KELVIN HUGHES

THE BOTTOM OF THE SEA AND FISH & CHIPS

KELVIN HUGHES LTD HAS A GLOBAL REPUTATION FOR THE MANUFACTURE AND SUPPLY OF INNOVATIVE AND GROUND BREAKING RADAR SYSTEMS BUT MANY MAY NOT KNOW THAT AT THE TIME OF DEVELOPING THE FIRST COMMERCIAL MARITIME RADAR IN THE LATE 1940'S, THE COMPANY WAS ALREADY AT THE FOREFRONT OF DEVELOPMENT AND SUPPLY OF MARITIME ECHO SOUNDERS.

EARLY DEPTH MEASUREMENT

In the centuries before electronics, navigators were reliant on a depth reading system that dated back to ancient civilisations. A weight, typically lead, attached to a rope was thrown into the water and when it hit the bottom, the rope was pulled back onto the ship and measured to give a depth reading.

Throwing the lead into water and then pulling it back on board was a physically demanding task and yet, the term 'swinging the lead' has curiously entered English folk law as a term for someone being lazy.

Over the centuries this method was perfected with knots on the rope that could be counted rather than measured and later, the lead weight would be covered in tallow so that when the weight hit the bottom, particles of the seabed such as sand stuck to the weight. When it was pulled back on board, the navigator could see the makeup of the seabed so, if came up clean, the seabed was probably rock and not a good position to drop anchor.

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20TH CENTURY DEVELOPMENTS – LORD KELVIN

Early mechanical machines invented could only operate in relatively shallow waters. This limited the capabilities of 19th century survey ships as they investigated the new technology of underwater telegraphy cables.

In 1858, William Thomson (Lord Kelvin) became involved with laying the first transatlantic cable between the UK and America and must have seen this problem first hand so, in 1876 he improved on his original design and patented a mechanical Sounding Machine which over time became the most widely used method of establishing depth.

Catalogue entries can be found for the 'Patented Lord Kelvin Sounding Machine' held in the Kelvin Hughes archive dating from between 1901 to 1926.

A 1901 catalogue entry states:

" This invaluable aid to navigation enjoys a high reputation for accuracy and reliability.

The machine is always ready for immediate use and can easily be manipulated by two men under the supervision of an officer.

It is extensively used in the navies of Great Britain, United States, France, Spain, Portugal, Japan, China, Argentina, Brazil, and on board the ships of all the leading lines."

Lord Kelvin's Patent Sounding Machine,
with New Pattern Depth Recorder.

Height,	29 inches.
Length,	17 "
Breadth,	7½ "

Price, complete with Accessories, £20.

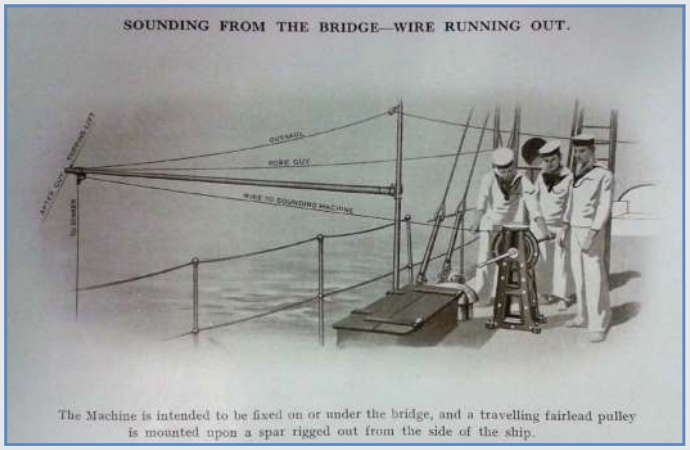
Data from a 1901 catalogue held in the Kelvin Hughes archive

