



# Rochester Avionic Archives Newsletter

**From the Curator.** This is the 40th edition of our Newsletter and it is interesting to look back at the first edition from the last quarter of 2008. The RAA had moved into the Corsair Building and like any removal it was a bit chaotic. We had yet to scan the archive of films onto DVD and the handwritten registers of all our negatives had not been transcribed into a searchable database. The catalogue system was even then beginning to show its limitations and much the same could be said about the website.

So, we have come a long way largely through the hard work of a dedicated team of volunteers. We have had the sad loss of a few friends along the way but the enthusiasm of the team has never failed and helped us to keep going through the difficult times of lockdown. One of the important events was the recognition of the RAA as part of the BAE Systems Heritage organisation which has encouraged heritage to be seen as part of the company business. This has led to really strong support from the Rochester Site Lead and the management.

Recently the RAA has become affiliated to the National Archives and become a partner of the Aviation and Aerospace Archives Initiative (AAAI). Our Webinar about the RAA was challenging but it was well received.

Our theme this coming year is to populate the display cases we have acquired with exhibits and brief notes in the manner of a museum to make it more interesting. The formal operating Procedures are under way, a revamped Website is being considered and there are some exciting plans which we hope to announce in the New Year.

Myself and the Team wish you a Happy Christmas and a peaceful New Year

*Chris Bartlett, Curator*

## The RAA team fly the BAE Systems new Simulator

The whole team have had a session flying the cutting-edge new business jet simulator. The cockpit simulator has been used as the development test bed for taxi guidance and runway overrun awareness aids and as a demonstrator for company products such as Cockpit Displays and Active Sticks.

We each had a guided tour around the facility and finally had a 20 minute flight around the London area. This was not an easy task even for those with some pilot experience (*I for one found the slow response a problem as I am more familiar with fast jet simulators; Curator*). Landings in general proved the most challenging although most of the team did at least get onto the runway! The conclusion was that it was most enjoyable but if on our holiday flight there was ever a call "*Is there anyone who knows how to fly this plane*" it was probably best that none of us should volunteer!



Curator: Chris Bartlett, Deputy Curator: Ann Jackson, Secretary Geoff Harvey

Tel: +44 3300 484082 or +44 1634 203321.

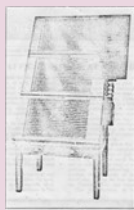
National Archives ARCHON Code 3550

e-mail: [info@rochesteravionicarchives.co.uk](mailto:info@rochesteravionicarchives.co.uk)

Website: [www.rochesteravionicarchives.co.uk](http://www.rochesteravionicarchives.co.uk)

### The Aircraft Position Indicator

Elliot Bros. (London), Ltd., Century Works, Lewisham, London, S.E.13.—In addition to the recording and testing equipment which they make, this firm produces an aircraft position indicator and a windspeed and direction indicator. The former, an ingenious device evolved in conjunction with the Air Ministry, consists of sixteen pairs of endless perforated steel tapes driven by a synchronous motor and moving at different speeds representing between 100 and 400 km.p.h. Each tape represents a route length of 350 km., and carries one or more light-coloured metal tabs, attached magnetically at any required point to represent an aircraft travelling on that route at the appropriate speed. The control officer thus has visual indication of the progress of an almost unlimited number of aircraft, while an auxiliary device records the height at which each machine is travelling.



The wind-speed recorder provides an electrical method recording the true wind speed and direction and has particular value for guidance when launching ship-borne aircraft by catapult or similar other means.

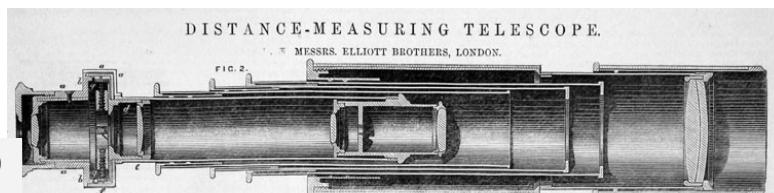
*Flight Magazine 03/11/1938*

*(See Newsletter 32. Unfortunately The Historic Croydon Airport Trust could not find any better pictures. Curator)*

A Distance Measuring Telescope by Elliott Bros c.1880

### Lord's Calculator

Around the end of the 19th century Elliott Bros (London) made a number of these 'circular Slide Rules'. The Lord's Calculator was used to measure and figure values of yardage and textiles. The dial of the calculator is approx. 10 ¼ inches in diameter. The dial in this example has a number of concentric scales but no words. Others were marked with numbers and words, percentages, counts, reeds & amp; Picks, Widths & amp; Ends and Values. There are two stem winders at the top and some devices had three such winders.



