



50 years of innovation in sound

“Transformed to a dance of electrons along a wire, its ghost lives on. When KEF returns music to its rightful habitation, your ears and mind, it aims to do so in the most natural way it can; without drama, without exaggeration, without artifice.”

Raymond Cooke OBE Founder of KEF

Raymond E. Cooke





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a pioneering project

Maidstone in Kent, South East England, October 2006. In the KEF research centre, work is underway on a pioneering project.

The research team is assembling precision made components with materials such as titanium and neodymium-iron-boron alloy – the world's strongest permanent magnet – to build an

experimental version of a new loudspeaker drive unit.

The work will lead to the next evolution of a driver array devised and developed by KEF: the Uni-Q. This combines two of the three key drivers required for a full range loudspeaker: the tweeter, which delivers high notes, and the mid-range driver, which covers much of

the audio frequency spectrum, including the range of the human voice.

The new unit will be partnered with bass drivers in a brand new speaker. Yet the drivers won't be simply placed in a row, facing the same way. Instead, the speaker will feature a radical new arrangement of drivers.

Until the project is completed, details of this radical arrangement – and indeed its very existence – will be kept under wraps. For this project is hush-hush, with details restricted to the KEF team, who speak little of it outside work, and certainly don't mention their research to strangers.

The project will span three years, until the speaker is at last unveiled to the world.

Few loudspeaker companies in the world work on such ambitious projects. Few even have their own research teams. Yet KEF is dedicated to audio research, to creating ever better loudspeakers.

While "innovation" is a buzzword for many companies, KEF has been true to its motto, "Innovators in sound", throughout its 50-year history. Indeed, passion and drive for change in speaker design underpinned KEF's origins, in autumn 1961.

the 1960s

as the Beatles and hi-fi emerge, popular songs are played on mono records

1961: aiming for the moon

Turbulent times mark the start of the 1960s. Three months after John F. Kennedy becomes US president in January 1961, CIA – trained Cuban exiles land at the Bay of Pigs for an invasion of Cuba that fails within just two days. In August, the Soviet Union begins building the Berlin Wall. China remains gripped by a three-year famine.

There are also grander human endeavours. On 12 April, Soviet cosmonaut Yuri Gagarin becomes the first human in space. The next month, President John F. Kennedy announces the aim of putting a man on the moon by the end of the decade.

The music world is set for radical changes. The Beatles give their first performance at the Cavern Club in Liverpool, England and the Beach Boys release their first single – “Surfin’”/“Luau”. A budding opera star named Luciano Pavarotti makes his debut. The third Grammy Awards are held, with the Album of the Year award going to comedian Bob Newhart.

It is a hundred years since Johann Philipp Reis installed an electric loudspeaker – the world’s first – in his telephone, which is also a world first. Loudspeakers have evolved considerably since then. However, there are, as yet, no domestic subwoofers.

Almost a decade will pass before the first home surround sound systems are introduced, and surround sound will not succeed until the advent of home theatre in the late 1980s.

There are no audio cassettes, CDs, or DVDs. Instead, people play music on records, which originally span at 78 revolutions per minute (RPM), but with the emergence of high fidelity or hi-fi, audio enthusiasts now favour LPs – long-playing vinyl records spinning at 33½ RPM. This change is accompanied by mono recordings giving way to stereo, which until the mid-1960s will be the preserve of jazz and classical music, with popular songs restricted to mono vinyl playing at 45 RPM.



KEF Maidstone site in the 1960s



Raymond Cooke outside the Nissen hut that was KEF's first headquarters

the 1960s

sound engineer Raymond Cooke establishes KEF, and promptly launches products

1961: risking everything

In September 1961, 36-year-old engineer Raymond Cooke and business partners John Balls and Bob Pearch found a speaker company on the banks of the Medway River in Maidstone. They acquire a site within Kent Engineering & Foundry, where Pearch is the Managing Director, and Cooke uses the initials to name the operation KEF Electronics. At first, the headquarters is a Nissen hut: little more than a prefabricated half cylinder of steel with doors and small windows, perhaps dating from the Second World War.

Though the building is modest, Cooke's ambitions are not. Keenly interested in audio reproduction, Cooke has worked for the BBC's Designs

Department, which was in many ways at the forefront of electronics and acoustics, before a six-year stint as Technical Director at Wharfedale – where he showed that bass drivers could be smaller than commonly believed and came up with novel ideas for making speakers.

At this time, speaker drive unit diaphragms are typically made from paper pulp, in a process that is expensive, time consuming and difficult. Cooke was recently shown one of the first moulded plastic cups and, on learning that a flat sheet of material could be vacuum formed over a shaping tool, started thinking of using a similar process to create speakers. But it did not seem Wharfedale was open to such a new technique

so, as Cooke later told *Gramophone* magazine, "I decided that the only way was for me to risk everything and start on my own."

Compounding the risk, Cooke and partners have started the company with only around £4,000. They cannot wait long to get development and tooling costs back. It helps that they can use the foundry for some of the metal work and making the diaphragms on the premises. Also, Cooke's expertise in speaker design, coupled with him proving correct that vacuum forming would ease design and manufacturing, enables them to get off to a quick start.



