










ORTOP Modular Robot v2.1

Parts List

<p>TETRIX™ Angles (144 mm) (W739072)</p> 	<p>Structural pieces feature 90° angles and heavy-duty aluminum construction. Can be cut to custom lengths with a metal-cutting blade.</p> <p>Arm Module: 1 Kit Total: 1</p> <p>Cost: \$10.36 (pkg of 2) Size: 144 mm x 16 mm</p>
<p>TETRIX™ Channels (32 mm) (W739065)</p> 	<p>Heavy-duty aluminum channel pieces are the structural base for building with the <i>TETRIX™ Robotics Design System</i>. Comes in five different lengths for flexible building – also, pieces can be cut to custom lengths with a metal-cutting blade.</p> <p>Arm Module: 1 Control Module: 1 Total Kit: 2</p> <p>Cost: \$9.56 (pkg of 2) Size: 32 mm x 32 mm x 32 mm</p>
<p>TETRIX™ Channels (160 mm) (W739067)</p> 	<p>Heavy-duty aluminum channel pieces are the structural base for building with the <i>TETRIX™ Robotics Design System</i>. Comes in five different lengths for flexible building – also, pieces can be cut to custom lengths with a metal-cutting blade.</p> <p>Arm Module: 2 Kit Total: 2</p> <p>Cost: \$14.36 (pkg of 2) Size: 96 mm x 32 mm x 32 mm</p>
<p>TETRIX™ Channels (288 mm) (W739068)</p> 	<p>Heavy-duty aluminum channel pieces are the structural base for building with the <i>TETRIX™ Robotics Design System</i>. Comes in five different lengths for flexible building – also, pieces can be cut to custom lengths with a metal-cutting blade.</p> <p>Arm Module: 1 Chassis Module: 2 Kit Total: 3</p> <p>Cost: \$23.96 (pkg of 2) Size: 288 mm x 32 mm x 32 mm</p>

<p>TETRIX™ Flat Bars (W739070)</p> 	<p>These structural pieces are 288 mm long and made of heavy-duty aluminum. Can be cut to custom lengths with a metal-cutting blade.</p> <p>Control Module: 1 Chassis Module: 2 Kit Total: 3</p> <p>Cost: \$8.76 (pkg of 2) Size: 288 mm x 16 mm</p>
<p>TETRIX™ Flat Building Plates (W739073)</p> 	<p><i>Flat Building Plates</i> are 64 mm x 192 mm and made of heavy-duty aluminum. Can be cut to custom lengths with a metal-cutting blade.</p> <p>Arm Module: 1 Control Module: 1 Kit Total: 2</p> <p>Cost: \$11.96 (pkg of 2) Size: 128 mm x 64 mm</p>
<p>TETRIX™ Stand-Off Posts (1") (W739102)</p> 	<p>Hex stand-off posts; female/female, 6-32.</p> <p>Control Module: 2 Kit Total: 2</p> <p>Cost: \$3.16 (pkg of 12) Size: 1"</p>
<p>TETRIX™ 12V Rechargeable NiMh Battery Pack (W739057)</p> 	<p>Use this 10-cell, 12-volt, 3000 mAh, NiMH pack with built-in 20-amp replaceable fuse for safety to power the <i>HiTechnic DC Motor</i> and <i>Servo Controllers</i>.</p> <p>Control Module: 1 Kit Total: 1</p> <p>Cost: \$31.96</p>
<p>TETRIX™ DC Drive Motor (W739083)</p> 	<p>12-volt DC motor features 152 rpm and 300 oz-in. of torque.</p> <p>Chassis Module: 2 Kit Total: 2</p> <p>Cost: \$23.96 Rated Voltage: 12-volt DC Torque: 300 oz-in.</p>





