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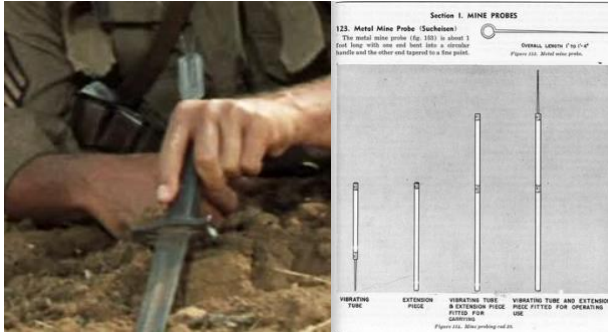
Images - top: WW2 Sappers and RASC; left to right: Sappers in Korea; BD Sappers in the Falkland; Lt. Józef Kosacki; LULU, tank-mounted mine detector

Mine the gap

In 1881, a metal detector designed by Alexander Graham Bell - the man credited with the invention of the telephone - was used in an attempt to locate an assassin's bullet lodged in the chest of US President James A. Garfield. The technology was based upon an 1841 patent and was proven but the surgical technique was wanting — and Garfield did not survive. Forty years later the technology was developed further, to help clear UXO from the battlefields of WW1. During the interwar years, the rise of the landmine and emergent doctrine concerning mine warfare prompted further research and development. A number of countries attempted to develop man-packable or vehicle carried *mine detection* systems using the principle of electromagnetic induction; but success was limited.

This short piece takes a selective look at how the mine detector evolved and examines some of the challenges faced on the battlefield and in post-conflict clearance operations.

The arrival of the 'Polish' detector



Before the advent of the mine detector, locating mines most often involved pushing a metal tool into the ground and *hoping* it struck a mine at an oblique angle; a process viewed as time consuming and requiring a steady hand. The *metal tool* in question ranged in sophistication from the common bayonet to the more

sophisticated 'vibrating tube' apparatus used by the Germans. Whatever was used, the laborious task of prodding for mines whilst 'under fire' cannot have been any fun.

Almost 100-years after the first patent for a *metal* detector was filed, *mine detection* became a military requirement. Before the *Great Patriotic War* (that is to say, war on the Eastern Front), and pre-empting the British *LULU* system, Soviet engineers produced a tank mounted mine detector: the TM-1 (shown right). In Poland, however, greater progress was being made on a man-packable system, leading to a design that would ultimately find its way to Britain.



Following the invasion of Poland and the fall of France, Józef Kosacki, a Polish officer, arrived in England. He had escaped from internment in Hungary, avoided the German Blitzkrieg and evaded from France. With him he carried the embryonic design for a mine detector: lighter and more effective than anything in use elsewhere. Working mainly independently (but supported by fellow Pole Sgt. Andrzej Gabros), Kosacki produced a working prototype and submitted it to a competitive trial run by the Ministry of Supply. In the long grass of the RE training establishment at Ripon, metal coins were strewn and the six competing detectors allowed one sweep to locate as many as possible. The Polish detector was the clear winner.

In Agnieszka Lewandowska-Kąkol's book *Titans of War*, it is noted that the detector '**operated precisely and quickly, and was also simple and lightweight enough to be operated by a single sapper**'. Designated 'Polish Mine Detector Mk1', 500 units were used to especially good effect by the 8th Army in North Africa. In a single night it proved possible to clear a minefield corridor four kilometers-wide and ten kilometers-long, thus bypassing enemy positions. The direct successors to the Mk1 remained in service with Royal Engineer units until the mid-1990s. The new capability did not remove entirely the need to prod; but it did provide a quicker and potentially more reliable option when dealing with metal mines.

The Falklands war and the 'plastic' mine

In the Royal Engineers' Museum there is a mine detector from the Falklands war of 1982. It is an American example of Vietnam war vintage - a model 4D-5000 - and was one of several taken to the islands by the invading forces. It had seen little or possibly no use with Argentinian Sappers and a similar example can be seen in at least one museum in Argentina. The immediate post-war clearance and maintenance of Argentinian minefields proved problematic, not just because of rough terrain and imprecise records but also because of the technical limitations of available mine detector technology.



The British Mk4c unit (a development of the wartime Mk1 Polish detector) was, like the *museum piece* shown above, identified by Cranfield University as '**woefully inadequate against minimum metal mines and awkward to use**'. Once again, a mine detecting capability reliant on metal detection technology had been defeated by a switch away from metal components. During WW2, for example, the Germans had begun to use mines made of wood, rubber, concrete and glass, partly for the same reason.



The poster (left) shows the 'plastic' mines used in the Falklands and the other image shows a disassembled SB 33 mine: its three metal components include (a) the spring, (b) the striker and (c) the detonator capsule (shown within its plastic retainer).

Ultimately, such mines were located by demining teams from Zimbabwe and the Lebanon, with supervising staff from British companies BACTEC, *SafeLane Global* and *Fenix Insight*. Their task involved labour-intensive digging from a location known to be clear and then advancing into the area established as being mined. Whilst a sound and effective process for use in humanitarian demining operations, the mine detection technique required for warfighting is, as noted, subject to a very different risk profile.

Selected links and references

<https://www.iwm.org.uk/collections/item/object/205206032>
<https://www.iwm.org.uk/collections/item/object/205066303>
<https://guides.loc.gov/chronicling-america-james-garfield-assassination>
TM5-223C German Mine Warfare Equipment, Department of the Army, 1952
<https://www.tankarchives.com/2020/05/t-26-as-minesweeper.html>
<https://ciekawostkihistoryczne.pl/2023/10/02/wykrywacz-min-jozefa-kosackiego/>
<https://eng.pw.edu.pl/Research/Business-Innovations-Technology-BIT-of-WUT/Jozef-Kosacki-an-engineer-at-the-fronts-of-WWII>
Cranfield University, FIELD SURVEY TO EXAMINE THE FEASIBILITY OF CLEARING LANDMINES IN THE FALKLAND ISLANDS (ISLAS MALVINAS), dated 9 July 2007
<https://www.gov.uk/government/news/falklands-finally-landmine-free-thanks-to-uk-funded-team>
https://commons.lib.jmu.edu/cisr-journal/vol25/iss1/6/?fbclid=IwY2xjawT4x8ZwZG9mBWV4dG4DYWVtAjEwAGJyaWQRMWU3S1J0b2VnbG1GdXdORG9zcnRjBmFwcF9pZBAYMjIwMzIxNzg4MjAwODkyAAEeLPfeOLx28eUWYHROXuPCG86Q7oWLePG_yconND_FEhtjcnLEvJTUUDrUnT0_aem_GvR0n3i0Ug50_wLekFvJbQ