### Our First Night Vision Goggles

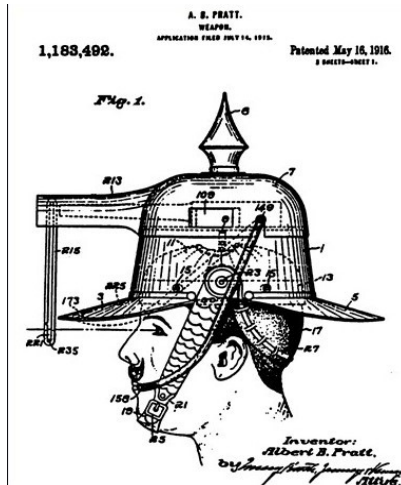
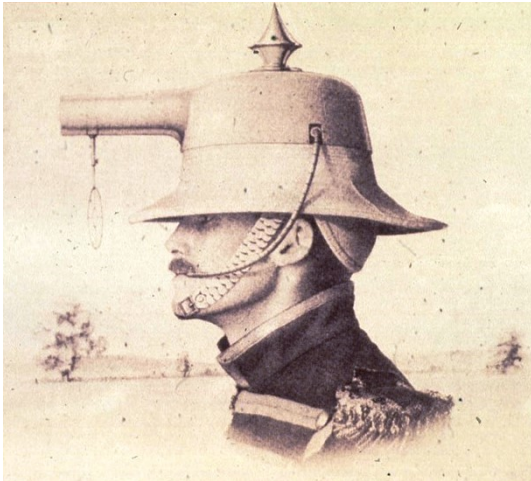
This is a story from Chas Atkins.

*"Circa 1970, I left the drawing office and joined Dave Marvell on ADD model shop. The first job I undertook was to make a prototype of Night Vision Goggles. The Project Engineer that I worked with was Staff Ellis, an Australian if my memory serves. Anyway, I made the goggles as requested, no drawings, just conversation. Staff brought a couple of image intensifiers for me to fit and wire up, then brought down a helmet on which I had to cut and fit the goggles. Having done that, he asked me to try them out. Now, our toilets had no windows, none in the towers did, so I put on the helmet, went into the gents and switched out the light. I was amazed. I could see everything, in a green hue, yes, but quite clearly. So, were they the first pair of NVG's anywhere in the world or Elliott's first trial? I remember a photo of the goggle/helmet assembly being worn by a chap from Staff's department. I wonder if it is on record somewhere? I can remember a fair bit about the construction. Much later, in the eighties I worked with an engineer, Ed Cheeseman, and made several ever increasingly sophisticated NVGs". Best wishes Chas Atkins*



## It all started a long time ago!

### The Helmet Mounted Display of Albert Bacon Pratt

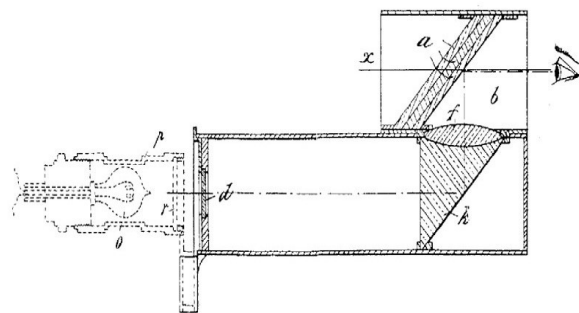
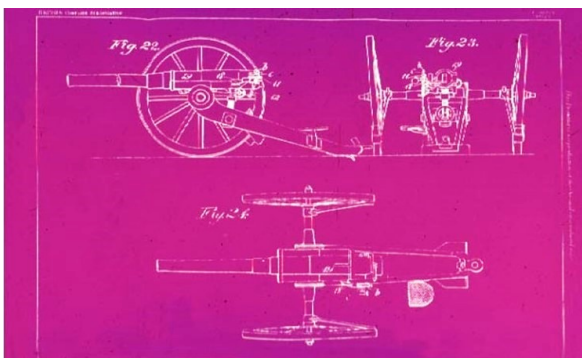


In the years before the United States entered World War I, Albert Bacon Pratt developed a novel invention: why not affix a firearm to a helmet that allows soldiers to track, target, and attack enemies simply by turning their heads? The result, patented in 1916, was the so-called “gun helmet,” the very first integrated weapon helmet system that included a firearm. The gun was “adapted to be mounted on and fired from the head of the marksman” by blowing through a tube, as Pratt wrote at the time.