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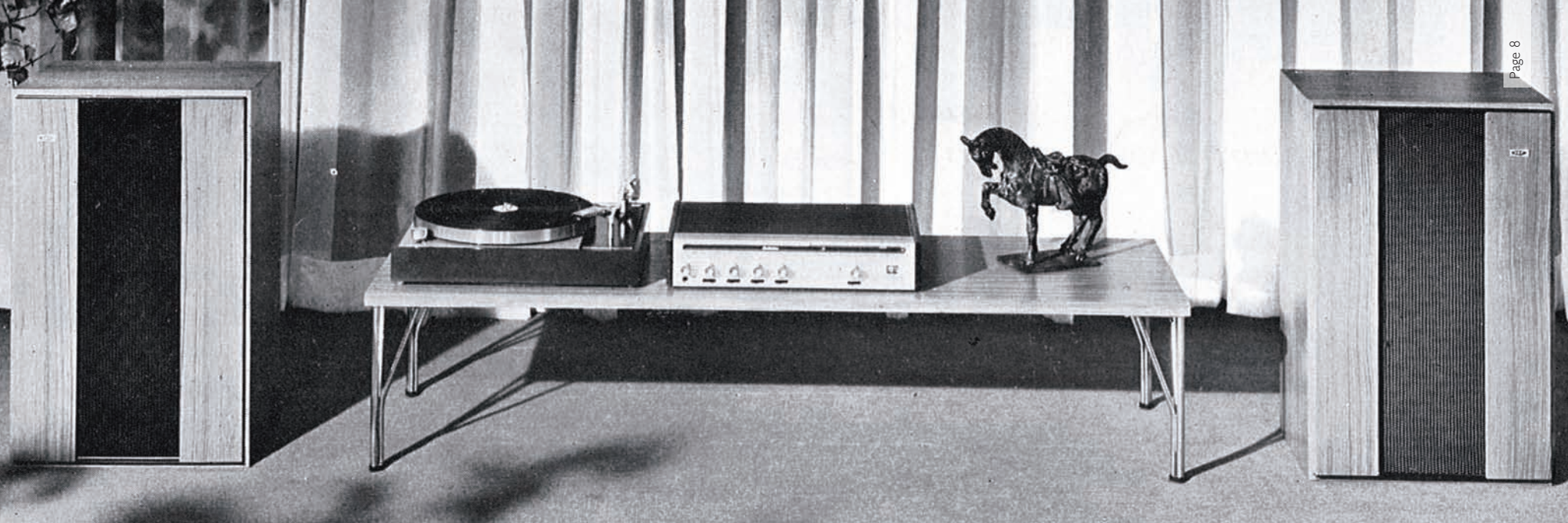
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A typical hi-fi system featuring the original KEF Concords

the 1960s

KEF commences operations around 12 October. The second employee – after Cooke – is Malcolm Jones, who has a Diploma in Technology and a strong interest in loudspeakers, and wrote to Cooke asking if he wanted staff. KEF starts shipping products the next month.

The first loudspeaker is the KI Slimline. Though just 6¾ inches deep, this

is 27 inches tall and 17 inches across. Its bass driver – or woofer – is unusual for being rectangular; and at 18 by 14 inches has a larger area than any hi-fi driver in existence at this time. The speaker weighs a hefty 46 pounds, 9 pounds of which is the magnet for the powerful woofer. The cabinet is by industrial designer Robert Heritage and, as Cooke later notes, the

KI Slimline looks, “a rather tidy product”.

Wholesalers handle most hi-fi distribution, and they don’t immediately welcome another loudspeaker brand. Yet there are some forward-looking dealers who lend initial support in the UK, and Cooke heads to France, Germany, Switzerland, Holland and Belgium – where dealers promote KEF products very well.

To *Gramophone*, the unveiling of the new KEF speakers ranks among three significant advances in the art of loudspeaker design during 1961. Yet it is another speaker, the Celeste, that seals the company’s early success. Again, *Gramophone* is impressed, with a reviewer noting: “High quality loudspeakers in cabinets less than half a cubic foot in volume have always been

considered to be well into the impossible category and therefore the appearance of one on the KEF stand at the 1962 Audio Fair may have caused some headshaking in high places.”

The Celeste readily fits on a shelf and is the first such speaker with a reasonable claim to high fidelity. It revolutionises the concept of bookshelf speakers, winning praise

from musicians, enthusiasts and technicians alike. Soon, a KEF brochure notes that the Celeste is, “Acknowledged as Europe’s best medium sized speaker”.

The Celeste includes the new, oval-shaped B139 bass driver – which will prove immensely successful.

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the 1960s tumultuous yet wonderful world



Images left to right:
João Gilberto and Stan Getz - Getz/Gilberto,
Louis Armstrong - What a Wonderful World. Courtesy of Universal Music
Bootprint of Buzz Aldrin, the second man on the moon. Courtesy of <http://grin.hq.nasa.gov/index.html>

In winter 1962, songwriter Antonio Carlos Jobim and poet Vinicius de Moraes sit in a café in southern Rio de Janeiro. A beautiful girl strolls by, as she does almost every day. Moraes jots two lines on a napkin. These lead to "The Girl from Ipanema", which is recorded – in both Portuguese and English – by Astrud Gilberto, João Gilberto and Stan Getz, becoming an international hit in 1964.

The Girl from Ipanema is a bossa nova song, adopting a fusion of jazz and samba that has emerged from Brazil, resulting in hits like the infectious "Soul Bossa Nova" by American musician Quincy Jones. Yet bossa nova soon fades, and the Sixties start swinging. In February 1964 the Beatles receive a tumultuous welcome in the USA; they later have an unofficial contest with the Beach Boys to see who can create the best album. The Motown

record label has a massive impact, releasing hits such as "My Girl" by the Temptations, and "My Cherie Amour" by Stevie Wonder. "You Really Got Me" by the Kinks has power chords credited with starting heavy metal. The Jimi Hendrix Experience bursts on the scene with outrageous guitar playing and studio experimentation. Folk rockers Joan Baez, Bob Dylan, and Simon and Garfunkel are quieter – among the latter's hits is *Sound of Silence*.

