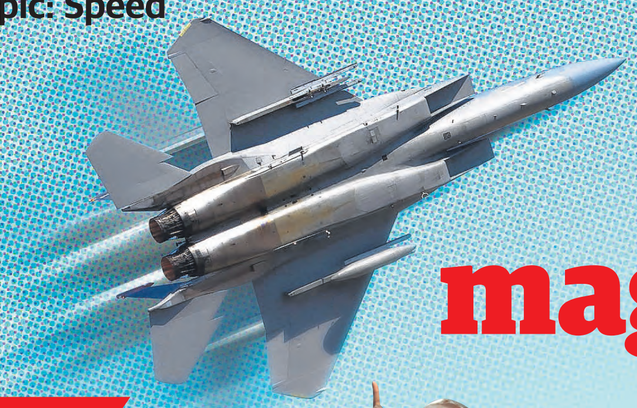
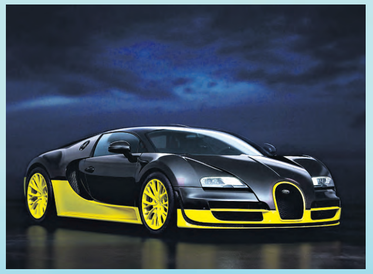


Attacking records in magnificent machines

There are people who dedicate their lives to building machines that will achieve the greatest speed. Heather Zubek looks at a variety of speed records as well as the people who continue to challenge them.



Record-breaking: Bugatti Veyron Supersport.

SPEEDY GLOSSARY

MACH: The ratio of the speed of a moving body to the speed of sound.

G-FORCE: Force of gravity on a body or the force of acceleration.

VELOCITY: Speed of something in a given direction.

ACCELERATION: The rate of change of the velocity of a moving body.

HORSEPOWER: The common unit of power, the rate at which work is done.

Above: Bloodhound SSC by Curventa

ON LAND

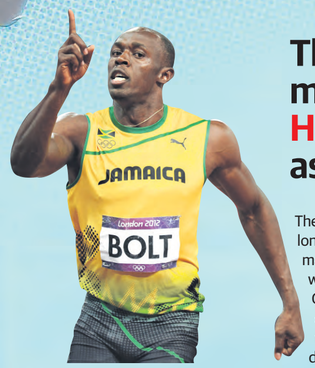
■ Even after all the flags of the London Olympics have been taken down, people are still pondering the amazing speed of one man. Jamaican sprinter Usain Bolt is being hailed as the greatest athlete ever and the fastest man alive. He is the first man to hold both world records for the 100m and 200m race.

■ With the invention of engines and motors, the need for speed accelerated. In December 1898 Count Gaston de Chasseloup-Laubat powered an electric wheel-driven car to a lightning speed of 63.15km/h in France. This record was broken just a month later but, as machines and engines were designed to go faster, speed records continued to fall. The current record on land is 1228 km/h by Thrust SSC (supersonic car), a jet-propelled car driven by British fighter pilot Andy Green in October 1997.

■ The fastest motorcycle is the Top 1 Oil-Ack Attack streamliner motorcycle ridden by American Rocky Robinson in September 2010. Robinson was the first person to break the 600km/h mark by reaching a top speed of 605.697km/h.

■ The fastest rail train is said to be the French TGV (Train a Grande Vitesse), which can reach speeds up to 574.8km/h, twice the take-off speed of a jumbo jet. Unfortunately the train needs 32km of track to stop when it is travelling at this speed, so for everyday use the speed is limited to just 320km/h.

■ If you want to own the fastest car, start saving your pocket money now. The Bugatti Veyron EB 16.4 super sport version is currently the fastest street-legal production car in the world, hitting speeds of up to 431.072km/h. It sells for more than $2 million.



Lightning fast: Usain Bolt of Jamaica.

The need for speed has been around for as long as man. During the Stone Age, the faster man could run, the less likely predators would eat him. It was Italian physicist Galileo Galilei who first measured speed by considering the distance covered and the time it took to travel that distance. He defined speed as the distance covered per unit of time. For example, if you cycled 15m in one second, you have a speed of 54km/h.

IN THE AIR

■ The first official airspeed record by an aircraft was 41.292km/h in a 14-bis aircraft piloted by Alberto Santos-Dumont in Paris in 1906. American pilots Captain Elden Joersz and Major George Morgan broke the air speed record flying an SR-71 Blackbird at 3529.56km/h in July 1976.

■ Rocket-propelled aircraft the X-15 was piloted by Pete Knight in October 1967 to reach speeds of 7273km/h, breaking the record for the fastest manned aircraft.

■ The unmanned Helios 2 Space Probe, launched by Germany and NASA in the mid 1970s, orbited the sun and relayed information back to Earth. During its orbit the probe hit speeds of up to 252,792km/h, making it the fastest spacecraft ever. However, the fastest manned spacecraft was the Apollo 10. During its return from the moon in May 1969, the crew vehicle travelled at 39,896km/h.

Blast off: Apollo 10 launch. Picture: NASA (via Wikimedia Commons)

SUPERFAST

ANDY GREEN

Wing Commander Andy Green loves all things extreme. He is a fighter pilot in the British Royal Air Force and on his days off he is a part of the land-speed record team. He is the current holder of the world land-speed record and is now working on breaking his own record with a new improved car. When Green broke the record in 1997 he became the first man to go faster than the speed of sound on land. The resulting sonic boom was said to have shaken a local school building. Green and his crew are now working on a new supersonic car, the Bloodhound.