<p>TETRIX™ Motor Mount (W739089)</p> 	<p>Attaches the <i>DC Drive Motor</i> to your robot. Includes the <i>Motor Mount</i>, two <i>kep nuts</i>, and two <i>cap screws</i>.</p> <p>Chassis Module: 2 Kit Total: 2</p> <p>Cost: \$15.96</p>
<p>TETRIX™ Servo (W739080)</p> 	<p>This servo with horn has a 180° turn radius.</p> <p>Arm Module: 2 Kit Total: 2</p> <p>Cost: \$19.96</p>
<p>HiTec Servo Horn (W739020)</p> 	<p>Forget those plastic servo horns! This heavy-duty aluminum servo horn lends extra strength to your servo applications.</p> <p>Arm Module: 2 Kit Total: 2</p> <p>Cost: \$4.76</p>
<p>TETRIX™ Servo Extension (W739081)</p> 	<p>Give your servo a little more room to roam with this extension.</p> <p>Arm Module: 1 Kit Total: 1</p> <p>Cost: \$1.56</p>
<p>HiTechnic DC Motor Controller (W991444)</p> 	<p>The <i>HiTechnic DC Motor Controller</i> for <i>TETRIX™</i> connects to an <i>NXT</i> sensor port and will enable you to control powerful DC gear motors for use with <i>TETRIX</i> robots. The controller has two H-bridge outputs to control the speed and direction of two DC gear motors and is designed to connect to the <i>TETRIX</i> hole pattern. A four-motor robot can also be built by paralleling two motors to one channel. A total of four <i>DC Motor Controllers</i> for <i>TETRIX</i> and/or <i>Servo Controllers</i> for <i>TETRIX</i> can be daisy-chained to provide additional motor and/or servo outputs.</p> <p>Control Module: 1 Kit Total: 1</p> <p>Cost: \$63.96</p>

<p>HiTechnic Servo Controller (W991445)</p> 	<p>The <i>HiTechnic Servo Motor Controller</i> for <i>TETRIX™</i> will enable you to control up to six R/C-type servo motors for use with <i>TETRIX</i> robots, enabling you to add proportional positioning to your robotic creations. A total of four <i>DC Motor Controllers</i> and/or <i>Servo Controllers</i> for <i>TETRIX</i> can be daisy-chained to provide additional motor and/or servo outputs. The controller connects to an <i>NXT</i> sensor port.</p> <p>Control Module: 1 Kit Total: 1</p> <p>Cost: \$63.96</p>
<p>TETRIX™ On/Off Switch (W739129)</p> 	<p>Controls the power from the battery pack.</p> <p>Control Module: 1 Kit Total: 1</p> <p>Cost: \$5.56</p>
<p>TETRIX™ Motor Power Cable (W739084)</p> 	<p>For use with the <i>DC Drive Motor</i>.</p> <p>Chassis Module: 2 Kit Total: 2</p> <p>Cost: \$1.56</p>
<p>TETRIX™ Single-Servo Motor Brackets (W739060)</p> 	<p>Heavy-duty aluminum brackets each hold one servo in place.</p> <p>Arm Module: 2 Kit Total: 2</p> <p>Cost: \$8.76</p>
<p>TETRIX™ Flat Brackets (W739061)</p> 	<p>Perfect for connecting structural elements or for creating a servo leverage arm. Made of heavy-duty aluminum.</p> <p>Arm Module: 4 Kit Total: 4</p> <p>Cost: \$5.56 (pkg of 2)</p>