"I feel good!" James Brown declares in his funky "I Got You". Yet for all the hippies, the mini skirts, the drugs, the free love that permeates the massive Woodstock festival, the Sixties is no feel-good decade. "I have a dream," announces Martin Luther-King in 1963; that same year, John F. Kennedy is assassinated and Soviet tanks end the Prague Spring. Five years later, both Luther-King and

Kennedy's brother Bobby are also assassinated. The Cold War intensifies; the Vietnam War is brutal. There are anti-war and civil rights protests. Chairman Mao unleashes the Cultural Revolution. Record producer Bob Thiele writes a song as an antidote to the gloom. The single barely sells in the US, where the company refuses to promote it. Yet in the UK, *What a Wonderful*

World by Louis Armstrong becomes the biggest selling single of 1968. In July 1969, Americans Neil Armstrong and Buzz Aldrin realise a dream of John F. Kennedy – becoming the first men on the moon.



Cresta (1967-71)

the 1960s

During the 1960s, the BBC is helping set standards for loudspeakers, by developing speakers for monitoring radio and television recording and broadcast sessions.

KEF begins producing and selling LS5/1A, LS5/2A and LS3 monitor speakers under licence from the BBC. Clients include radio and television studios throughout the UK, though only few consumers, as monitors are still expensive and mainly for controlling programme sound quality. KEF also develops and introduces more consumer speakers.

With the success of drivers like the B139 vindicating Cooke in his belief that speaker diaphragms can be made from the new plastic materials, he and Jones experiment with a high impact polystyrene

a star duo is born

called Bextrene. The idea for trying this stems from collaboration and discussion with BBC sound engineers.

Their tests show Bextrene indeed has the mechanical properties they require, as well as being sufficiently stable to maintain its performance under typical variations in temperature and humidity. Plus, they discover Bextrene drivers can be persuaded to work up to higher, midrange frequencies – which means the tweeters they are paired with no longer have to come down so far in order to integrate with them, allowing more flexibility in tweeter design.

In 1966, KEF introduces the world's first commercially available drive unit with a Bextrene cone, the B110. There is also a

new smaller tweeter, the T27, which delivers high frequencies extending to beyond audibility. The new drivers will allow KEF to design more varied speaker systems, and create a new mini system – the Cresta – that updates the Celeste concept. They also bolster KEF's thriving business in supplying drivers for other manufacturers: within a few years, half of Britain's speaker makers will be using KEF drivers.

Four years later, the BBC incorporates the B110 and T27 in its LS3/5 Monitor. At just 12 inches high, this small speaker is designed for use in outside broadcast vehicles. In 1975, after refinements to the drivers, it is developed into the LS3/5A.

The LS3/5A is manufactured under licence and made available to consumers.

It proves a lasting hit with audiophiles – hobbyists seeking the ultimate in hifi reproduction, with over 100,000 sold. Even in 2007 it receives praise, as *HiFiCritic* notes: "The LS3/5a still achieves its recognised high standards for low colouration, smooth frequency response and tonal accuracy... The legendary reputation of this best selling BBC monitor is well founded."

KEF manufactures the legend's drivers, the B110 and T27, until 1998.

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the 1960s

signature speakers of the decade



K1 Slimline (1961-66 approx.)
KEF's first loudspeaker



K2 Celeste (1962-66)
Revolutionises the concept of bookshelf
speakers, and seals KEF's early success

*"A unique combination of radical thinking, advanced
development, first class engineering and quality control is
directed to producing the finest loudspeakers in the world."*

C Series brochure



B110 and T27 Drivers
First developed in the 1960s, these drivers appear in speakers
including the BBC LS3/5A, and are manufactured until 1998

the 1970s

goodbye Beatles, hello Elton John



Images left to right:
Diana Ross - *Touch Me in the Morning*, Elton John - *Your Song*. Courtesy of Universal Music
In 1979 the Sony Walkman portable cassette player is launched

In 1970, the Beatles split up with the departure of Paul McCartney, and Diana Ross leaves Motown's premier act, the Supremes. Both launch solo careers, with Ross's success looking uncertain until 1973, when *Touch Me in the Morning* becomes her second Billboard Pop number one single.

Less noticed in 1970 is a young singer-songwriter with a ballad that becomes his first hit single, *Your Song*. Born Reginald Dwight, he has

renamed himself Elton John. As well as becoming hugely successful for his music, John will be renowned for his flamboyant style.

Flamboyance and showmanship are surely the hallmarks of Seventies popular music. Glam rock bursts on stage in makeup and glitter and platform-soled boots, performed by acts like T-Rex, Roxy Music, and David Bowie.

This is a decade of big hair and massive concerts, as arena rock

fills stadiums with pyrotechnics, coloured lights, and sounds of Queen, the Rolling Stones, Led Zeppelin, and Kiss. Disco arrives, surging to popularity with the help of a movie, *Saturday Night Fever*.

The late Seventies see a backlash against such pomp. Punk rockers snarl of anarchy, backed by sparse drums and fast, basic and brutal guitar chords.

Home video recorders become popular. The first *Star Wars* movie is released, providing a massive boost to surround sound in cinemas, which will in turn lead to home theatre. In 1979, the Sony Walkman portable cassette player is launched, and people begin carrying music to listen to on lightweight headphones.

There are political transformations worldwide. US President Richard Nixon ends the

Vietnam War, comments "It sure is a great wall," on a breakthrough visit to China, and resigns after the Watergate scandal. In 1976, Chairman Mao Zedong dies. Two years later, Deng Xiaoping becomes China's paramount leader, and introduces more open policies.

Margaret Thatcher is elected Britain's first female Prime Minister, as women play more influential roles in many nations.

A popular musical, *Evita*, is based on the life of an influential woman of earlier decades – Argentina's Eva Perón, second wife of President Juan Perón, and champion of labour rights and women's suffrage. Singer Julie Covington records one of the *Evita* songs, "Don't Cry for Me Argentina", which sells almost a million copies in the United Kingdom.

