Materials Required

Track

- 4' x 18" x 1" thick Medium Density Fiberboard (MDF)
- 2' x 3/4" thick MDF
- (20) 2" x 1" x 1/8" rare Grade N42 NdFeB magnets
- (54) 1" x 1/4" x 1/16" Grade N42 NdFeB magnets
- (54) 1" x 1/4" 1/8" Grade N42 NdFeB magnets
- (104) or (156) 3/16" diameter x 1/2" long Grade N42 NdFeB magnets
- (2) 1-3/8" x 2-1/8" x 21" x 1/8" thick, L-shaped Acrylic sheet
- (8) #6 x 1-1/4" stainless steel, self-tapping screws
- (2) 1" x 1/4" diameter LEGO pneumatic tubing
- Two-part, two-ton epoxy
- Carpenter's Wood Glue

Car

- (2) LEGO 2-Hole Technic Beam
- (2) LEGO 5-Hole Technic Beam
- (2) LEGO Technic Connector Peg/Cross Axle (Element ID 4186017)
- (2) LEGO Technic Connector Peg with Friction (Element ID 4121715)
- (2) LEGO Technic Pin Towball with Friction (Design ID 6628)
- (2) LEGO Grey Pulley Wheels (LEGO Education W970018)
- LEGO 16 x 32 stud plate
- (5) LEGO 1 x 4 stud plate
- (2) LEGO 1 x 8 stud plate
- (4) LEGO 1 x 10 stud plate
- (4) LEGO 2 x 6 stud plate
- (4) LEGO 4 x 6 stud plate
- (2) LEGO 4 x 8 stud plate
- (2) LEGO 1 x 6 brick
- (6) LEGO 1 x 12 brick
- (2) LEGO 1 x 16 brick
- (2) LEGO 1 x 6 brick
- Additional LEGO bricks and stud plates per your design
- (4) 1" x 1" x 3/16" Grade N42 NdFeB magnets
- 2' x 1/2" x 3/4" x 1/16" aluminum channel
- 12" x 3/4" x 1/8" aluminum bar
- (9) #6 x 1/4" brass screws
- (9) 3/8" diameter brass washers
- (9) #6 brass nuts
- 12" x 1/4" inside diameter brass tubing
- (6) rolls x 400' x 30 gauge, enamel coated, copper (magnet) wire
- 1/4" x 3/16" x 8" bass wood
- 1/4" x 1/16" x 5" bass wood shims
- (2) 1/4" x 3/4" x 2", 5-ply marine grade plywood, or similar
- 6" x 12" x 1/32" thick plastic laminate
- 1/4" diameter x 1-1/2" hex bolt

Controller

- LEGO Power Functions Battery Pack
- LEGO Power Functions Remote Speed Controller
- LEGO Power Functions Infrared Receiver
- Arduino Duemilanova or Arduino Uno (Jameco # 2121105)
- (2) Arduino Protoshield Kit (Sparkfun # DEV-07914)
- (3) 16-Pin IC Socket (Fry's #2876844 )
- (3) Texas Instruments SN754410 Quadruple Half-H Drivers (Mouser Electronics 595-SN754410NE)
- (3) Header Socket for Hall Effect Sensors (NEED TO LOOK THIS UP)
- (3) Allegro Micro 1301UA Hall Effect Sensors (Digikey has these, but in min. quantities of 3,000)
- (12) 6-Pin extra tall stackable headers (Sparkfun # PRT-10007) (2 are included with each protoshield kit)
- (6) 8-Pin extra tall stackable headers (Sparkfun # PRT-10007) (2 are included with each protoshield kit)
- (3) 3-Pin Modular Headers (can be broken off long strips)
- (2) 6-Pin Modular Headers (can be broken off long strips)
- (2) 8-Pin Modular Headers (can be broken off long strips)
- (1) 100µF Capacitor (RadioShack #)
- (1) 1µF Capacitor (RadioShack #)
- (3) 0.1µF Capacitors (included in Protoshield Kits)
- (12) Diodes (NTE 116)
- (1) 330Ω 1/8 Watt Resistor (included in Protoshield Kits)
- (3) 220Ω 1/4 Watt Resistors (RadioShack #)
- (7) 10kΩ 1/4 Watt Resistors (RadioShack #)
- (6) Bi-Color (Red/Green) LEDs (Fry's 625632)
- (1) Yellow LED (included in Protoshield Kit)
- (1) Reset Switch (included in Protoshield Kit)
- Jumpers of various lengths
- 10' x Cat-5E Cable (mostly pulled apart for color-coded AWG-24-Guage Wire inside)

Tools

- Radio Arm Saw or Table Saw
- Hole Saw
- Power Drill
- Hacksaw
- File
- Router
- Countersink Bit
- Clamps
- Vice
- Soldering Iron
- Solder