“The weapon described has many advantages,” Pratt wrote in his patent application. “The gun is automatically aimed unconsciously and incidentally to the turning of the head of the marksman in the direction of the target. In self-protection, one immediately and instinctively turns the head in the direction of attack to see the enemy, or, in hunting, toward any sound made by nearby game. Thus the gun is automatically directed toward the mark in the course of the first instinctive movement.”

A further claim was that the top section of the Helmet could be removed and used as a cooking pot!

### Sir Howard Grubb’s patent for a Head Up Display



In June 1901, well before aircraft, a patent for a collimated Sight was attributed to the Irish inventor, Sir Howard Grubb. Sir Howard's patent (12108 ‘Improvements for sighting devices for guns’) embodies the key element of an aircraft Sight. The Royal Dublin Society also published his paper entitled ‘A New Collimating Telescopic Gunsight for Large or Small Ordnance’. Sir Howard Grubb describes the basic principles as:

- An image source: in this case an illuminated graticule
- A reflector: in this case a sophisticated prism assembly
- A collimating lens to produce parallel light
- A semi-reflective combining glass.

A further similarity is that this device must be aligned to the gun itself, a process known as boresighting.

**To be continued**

## The Rochester Airport site of BAE Systems

### Pre-Airport History

The Rochester Airport site runs to the Municipal boundary of Rochester East to the North where there was a line of trees and a footpath, and to the South to a junction of the A229 and Maidstone to Rochester Road once called Bridgewood Gates. To the East the edge borders the A229 originally a Roman road and to the West by the Maidstone to Rochester road running above the escarpment of Nashenden Bottom. There is another boundary called the Union and Municipal Boro Boundary which intrudes into the land from the on the Eastern side which is the current Tonbridge and Malling area. Otherwise the land is entirely within the current Medway Council area of Rochester South and Horsted. The little intrusion of the Tonbridge and Malling Borough was to cause issues when the plans for the Airport development were issued.



The land was largely woodland with the Great Delce Woods to the North East and a wood called Slipper Hearnes along the Western edge. The South had Woolmand Wood still named today as a Caravan site and the old Roman Road ran North through Westfield Wood on the West and Binland Wood to the East before reaching Horsted Farm on the Eastern side which marked the entrance to the area. The land between the woods was quite flat but of poor quality, full of flint stones, and just dotted with a few large trees.

In the late 19th Century a chain of Forts was built to protect the Naval Base at Chatham and of these Fort Horsted is still in existence to the East of the Airport site but Fort Bridgewoods to the West was demolished many years ago and is now a Royal Mail Depot. Four of the forts (Luton, Horsted, Bridgewoods and Borstal) were linked by an 18 inch gauge railway, hauled by convicts, to move building materials between the sites. Building materials were brought by barge up the River Medway to a quay at Borstal; they were landed, then hauled by a steam-powered ropeway up the steep scarp slope of the North Downs to Fort Borstal, where they were offloaded onto the railway. The prisoners were accompanied on their labours by armed warders on horseback. (Another story is that the railway was used to transport ammunition between the Forts.) The route of a section of the track between Fort Bridgewoods and Fort Horsted can be seen from the air (for example on Google Earth), as it curves away in a south westerly direction from the junction of City Way and Marconi Way. This line runs along the Northern edge of the BAE Systems Car Park along past the Towers and roughly following the footpath eventually arriving at the Fort Bridgewoods area. The railway remained in use until about 1905 and was to cause concern when part of the trackbed collapsed in the Car Park in 2018.

The Ordnance Survey Map of 1931/32 shows a Recreation Ground opposite and just North of the Horsted Farm buildings at the end of the site and a Sports Pavilion is also shown. Just South of the Recreation Ground is an area marked as a Sports Ground (see below) and Medway Archives have a plan of a Sports Pavilion just by the original entrance road.

Nothing else of any significance would seem to have happened until 1933.

**To be continued**