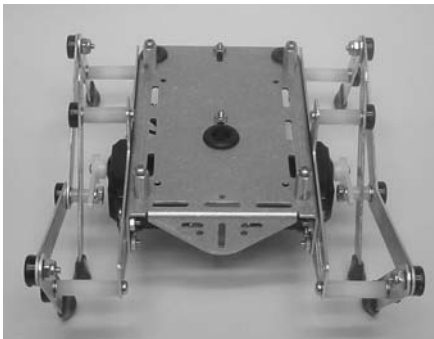
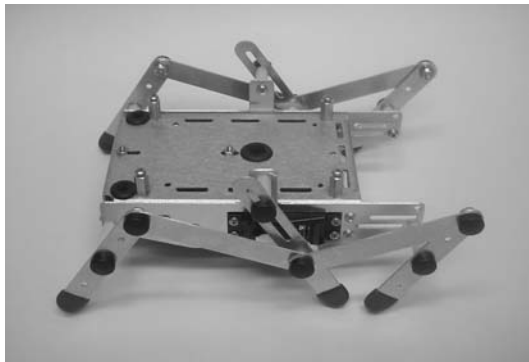


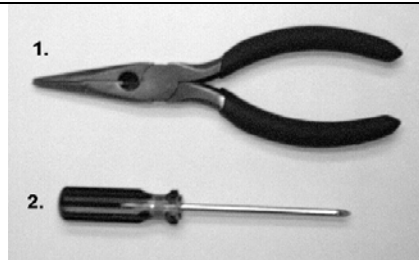
Crawler Kit for Boe-Bot (#30055)



Recommended Tools

1. Small needle nosed pliers
2. Phillips #1 point screwdriver

WARNING! **DO NOT** use electric screwdrivers with this kit. Please assemble using hand tools only to avoid damaging your Crawler.



The Crawler Kit assembly takes approximately 60 minutes to complete. Before getting started, take an inventory of the parts in your kit. Use **Fig #1** to identify each part to the parts list. Once you have inventoried your kit, proceed to **Step #1**. Boe-Bot (#28132) sold separately.

Parts List

<u>Item</u>	<u>Qty</u>	<u>Description</u>
A	(2)	Crawler Side
B	(4)	Leg
C	(6)	Rubber Feet
D	(4)	1/8 Inch Nylon Spacer
E	(2)	Servo Horn
F	(2)	Servo Horn Arm
G	(4)	Push Arm
H	(2)	3/4 Inch Nylon Standoff
I	(4)	1 Inch Nylon Standoff
J	(2)	M3x18 Phillips Pan Head Screw
K	(6)	4/40 Phillips Pan Head Screw
L	(16)	M3x10 Phillips Pan Head Screw
M	(6)	4/40 Hex Nut
N	(8)	Steel Washer
O	(6)	6/32 Nylon Insert Locknut
P	(2)	Middle Leg
Q	(12)	Plastic Screw Cover