<p>TETRIX™ L Brackets (W739062)</p> 	<p>Brackets with 90° angles connect structural elements. Made of heavy-duty aluminum.</p> <p>Arm Module: 3 Kit Total: 3</p> <p>Cost: \$4.76 (pkg of 2)</p>
<p>TETRIX™ 3" Wheel (W739025)</p> 	<p>Add some mobility to your <i>TETRIX™</i> robot with these wheels that come in two sizes.</p> <p>Chassis Module: 4 Kit Total: 4</p> <p>Cost: \$15.96 Diameter: 3"</p>
<p>TETRIX™ Axles (W739088)</p> 	<p>Attach wheels and gears with these 100 mm axles.</p> <p>Arm Module: 3 Chassis Module: 4 Kit Total: 7</p> <p>Cost: \$14.36 (pkg of 6)</p>
<p>TETRIX™ Bronze Bushings (W739091)</p> 	<p>Bronze axle bushings are greased to reduce friction.</p> <p>Arm Module: 12 Chassis Module: 6 Kit Total: 18</p> <p>Cost: \$12.76 (pkg of 12)</p>
<p>TETRIX™ Axle Set Collars (W739092)</p> 	<p><i>Axle Set Collars</i> lock a rotating axle to secure the horizontal alignment.</p> <p>Arm Module: 6 Chassis Module: 4 Kit Total: 10</p> <p>Cost: \$3.16 (pkg of 6)</p>

<p>TETRIX™ Gears (40-tooth) (W739028)</p> 	<p><i>TETRIX™ Gears</i> are a step above kits and systems with plastic gears – these are made of heavy-duty aluminum and really stand up to wear and tear. Three sizes available.</p> <p>Chassis Module: 2 Kit Total: 2</p> <p>Cost: \$23.16 (pkg of 2) Number of Teeth: 40</p>
<p>TETRIX™ Gear (80-tooth) (W739086)</p> 	<p><i>TETRIX™ Gears</i> are a step above kits and systems with plastic gears – these are made of heavy-duty aluminum and really stand up to wear and tear. Three sizes available.</p> <p>Chassis Module: 2 Kit Total: 2</p> <p>Cost: \$19.96 Number of Teeth: 80</p>
<p>TETRIX™ Gear Hub Spacers (W739090)</p> 	<p>Provides adequate spacing between wheels and gears. Includes four 1 ¼" cap screws for each spacer.</p> <p>Arm Module: 2 Chassis Module: 4 Kit Total: 6</p> <p>Cost: \$6.36 (pkg of 2)</p> <p>Note: This kit only uses 13 of the 24 screws that come with the 6 spacers: 8 for the chassis and 5 for the arm.</p>
<p>TETRIX™ Motor Shaft Hubs (W739079)</p> 	<p>Attach wheels and gears to motor shafts with these hubs. Each hub comes with a screw and is made of heavy-duty aluminum.</p> <p>Chassis Module: 2 Kit Total: 2</p> <p>Cost: \$6.36 (pkg of 2)</p>
<p>TETRIX™ Split Clamps (W739078)</p> 	<p>Used to attach gears and wheels to axles and axles to structural elements. Features heavy-duty aluminum construction.</p> <p>Chassis Module: 4 Kit Total: 4</p> <p>Cost: \$6.36 (pkg of 2)</p>
<p>TETRIX™ Axle Spacers (1/8") (W739100)</p> 	<p>These spacers are handy when you need a little space between wheels, gears, and other elements on axles.</p> <p>Arm Module: 2 Kit Total: 2</p> <p>Cost: \$1.56 (pkg of 12) Size: 1/8"</p>