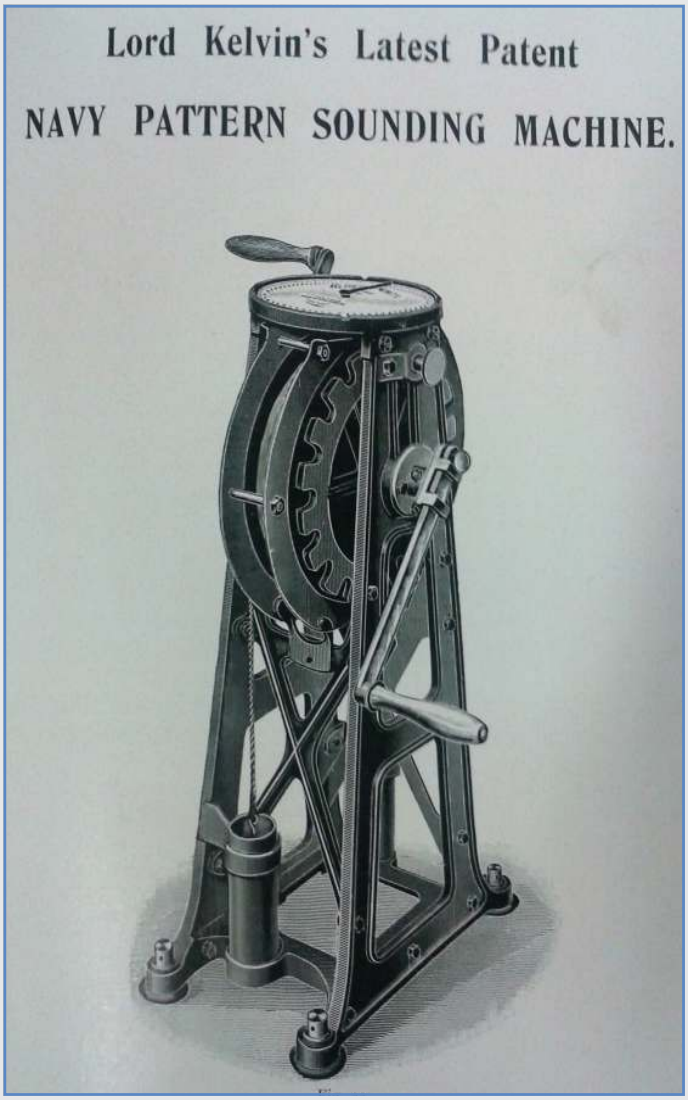
THE BOTTOM OF THE SEA AND FISH & CHIPS

These mechanical machines consisted of a drum of galvanised steel wire with a much heavier weight than could have been used by hand, a winding mechanism and dial which recorded the length of line let out.

Later developments included motorisation of the winding mechanism and operation directly from the bridge of the ship.

A catalogue entry from 1929 states that "the unit could be used with great ease and quickness without stopping the ship or slowing the speed of the vessel".





The KELVITE Mk IV hand sounding machine from a 1929 Kelvin Bottomley & Baird Ltd catalogue.

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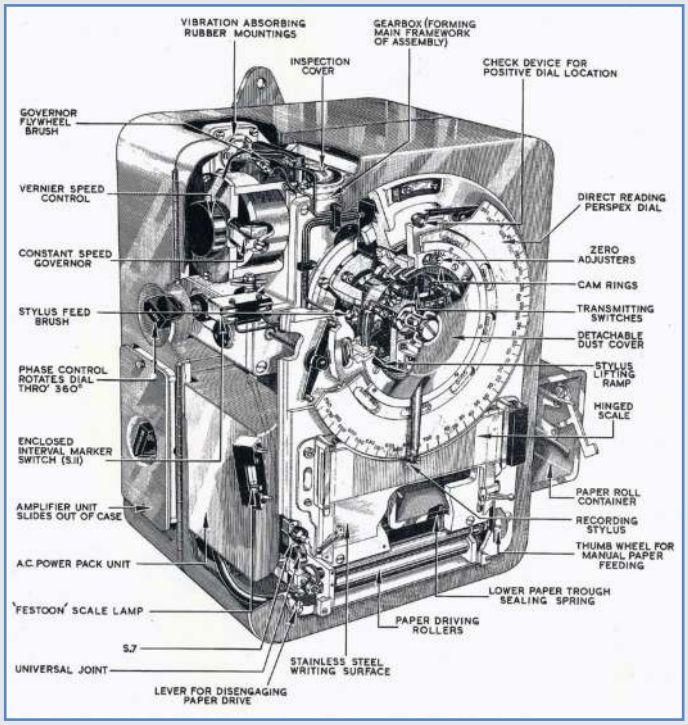
20TH CENTURY DEVELOPMENTS – HENRY HUGHES & SONS

