



IPHONE INSURGENCY

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OUR 8TH ANNUAL TECH MELTDOWN

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+

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Print Your Own Steak!
 How 3D printers will shape your future



Charge of the bike brigade

LIKE THE IDEA OF CYCLING BUT AVERSE TO SWEATING? SOUNDS LIKE YOU NEED AN E-BIKE, SQUIRE



In central Europe electric bikes are a common sight – they make up around 15 per cent of the total market in Holland, for instance. Here in the UK, where we have hills and cycling is undergoing a resurgence, we're playing catch-up on this largely effort-free mode of transport.

The most popular type of e-bike is the pedelec, which combines pedal power with an electric motor; all the bikes on test here use this setup. EU legislation means their top speed is limited to 15mph but they will zip you away from traffic lights and cars pretty quickly. Are you ready to power up your commute? →

{CONTENDERS}
Enter the high-voltage velodrome...

STORCK RADDAR
MULTITASK SE
£2,699

AVE TH 5
LOWSTEP
£1,899

RALEIGH
LEEDS TOUR
£1,900

MOBIKY YOURI 3
SPEED 11AH
£1,299

GOCYCLE
G2R
£2,799



STORCK RADDAR MULTITASK SE

£2,699, STORCK-RADDAR.CO.UK

{SPECIFICATION}

FRAME 7005 alloy
FORK Alloy, rigid
GEARS Shimano Deore 30-speed
BRAKES Shimano Deore hydraulic disc
MOTOR 250W Raddar Sport
BATTERY 25.5v lithium polymer
MAX RANGE 62 miles
RECHARGE TIME 5 hours



{DIMENSIONS}



WHEEL SIZE 700mm
WEIGHT 18.5kg

{DETAILS}

1 BRAKES
 Shimano Deore hydraulic discs stop you in a trice

2 DISPLAY
 Battery life and your level of engine assistance show on the handlebars

3 BATTERY
 Lithium polymer power pack locks into the frame

4 GEARS
 The only derailleur-gear bike on test, with 30 gears to switch between

Looks like a traditional bike, but packs a futuristic e-boost...

German manufacturer Storck is renowned for building high-end road and time-trial bicycles. Its e-bikes are a collaboration with Swiss company Raddar and, of all the bikes on test, the Multitask SE looks, rides and handles the most like a conventionally-powered bicycle.

This is also the only bike tested to have its motor positioned on the rear wheel. Totally silent, the motor has an in-built torque sensor which reads the amount of force put through the pedals and applies assistance accordingly. Slogging up a steep hill, the Multitask will feel your pain and automatically give you a motorised boost. Don't appreciate the help? A thumb-controlled throttle allows you to easily tweak the level of motor power as you go.

The result is a ride almost unsurpassed in its smoothness and acceleration. At full power, you'll reach the 15mph legal limit in no time. Without the motor engaged however, and despite the presence of 30 gears, you will feel the burden of the heavy motor on the back wheel spoiling the fun somewhat.

There's no speedometer, so choosing the right power balance is imperative if you wish to keep on pedalling with motor assistance instead of sitting back and letting

the electrics do all of the work for you.

The finishing on the frame and fork is excellent. Being plastic powder-coated rather than painted means it can take some punishment. Front and rear Deore hydraulic disc brakes provide assured stopping and the Shimano group-set continues with Deore 30-speed gears and thumb shifters. High volume Big Apple tyres virtually eliminate the need for suspension and make for a very comfortable ride.

We were disappointed to see fittings in place for rim brakes on the frame and forks when there is no need for them on this model. Still, an electrifying ride.

LOVE Quality frame. Responsive torque-sensing motor. Handles like a traditional bike

HATE Without motor assistance the back wheel feels heavy. No speedometer. No mudguards or lights

T3 SAYS Equally at home on or off-road, this is a seriously capable, high spec cycle machine



{ACCESSORISE}

Macwet Climatec gloves

Made for biking Brits, the grip on these gloves increases in wet weather. Their Aquatec fabric isn't waterproof, but wicks water away to the surface.