<p>TETRIX™ Axle Spacers (3/8") (W739101)</p> 	<p>These spacers are handy when you need a little space between wheels, gears, and other elements on axles.</p> <p>Arm Module: 1 Kit Total: 1</p> <p>Cost: \$0.76 (pkg of 6) Size: 3/8"</p>
<p>TETRIX™ Socket Head Cap Screws (5/16") (W739098)</p> 	<p>These 6-32 <i>Socket Head Cap Screws</i> connect your robot design. Requires hex keys, sold separately, to tighten and loosen the screws.</p> <p>Arm Module: 14 Kit Total: 14</p> <p>Cost: \$9.56 (pkg of 100) Size: 5/16"</p>
<p>TETRIX™ Socket Head Cap Screws (1/2") (W739097)</p> 	<p>These 6-32 <i>Socket Head Cap Screws</i> connect your robot design. Requires hex keys, sold separately, to tighten and loosen the screws.</p> <p>Arm Module: 2 Chassis Module: 29 Control Module: 3 Final Assembly: 4 Kit Total: 38</p> <p>Cost: \$8.76 (pkg of 100) Size: 1/2"</p>
<p>TETRIX™ Button Head Cap Screws (W739111)</p> 	<p>These 6-32 screws feature a low-profile head – great for areas where moving parts are close to the screw heads.</p> <p>Arm Module: 12 Chassis Module: 2 Control Module: 4 Kit Total: 18</p> <p>Cost: \$7.16 (pkg of 50) Size: 3/8"</p>
<p>TETRIX™ Kep Nuts (W739094)</p> 	<p><i>Kep Nuts</i> feature a star washer that locks down on the heavy-duty aluminum structural elements for added strength to any <i>TETRIX™</i> robot design.</p> <p>Arm Module: 37 Chassis Module: 12 Control Module: 3 Final Assembly: 8 Kit Total: 60</p> <p>Cost: \$2.36 (pkg of 100)</p>

<p>Hook-and-Loop Fastener (W751974)</p> 	<p>Great for a multitude of applications! One 10-foot strip of each material. 3/4" wide.</p> <p>Chassis Module: 6" (hook side) Control Module: 6" (loop side) Kit Total: 6"</p> <p>Cost: \$18.36 (10' of each) Size: 3/4" wide x 10 feet</p> <p>Note: The hook-and-loop fastener material may already be adhered to the chassis, battery and CPU. If so, please do not remove them.</p>
<p>LEGO® Hard Point Connector (W739120)</p> 	<p>The new <i>Hard Point Connector</i> takes LEGO MINDSTORMS® Education to a whole new level by allowing LEGO Technic elements to be connected to the revolutionary new metal building system, <i>TETRIX™</i> by Pitsco! The connector is key to giving students the ability to build more robust and real-world robotics creations.</p> <p>Arm Module: 1 Kit Total: 1</p> <p>Cost: \$9.60 (pkg of 12)</p>
<p>NXT Intelligent Brick (W979841)</p> 	<p>This state-of-the-art programmable intelligent brick serves as the brain for LEGO® Education robots. The brick features four input ports for taking in data and three output ports for distributing the data as commanded. Students transfer their programs from the computer to the brick using a USB cable or Bluetooth technology. With on-brick programming and a 32-bit microprocessor, this intelligent brick is ready for anything students might create! The brick is powered by six AA batteries or the 979798 <i>NXT Rechargeable Battery</i> (each sold separately).</p> <p>Control Module: 1 Kit Total: 1</p> <p>Cost: \$144.95</p>
<p>.2M NXT Connector Cable (W991300)</p> 	<p>Available in three lengths, these connector cables were designed specifically for use with the <i>NXT Brick</i>. Already included in the LEGO® MINDSTORMS® <i>Education NXT Base Set</i> are one .2M cable, two .5M cables, and four .35M cables. Use these cable packs to supplement your cable selection.</p> <p>Control Module: 1 Kit Total: 1</p> <p>Cost: \$10.00 (pkg of 3)</p>

<p>4297209 Tire balloon wide 4297210 Rim wide w. cross</p> 	<p>Arm Module: 1 Kit Total: 1</p>
<p>O-Ring</p> 	<p>Arm Module: 2 Kit Total: 2</p>
<p>Small Wide Tire & Hub (W991331)</p> 	<p>Arm Module: 1 Kit Total: 1</p>
<p>Angle Beam</p> 	<p>Arm Module: 1 Kit Total: 1</p>
<p>Friction Peg</p> 	<p>Arm Module: 3 Kit Total: 3</p>
<p>Rubber Band</p> 	<p>Final Assembly: 1 Kit Total: 1</p>