Our links with electronic echo sounding equipment started during the First World War when Henry Hughes worked with the Admiralty on Anti-Submarine detection. Early testing methods included using shotgun cartridges exploded at the sea surface and low frequency transmitters.

From this work Henry Hughes & Sons were allowed to use some of their designs and in 1926 developed their first commercial echo sounder consisting of an electric hammer and hydrophone (an underwater microphone), with depth being detected and calculated using a pair of headphones.

This was put into successful operation but owing to the difficulties encountered in fitting the unit to the ship's hull, it cost the company £25,000 in research.

A lawsuit with an American company over the 'electric hammer' method forced the company to investigate better means of detection and in 1930, the company produced the first 'magnetostrictive' oscillator Echo Sounders under an Admiralty Licence that displayed the depth on 'wet paper' recorder.



Henry Hughes & Sons MS 21

OTHER APPLICATIONS

Development continued over the years with the sonar technology being used for the detection of flaws in metal. Systems were produced that were able to detect flaws through twelve feet of steel. In later years, some of these applications were turned to medical use and resulting in an Automatic Body Scanner to detect tumours. This work was not followed up and it was left to other firms to develop.

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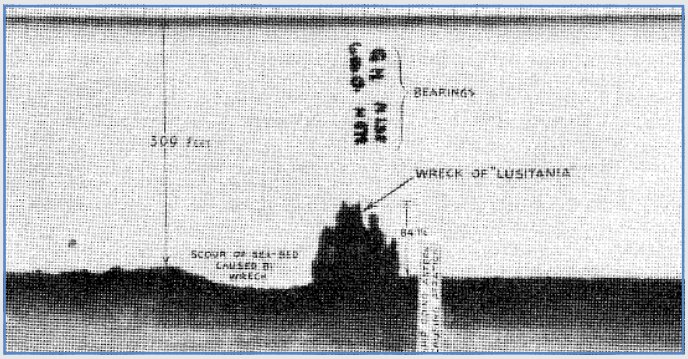
OTHER APPLICATIONS

Further work with the Admiralty also saw the company assisting in the detection of underwater mines during WWII.

As the company's knowledge and expertise grew, one of the company's founding members, Author J Hughes OBE, published his book entitled ECHO SOUNDING.

Included in this lengthy investigation into the development and the benefits of using echo sounders, he included an 'undated' sonar scan allegedly showing the wreck of the ill-fated Lusitania.



Sonar scan reporting to show the wreck of the Lusitania

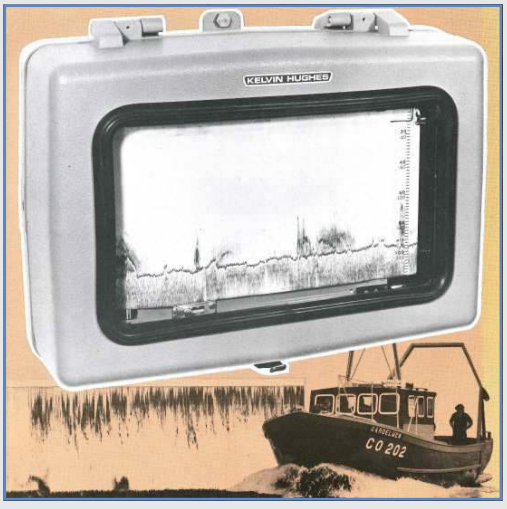
FISH FINDING KELVIN & HUGHES

Perhaps the greatest boon from these early echo sounders was fishing. In 1935 the company made the first recording of 'fish echoes' on a sounder.