£30, MACWET.COM



AVE TH 5 LOWSTEP

£1,899, EBCO-EBIKES.CO.UK

{SPECIFICATION}

FRAME Aluminium 6061 T6
FORK SR Suntour CR 8V,
 50mm travel
GEARS Shimano Nexus
 7-speed
BRAKES Tektro V
MOTOR 250W Bosch
 Centre Drive
BATTERY 36v lithium-ion
MAX RANGE 80 miles
RECHARGE TIME 3 hours



{DIMENSIONS}



WHEEL SIZE 660mm
WEIGHT 26kg

{DETAILS}

1

BRAKES

Tektro V brakes provide adequate, rather than confident, stopping power

2

DISPLAY

Check speed, battery power or switch travel modes on the go

3

GEARS

Seven-speed grip-shift gears are great for hills

4

BATTERY

Stowed safely beneath a useful pannier rack

Heavy and powerful, the AVE is one brute of an electric bike

With its step-through frame, continental looks and considerable weight – a hefty 26 kilos – you'd imagine the AVE TH 5 to be a pretty ponderous machine. Whack it into its fastest travel mode and start pedalling, though, and this German bike will leave many others standing at the traffic lights.

A Bosch-made motor is at the heart of things and with its 250W power and dependable performance, it's not hard to see why this maker of everything from washing machines to power drill pepper mills is the most popular e-bike electronics system.

Like the Raleigh (p132), the AVE's motor provides power and pedal assistance directly through the cranks rather than the wheels. The advantage of this motor position is that, when travelling over the EU speed restriction of 15mph, the bike still feels well balanced with the motor located centrally.

The electronic display on the handlebars shows your current speed, the remaining charge – you get an impressive 80 miles on a full battery – and your current engine mode (eco, tour, sport or speed). You can switch between the four different ride modes whilst cycling, as easily as changing gears.

It may be simple to control, but the AVE is not as easy to carry. This is not a carbon fibre beauty; in fact it's the equivalent of lugging a heavy sack of potatoes up your apartment block's stairs or onto the train. It's just not practical.

The AVE's extra pounds also add some concerns when wanting to come to a sudden halt. Fortunately, the Tektro V brakes do a reasonable job, though hydraulic discs would make for more confident stopping.

The aluminium frame comes in two sizes (26- and 28-inch), with adjustable seat and bar height and angle providing a bike fit that will suit just about everyone short of full-on weaklings.

LOVE Impressive maximum range. Plenty of grunt when you need it. Dynamo-powered lighting system
HATE Heaviest bike on test. Disc brakes would be a welcome addition. Slight mum-bike looks
T3 SAYS A dependable, if hefty, workhorse for rides in the city and beyond



{ACCESSORISE}

Rapha long sleeve shirt

A fast-drying and breathable blend of cotton, polyester and elastane, plus a sharp, urbanite cut, make this shirt ideal for sweat-inducing commutes.

£100, RAPHA.CC



RALEIGH LEEDS TOUR

£1,900, RALEIGH.CO.UK

{SPECIFICATION}

FRAME Aluminium
FORK Aluminium, rigid
GEARS Shimano Nexus 7-speed
BRAKES Concept SL V
MOTOR 250W Panasonic
BATTERY 26v lithium-ion
MAX RANGE 50 miles
RECHARGE TIME 5 hours



{DIMENSIONS}



WHEEL SIZE 660mm
WEIGHT 22kg

{DETAILS}

1 BRAKES
 Low-spec V brakes still manage well

2 DISPLAY
 Check battery power and switch engine mode

3 BATTERY
 Pretty chunky, adding extra weight, but it is coloured to match the bike

4 GEARS
 Shimano hub gears make for a reliable and low maintenance system

An affordable e-bike with all the trimmings, but little spark

The Leeds Tour may not sound as glamorous as the Tour de France, but it is the name of Raleigh's top-of-the-range, flagship e-bike. Rather than using the Bosch motor system, favoured by AVE amongst others, Raleigh has gone with another electronic giant: Panasonic.

Positioned out of the way behind the seat tube, the Panasonic engine's battery locks into place and is easy to remove and charge indoors overnight. The motor has three power modes – high, mid and low – with Raleigh claiming ranges of 25, 35 and 50 miles respectively. That's not the furthest range on test, but a respectable one.