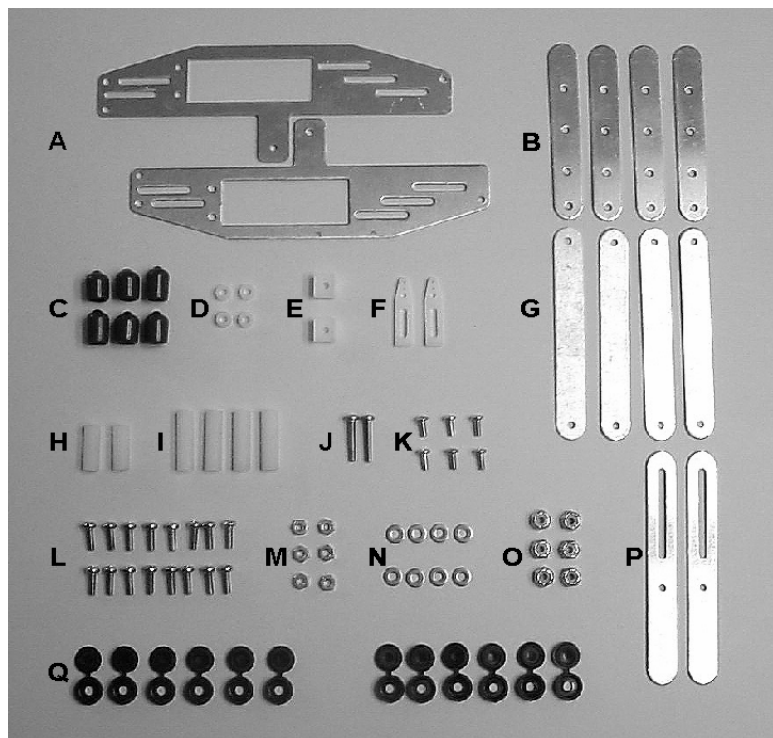


Fig #1

Step #1 Assembling the Crawler Sides

<u>Item</u>	<u>Qty</u>	<u>Description</u>
(I)	(4)	1 Inch Standoff
(H)	(2)	3/4 Inch Standoff
(L)	(6)	M3x10 Phillips Pan Head Screw
(A)	(2)	Crawler Side

Use **Fig #2** as a guide to install the Nylon standoffs (H & I) using the screw (L) to the Crawler sides (A). The shorter standoffs (H) go towards the center, and the longer standoffs (I) are mounted to the left & right. Tighten them firmly.

Each side panel should be a mirror image of the other. Before moving on position the pieces exactly as they appear in **Fig #3** and double check your work. Next move on to **Step #2**.

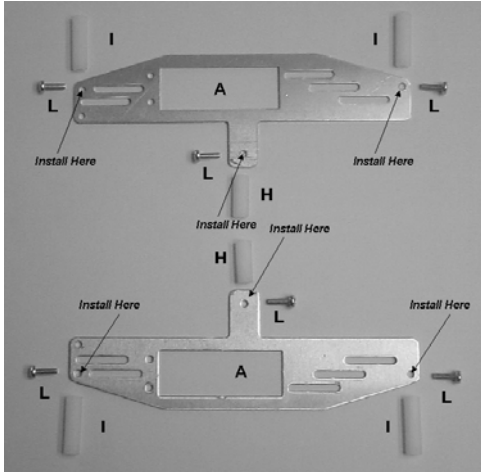


Fig #2

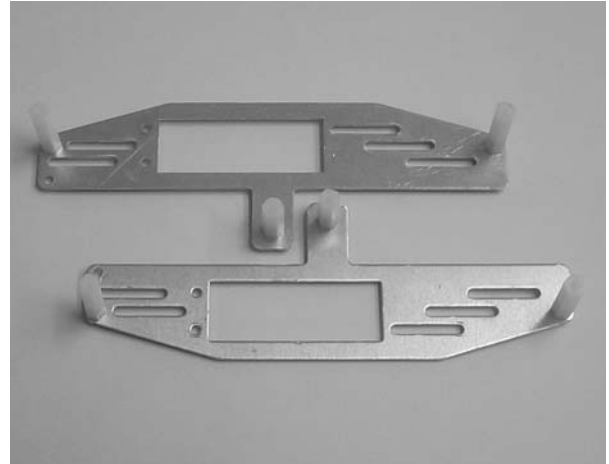


Fig #3

Step #2 Installing the Legs

<u>Item</u>	<u>Qty</u>	<u>Description</u>
(B)	(4)	Leg
(Q)	(4)	Plastic screw cover
(L)	(4)	M3x10 Phillips Pan Head Screw
(N)	(4)	Steel Washer

Use **Fig #4** as a guide install Leg (B) to standoff (I) Insert screws (L) through screw cover (Q) insert Screw through middle hole of Leg (B) add washer (N) Screw into standoffs (I) Tighten until leg can just rotate freely but is not sloppy.

Before continuing, position the pieces exactly as they appear in **Fig #5** and double check your work. Next move on to **Step #3**.