THE CAMPBELL FAMILY

Three generations of the Campbell family have set world speed records, all in vehicles named Bluebird. Sir Malcolm Campbell held the world speed record on land and water at various times during the 1920s and 1930s. He was the first man to pass the 480km/h barrier in 1937. His son, Donald Campbell, broke eight world speed records during the 1950s and 1960s and remains the only person to set both land and water-speed records in the one year. Donald Campbell broke his water-speed record in December 1964 on Dumbleyung Lake in WA where he reached a speed of 444.71km/h. He was trying to break his own record in 1967 when his Bluebird crashed on Coniston Water in England, killing him instantly. His daughter Gina Campbell set the women's world water-speed record in 1984 in Bluebird II and then again in 1990 at 267km/h.

CRAIG BREEDLOVE

A five-time world land-speed record holder, Craig Breedlove was the first man to break the 640km/h, 800km/h and 970km/h records using turbo jet-powered vehicles all named Spirit of America. When one of his cars sped out of control in 1964, Breedlove broke another record — for the longest skidmark made by a vehicle. It was nearly 10km long. Breedlove and his team are working on breaking 1287km/h next year.

ROSCO McGLASHAN

In 1994, Perth man Rosco McGlashan broke the Australian land-speed record with an official 802km/h speed in his car the Aussie Invader II. Now he is after the world land-speed record with his new car Aussie Invader 5R (AI5R), reportedly the most powerful car in the world. At the moment there are no rubber tyres that can withstand speeds of more than 1000km/h so the AI5R will run on solid wheels with a carbon fibre/aluminium alloy core wheel design.

Swift family: Gina Campbell with a portrait of her father, Donald Campbell.

Speedsters have modified bathtubs, toilets, beds and sofas in their need for speed. The fastest sofa takes off and reaches speeds of 140km/h.

Record-chaser: Rosco McGlashan.

STUDENT ENGINEERS

Willetton Senior High School physics and engineering studies teacher Brett Boughton is also a car enthusiast. He joined Rosco McGlashan's Aussie Invader 5R team last year as its education adviser. The school's Year 12 engineering students have been challenged to design selected components of the AI5R including the canard (the small wings), air brakes, emergency skid brake, cockpit display and performance spreadsheets. Not only will these challenges be helpful in breaking the world record, they will also be part of the students' engineering studies school assessment.

Being a part of the AI5R team has inspired some of the students to continue studying engineering.

"Designing the canard system was a great insight into real-world engineering," student Maciek Bendlin said. "Being part of the rocket car project has boosted my motivation and assured me that mechanical engineering is the pathway for me."

Another student, Alexander Ahern, was the project leader for the group that developed a performance spreadsheet for the car. This was designed to help the team predict the speed, acceleration, displacement and mass of the car at any given point in time during the run.

"We are blown away by the fact that our performance spreadsheet was good enough to be used by the team," Alexander said.

Challenged: Alexander Ahern, Ben Murfit and Maciek Bendlin and teacher Brett Boughton (second from left) show a finished Eco Warrior similar to the one they're working on. Picture: Simon Santi

EXTREME RACERS

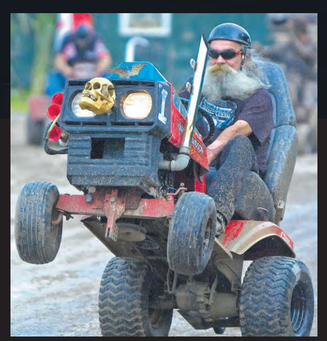
Not content with traditional methods of transport, these speed racers have gone to another level.

LAWN MOWERS: Today's riders can reach speeds of up to 133km/h.

FURNITURE: Speedsters have modified bathtubs, toilets, beds and sofas in their need for speed. The fastest sofa reaches speeds of 140km/h.

SOURCE: GUINNESS WORLD RECORDS

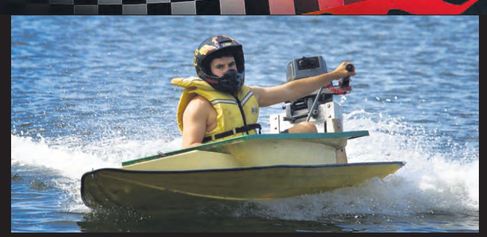
The Bugatti Veyron EB 16.4 super sport version is currently the fastest street-legal production car in the world, hitting speeds of up to 431.072km/h.



Fast grasscutter: Racer Alf Wright at Ontario's lawnmower games.

GRAVITATIONAL FORCE

The forces that these speedsters are exposed to are similar to those felt by fighter pilots. The body experiences G-force, which is produced when the vehicle speeds up and slows down. G-force is measured in multiples of Earth's gravity so when we are standing upright we are exposed to 1G. When exposed to high G levels not enough blood flows to the head causing "greyout" or a loss of consciousness. Fighter pilots and speed record challengers are fitted with special anti-G suits which help prevent this.



Breakneck bath: Australian bathtub racing champion, Daniel Rutherford, puts his tub through its paces on the Swan River.

ON WATER

Australian motorboat racer Ken Warby set the speed record on water in October 1978 on Blowering Dam in New South Wales. His boat, Spirit of Australia, was built in his Sydney backyard from balsa wood, fibreglass and a military surplus engine costing only $69. The boat hit speeds of 511km/h. No speedboat driver has reached these speeds since and survived.