



# *Rochester Avionic Archives*

## *Newsletter*

Given the current situation in Ukraine it is interesting to note that Elliott Bros was created as a global organisation after WWII by a Ukrainian refugee called Leon Bagrit.

We are celebrating the Platinum Jubilee of Her Majesty The Queen and the Company has previously celebrated the Silver, Golden and Diamond Jubilees but I cannot find any record in our Archives of how the Coronation was marked. Incidentally the Company has been awarded seventeen Queen's Awards between 1966 and 2002. I have included a note about the award given to Norma Crowe who through her work at the Medway Archives strongly supported the RAA.

Sadly I have to record the recent death of Malcolm Moulton.

**From the Curator.**

**Chris Bartlett, Curator**

### **Sir Leon Bagrit**

Leon Bagrit was born on 13 March 1902 in Kiev, Ukraine, the younger son and second of three children of Manuel Bagrit, jewellery designer and jeweller, and his wife, Rachel Yousopovich. The family left Ukraine when he was a small child and arrived in London from Belgium in 1914.

Leon Bagrit knew no English then, but mastered it quickly, and soon gained a school prize for English literature. His many-sided gifts included music, and playing the violin in the Royal Philharmonic orchestra.

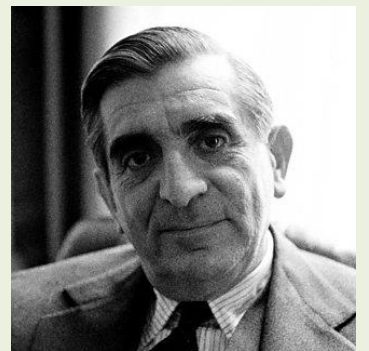
Leon Bagrit, was a great innovator and in May 1947 he acquired control of Elliott Bros London. The New Year Honours list of 1962 announced the award of Knight Bachelor to Leon Bagrit and in the same year he was elected Chairman and Managing Director of Elliott-Automation Ltd.

In retrospect, it can be seen that it was the action of Sir Leon Bagrit that led to Elliott's re-entry into the aircraft instrument field, and the eventual formation of Elliott Flight Automation Limited.

In 1964 Sir Leon presented the Reith Lectures on the BBC on the 'The Age of Automation' and this important lecture was mentioned several times in this year's Reith Lecture by Stuart Russell entitled 'Living With Artificial Intelligence'

In 1973 Sir Leon Bagrit retired as Chairman of GEC-Elliott Automation Ltd and he died on April 22nd, 1979. He is buried with his wife Stella in Willesden United Synagogue Cemetery.

More of the story can be found in Newsletters 8 (M0504), 35 (M0566), 38 (M0569) and a more comprehensive article is in the RAA Pamphlet (D0727)



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## The Queen's Jubilees



### Silver Jubilee 1977

This holographic coin was presumably an advertisement for our work with holographics for a range of Head Up Displays. The image of the Jubilee Crown was produced in 1977 to celebrate the Queen's Silver Jubilee and has an image of the Queen riding a horse and the inscription around the edge of 'ELIZABETH II D G REG F D'. The coin is in the RAA Collection Catalogue Number C1234.



### Golden Jubilee 2002

This Glass Bowl was presented together with a framed certificate to commemorate the success of BAE Systems Avionics in winning a Queen's Award for Innovation for the development of Helmet Mounted Displays. This award in 2002 coincided with the Queen's Golden Jubilee 2002 hence this is also engraved on the bowl. *'The Queen's Golden Jubilee 2002 To Commemorate the success of BAE Systems Avionics in winning a Queen's Award for Innovation'*



### The Diamond Jubilee 2012

This flypast over Buckingham Palace took 27 coordinated BAE Systems Hawk airplanes to make the picture..

The message reads "E II R." stands for "Elizabeth II Regina."

## The CILIP Award to Norma Crowe

Norma Crowe, Local Studies Librarian at Medway Archives Centre, won the Award for 2020. She worked in local studies in Medway from 1995 and has a fine record of community engagement. Her work on the history of Short Brothers of Rochester led to the founding of the Short Brothers Commemoration Society (which she chaired) and the erection of a memorial in the town. A similar project led to the setting up of Strood Heritage Society. Her outreach work often used exhibitions to involve local volunteers and encourage visitors to the Archives Centre, in recent years she featured women's history and World War I. New audiences have also been attracted by her wide range of publications and web pages. Norma was a great help to the RAA in both advice on running the Museum and in research into local history.



The Chartered Institute of Library and Information Professionals (CILIP) Local Studies Group supports local history collections and their staff in libraries across the U.K.

## Llanwern Steel Works was opened in 1962

In a once barren valley nestled among the green hills of Wales, Queen Elizabeth II last week pushed a button and put to work Britain's newest steel mill—the Spencer plant of the government-owned Richard Thomas & Baldwins company. The new plant is designed to produce high-quality steel by means of the fast-spreading LD oxygen process. It has one other remarkable attribute: it almost runs by computer. From receipt of customers' orders to the final finishing of bars, its operations will be scheduled and supervised by a unique corps of machinery designed by Britain's Elliott-Automation Ltd.

Elliott-Automation in barely 16 years has established itself as one of the world's most sophisticated manufacturers of automatic controls, and the largest outside the U.S. Elliott's 38 divisions and 25 factories turn out hundreds of complex products ranging from industrial computers to automatic homing heads for missiles. Since 1959 the company's sales have increased 122% to \$756 million, and its annual profits have soared almost 83% to \$6.6 million.

From the Magazine 'World Business', 'The Wages of Automation', Friday, Nov. 2, 1962



Queen opens the Llanwern Steel Works in 1962.