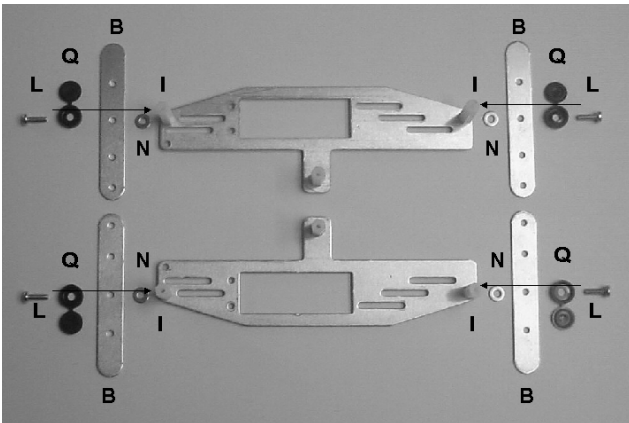


Fig #4

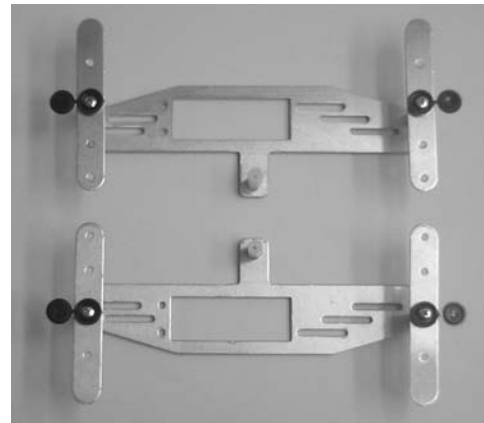


Fig #5

Step #3 Assembling Middle Legs

Item Qty Description

(J)	(2)	M3x18 Phillips Pan Head Screw
(Q)	(2)	Plastic screw covers
(G)	(4)	Push Arms
(N)	(2)	Steel Washer
(D)	(4)	1/8 Inch Nylon Spacers
(P)	(2)	Middle Legs
(F)	(2)	Servo Horn Arm
(O)	(2)	6/32 Nylon insert Lock Nuts

Use **Fig #6** as a guide to assemble the Middle Leg. Insert screw (J) through screw cover (Q) next insert screw through end holes of two pieces of (G). Add washer (N) then Nylon spacer (D) insert screw through middle hole of (P), add spacer (D) Screw into large hole on Servo Horn Arm (F), tighten until all parts can still rotate freely but are not sloppy. Next screw Locknut (O) onto Screw (J) with the nut **Reversed.** (See Fig #7)

Tighten against (F). Before continuing, position the pieces exactly as they appear in **Fig #7** and double check your work. Next move on to **Step #4.**

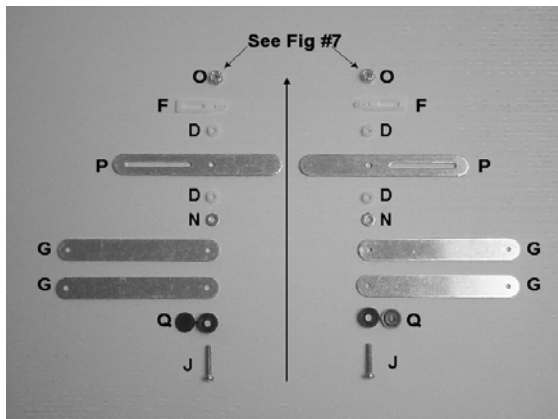


Fig #6

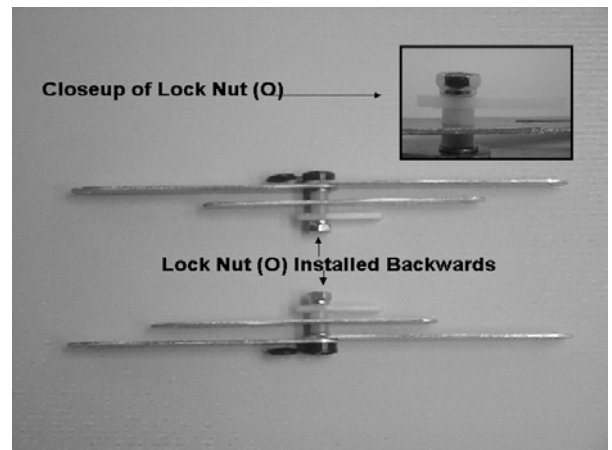


Fig #7

Step #4 Installing Middle Legs

Item Qty Description

(L)	(2)	M3x10 Phillips Pan Head Screw
(Q)	(2)	Plastic screw covers
(N)	(2)	Steel Washer

Use **Fig #8** as a guide to install the middle leg assembly you just built to standoff (H). Insert screw (L) through screw covers (Q), next insert screw through long slide hole of Leg assembly. Add washer (N), Screw into standoff (H). Tighten until leg can just slide freely but is not sloppy.