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"In a couple of days we produced the first digitally-achieved frequency characteristics of a loudspeaker."

Raymond Cooke OBE, Founder of KEF



Raymond Cooke with his engineering team

the 1970s the speaker engineers

In late summer 1971, Raymond Cooke and KEF Technical Director Laurie Fincham borrow a Fourier analyser from Hewlett-Packard and, as Cooke later relates, "In a couple of days we produced the first digitally-achieved frequency characteristics of a loudspeaker."

They have borrowed the analyser – an advanced computer that can perform a multitude of complex calculations, including a speaker's response to a pulse – on the advice of Rex Leedham, a Senior Lecturer at Bradford University who is looking at digital computer techniques for assessing reverberation in halls. KEF begins working with Leedham and his research team, which

obtains a grant to buy a Fourier analyser.

KEF is growing rapidly – in 1970 and 1975 it wins Queen's Awards for Export – and with the research work proving fruitful, Cooke decides that KEF will buy its own Fourier analyser. Including peripheral and terminal equipment, this is around the size of a family wardrobe, and in 1975 costs over £60,000 – a huge sum for this time.

Using the analyser, Fincham and his team can make extremely precise measurements of speaker responses, and produce some of the world's first three-dimensional graphs of the behaviour of loudspeakers under "real time" conditions.

They make measurements in an anechoic (sound-absorbing) chamber, as well as outdoors. To make outdoor measurements free of reflecting surfaces, the team employ an elevating platform that electrical companies use to change street lights, and find that being perched up to 30 feet above the ground with little support below can be quite scary.

Benefits of KEF's pioneering work with computers include being able to test speakers in production, and to match near-identical pairs so they produce perfect stereo. Plus, the team can design new and improved speakers.

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the 1970s

The Model 104, introduced in 1973, is the first loudspeaker to benefit from the new techniques for assessing sound reproduction. This is the first domestic unit to match the standards of a true monitor loudspeaker, such as the speakers the BBC is using to monitor studio and live broadcasts. It produces lucid natural sound, and has a control to adjust for room acoustics.

To date, KEF has tended to use speaker names starting with C – such as Celeste, Chorale, and Coda. Cooke this time opts for something different. He finds coming up with the name a challenge, partly as he wants to avoid misleading and over-used words like “monitor”, whilst seeking to convey the idea that every loudspeaker is subject to test and scrutiny, culminating in a comparison with a laboratory maintained reference standard. He settles on Reference,

which becomes the name of KEF's flagship speaker series.

The Model 104 is a commercial success. Three years later, the 104 is improved as a result of computer based research and development. The Reference Series Model 104aB has an enhanced crossover filter (which splits the overall speaker input to power the individual drivers) that reduces “colouration” from the tweeter.

A brochure bills KEF as “The Speaker Engineers”. Helped by the Fourier analyser together with software they develop, Fincham and colleagues are now employing what they call the Total System Design approach. They consider the whole system, ensuring components of every type – drive unit, enclosure and crossover – are optimised. KEF is the first loudspeaker company to adopt this approach.

Fincham's team discovers they can use the computer to predict the acoustic responses of combinations of drivers and crossovers, and then measure these responses in practice. Encouraged by the results, they begin working on a new speaker.

The result is one of the most radical and sophisticated loudspeakers ever made – Reference Series Model 105, which debuts in 1977. It looks like three speakers in one, with a treble module on top of the mid-range and both of these perched atop the mighty bass enclosure.

This arrangement, which will be often copied, creates a wide and deep listening area, with the best sounds heard in the average listening position. The stereo image seems to float in space.

Reference Model 105 goes into the anechoic chamber



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the 1970s signature speakers of the decade



Reference Series Model 105.2 (1979-87)
Evolution of the ground-breaking
Reference Series Model 105



The BBC LS3/5A broadcast monitor
Incorporates KEF's B110 and T27 drivers



Surrounded by his products of the day, Raymond poses in front of the first Queen's Award For Industry plaque

the **1980s** the global jukebox



Images left to right: The Cure - Seventeen Seconds, Tears for Fears - The Hurting. Courtesy of Universal Music
Raymond Cooke meeting Jean Michel Jarre - AES Paris 1984

The 1980s begins with a colossal bang, as Mount St Helens blows its top in the deadliest volcanic event in US history.

Punk rock's explosive impact on popular culture has peaked, yet punk has lasting influence. "Alternative rock" emerges, with acts favouring creativity over commercialism such as The Cure, who achieve their first UK chart success with "A Forest" in 1980.

Two years later, little-known new wave band Tears for Fears release their third single, thinking it might gain some attention and build them a little following. "Mad World" soars to number 3 on the UK charts and becomes their first international hit.

MTV – the initials then standing for Music Television – debuts in 1981. The first video is "Video Killed the Radio Star", by The Buggles. Michael Jackson creates arguably the best-ever music video, for the title

track from the record that makes him the "King of Pop", and powers to the best-selling album ever: *Thriller*.

Madonna becomes a music video star, including with "Material Girl" in 1985. Also this year, pop musicians show there's more to life than sex and drugs and rock and roll – as Boomtown Rats frontman Bob Geldof co-organises the charity super-concert Live Aid, dubbed "the global jukebox".

Concerts in London and Philadelphia are broadcast to a worldwide audience of around two billion, raising £150 million (US\$280 million) to help relieve famine in Ethiopia.

Billboard's top song of 1985 is "Say You Say Me" by Lionel Richie.

Home computers, video games and music CDs become commonplace. CDs are based on laserdisc technology, which is obscure in Europe,

except for France, but popular for home entertainment in the USA and east Asia.

Not all is rosy with technology. On 26 April 1986, a fire and explosion blast radioactive material into the skies above the Chernobyl nuclear plant, in the Ukraine. It's the world's worst nuclear accident.

