

## HISTORY OF THE DEFENCE SURVEYORS ASSOCIATION

### ORGANISATION OF FLASH SPOTTING AND SOUND RANGING AND OTHER HOSTILE-BATTERY LOCATING UNITS DOWN TO THE OUTBREAK OF WORLD WAR II

1. In 1915 W.L. Bragg, already, although only in his early twenties, a Nobel Prizewinner (with his father) in Physics, but then a subaltern in a Royal Horse Artillery Yeomanry Regiment, was despatched to France to investigate the French Army's experiments in locating enemy battery positions with what became known as sound ranging. After doing so he was instructed to create similar sound ranging subunits in the British Army. For this purpose he combed the Army for physicists. His Sound Ranging Sections were put into the Field Survey Companies (later Field Survey Battalions) RE although the bulk of the officers were Royal Field Artillery, and the other ranks were from all arms. By the end of World War I there were about 34 Sound Ranging Sections in service. In the early part of World War I Flash Spotting had been invented by H.H. Hemming, a Canadian engineering student serving in the Royal Field Artillery on the Western Front. During the War Observation Groups, similarly recruited and placed in the Field Survey Companies, carried it out. The surveying of our own battery positions and the provision of bearing pickets and aiming points to enable them to undertake predicted fire as developed in World War I was also undertaken by the Field Survey Companies.

2. In 1920 it was decided to transfer all sound ranging and flash spotting and battery survey to the Royal Artillery. A single regular Survey Company RA was formed composed of a Survey Battery, a Flash Spotting Battery, (deploying one flash spotting base), and a Sound Ranging Battery, (deploying one sound ranging base). Two similar Territorial Army Survey Companies RA were formed. Shortly before World War II these units were renamed Survey Regiments. To provide one for each projected Corps, a second regular Survey Regiment was to be formed on any mobilisation and early in 1939 each TA Survey Regiment also formed a second Regiment.

### FORMATION AND ORIGINAL OBJECT OF THE ASSOCIATION

3. On demobilisation at the end of World War I apparently none of the sound ranging officers remained in the Army. One joined the Air Defence Experimental Establishment which was charged with the development of sound ranging equipment, but his capabilities were not highly regarded by other ex-sound ranging officers. Most of them had gone into the academic world and ranked it much higher than the Government's scientific service. Soon many of the Professors of Physics in the universities were former sound-ranging officers. There was no civilian use and consequent civilian development of sound ranging – the oil prospecting acoustic survey had different problems and was not productive of improvements in sound ranging. Bragg (later to become Sir Lawrence Bragg, C.H., and President of the Association 1949-73) was greatly concerned that the development of sound ranging methods and equipment was being effected without any input from anyone with a reputation for successful research who had carried out sound ranging in active service conditions, and also that if there were another major war it would be difficult to gather back into sound ranging the talented and experienced officers who had been in charge of its bases in 1918. Harold Hemming had similar concerns about flash spotting which also had aspects difficult or impossible to reproduce on a peacetime artillery range. He got together with Bragg to form the Association in 1927. It was called the Flash Spotting and Sound Ranging Association. Soon it was expanded to include all aspects of the work of the Survey Company RA and of the Field Survey Companies RE and, eventually, of the Hydrographic Service RN and also later to include the air survey aspects of Air Photo Reconnaissance in the RAF.

4. Actually, the Association was formed too late to influence the design and manufacture of a post-WWI generation of sound ranging equipment that was remarkably ponderous, cumbersome and troublesome. Fortunately, much of this equipment was abandoned on the continent at the Dunkirk evacuation, though it seems unlikely that this was responsible for derailing German developments. But the Association did ensure that Bragg was asked in the late 1930's to advise the Government on sound ranging and other scientific matters and that Harold Hemming and Tom Atkins were back in uniform in 1939, although beyond the ordinary age limit, and were placed in charge of instruction and developments in flash spotting and sound ranging respectively at the newly-created RA School of Survey (later the Survey Wing, School of Artillery). The School then set up an Experimental Section, which generated most of the developments in general sound ranging equipment of World War II.

## DEVELOPMENTS IN WORLD WAR II

5. A great expansion of sound ranging and flash spotting occurred in WWII. By 1945 there were 9 British, 1 Indian and 2 Canadian Survey Regiments (deploying altogether 24 major sound ranging bases, 24 flash spotting bases and 6 or more four-microphone short sound ranging bases), the Survey Wing of the School of Artillery, and a special force (consisting of another Survey Regiment, a Sound Ranging specialised headquarters staff and a Radar Battery) engaged on locating V2 launch-sites and deploying a sound ranging lattice, two observation bases and radar equipment. In all there were about 400 British officers in these units. Most of them were recruited into the Association, which thus in the late 1940's and early 1950's had a large membership, mainly former RA sound ranging and flash spotting officers. Their subscriptions and other payments were principal contributors to building up the substantial reserve funds that the Association now has.

6. There were very considerable changes in equipment and methods in the course of WWII and still more after it ended. In sound ranging, more compact, less heavy and more reliable recorders and less bulky and less heavy microphones were designed in outline by the Experimental Section at the School of Artillery Survey Wing. The detailed design and manufacture of the recorders was carried out by the Cambridge Instrument Company. The system of 3-dimensional sound ranging location of V2-launchsites by recording the supersonic boom of the V2 at a lattice of microphones was devised and developed in detail, and the special equipment required for it was designed, at the RA sound ranging headquarters mentioned in the last preceding paragraph above. For this, the special equipment was made partly in the workshop of the Air Defence Research and Development Establishment under the direction of the Army Operational Research Group and partly by the Cambridge Instrument Company supervised by Sir Lawrence Bragg. Immediately after WWII shell and mortar bomb tracking radar was developed and was able to locate hostile weapons from a single station. In flash spotting, improvements in methods were made by the Survey Wing. The commanding observation points required by the flash spotters were often sited in the foremost infantry positions and were vulnerable in enemy attacks. Observation towers were constructed set back from the foremost crest in some theatres. The air OP could serve a similar purpose, particularly once equipped to take oblique air photographs. After WWII, closed circuit television fixed to the top of a pole or carried in an unmanned airborne vehicle (UAV) provided commanding height without excessive vulnerability of valuable skilled personnel. The UAV was particularly welcome as a means of dealing with the "shoot and scoot" tactics of insurgents and, increasingly, conventional forces.