

## Australian innovation – Aussies change the world



Watch the Aussie innovations video at: <http://www.youtube.com/watch?v=LvvfWumyFbs> .

Australian innovations featured in the video			
Innovation	Date	Credited to	About the innovation
Refrigeration	1856	James Harrison	Using the principle of liquid-vapour compression, Harrison patented the world's first practical refrigerator. In true Aussie style, he was commissioned by a brewery to build a machine that cooled beer!
Electric drill	1889	Arthur James Arnot	Arnot patented the world's first electric drill while he worked for the Union Electric Company in Melbourne. He designed it to drill rock and dig coal. As well as having numerous industrial uses, the electric drill now appears in the toolbox of every self-respecting home handyman.
Box kite	1894	William Hargrave	The box kite was used as basis for early flying machines. Hargrave managed to get one to fly nearly 5 metres by adding a seat to some connected box kites. He didn't patent his ideas, so the first manned flying machines were credited to other inventors. His studies of curved aerofoils also had a great impact on aeroplane development.
Differential gears	1897	David Shearer	The "diff" used in vehicles enables wheels to spin at different speeds when cornering, radically improving handling. Although the basic principles of differential gearing have been known since ancient times, it was first applied to a car by Shearer, who built a differential inside left rear wheel hub into a steam car.
Notepad	1902	J A Birchall	For hundreds of years, people used to write on loose sheets of paper. Then Birchall came up with the idea of cutting smaller sheets, backing them with cardboard and gluing them together at the top. Simple, eh?
Feature film	1906	Charles Tait, W A Gibson, Millard Johnson	The world's first feature-length film was <i>The Story of the Kelly Gang</i> , just over an hour long. Directed by Charles Tait, it traces the life of Australian bushranger Ned Kelly. When first screened, it was accompanied by an on-stage narrator who provided sound effects such as gunfire and hoof beats.

<b>Car radio</b>	1924	Kellys Motors	The first car radio was fitted to an Australian car built by Kellys Motors in New South Wales.
<b>Solar hot water</b>	1953	R N Morse, CSIRO	Although the idea of using the sun to heat water has been around for a long time, advances by the CSIRO in the 1950s made the system far more efficient and suitable for residential use.
<b>Black box flight recorder</b>	1954	Dr David Warren	Australia's first major air calamity claimed the life of David Warren's father, which prompted David to find a way of helping future crash investigators. He developed the flight voice and data recorder, which is now fitted to every aircraft in the world. Originally made of black Bakelite, the "black box" is now made in orange for greater visibility.
<b>Ultrasound scanner</b>	1961	David Robinson and George Kossoff	Robinson and Kossoff's work resulted in the first commercially practical water path ultrasonic scanner, called the "CAL Echoscope". They developed the "grey scale ultrasound" technology which gave clearer, more detailed obstetric scans, helping to diagnose problems before babies were born. Ultrasound is now widely used for medical diagnostics and treatment, and scan pictures are proudly circulated by most parents-to-be!
<b>Wine cask</b>	1965	Thomas Angove	Angove's innovative thinking gave us wine that's on tap, lasts longer and is easy to transport and store. His patented "bag-in-box" wine cask is basically a cardboard box containing a flexible plastic bag which collapses as the wine is used, preventing contact with air and making the wine last longer.
<b>Bionic ear</b>	1978	Professor Graeme Clark, University of Melbourne	The first bionic ear was implanted into an adult at the Royal Victorian Eye and Ear Hospital. The cochlear implant is a device implanted under the skin, linked to an external speech processor. It works by analysing speech signals, converting them and electrically stimulating the hearing nerve. More than 80% of the world's 50,000 cochlear implant patients use technology manufactured in Australia.
<b>Frozen embryo fertilisation</b>	1984	Doctors Alan Trounson, Carl Wood and Linda Mohr	The world's first baby from in-vitro frozen embryo fertilisation was a girl called Zoe Leyland born in Melbourne. She was delivered by Caesarean section and weighed 5 lbs 13½ oz. Most IVF clinics now offer embryo freezing and storage to women undergoing IVF treatment, and the babies who are born seem to suffer no adverse effects from their time in the deep freeze!
<b>Multi-focal contact lens</b>	1992	Stephen Newman	The multi-focal contact lens allows people to focus at different distances through the same lens. It was invented by Newman, an optical research scientist in Queensland.
<b>Cervical cancer vaccine</b>	1990s	Professor Ian Frazer, Dr Jian Zhou and University of Queensland colleagues	The vaccine helps prevent cervical cancer, the second most common type of cancer among women. It acts on the virus that causes cervical cancer, one of the few human cancers known to be caused by viral infection. The vaccine was released commercially in 2006 after many years of development and testing in the 1990s, and has the potential to save many lives.