A singer-songwriter argues with her manager when he says her song about child abuse could be a hit.

She relents, and it takes at least a year before the song is arranged, produced and burnished to a sheen. "Luka" by Suzanne Vega becomes an international hit – and a favourite hi-fi demo track.

In 1989, the Cold War between the Communist World and the West ends. Euphoric crowds tear down the Berlin Wall.



Exploded view of the Uni-Q driver array

the **1980s** unifying the Q

The 1980s begins with KEF loudspeakers playing a unique role in Britain's Edinburgh Festival, for a classical music concert broadcast by the BBC. The performance of *Te Deum*, a monumental work by Hector Berlioz, requires an organ together with an orchestra, but the organ at the venue is unplayable.

Laurie Fincham and colleagues arrange 36 Reference Series Model 105.2 speakers in the concert hall – to reproduce sound relayed from an organ played by Dame Gillian Weir in a cathedral a mile away. The “crazy idea” works; Dame Weir finishes playing and is whisked from cathedral to venue in time to greet the ovation.

The 105.2 is a successor to Reference 105 and likewise has a “listening

window”, with a small light that can be seen by someone who is in the optimum listening position. The design is based partly on considerations of time: the drivers are vertically aligned and slightly staggered, so they can be an equal distance from a listener and the bass, mid-range and treble sounds will arrive at the same time.

There would be no such problems with timing if one driver could produce the full range of sounds, yet producing premium drivers of this type is costly. The KEF team is aware that placing two different drivers together might work, yet they must not distort each other's sounds. Existing tweeters are simply too large to readily combine with mid-range drivers without causing sound deterioration; plus, having one driver in

front of another would mean the sound from one will reach a listener slightly ahead of the sound from the other.

Fincham hears of a new, extremely powerful magnet – neodymium-iron-boron, discovered by General Motors and Sumitomo Special Metals. With this, KEF may be able to make a tweeter so small that it can fit inside the cylindrical voice coil at the heart of a mid-range driver.

the **1980s**

The motor system of a drive unit consists of a voice coil attached to the driver's cone, ringed by a permanent magnet. An oscillating current passing through the coil results in a fluctuating magnetic field, causing the coil to move back and forth within the permanent magnet – in turn making the cone vibrate, creating sound waves. With a tweeter inside the mid-range voice coil, the sound waves from the two drivers will be synchronous.

The team makes a trial prototype using ordinary, ferrite magnets. It works – and the benefits are not only in timing. The new driver array can also produce treble and mid-range sounds with almost the same directionality.

The KEF research team begins working with neodymium magnets. They produce many prototypes, aiming for a structure that maximises the magnet's efficiency.

The Small Motors department of Sheffield University helps with magnet simulations. KEF's Mike Gough and colleagues including Principal Electroacoustics Engineer Enrico Cecconi refine the magnet designs, using computer simulations. They eventually produce two designs for tweeters that can be placed at the acoustic centres of mid-range drivers.

With the new driver combination, the treble and mid-range sounds reach listeners at virtually the same time. Plus, the sounds spread in near-identical patterns – meaning that even fastidious listeners do not have to sit in just one "sweet spot" in order to enjoy the best stereo imaging, with vivid impressions of locations – instruments and vocalists are performing on a "soundstage".

Audio engineers describe sound directivity using a Q factor. As the KEF team have developed an array of two drivers that unifies sound directivity, they name it the Uni-Q.

The Uni-Q first appears in KEF's C Series, in 1988. The next year, KEF introduces its first Reference Series speaker to feature Uni-Q, the I05/3. Already, there are improvements, and Uni-Q is in its second generation. Over the years, Uni-Q will become a hallmark of KEF speakers.



C95 complete with Uni-Q technology

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the **1980s** signature speakers of the decade



Celeste IV (1980-82)
KEF's computer aided design approach has enabled the broadest frequency response to be achieved with the optimum efficiency and from a surprisingly small enclosure



Reference Series Model 104/2 (1984-96)
Combines attractive, functional styling with the latest developments in loudspeaker engineering



Reference Series Model 105/3 (1989-94)
The first Reference Series speaker to incorporate Uni-Q technology
Voted Best Imported Speaker by the Japanese Press in 1992

the 1990s

hello, Dolly!



Images left to right: The Cranberries - *Everybody Else is Doing It, So Why Can't We?*
Vanessa Williams - *The Comfort Zone* Courtesy of Universal Music
The first DVD Players were sold in the 1990s

In August 1990, the Gulf War begins with Iraq's invasion of Kuwait. Six months later, UN forces drive the Iraqi Army from Kuwait.

British scientist Tim Berners-Lee, inventor of the World Wide Web, creates the first web browser, web server and web pages. In August 1991, the Web becomes a publicly available service via the Internet.

Nirvana are at the vanguard of grunge rock in the US, achieving surprise success with

their album *Nevermind*. Britpop rises in the UK, popularised partly by a "chart battle" between Blur and Oasis. Hip hop hits the mainstream as MC Hammer becomes a household name.

In 1991 movie *The Commitments*, Irish musicians form a band, play songs from the golden era of soul, including "Mustang Sally", then argue and split up. The year also sees British jazz funk band Incognito release *Inside Life*, with tracks

including "Metropolis". Incognito are still playing and draw large enthusiastic crowds at major concerts today. A former Miss America – Vanessa Williams – achieves the biggest success of her music career with "Save the Best for Last", which ranks fourth in the Billboard Top 100 hits of 1992.

The debut album of Irish band the Cranberries – *Everybody Else is Doing It, So Why Can't We?* – receives

little attention when it debuts in 1993. It becomes a commercial success as videos for their singles "Linger" and "Dreams" are often played on MTV. The Cranberries become one of the most successful rock bands of the Nineties, yet their sales are eclipsed by the all-female, all dancing Spice Girls, who are credited with paving the way for teen pop singers Britney Spears and Christina Aguilera.

