

charlesg's electric vehicle newbie cheat sheet

and resources guide

An electric vehicle is a combination of mechanical systems, electronics, power and electrical systems, battery technology, and manufacturing & fabrication. So, building your own vehicle is a great way to gain a working knowledge in electric vehicle systems and provide a practical and useful product in the end. In the past five years, the market for electric vehicles has grown enormously. Businesses now cater specifically to the DIY EV enthusiast, and for the personal electric vehicle segment, inexpensive R/C model parts can even be used. This is a non-comprehensive list of useful websites and Internet retailers from which personal EV parts can be purchased.

Electric Power Systems

kellycontroller.com Kelly Controls sells EV motor controllers, throttles and pedals, and some drive motors. the **kbs** line is suitable for small e-bikes and e-scooters.

hobbyking.com is a Hong Kong based R/C Hobby supplier. While no EV grade components, some of their large aircraft motors have been successfully adapted to use in e-bikes and e-scooters. Their aircraft controllers can also be used in ground vehicles with some limitations. **Very inexpensive source of lithium ion batteries and charging supplies.**

robotmarketplace.com While the RobotMarketPlace caters more to mobile robotics, they have an extensive **dc** motor selection and controllers to match. Made-to-order battery service, general hobby supplies.

batteryspace.com A Chinese battery equipment supplier, they are a good source of single-pack chargers and battery pack making equipment.

Mechanical and Drivetrain

electricscooterparts.com Essentially one-stop shop for **wheels, belts and chain**, most scooter and bike peripherals.

surpluscenter.com Very inexpensive drivetrain components. **Chain and sprockets** are the most economical to buy here. Shafting, wheels, hubs, adapters. No gears and belts.

sdp-si.com Precision parts, timing belts and pulleys, gears. No chain.

mcmaster.com The undisputed leader of industrial components suppliers. Raw materials, chain and sprockets comp. to Surpluscenter. Poorer belt selection. All other drivetrain parts imaginable. Small hardware.

vxb.com Inexpensive ball bearings, mounted or unmounted. **Small metric bearings.**

Fabrication

bigbluesaw.com Custom online-quote interface for waterjet- and laser-cut parts. Atlanta local business. Use them to make frame parts and custom chassis components that are otherwise hard to manufacture by hand.

shapeways.com Custom 3d-printed parts according to your model in various materials. Structural ABS „Grey Robust“ and Nylon „White and Tough“ are useful for custom hubs and spacers, motor mounts, etc.

Knowledge Base and Reading

evalbum.com Mike Chancey's EV Album is an index of vehicles from across the world. Searchable by make/model, components used, location, etc. Great for idea harvesting.

Scooter Instructable at <http://www.instructables.com/id/The-New-and-Improved-Brushless-Electric-Scooter-Po/> or search „**Brushless Electric Scooter**“. Written by myself, a more comprehensive treatment of how to select parts and design some aspects of your vehicle.

Torque and Amp Hour Calculator <http://architeuthis-dux.org/torquecalc.asp> Originally designed for robots, calculates the maximum acceleration and top speed of your drivetrain. For EV usage, select **0.5 motors per side** for single motor vehicles, and change **Average % of Peak** to 5% (Peak current is „burnout“ or wheelspin current – very unrealistic for EVs!) and use „**Arena Size**“ as your desired distance, e.g. ¼ mile

Individual Builders

You're encouraged to document your build, no matter how novice, on the Internet!

Amy <amymakesstuff.com> Small and stealthy electric vehicles – electric pennyfarthing, small electric go-kart

Charles <etotheipiplusone.net> Specific section for electric vehicles – hub motor and conventional EVs.

Jed <mitrocketscience.blogspot.com> 4-wheel drive hub motor longboard, meticulous fabrication reports.

Jamison <thevariableconstant.blogspot.com> Hub motor drive and conventional drive scooters, electric longboard

Jerome <jeromedemers.com/blog/category/electric-scooter/> Electric scooter using model aircraft components

Julian <wattsdottime.blogspot.com> Custom motor development and vehicle application

Shane <scolton.blogspot.com> Custom hub motor scooters, custom motor inverter design, other projects.