## A–Z of Aussie innovations

- **Aircraft inflatable escape slide** (1965; Jack Grant, Qantas)
- **Anthrax vaccine** (1918; John McGarvie Smith)
- **Antibiotic penicillin** (1944; Howard Florey and Ernst Chain)
- **Army tank** (1912; Lance de Mole)
- **Aspro pain reliever** (1917; George Nicholas)
- **Atomic absorption spectrophotometer** for chemical/metal analysis (1952; Sir Alan Walsh)
- **Automatic totalisator** for betting (1913; Sir George Julius)
- **Bionic ear cochlear implant** (1978; Professor Graeme Clark)\*
- **Black box flight recorder** (1954; David Warren)\*
- **Box kite** used in first powered flight (1894; William Hargrave)\*
- **Car radio** (1924; Kellys Motors)\*
- **Cervical cancer vaccine** (1990s; Ian Frazer)\*
- **Combine harvester** (1884-86; James Morrow, Hugh Victor Mackay)
- **Differential gears** in a car (1897; David Shearer)\*
- **Electric drill** (1889; Arthur James Arnot)\*
- **Esky cooler** (1952; Malleys Ltd)
- **Exelgram** anti-counterfeiting technology (1995; CSIRO)
- **Feature film *The Story of the Kelly Gang*** (1906; Charles Tait, W A Gibson, Millard Johnson)\*
- **Flame ionisation detector** to detect emissions (1957; Ian McWilliam)
- **Flying Doctor Service** (1928; Rev John Flynn)
- **Frozen embryo fertilisation** (1984; Doctors Alan Trounson, Carl Wood and Linda Mohr)\*
- **Football rules** (first codified in 1858; Tom Will and Henry Harrison)
- **Gene shears** for genetic research (1986; Wayne Gerlach and Jim Haseloff)
- **Grain stripper** (1843; John Ridley and John Bull)
- **Heart pacemaker** (1926; Crown Street Women's Hospital, Sydney)
- **Hills Hoist** rotary clothes line (1945; Lance Hill)
- **Humespun process** for concrete (1910; Walter Hume)
- **Instream analysis** of metals (1972; Amdel Ltd)
- **Jindalee Radar System** (1995; CSIRO)
- **Multi-focal contact lens** (1992; Stephen Newman)\*
- **Notepad** (1902; J A Birchall)\*
- **Nucleur fusion research** (1930s; Mark Oliphant)
- **Orbital internal combustion engine** (1972; Ralph Sarich)
- **Permanent crease** trousers (1957; Dr Arthur Farnworth)
- **Plastic bank notes** (1988)
- **Plastic injection moulding software** (1978; Moldflow Pty Ltd)
- **Plastic spectacle lenses** (1960; Scientific Optical Laboratories)
- **Race-cam** for sports broadcasting (1979; Geoff Healey)
- **Refrigeration** (1856; James Harrison)\*
- **Rotary lawnmower** (1952; Mervyn Victor Richardson)
- **Solar hot water** (1953; R N Morse, CSIRO)\*
- **Stroller**, transverse folding buggy for infants (1942; Harold Cornish)
- **Stump-jump plough** (1876; Robert and Clarence Bowyer Smith)
- **Supersonic combustion**, Mach 8 (2002; University of Queensland)
- **Surf lifesaving reel** (1906; Lester Ormsby)
- **Telephane**, a forerunner of TV (1885; Henry Sutton)
- **Ultrasound scanner** (1961; David Robinson and George Kossoff)\*
- **Underwater computer** (1993; Bruce MacDonald)
- **Ute** – utility vehicle/pick-up (1934; Lewis Brandt, Ford)
- **Variable rack and pinion steering** (1970; Arthur Bishop)
- **Wine cask** bag-in-box wine (1965; Thomas Angove)\*
- **Winged keel** for yachts (1983; Ben Lexen)
- **Woomera spear-throwing tool** (Australian aboriginals, date unknown)
- **Zinc cream** sun block (1940; Fauldings pharmaceutical company)

\*featured in the video



## Resources for today's innovators

ABC television - New Inventors

<http://www.abc.net.au/tv/newinventors/>

National Invention Centre

<http://www.inventions.net.au/>

The Australian Institute for Commercialisation (AIC)

<http://www.ausicom.com>

Triton Foundation

<http://www.tritonfoundation.com.au/>

Australian Small Scale Offerings Board

<http://www.assob.com.au>

Australian Government Department of Innovation, Industry, Science and Research (DIISR)

<http://www.innovation.gov.au/>

AusIndustry

<http://www.ausindustry.gov.au/>

Innovic's Next Big Thing Award

<http://www.nextbigthingaward.com/>

IP Australia

<http://www.ipaustralia.gov.au>

Institute of Patent and Trade Mark Attorneys of Australia

<http://www.ipata.com.au/>

Inventors Association of Australia (SA) Inc

<http://www.inventors.asn.au>

Fast Thinking

<http://www.fastthinking.com.au>

Australian Innovation Festival

<http://www.ausinnovation.org>

Australian Technology Showcase

<http://www.ats.business.gov.au>

clickfind™ business directory and Australian search engine

<http://www.clickfind.com.au>

## References used for this research

The Australian Government's Innovation Report 2006-7

<http://backingaus.innovation.gov.au/2001/statement/>

Australian Government: Culture & Recreation – Australian Inventions

<http://www.cultureandrecreation.gov.au/articles/inventions/>

Tomorrow's World: Australian firsts

<http://apc-online.com/twa/firsts.html>

Convict Creations

<http://www.convictcreations.com/culture/inventions.htm>

Bionic Ear Institute

<http://www.bionicear.org/bei/AboutHistory.html>

IMDB: Story of the Kelly Gang

<http://www.imdb.com/title/tt0000574/>

A Short History of the Development of Ultrasound in Obstetrics and Gynaecology

<http://www.ob-ultrasound.net/history1.html>

Questacon: 100 years of innovations

[http://www.questacon.edu.au/html/100\\_years\\_of\\_innovations.html](http://www.questacon.edu.au/html/100_years_of_innovations.html)

Timeline science: infertility treatments

<http://www.timelinescience.org/resource/students/inferty/ethics.htm>