In 1995, a consortium of

companies agrees on the specifications for Digital Versatile Discs – DVDs. The first DVD players are sold in Japan the next year, arriving in the US in 1997, Europe in 1998, and Australia in 1999.

The world's most famous sheep is born on 5 July 1996, though her existence is only made public in February the next year. She is the first cloned mammal, and is named Dolly.

Radiohead release one

of the greatest ever albums, *OK Computer*, in 1997. In December this year, with global warming a concern, nations adopt the Kyoto Protocol, with the goal of stabilising greenhouse gas emissions.

On 12 October 1999, a baby born in Bosnia and Herzegovina becomes, according to the UN, the world's 6 billionth living person.



Purpose built and opened in 2004, the GP factory produces for KEF and also for many other famous domestic and professional brands

the 1990s pioneering home theatre

The 1990s proves a watershed decade for KEF.

Raymond Cooke, founder and Life President of KEF Electronics, now KEF Audio, dies on 19 March 1995, aged 70. An obituary in *Gramophone* credits him as: "One of the best known, most forward-looking and widely admired of British audio engineers."

Though speakers are

still selling well, KEF encounters financial difficulties in 1991. The next year, it is acquired by an unlikely buyer: the Hong Kong based Gold Peak Group, which was established in 1964 and, though primarily a battery manufacturer, has become one of the largest manufacturers of car audio equipment.

There are personnel changes associated with the acquisition, plus a shift in manufacturing,

much of which will soon be in a custom-built, GP Acoustics factory in south China. Yet the KEF team is still headquartered on the original site in Kent and remains staunchly proud of their heritage, carefully safeguarding the BBC-influenced, sweet British sound of KEF.

There is another constant amidst the changes: innovation – particularly as KEF

becomes a pioneer and a leader in the home theatre market, which burgeons through the Nineties.

Home theatre is unusual in requiring a centre speaker that is placed horizontally rather than vertically, and is especially important for speech. When this speaker has a tweeter and mid-range driver positioned side by side, the time differences between their sounds

can create noticeable degradation of audio quality to left and right of the optimum position. The problem is most acute in the crossover region – where the driver frequencies overlap – which is within the range of human voices.

Enter Uni-Q. The KEF team realises their recent invention is ideal for the centre speaker: no time delay means no sound degradation to

left or right. They create audiophile quality centre speakers, the Reference Series Model 90 and Model 100 – each with a Uni-Q driver array. KEF launches the new speakers at the International Consumer Electronics Show (CES) – the world's largest consumer technology tradeshow – in January 1993. They are the most expensive centre speakers available.



KEF's first sub/sat home theatre system (60S/80C/30B) featured high quality moulded designer speaker cabinets and eye-catching advertising campaigns

the 1990s

The KEF team recreates a cinema, and Laurie Fincham demonstrates both speakers, with people swivelling their chairs round to hear one system and then the other. The "in" film of the time is *Terminator 2*, and Steve Halsall, Managing Director of KEF UK, is struck by the audience being blown away by the opening sequence. "The dialogue quality was something people hadn't heard before", he later recalls. Even from the side, it seems the dialogue is coming from the screen.

Lucasfilm – known for the *Star Wars* movies – introduces THX system certification for home theatre equipment, to ensure it maintains the quality of film sound. It focuses on clarity of dialogue, "soundstaging", surround sound diffusion, frequency response, and

transparency. In 1994, KEF becomes one of the first companies to release a THX approved home theatre system, complete with small rear speakers that enhance atmosphere by generating diffuse sounds.

The THX system is in the Reference Series. Yet KEF not only creates home theatre for big budget audiophiles, but is also one of the first companies to make affordable packages of satellite speakers and subwoofers so families can enjoy good quality surround sound.

KEF introduces a small moulded satellite speaker featuring a Uni-Q array, and follows with a compact 5.1 system. These are the forerunners of one of KEF's most successful products – the KHT 2005, with its iconic,

egg-shaped satellite speakers.

Thanks to computer-aided design, the "Egg", as the system is often called, takes just six months to develop, and is introduced in 2000. Featuring Uni-Q driver arrays in die-cast aluminium housings, the Egg is described by *What Hi-Fi? Sound and Vision* as, "simply brilliant".

Also reflecting KEF's commitment to producing affordable speakers, the Nineties sees KEF release a new Coda Series in 1994. The Coda 7 soon wins awards, including *What Hi-Fi?*'s "Best Buy" Loudspeaker of the Year Award for 1995. It becomes the best-selling loudspeaker of KEF's first 50 years.

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the 1990s
signature speakers
of the decade



Coda 7 (1995-97)
Best-seller of KEF's first 50 years, with
over a quarter of a million units sold



Reference Series Model 100 (1993-98)
Audiophile quality centre speaker,
featuring Uni-Q driver array

1961 1963 1965 1967 1969 1971 1973 1975 1977 1979 1981 1983 1985



Reference Series Model 109, 'The Maidstone' (1997-2000)
Demonstrates KEF's capabilities at the very high end. Features
a direct radiating bass driver together with the proven four-way
system design first introduced in the 105/3

1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011

the 2000s

songs in your pocket



Images left to right: Elvis Costello - North, Gladiator Soundtrack, Courtesy of Universal Music
In 2007 the US banking system triggers a financial crisis

“Anol shalom” begins the theme song for *Gladiator*, which is a box office success in 2000, later becoming highly rated for home theatre surround sound. The song, “Now We Are Free” is by Lisa Gerrard, in a language she created.

