



RALEIGH

Celebrating 125 years



ENGINEERING AND INNOVATION AT RALEIGH

Alan Oakley, chief designer at Raleigh in the 1960s, first sketched the Chopper on the back of an envelope, on an airplane. At least, that's the story. Inspired by the American youth craze for high-riser bikes, Oakley's re-imagining of the traditional diamond-shaped frame with 'ape-hanger' handlebars, different-sized wheels and spongy saddle with backrest was as cool as Mark Bolan. It wasn't an instant success, but when Chopper sales did take off in the early 70s, the bike changed the way a generation of British kids rode. It became a design icon. It may have even saved Raleigh from bankruptcy: 1.5 million Choppers were sold in the UK alone.



Though good value, quality and reliability are the foundations of the Raleigh brand, innovation and design have always been at the heart of the story. From the start, Frank Bowden (pictured left), who founded Raleigh when he invested in a small frame-building workshop in Nottingham in 1887, encouraged his engineers in the task of improving both the technology behind and the design of the beautiful machine.

Bicycle manufacturing emerged from its roots as a cottage industry to become big, big business in the 1890s. Bicycles were mass-produced on assembly lines for the first time; the design process was separated from production; specialised factories supplied standardised components. One third of all patents registered

at the U.S. Patent Office during the 1890s were bicycle related. In fact, the bicycle had its own dedicated patent building in Washington, DC.

Raleigh invented the tubular fork crown (1892) and the back pedaling brake (1899) but the most significant stroke of ingenuity was Sturmey Archer gears.

Bowden hired Henry Sturmey and James Archer in 1902, to realize the first, three-speed gearing device that could be changed on the fly. They applied for a patent in 1902, for 'Improvements in Speed Gears for Velocipedes, Motor Cars and the like'.



The three-speed hub comprised a myriad of tiny components and it was complicated to manufacture. Nonetheless, practical gearing was a great leap forward for the bicycle on its heady journey to become the first utilitarian form of transport for the masses – the people’s nag. Over the course of the 20th century, the Sturmey-Archer hub gear (the ‘Hub of the Universe,’ as one advertisement said) became a British institution, a cornerstone of the Raleigh business and an integral part of the classic three-speed, roadster bicycle sold by the million all over the world.



The demand for safety bicycles around the end of the 19th century was unprecedented in the history of manufacturing. The industry was forced to adapt quickly to mechanisation and mass production, just to meet demand.

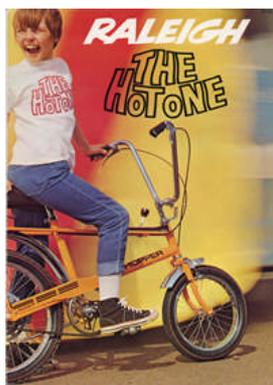
The industrial model this created was part of the economic legacy of the bicycle, which was inherited by the nascent automotive industry around the beginning of the 20th century. While Raleigh helped create the legacy, they also benefited from it: the company briefly ventured into making motorbikes, motorcars and later mopeds.

Under George Mills, another Frank Bowden appointee, Raleigh played a major role in adapting American technology into British cycle manufacturing: automatic machinery, liquid brazing (an advance that allowed Raleigh to make the first 'all-steel' bicycles in 1907) and sheet-steel stamping were all means of production that Raleigh pioneered in the UK in the early years. In fact, modernization of manufacturing processes, changing organizational practices and new technology were matters continually raised at the fortnightly meetings of the Raleigh committee, most notably during the massive expansion in capacity during the 1920s and 30s under Frank's son, Harold Bowden.

During World War II, the whole bicycle industry turned itself over to making armaments: Raleigh mass-produced artillery fuses and cartridge cases but the innovators also turned their keen minds to the 'paratrooper' bike – an ingenious folding bike for military use that was still at the prototype stage when the War ended.



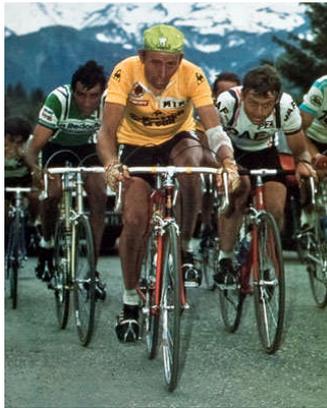
'There was always innovation. It was in the bones of the company. We didn't bother with what anyone else was doing,' Dave Marsland said. Marsland joined Raleigh as a 'technical apprentice' in 1973, when the company was still all-powerful. 'I first worked on prototype drawings, in an office so long you could hardly see the other end,' he said.



Throughout the 60s, 70s and 80s, Raleigh always seemed to be ahead of the curve in commercial bike design. Though originally the idea of Alex Moulton, Raleigh developed and aggressively marketed the RSW16 and the Twenty, two unisex, small wheel bicycle models. They were practical and stylish, and went some way to arresting the decline in adult bike sales during the 60s when utility cycling died a

death in the UK. Through the Chopper, the Grifter, the Boxer, the Strika and the Burner, Raleigh exercised a vice-like grip on the imagination of British youth.

While the Chopper opened up a new market in children's bicycles, marking a shift in the company's philosophy away from transportation, the 1970s also saw a revival in the production of high end racing bicycles at the 'Specialist Bicycles Development Unit' (SBDU) at Ilkeston. Here, under the renowned figure and master frame builder, Gerald O'Donovan, engineers and artisans perfected the



hand built racing bicycle for the nascent professional TI-Raleigh team. When Joop Zoetemelk from TI-Raleigh won the Tour de France in 1980, he was riding the only British manufactured bike to win in the Tour's history. As Peter Post, the abrasive Dutch team director said: 'We are perhaps the best team in the world because we have the best bikes in the world.'

The SBDU morphed into Raleigh Special Products (RSP), which Dave Marsland later joined. Pioneering work was undertaken on thermal bonding technology, oval tubing and titanium frames, among other technologies. What may well be the first ever carbon fibre bicycle was produced by Raleigh and exhibited at the Cycle Show in 1971. Later, Raleigh broke ground with mass-produced suspension mountain bikes, electrically assisted bikes and the first mass-produced hybrid, the Raleigh Pioneer, in 1991.

Today, Raleigh is sponsoring a professional team once again. Road racing remains the ideal arena to test out the advances in frame design and technology that the Raleigh technical team is continually making to the race bikes. Those advances are



translated into the top end road bikes sold commercially, often the following year. It's an extraordinary to think you might be out for a Sunday morning ride

on the same bike pros were racing on six months ago: it's a testament to the decades Raleigh have spent refining the design process and improving bike technology.