Before moving on position the pieces exactly as they appear in **Fig #9** and double check your work. Next move on to **Step #5.**

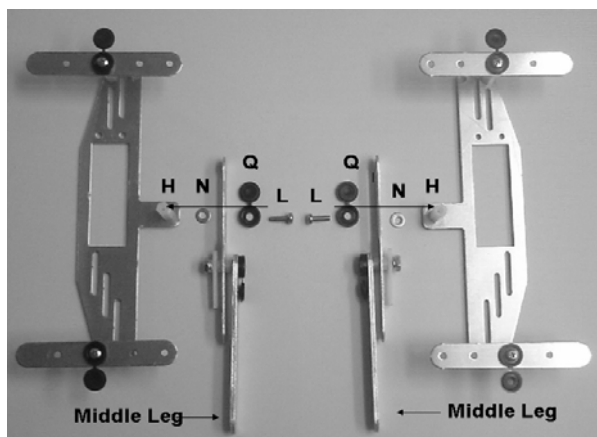


Fig #8

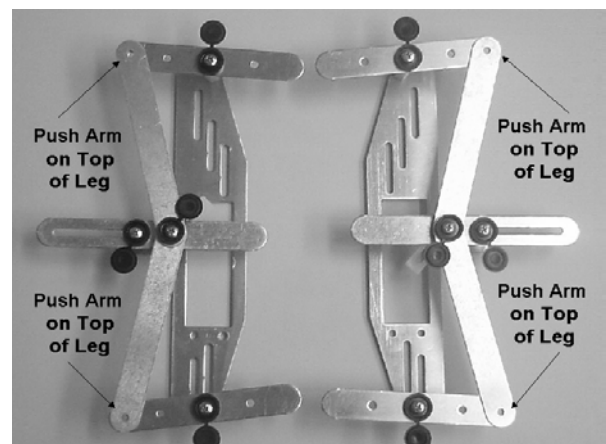


Fig #9

Step #5 **Connecting Push arms to Legs**

<u>Item</u>	<u>Qty</u>	<u>Description</u>
(L)	(4)	M3x10 Phillips Pan Head Screw
(Q)	(4)	Plastic screw covers
(O)	(4)	Nylon Lock Nuts

Use **Fig #10** as a guide to connect push Arms (G) to Leg (B). Be sure push arms are sitting on top of legs and holes are aligned. Insert screws (L) through screw covers (Q), next insert screw through hole of push arm and top hole on Leg then install Lock Nut (O) from back of leg. Tighten until legs can just move freely but are not sloppy.

Before moving on, position the pieces exactly as they appear in **Fig #11** and double check your work. Next move on to **Step #6**.