On 23 October 2001, Apple CEO Steve Jobs introduces the world to a device with which you can carry “1,000 songs in your pocket”. The iPod becomes one of the most iconic digital

devices launched during the decade some call the “Noughties”; others include more versatile mobile phones and digital cameras.

On 11 September 2001, two passenger jets are flown into New York’s Twin Towers, killing 2,752 people. Another plane is crashed into the Pentagon, a fourth crashes into a field in Pennsylvania. US President Bush announces a war on terror, and US and British forces invade

Afghanistan, searching for senior members of al-Qaeda. Two years later, the US and Britain lead a coalition of forces that invade Iraq.

Wikipedia is launched in 2001, and becomes the most popular general reference work on the Internet. Google, Facebook and Twitter also burst on the scene.

In 2002, New Age duo Secret Garden record “You Raise Me Up” with Irish singer Brian Kennedy. Subsequently,

over a hundred artists cover the song.

Popular music remains in flux, as performers reinvent themselves. Laura Fygi began her career with sexy Dutch girl band Centerfold, yet is now a jazz artist, singing “Historia De Un Amor” on *The Latin Touch*. Elvis Costello achieved stardom as a Seventies new wave artist; his 2003 album *North* features piano based ballads including “Still”.

More bizarrely, former Blur frontman Damon Albarn partners with Jamie Hewlett to create virtual band Gorillaz. There’s even a punk rock opera – Green Day’s *American Idiot*, which leads to an award-winning Broadway musical.

On Boxing Day 2004, an earthquake off western Indonesia causes a tsunami that kills 230,000 people in 14 countries. The next year, Hurricane Katrina devastates New Orleans in the US.

In 2007, a liquidity shortfall in the US banking system triggers the worst financial crisis since the Great Depression of the 1930s.

As the 2010s begin, turmoil sweeps through the Middle East. On 11 March 2011, an earthquake off the coast of Japan causes a tsunami that kills at least 13,000 people and causes serious damage to the Fukushima I Nuclear Power Plant.

Stereo Sound

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Muon features on the cover of a top Japanese audiophile magazine

the **2000s**

grand speakers and new technologies

Though the KHT2005 "Egg" series features elegant designer speakers that can readily fit on shelves, its arrival by no means indicates that KEF is turning away from building big, mighty loudspeakers. Far from it: the first decade of the new millennium sees KEF introduce its tallest and grandest speakers yet.

The first of these is the Muon, which packs eight drivers into a futuristic and statuesque cabinet of super-formed aluminium that stands over six feet tall. The acoustic concept and execution are led by KEF's Head of Acoustics, Dr Andrew Watson, while renowned industrial designer Ross Lovegrove chooses to use aluminium to achieve the style he envisaged. At all points it is paramount that acoustic and industrial

design teams work together to create a shape that can achieve the acoustic goal. Form follows function.

The Muon features KEF technologies like a new generation Uni-Q driver array, and ACE, which boosts bass extension through the use of activated carbon inside the cabinet.

Muon debuts in 2007, with only 100 pairs for sale, at a price tag so high that *Softpedia* bills them: "Speakers you can't afford." Yet later come warnings that anyone still wanting a pair must hurry, as only a few are unsold.

The second of the grand speakers is the Concept Blade – as the project conceived by Mark Dodd and worked on by a team including research engineer Jack Oclee-Brown came to be known.

Once finalised, this will be around five feet tall – though Dodd points out the size is not for visual effect, but instead enables more powerful and deeper bass.

The Concept Blade's radical new arrangement of drive units takes the Uni-Q idea of all sound frequencies apparently coming from one source a step further: a Uni-Q driver array will be flanked by two pairs of bass drivers, which will face sideways, be mounted back to back and glued, so that each bass driver in a pair cancels out the other's unwanted vibrations. If successful, it will seem all the sound is coming from exactly one place.

This arrangement is Mark Dodd's brainchild, a pet idea he came up with over a decade ago, when he first worked

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the 2000s

for KEF, as Development Manager, and has the opportunity to work on when he rejoins KEF as GP Acoustics' Head of Research.

With Muon set for launch, GP Acoustics is ready for a new project to further push the boundaries of audio technologies. A speaker with Dodd's new driver array is a contender. Yet first, the idea must prove viable.

The KEF team spends around three weeks building an initial prototype, with existing drivers in a metre-tall cabinet. There is a nerve wracking time for Dodd, as a small audience including him, Oclee-Brown and Steve Halsall gather for an initial listening session.

They play music tracks. "That's one of the few times I've heard a double bass playing up and down a scale like the real instrument

without any of the notes sounding too loud or too quiet" remarks Halsall. The prototype is really promising; the project is launched.

Next, they built a six-foot tall prototype, and this time there are clear issues, especially resonances within the cabinet. To reduce this, the team turns to computer modelling, which plays a crucial role in developing the Concept Blade. As the project progresses, the team build prototypes, find problems, improve their computer models, and assess enhanced prototypes.

The three-year project morphs as it proceeds. From initially aiming for a commercial series, the goal becomes the creation of a concept speaker. And there is scope for developing KEF's bass and Uni-Q drivers even further – such as through

incorporating Dodd's plan for a new Tangerine Waveguide in front of the tweeter.

The team introduces new materials as the Concept Blade nears completion. A liquid crystal polymer makes a very stiff core for the mid-range cone. The speaker cabinet is crafted from carbon fibre over balsa wood – an extremely stiff composite that minimises any resonance.



Concept Blade (2009)



Members of the KEF R&D Team

the 2000s

"This isn't the end of the Concept Blade story. Things are really interesting – the technologies are working well."

Mark Dodd

The Concept Blade is scheduled to feature at the Munich High End Show in May 2009. Time proves tight as the deadline approaches. Assembly includes bolting and gluing the pairs of bass drivers together, to ensure the force cancelling works. The pair of speakers is completed just a week before the show, and there is only time for a couple of listening sessions before they are packed into a van and driven to Munich.

