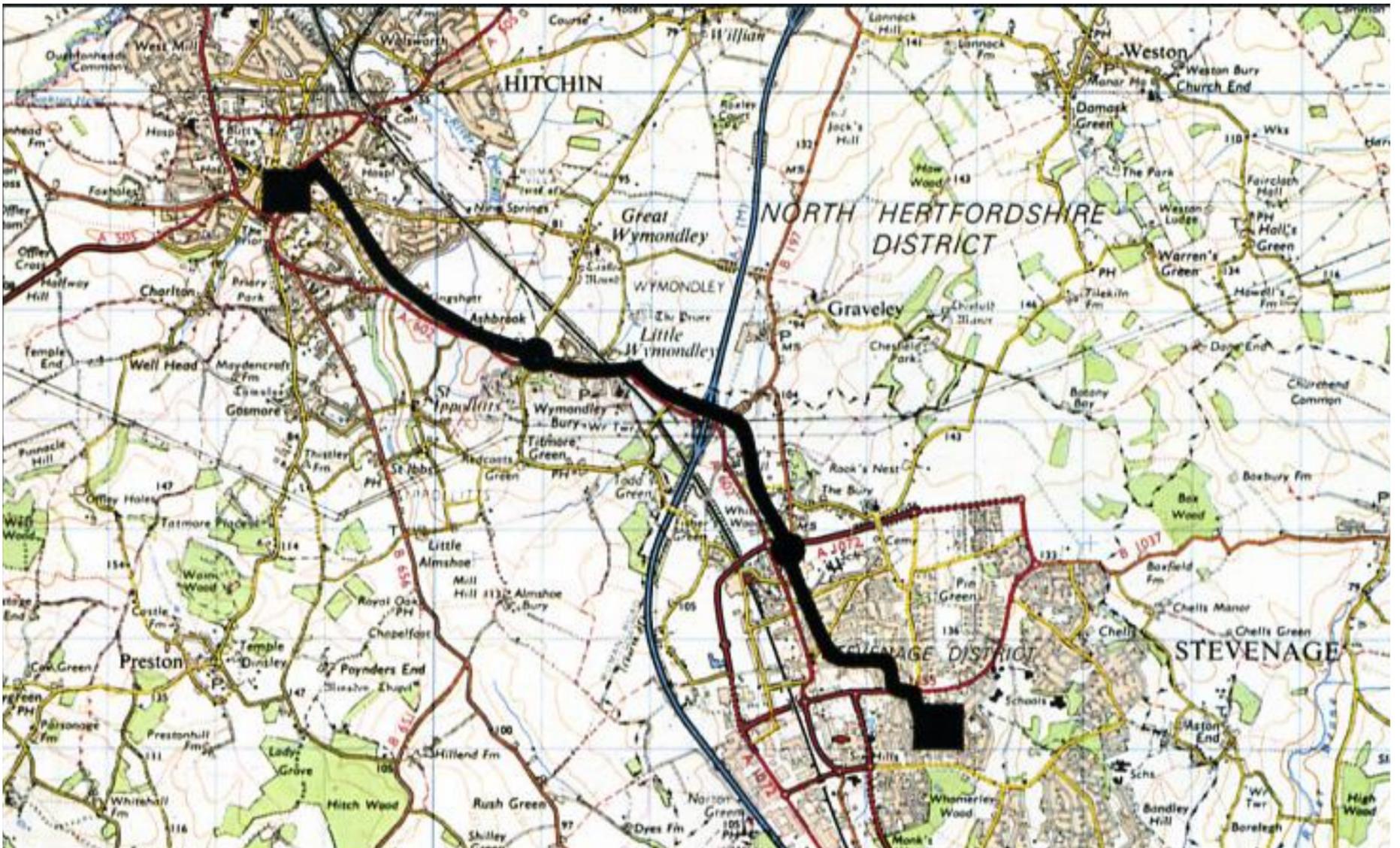


# Bindi Bhumbra – Hitchin, Stevenage and a Nobel Prize in Physics



Hitchin has always been recognised as a historic town, but not many people know of the role that two North Herts towns played in an important landmark activity that took place here.

Exactly forty years ago, a technical trial commenced to demonstrate that optical fibre was capable of transmitting high speed data over large distances. This took place between Hitchin and Stevenage. It was a world-leading activity that catapulted the development of modern fibre-optical telecommunications and ultimately led to a Nobel Prize for Physics.



Charles Kao at STL in 1966

Fibre optics as a communication was proposed in a theoretical publication in 1966 by Charles Kao and George Hockham, who were part of a team of scientists at Standard Telecommunication Laboratories (STL) in Harlow, Essex.

Kao defied conventional wisdom at the time predicting that glass could be made pure enough – people were saying that you couldn't even see through a foot-thick piece of glass, let alone send signals over hundreds of kilometres.