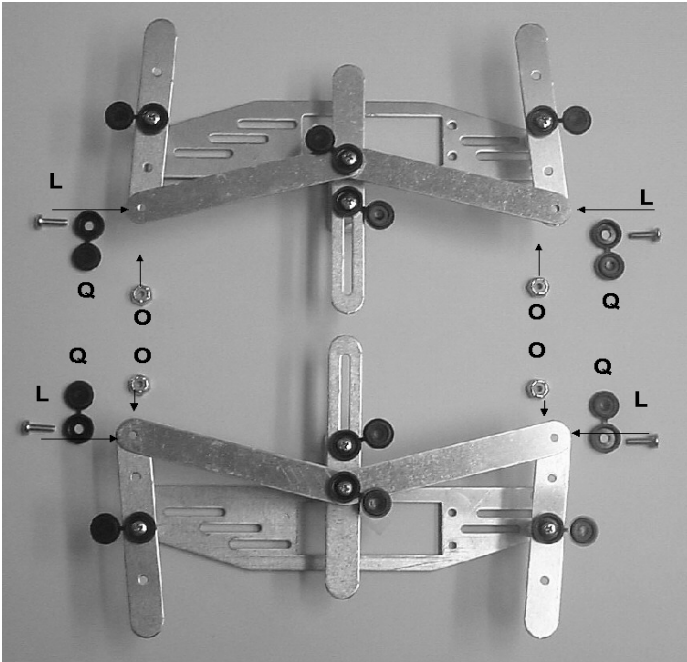


Fig #10

Step #6 **Installing the Rubber Feet**

<u>Item</u>	<u>Qty</u>	<u>Description</u>
(C)	(6)	Rubber Feet

Use **Fig #12** as a guide to install the rubber feet (C) to Leg (B) and (P). Be careful not to bend the legs. Before moving on position the pieces exactly as they appear in **Fig #13** and double check your work. Next move on to **Step #7**.

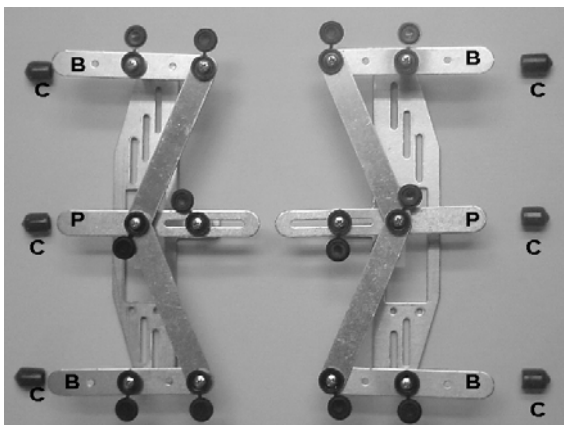


Fig #12

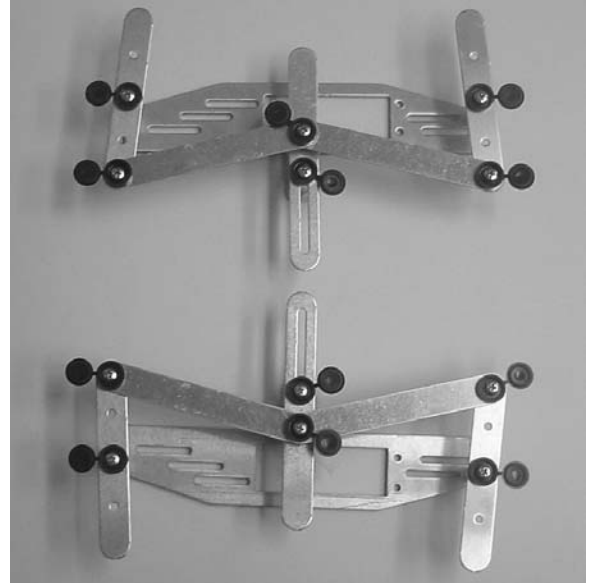


Fig #11

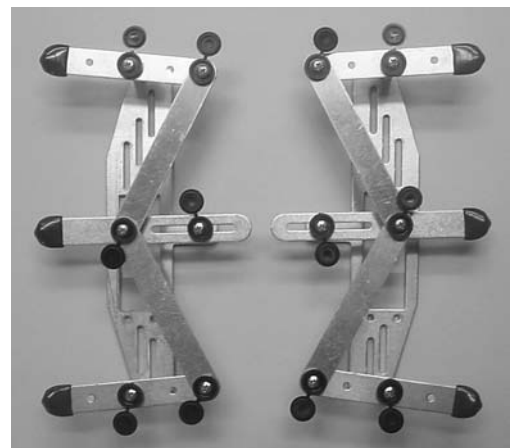


Fig #13

Use **Fig #14** as a guide. To complete the Crawler Kit upgrade, some simple changes must be made to your Boe-Bot. First, remove the wheels and ball caster. We recommend removing your Board of Education (BOE) to prevent the chance of damaging it during the installation. Next compare your servo installation to **Fig #14** . If your servos are not installed to the outside of the body, they must be removed and reinstalled as shown. Next move on to **Step #8**