Thanks to all the testing and modelling, Dodd is now confident of the Concept Blade's performance. Yet throughout the Munich show, Oclee-Brown is very nervous that one of the glue joints on the bass drivers will come apart.

The joints hold, and the KEF team finds there is a very satisfying response to the speaker, which is rated among the highlights of the show. Dodd is thrilled, and proud of the Concept Blade, later saying, "I think if Raymond Cooke could see it, he'd love it."

Though *AVguide* bills it as "The Best Loudspeaker Money Can't Buy", the Concept Blade is far from being the product of a purely intellectual exercise. Four important patents result from the project, and the new technologies are soon being incorporated in new KEF "affordable" products. A wholly revamped Q Series and the brand new T Series – with slim yet powerful speakers –

are launched in quick succession and receive glowing reviews.

"This isn't the end of the Concept Blade story," says Dodd. "Things are really interesting – the technologies are working well."

Another KEF technology enhances the immensely popular Egg home theatre system. The newly designed 3000 Series appears in 2006, featuring Sealed Suspension Technology to help maintain clean output despite the very high sound pressures that exist in small enclosures.

the 2000s signature speakers of the decade



KHT 2005 (2000-03)
The first of the "Egg" home theatre systems, which prove a major hit with consumers and reviewers alike, receiving 5 stars from *What Hi-Fi?* for an outstanding four years in a row



T Series model T205 (2010)
One of the world's thinnest high performance home cinema systems. "these wafer-thin home cinema speakers astound with a performance that must be heard to be believed" - *iGizmo*



All new Q Series family (2010)
Latest evolution of the multiple award-winning Q Series, the first complete product range to showcase Uni-Q in every model



Reference Series Model 207/2 (2006 to present)
"To all intents and purposes, it is without flaw." - *Stereophile*

KEF: 50th anniversary – from concept to reality

In spring 2011, information on the forthcoming High End Show – a major hi-fi trade fair in Munich, Germany – announces what has been a carefully guarded secret: the Blade project has progressed from concept to reality. The show will feature the global launch of the Blade, as the new product is simply known.

At 10am on 19 May, the KEF room is packed with an expectant crowd for the media launch. Everyone knows they are about to see speakers like the Concept Blade that debuted in Munich two years ago, yet faces reveal surprise as the covers are removed and the gleaming new Blade speakers are not black, but white.

Johan Coorg, KEF's ebullient Brand Development Manager, introduces the Blade and plays music that demonstrates the speakers' performance, ranging from clearly reproduced vocals to a

drum track with powerful bass. Audience members watch and listen intently; the very first production pair of Blade speakers is living up to KEF's promise of, "ground-breaking sculptural design and astonishingly convincing sound". During the four-day event, the KEF team alternates between demonstrating Blade, and Q series home theatre speakers. The Blade is a highlight of the High End Show. Initial reports are positive – *Soundstage!* *Global notes*: "The Blade is special – and available and reasonably priced – at least for something aiming to represent the state of the art."

Instead of carbon fibre like the Concept Blade, the Blade's cabinet is made from glass-reinforced composite, delivering the required acoustical properties whilst suiting production at more affordable prices.

The bass drivers are ten percent smaller, yet with improved "extension" in the low frequencies. The

KEF team has also enhanced the Uni-Q driver array, so it both looks and sounds better.

The Blade is a natural evolution for KEF. In the 1960s, Raymond Cooke noted that directivity is important in loudspeakers, and can vary with frequencies. The Reference Series Model 105, introduced in 1977, included an LED light that could only be seen when a listener was in the right position. And in the 1980s, KEF created its hallmark Uni-Q, with tweeter and mid-range driver radiating sound with the same directivity at the all-important crossover frequency.

Using unique new Single Apparent Source technology, the Blade is an appropriate first product to mark KEF's 50th anniversary. With the entire frequency range effectively produced from one point in space, the sound picture is virtually indistinguishable from a live performance.



Blade (2011)

the future of KEF – desirable designs and ongoing innovation

The home of Victor Lo, Chairman and Chief Executive of the Gold Peak Group, looks like a real life KEF showroom, with an array of six KEF speaker models. Lo was a driving force behind development of the Muon and Blade speakers, and has helped ensure a move away from typically using conventional looking speaker boxes – asking the KEF team: “Why do

all the most expensive loudspeakers have to be ugly? Why don't they look beautiful in the living room?”

The increased emphasis on speaker design is in response to audio customers seeking more sophisticated products that they can enjoy at home.

Looking ahead, Lo summarises KEF's fundamental mission: “We will keep on learning more about the market, more about the consumers, try to figure out what future needs are and what future designs might be. We aim to keep on coming with products that are competitive in price and technology and making our products desirable.”

KEF must respond to changes within the industry, such as the advent of digital music and flat screen TVs, whilst adhering to key principles. “KEF will continue to combine the best possible engineering with the best possible design and the best possible craftsmanship, but still at affordable prices,” says Lo.

“Quality is the absolute priority – in engineering, in design, in production and in marketing.”

KEF has itself undergone transformations since Raymond Cooke launched the business in 1961. Today, owned by a group based in Hong Kong, with manufacturing in south China and the UK and sales operations around the world, KEF is in many ways a global

brand. The Nissen hut by the River Medway has long gone.

Yet Lo envisions that the Maidstone site will always be KEF's global headquarters for technology. KEF will remain true to its British heritage, and to its goal of creating the ultimate loudspeakers through constantly pursuing innovation in sound.

"We will continue creating products that are not just competitive in price and technology, but are also desirable. That is our fundamental mission."

Victor Lo, Chairman and Chief Executive of the Gold Peak Group





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