The STL Scientists were also researching the technologies that would be used to build such a communications system, but up until this point, the idea of using optical fibres had not been demonstrated in a real-world environment.



In order for the commercial decision to be made to invest in its manufacture, the technology first needed to be proven viable in the field.

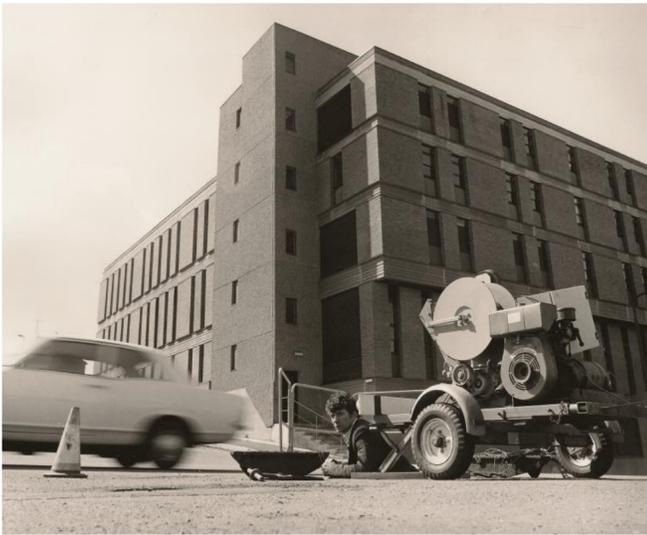
An agreement was therefore reached with the Post Office to use their ducts to connect the telephone exchanges of the towns of Hitchin and Stevenage, and demonstrate operation of a link operating at 140MB/s link.

This would have the capacity to carry over 2000 telephone calls, and though only slightly faster than the superfast broadband that we are used to today, this was the world's highest transmission rate at that time.

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The STL scientists developed components and optimised the design of optical fibres in association with STC (Standard Telephones and Cables) Ltd. These all formed part of a cutting edge communications system that turned theory into reality.

The installation of the equipment between Hitchin and Stevenage started on April 1977. The total length of the route was 9km with repeaters at 3 km spacing, and connected the exchange equipment between the two towns.



*Outside the Hitchin exchange building at the lower end of Hollow Lane*

The team encountered many challenges, including flooded manholes, and tight bends round which the fibre cables had to be carefully eased. The route also happened to cross a railway line and a Motorway, which gave further credence to the robustness of optical fibres.

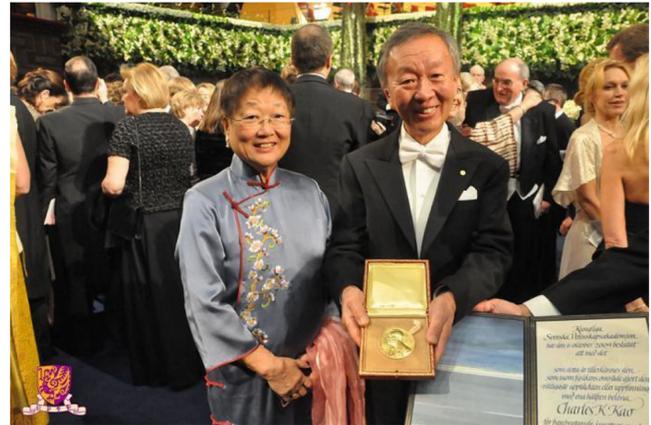


*Installation activities being carried out of the Optical Fibre system.*

After deployment was completed, it was soon proved that the technology worked, and the transmitted signals could clearly be received at the far end of the link.

The successful outcome of the Hitchin-Stevenage trial was a pivotal moment in the history of optical communications, and led to the UK becoming a world leader in the development of fibre optics technology.

The Nobel Prize for Physics was eventually awarded to Charles Kao in 2009 for his pioneering work.



*Charles Kao with his Nobel Prize*

Today's communication networks depend heavily on optical fibres, with undersea optical cables connecting the continents across thousands of kilometres of ocean.

The technologies that were developed back then continue to be improved upon, to give us the ever increasing demand for higher connection speeds. Indeed, it can be said that the Optical Fibre did for telecommunications, what the wheel did for road transport.

I'd like to thank my former colleagues of STL, Harlow, Essex, and in particular Richard Epworth for the source material for this article.

Please see the below links for further information.



[https://www.nobelprize.org/nobel\\_prizes/physics/laureates/2009/press.html](https://www.nobelprize.org/nobel_prizes/physics/laureates/2009/press.html)



<https://www.youtube.com/watch?v=EcSUw9vcIF4>



<http://opticalfibrehistory.co.uk/images/the-hitchin-stevenage-140mbs-field-demonstration/>

All pictures except Charles Kao\* with his Nobel Prize are provided courtesy of STL Quarter Century Club

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