The thumb-operated motor controls are mounted on the left of the handlebars, where you'll also see the remaining battery charge. When you want to quickly pedal away from a standing start, switch to high power and after a couple of strong pedal rotations you'll get a satisfying surge of electric assistance to help you on your way. Once travelling at your chosen speed, you can switch to a lower power mode, which increases battery life.

The Leeds Tour's swept-back handlebars give the bike a pleasant cruising feel and affords the rider an easy riding position, while

SL V brakes provide decent stopping power.

Seven-speed hub gears provide plenty of options in varied terrain and Schwalbe's Big Apple tyres, combined with a suspension seatpost and a well-padded seat, give a comfortable ride even over broken surfaces and inner city potholes.

This is a bike designed for city riding, so the rear pannier rack is a handy addition. Mudguards, a kickstand and a pair of dynamo-powered LED lights complete the package, making this an affordable bike for electric newbies. The relatively basic spec, bland look and overall weight may put off serious roadies, though.

LOVE A comfortable and efficient ride. Comes with dynamo-powered lights. Reliable Shimano gears

HATE Uninspiring utilitarian looks. Heavy, with a chunky battery charger

T3 SAYS A comprehensive e-bike, but with a less-than-electrifying spec list



{ACCESSORISE}

Brooks Islington bag

Like Raleigh, Brooks epitomises British cycling. This waxed cotton, leather and canvas rucksack is no exception. One for wealthy, gentleman cyclists.

£264, BROOKSENGLAND.COM



MOBIKY YOURI 3 SPEED 11AH

£1,299, EBCO-EBIKES.CO.UK

{SPECIFICATION}

FRAME Aluminium 6061
FORK SR Aluminium
GEARS Shimano Nexus
 3-speed
BRAKES Tektro V
MOTOR 250W Tongsheng
 TSD 100F
BATTERY 24v lithium-ion
MAXIMUM RANGE 37 miles
RECHARGE TIME 6 hours



{DIMENSIONS}



WHEEL SIZE 406mm
WEIGHT 18.5kg

{DETAILS}

1

BRAKES

The levers have some play in them, but the Tektro V brakes still do a decent job

2

DISPLAY

Shows engine level and remaining battery

3

BATTERY

The box-like battery's external cabling detracts from the bike's cool look

4

GEARS

Nexus three-speed hub is reliable, but limited

The fun, fold-up electric bike for inner-city commuters

Like Jacques Tati and Serge Gainsbourg, the folding bikes from this French manufacturer have acquired something of a cult status. Purely human powered Mobikys have been around since the 1990s, but now three electrically assisted versions are also available; the Youri 3 Speed 11 AH, tested here, being the mid-priced model in the range.

While it may cause a little Tati-style head scratching at first, the Mobiky takes just a few seconds to fold or unfold once you get the knack, but is a little heftier than it looks.

Like the folding mechanism, riding the bike may also take a little getting used to. The small wheel size and the frame's low centre of gravity make the handling feel twitchy. Once you get the hang of it though, the bike's nimble nature is great fun and it has a really tight turning circle. Despite lacking suspension, the chunky tyres make for a comfortable ride on any road surface.

The electric motor has three levels of assistance that can easily be switched between as you ride. The motor does not kick in until you complete a few pedal rotations, but on the highest assistance setting the power surge quickly propels you forward.

There is also a 6km/h button which, when held down, will keep the bike trundelling along beside you at walking pace. Use it striding along the pavement and onlookers will think you have a very well-trained bike.

Battery life is visible on the handlebars' instrument display. It's a good idea to keep an eye on it, as the battery's 37-mile range is the shortest on test.

Mudguards, LED lights, a kickstand and a hook to hang your briefcase on are included. Easy to store and charge under your desk, the Mobiky has undeniable charm, but its three-speed gears and occasionally rickety frame make it one for short journeys only.

LOVE Playful handling and an ingenious folding mechanism. Design has cult appeal

HATE Short range and slow recharging. Disconcerting frame rattles. Fairly heavy

T3 SAYS A bright spark of a fold-up bike that's ideal for shorter trips



{ACCESSORISE} Vulpine tailored trousers

Respectable in the office yet helpful on the road, with reflective piping up the inside of each leg, magnetic closures on the pockets and a water-resistant fabric.