Realising the value of being able to 'spot' shoals of fish, an entire range of devices specifically aimed at the fishing ships both large and small was developed with the first dedicated Fish Finder being released in 1946.

From records held in the Kelvin Hughes archive, the MS.39 echo sounder is described as being "popular with the inshore fisherman because of its good performance, simple fitting and very low power consumption."

A video produced in the 1960's showing the MS.39 in use can be found on the Kelvin Hughes YouTube channel. Click here



The Kevin Hughes MS39 Fishing Echo Sounder

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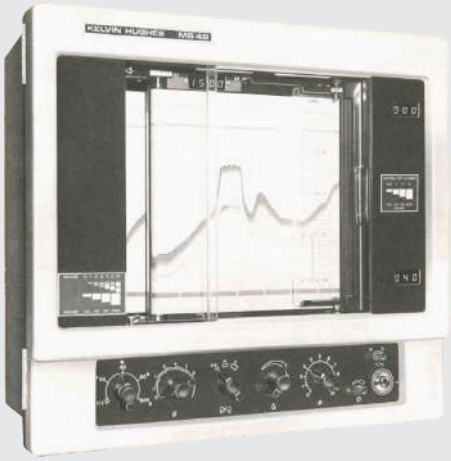
DECADES OF DEVELOPMENT

Numerous echo sounders were produced over the following decades. The following shows just a few of the many systems produced:

A copy of a wet paper recording from a Kelvin Hughes Kingfisher sounder



MS48 hydrographic echo sounder

MS132 echo sounder

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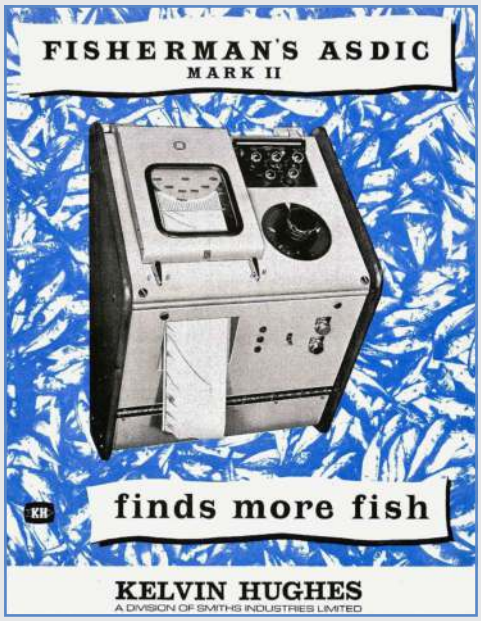
MS45 shallow water depth indicator



The list of Kelvin Hughes historical 'firsts' continued to grow and in 1951, a record depth of 10,540 metres was measured on a Kelvin & Hughes MS-21J echo sounder off the Philippines. Further accolades continued when in 1968, Kelvin Hughes were awarded the Queen's Award to Industry for the Humber Fish Detection System.

Development continued with the display of depth moving from 'wet paper' to electronic displays and the digital storage of depth data being investigated as early as 1971.

Echo Sounder production continued well into the early 1980's but manufacturing was eventually phased out to allow the business to concentrate on radar systems. Despite production being stopped, the quality of these early echo sounders is evident as Kelvin Hughes hold a copy of a service report for a working MS45 (produced circa 1960) dated March 2011.

Today, Kelvin Hughes design and production is focused on a range of highly sensitive radar sensors building on the experience and expertise amassed during decades of working in the maritime environment.

From his personal memoirs held in the Kelvin Hughes archive, Author J Hughes OBE noted:

"Navigation (that useful part of the mathematics) is a science which has been highly valued by the ancients, especially by our ancestors of this island it being indeed the beauty and bulwark of England, the wall and wealth of Britain, and the bridge that joins it to the universe."