Step #7 Preparing your Boe-Bot

Item	Qty	Description
	(1)	Your Boe-Bot

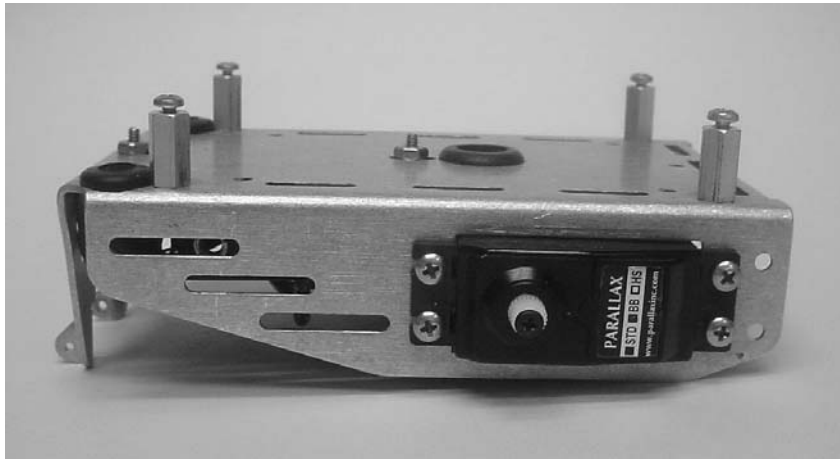


Fig #14

Step #8 Installing the Servo Horn

Item	Qty	Description
(E)	(2)	<u>Servo Horns</u>

Use **Fig #15** as a guide. The Servo Horn (E) is a press fitting. To install them, position the Servo Horns over the Servo Shafts. Insert the servo screw and begin to tighten. This will press the horn onto the shaft. Fit will be very tight. Be sure horn goes on as straight as possible. Compare your work to **Fig #16** . Next move on to **Step #9**

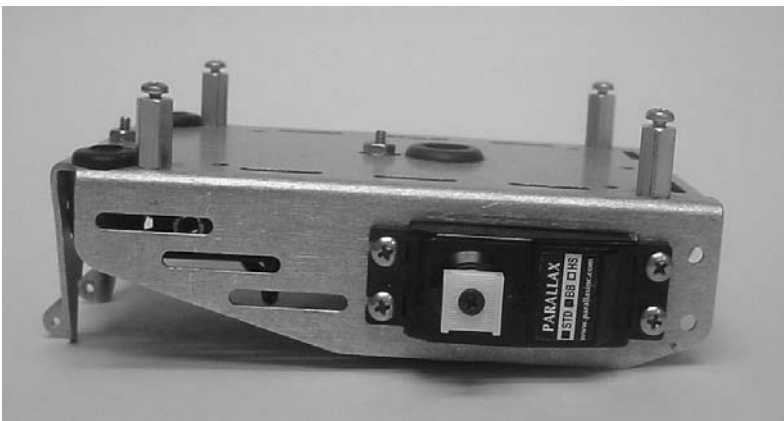


Fig #15

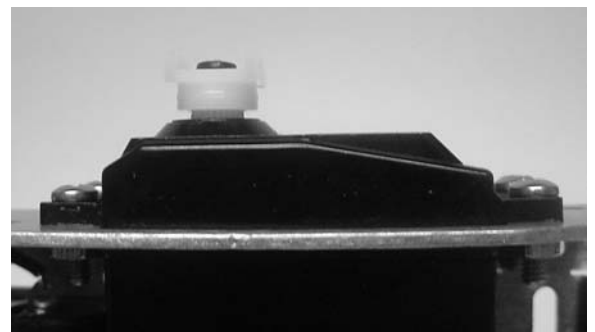


Fig #16

Step #9 Install Crawler Sides

<u>Item</u>	<u>Qty</u>	<u>Description</u>
(K)	(6)	4/40 Pan Head Screws
(M)	(6)	4/40 Hex Nuts

Use **Fig #17** as a guide. Line up the side panels to your Boe-Bot and secure with Screws (K) and Nuts (M). Next, remove the Servo Screw and secure Servo Horn Arm (F) to Servo Horn (E) Use **Fig #18** as a guide. Check all work and close the screw covers. Compare your work to **Fig #19** and **Fig #20**.