£120, VULPINE.CC



GOCYCLE G2R

£2,799, GOCYCLE.COM



{SPECIFICATION}
FRAME Magnesium injection moulding
FORK Magnesium injection moulding
GEARS Shimano Nexus 3-speed
BRAKES Hydraulic disc
MOTOR 250W Gocycle G2
BATTERY 22v lithium-ion
MAX RANGE 40 miles
RECHARGE TIME 5.5 hours



{DIMENSIONS}



WHEEL SIZE 508mm
WEIGHT 15.6kg

{DETAILS}

1 BRAKES
 Hydraulic disc brakes make stopping safe and quick

2 DISPLAY
 Check battery power, or head to Gocycle's app for more readouts

3 BATTERY
 The moulded frame neatly houses the battery and all necessary cables

4 GEARS
 Switch between the three gears with a button push

It's the bike from the future that you can buy today

It may resemble a two-wheeled relative of the Sinclair C5 at first glance, but the Gocycle is actually the brainchild of an ex-McLaren F1 designer. Its sleek appearance looks every inch the futuristic transport solution. At 15.6kg, it's also the lightest bike here.

While it took a few minutes to fully assemble, we were pleased with the simplicity of putting it together, particularly the easily removable Pitstop wheels, which snap back into place with minimum fuss. While we wouldn't class the Gocycle as a folding bike, being able to break it down for storage, charging or transport is a handy feature.

Once out on the streets, the bike handled like a charm. It's blessed with standard bike dimensions; the wheels are slightly smaller, but not BMX-like, and it delivers a comfortable ride, with a tight turning circle that makes it adept in traffic. Fat tyres and rear suspension make rough-surface travelling bearable.

The front-wheel drive motor pulls you along with 250W, ably assisting your pedalling, while the additional boost button takes you to max speed in seconds.

Pushing the button on the right-hand side of the handlebars easily shifts you through

the three gears. A double tap takes you back down again, or the bike automatically shifts when you lose speed.

The engine has four ride modes with varying degrees of assistance, torque, cruising speed and battery economy, although you can expect a maximum of 40 miles from a full charge.

Engine modes can be adjusted using the console on the handlebars, or you can use the free iOS and Android app that links to the bike via Bluetooth. You can also choose to exceed the 15mph limit with the help of the app – all other bikes on test need to be jailbroken to do this. Cutting-edge features and a comfortable ride. Shockingly good.

LOVE Futuristic looks. Very smooth ride and excellent handling. The lightest e-bike currently on the market

HATE Lacks a speedometer. The battery cannot be removed for charging. No lights included

T3 SAYS Assured handling, advanced features and alluring looks. A top urban runaround



{ACCESSORISE} POC Receptor bike helmet

Makers of the time-trial helmets used by the Swedish cycle team in the 2012 Olympics, POC's commuting helmet is equally well designed. £100, POCSPORTS.COM





