

Tested

Brompton Freedom Power Assist

We've tested good, bad and indifferent bicycles over the years, many of them folding bikes, and many others electrically-assisted, but very few that were both.

Of that handful of folding electrics, only the Nano-Brompton really shone. It was light (well, fairly light), almost as compact as a normal Brompton (very compact in other words) and it went nearly 50 miles on a charge. The secret weapons included quite a large battery in the front pannier, a supremely efficient little Tongxin 210rpm motor, giving a top assisted speed of only 11mph, but stonking hill climbing, and a considerable range.

The magic part was that the Nano was a perfectly normal and rideable Brompton, so you could chug along at 14mph on the flat, but engage the motor to deal with headwinds, or keep speed generally above 10mph on hills, for which read *any* hills. Only 1:4 (25%) had any significant impact on our humble 3-speed bike, but even that proved quite manageable.

The Nano-Brompton was enormously popular, but for various reasons, the company wasn't able to keep up with demand, and the design was passed on to the Electric Wheel Company, where the design has been developed further. Since then, Dahon has launched the Boost, and everyone is now waiting to see what Brompton's own electric bike will be like, although a launch doesn't seem to be imminent.

Meanwhile, other Brompton-based designs continue to pop up, and the latest is the Freedom Ebike, designed by Andrew Hamilton, an Australian living in Israel, which gives the project an interesting international flavour. Andrew had been looking for ways to 'green' his transport, and tried the Segway briefly, but found the 42kg weight unmanageable ('It was cool, but impractical'). The Nano-Brompton sounded a much more useful machine, and he liked it so much he started building his own when production of the original Nano ceased.



Freedom Ebike

Like the Nano, the Freedom uses the Tongxin motor, which has been released in a narrow 75mm form since our original Nano test in June 2007. This narrower motor - also fitted to modern Nano machines - is significantly lighter, and makes the kit much easier to fit, because there's no longer any need to exchange your front forks for reworked wider examples. To accommodate the new motor, the normal forks only have to be sprung out by 5mm, a mere trifle in engineering terms.

Unusually (uniquely in the UK), the Freedom is fitted with an A123 battery pack, developed in the USA for portable power tools. These ground breaking lithium batteries can recharge very quickly, give a lot of power from a very small pack, and are claimed to have a life that far exceeds anything else. OK, we've heard most of that before, but there

does seem to be some evidence that they are lasting as well as was hoped.

Unfortunately, being designed for electric drills and the like, these are very small batteries. The Freedom comes with a tiny 91Wh pack weighing just under a kilogram, although these can be plugged together, so it's possible to carry two packs or more. Extra packs cost £110 plus £2

postage.

The bike, complete with motor and wiring is (oddy) a shade



The battery and controller (left) fit easily into a rear pocket of the Brompton pannier, connected by the socket to the motor (Below)

heavier than our original Nano at 14.7kg, but as the motor is definitely lighter, and gravity doesn't seem to have changed much, we must assume this donor bike is a little heavier. The tiny battery and controller live in one of the back pockets of the front Brompton bag, adding an extra 1.2kg, plus around 1.3kg for the bag, bringing the all-up weight to 17.2kg. Not quite the lightest electric bike we've seen, but inclusive of the battery, it's noticeably lighter than the Nano, and of course - like the Nano - you carry it in two packages, which makes life easier.

Unlike the Nano, where the



power from the battery runs through the Brompton's front carrier block (a superb innovation that works really well), there a simple connector that must be unclipped when the bag is removed. It's much quicker and easier to fit, and it means the battery can be swapped from bag to bag, but not half as sophisticated as the Nano solution. We were worried that we'd forget to unplug it, and pull the wires off. In a short test, we didn't, and we'll have to take Andrew's word that this doesn't happen.

"...Hills just whiz by, and our standard 1:6 restart proves a mere nothing..."

On the Road

Our test bike was fitted with a 260rpm motor, giving a top assisted speed of around 15mph, so the bike is much chirpier (and of course thirstier) than the Nano. It's possible to specify which type of motor you get, and we would certainly go for the 210rpm type giving around 12mph, because with this sort of bike, speed (and arguably range) are much less important than weight.

Range on our hilly course was quite limited with a single battery. On a very squally wet day, we managed seven miles, before changing over to a spare battery (phew!) and getting a further seven miles. Average speed was 13.8mph, broadly the same as the Nano, although in this case pedal effort was rather less because the higher motor gearing means the motor does more work.

On the road, the bike nips along just like the Nano, but faster. Hills just whiz by, and our standard 1:6 restart proved a mere nothing for the Freedom, as we had hoped. Charging takes place at about the same rate as that of typical big electric batteries, but these are so small that it's all over quite quickly. The claimed time is one hour 25 minutes, but our figures suggest something closer to one hour 45 minutes (in a very brief test, we didn't get a chance to confirm this).

Our running costs of 11.4p/mile include nominal depreciation of a host Brompton over ten years, and battery life of a year or 250 charges. On past form, Brompton depreciation should be nominal, and the A123 battery has a 12 month warranty, plus replacement at 30% of retail price in year two (but watch out - you have to pay transport costs). Battery life is claimed to be at least 1,000 charges, and if all the above turns out to be true, running costs fall to 5.5p/mile, making it one of the cheapest packages available.

Conclusion

The most tempting aspect of the Freedom package vis-a-vis the Nano is that it's much cheaper - currently £470 plus £25 postage for the kit (Andrew can also produce a fully fitted Brompton M3E and mail it out from Israel for around £1,150 plus £55 postage to the UK). By contrast, the more 'engineered' Nano kit costs £750 if our website is to be believed, but that price includes a much bigger 380Wh battery, which should give at least 30 miles range.

Not everyone wants that sort of range, of course, and if you only expect to use the bike for toddling a mile or four up hill to the shops a cheaper kit incorporating a smaller, lighter battery is a tempting option. It's all a matter of juggling the figures: with a single battery the Freedom costs £495 and gives a seven-mile range, and with a pair it costs £607 and gives a 14-mile range. If weight is a big issue, you want an economical power conversion (they don't come much cheaper), and you *really* don't expect to ride far, the Freedom is certainly worth considering.

Specification

Freedom Ebike (kit only) **£470** (plus £25 delivery) . **Weight** Bicycle **14.7kg** Battery & Bag **2.5kg**
Total **17.2kg (38lbs)** . **Battery** Li-ion . **Capacity** 91Wh . **Replacement** £110 (plus £2 postage)
Running costs 11.4p/mile . **Range** 7 miles **Charge Time** 1hr 25 mins . UK tel **0871 284 5225**
Israel tel **052 500 1309** web www.freedomebikes.com mail andrew@freedomebikes.com