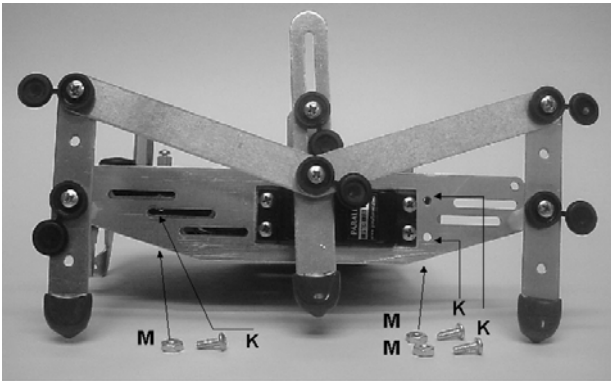


Fig #17

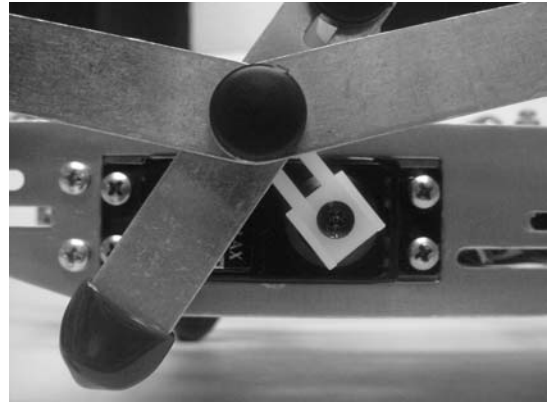


Fig #18

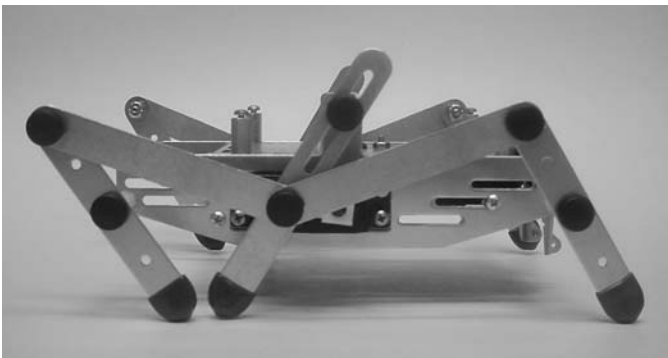


Fig #19

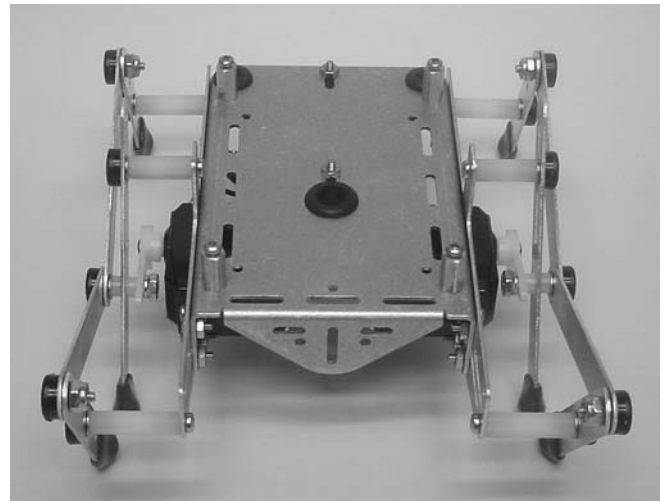


Fig #20

Step #10 **Install the BOE**

<u>Item</u>	<u>Qty</u>	<u>Description</u>
(1)		Board of Education
(1)		Assembled Crawler Kit

Use **Fig #21** as a guide. Line up the holes in your BOE with standoffs on walker and secure with Screws. Next connect servos to servo port.

Congratulations, assembly is complete!