MAKE AND MODEL	STORCK RADDAR MULTITASK SE	AVE TH 5 LOWSTEP	RALEIGH LEEDS TOUR	MOBIKY YOURI 3 SPEED 11AH	GOCYCLE G2R
PRICE	£2,699	£1,899	£1,900	£1,299	£2,799
WEBSITE	STORCK-RADDAR.CO.UK	EBCO-EBIKES.CO.UK	RALEIGH.CO.UK	EBCO-EBIKES.CO.UK	GOCYCLE.COM
FRAME	Storck 7005 Alloy	Aluminium 6061 T6	Aluminium	Aluminium 6061	Magnesium injection moulding
FORK	Alloy, rigid	SR Suntour CR 8V, 50mm travel	Aluminium, rigid	SR Aluminium	Magnesium injection moulding
GEARS	Shimano Deore 30-speed	Shimano Nexus 7-speed	Shimano Nexus 7-speed	Shimano Nexus 3-speed	Shimano Nexus 3-speed
BRAKES	Shimano Deore hydraulic disc	Tektro V	Concept SL V	Tektro V	Hydraulic disc
MOTOR	Raddar Sport 250w	250W Bosch Centre Drive	250W Panasonic	250W Tongsheng TSD 100F	250W Gocycle G2
BATTERY	25.5v lithium-polymer	36v lithium-ion	26v lithium-ion	24v lithium-ion	22v lithium-ion
MAX RANGE	62 miles	80 miles	50 miles	37 miles	40 miles
BATTERY RECHARGE TIME	5 hours	3 hours	5 hours	6 hours	5.5 hours
WHEEL SIZE	700mm	660mm	660mm	406mm	508mm
WEIGHT	18.5kg	26kg	22kg	18.5kg	15.6kg
LOVE	Quality frame. Responsive torque-sensing motor. Handles like a traditional bike	Impressive maximum range. Plenty of grunt when you need it. Dynamo-powered lighting system	A comfortable and efficient ride. Comes with dynamo-powered lights. Reliable Shimano gears	Playful handling, ingenious folding mechanism. Design has cult appeal	Futuristic looks. Very smooth ride and excellent handling. The lightest e-bike currently on the market
HATE	Without motor assistance the back wheel feels heavy. No speedometer. No mudguards or lights	Heaviest bike on test. Hydraulic disc brakes would be a welcome addition. Slight mum-bike looks	Uninspiring utilitarian looks. Heavy frame, with a chunky battery charger	Short range and slow recharging. Disconcerting frame rattles. Fairly heavy	Lacks a speedometer. The battery cannot be removed for charging indoors. No lights included
T3 SAYS	Equally at home on or off-road, this is a seriously capable, high spec machine	A dependable, if hefty, workhorse for rides in the city and beyond	A comprehensive package, but with a less-than-electrifying spec list	A bright spark of a fold-up that's ideal for shorter trips and decently priced	Assured handling, advanced features and great looks. The urban runaround of the future
RATING	T3 ★★★★★	T3 ★★★★★	T3 ★★★★★	T3 ★★★★★	T3 ★★★★★

{REASONS}
Why the Gocycle G2R claims T3's yellow jersey...

- Clean, uncluttered, crisp, white design, with the battery and all wires stashed out of sight.
- Evenly distributed weight and a low centre of gravity make for very nimble handling.
- Three engine speeds and a dedicated boost button for speed off the lights.
- Free iOS and Android app links via Bluetooth and lets you customise your ride assistance program.
- Front and rear hydraulic disc brakes give you assured and confident stopping even at speed.
- The motor's torque sensor recognises the extent of your pedal power and assists accordingly.
- Electronic shifting gives seamless transition between the three gears.
- The G2R can be quickly taken apart and stored.
- You can go beyond the artificial 15mph limit if you're on private land.

{FINAL WORD}
THE ELECTRIC SWITCHOVER

There's no shame in a little electronic assistance every now and again. These bikes all provide a subtle boost when you're flagging, or in need of a speedy exit, but every cyclist is different. So, which one suits your style? Our winner, the Gocycle, is a high concept, futuristic mode of travel. Its look suits the city, while its excellent brakes and electronic gear shifts are ideal for navigating heavy traffic. The Storck Multitask is a more traditional-looking bike, with a high-end spec that's equally at home on the commute or exploring easy off-road trails. It's a great choice for those that want a battery boost attached to a bike that could pass for a regular road bike. It may be cursed with mum-on-a-school-run looks, but the AVE Lowstep is a very capable bike. It's heavy, but for short errands it's a dependable option. Then there's the Mobiky: a fold-up e-bike that's ideal for quick hops across the city and commuters that need to spend time on packed trains or tubes. Finally, the Raleigh Leeds Tour is a great starter pack for newbie cyclists wanting to go electric. It has dynamo lights and mudguards, but no real spark.

{FOCUS}
Want to get there under your own steam? Try these trad bikes...

- WHYTE M-109 S**
29-inch wheels, 100mm front and rear suspension, great component spec and agile handling. One of the fastest XC bikes around. £3,000, WHYTEBIKES.CO.UK
- GIANT DEFY 4**
A bike that punches well above its budget price. Great on slopes and copes well with iffy road surfaces. Ideal for long rides. £599, GIANT-BICYCLES.COM
- BROMPTON S6L-X**
The smallest and lightest folding bike on the market. Sonn dynamo front hub, Lumitec front light and six gears add extra appeal. £1,650, FOLDINGBIKES.CO.UK
- CHARGE MIXER**
A steel-framed steed for tough streets. With an eight-speed hub, hydraulic disc brakes it's bomb-proof and low maintenance. £1,200, CHARGEBIKES.COM