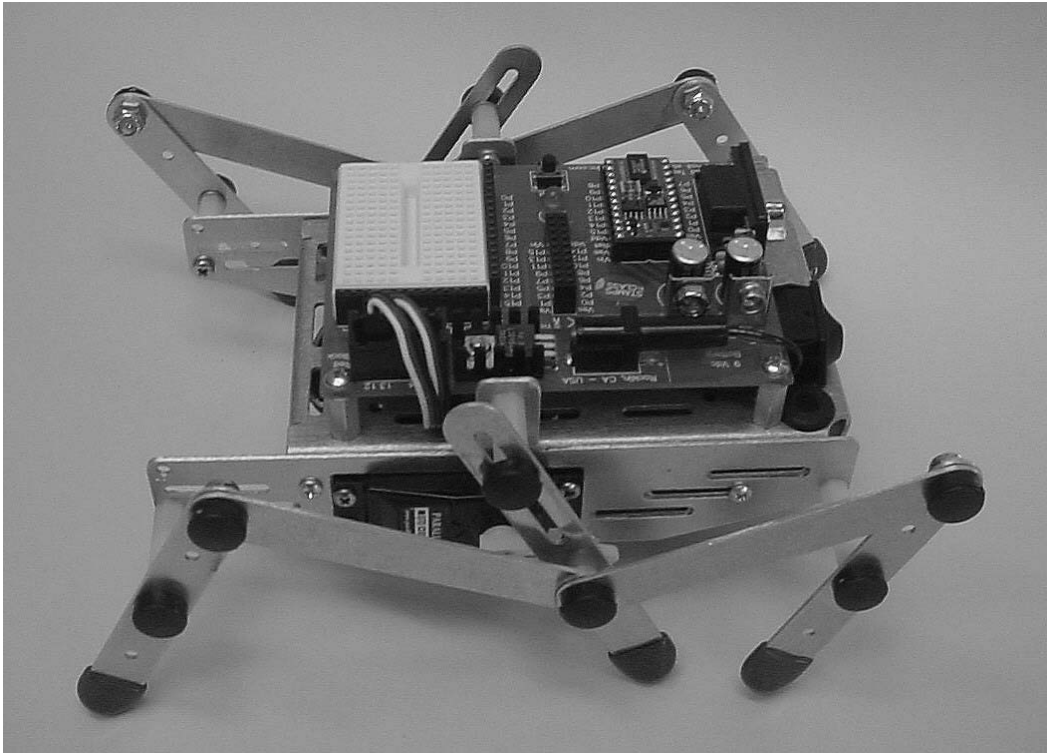


Fig #21

Troubleshooting your Crawler

The Crawler has been designed to be straightforward and very reliable. The information below will provide helpful assistance to troubleshoot the Crawler. This section covers the most common problems you might encounter.

Legs bind when walking (Check all joints and loosen as needed. Joints should always move freely without being too loose.)

Legs hit when walking (Improper assembly of unit or legs bent. Legs should never hit each other while moving)

Testing your Crawler

The Crawler can run any PBASIC program written for the Boe-Bot. This documentation includes a simple test program as an example.

This program commands the Boe-Bot Crawler to perform the following movements:

1. Walk Forward
2. Pause for 2 seconds
3. Turn left 90 degrees
4. Pause for 2 seconds
5. Turn right 180 degrees
6. Pause for 2 seconds
7. Turn left 90 degrees
8. Pause for 2 seconds
9. Walk Backwards
10. Stop

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The Boe-Bot Crawler is designed and manufactured by Michael Berta Enterprises. Documentation and photos are provided by MBE.

```
' BOE-BOT Walker Demo program'
'----- Declarations -----'
pulse_count var word
'----- Initialization -----'
low 12
low 13
'----- Main Rountine -----'
main:

forward:
for pulse_count = 1 to 100
pulsout 12,500
pulsout 13,1000
pause 20
next
pause 700

left_turn:
for pulse_count = 1 to 90
pulsout 12,500
pulsout 13,500
pause 20
next
pause 700

right_turn:
for pulse_count = 1 to 180
pulsout 12,1000
pulsout 13,1000
pause 20
next
pause 700

left_turn2:
for pulse_count = 1 to 90
pulsout 12,500
pulsout 13,500
pause 20
next
pause 700

backward:
for pulse_count = 1 to 100
pulsout 12,1000
pulsout 13,500
pause 20
next
pause 700
stop
```