(Courtesy of British Pathé)

## Did you know.....?

### The Flower seller.

One day a long time ago a gentleman was observed selling flowers in the Corsair Building. Upon being asked if he was a Company Employee, he said that he was not. The second obvious question was "How did you get in here then" to which he replied that he had just walked in with a smile and bunches of flowers!

### The Airfield Car Park

The hard-core base for the airfield Car Park came from a Victorian Bottle Factory dump at Sittingbourne. In turn that material had come from London. The weekend after it was laid down many employees came with their families and dug it over to acquire a selection of small clay bottles and the occasional blue glass bottle. Apparently, the Thames barges would take bricks to London, and rather than return empty would pick up a load of waste products and dump them on the beach. One such place is 'Bottle Beach' Halstow Creek, on the River Medway.

### The Towers

The three Towers were built in the early 60s as part of Harold Wilson's 'White Heat of Technology' programme. They are suspended from a central core such that if you had a desk on an outside corner it would gently bob up and down in a strong wind.

After the 1987 storm, the old wooden windows in Tower 3 were largely blown out; they were quite rotten. The old metal frame windows in the other two Towers were stronger and survived. The crows would come and pull out the sealant used to put the new double-glazed windows in.

## LiteWave® Head-Up Display (HUD)

The Company recently had a Press Release for the new 'LiteWave® HUD and the Daily Telegraph reported this. A letter was received as follows:

### High-tech warfare

SIR -I was pleased to see your report (May 8) that the Rochester Airport site is still being used for the development, design and manufacture of military high-tech systems.

I had the privilege in 1962 of being seconded there from the British Army during the design of the first digital computer for the Royal Artillery. In adjacent laboratories much secret work was being conducted for the radars of the TSR2 aircraft. (*This was probably integration of the Elliott HUD with the Ferranti Radar. Ed*)

## It all started a long time ago

### Fuel Flow systems

All aircraft fuel systems must have some form of fuel quantity indicator. These devices vary widely depending on the complexity of the fuel system and the aircraft on which they are installed. Simple indicators requiring no electrical power were the earliest type of quantity indicators and are still in use today on light aircraft. However, as aircraft grew larger it was necessary to have remote reading gauges. Another consequence of large aircraft was that fuel tanks may be distributed around the aircraft in the wings and fuselage and it is necessary to balance the quantity to maintain the aircraft trim. Yet another more sophisticated use of the fuel is to act as a heat sink to absorb kinetic heating from the structure and to dissipate heat generated by the air-conditioning and hydraulic systems.

The advent of the jet age saw the need to know an engine's fuel use in real time. This can be useful to the pilot for ascertaining engine performance and for flight planning calculations. With accurate fuel flow knowledge, numerous calculations can be performed to aid the pilot's situational awareness and flight planning. Most high-performance aircraft have a fuel totalizer that electronically calculates and displays information, such as total fuel used, total fuel remaining onboard the aircraft, total range and flight time remaining at the present airspeed, rate of fuel consumption, etc.

Elliotts entered the Fuel Flow business in the late 1940s probably through the licence agreement with Bendix. The Company purchased Firth Cleveland Instruments at Treforest in 1961 and supplied Instruments for Flow Rate, Fuel Remaining and Fuel Used and Fuel Flow Transmitters and Test sets. The list of the aircraft supplied reads as a roll call of British civil and military aircraft for over 40 years.

On November 20, 1963, Mr Neil Marten, M.P., Parliamentary Secretary to the Ministry of Aviation, officially declared open the new high-temperature fuel flow laboratory of Elliott-Automation Ltd. at Rochester in Kent. The new Faraday facility continues work on Fuel Flow systems today.



A Fuel Flow Transmitter from 1951



Fuel Used & Flow Rate Indicator from 1962



A Fuel Flow Transmitter from 1980

## Operation of the Buccaneer from a Carrier



The initial deck landing trials with the Buccaneer (NA.39) at sea were due to have taken place at the end of 1959 but these unfortunately had to be put back to early the following year following the loss of XK490 on 12 October. The aircraft involved in the trials were XK489 and XK523 and these were flown from HMS Victorious in the English Channel. Both aircraft were fully navalised with folding outer-wings and nose section, together with an arrestor hook, tail skid and catapult hooks. The controls had also been modified with revised aileron gearing to improve the aircraft's lateral characteristics at low speeds and reduced friction in the longitudinal control circuit. An Elliott three-axis autostabiliser was fitted to both aircraft and in addition XK489 was fitted with a Blackburn (Hobson) autostabiliser operating on the rudder only. This installation was intended as a standby system to be used in the event of failure of the unduplicated Elliott system. It is possible that these aircraft were also fitted with a Head Up Display; at that time made by Cintel. It was not until 1964 that Elliotts acquired Cintel.

### Malcolm Moulton 1935-2022

Malcolm Moulton joined Elliott Bros in 1961 as a valuable recruit to the strong aviation equipment team at Borehamwood. He worked on the Flight Control System for the VC10 and transferred with that project to the Rochester site. He worked on programmes such as Concorde, but after a period on advanced projects he changed roles to become the Company Information Executive.

He was President of the Medway Royal Aeronautical Society for many years and an enthusiast for aeronautical history.



Malcolm Moulton receiving his 25-year Long Service Award in 1986 from Bill Alexander



## The Rochester Airport site of BAE Systems

### Airport History (Continued)

Shorts slowly began to extend the works at the Airfield in 1936 with a simple Mess Room on the East side of the North Hangar. Presumably this was for the employees working at the airfield. Clearly Shorts must already have had in mind to extend the works considerably to make an aircraft factory. Prior to the Munich Agreement of 1938, Shorts had received a pair of orders for the Stirling Bomber, each for the production of 100 aircraft; however, as a result of Munich, the Ministry of Aircraft Production (MAP) enacted 'Plan L', under which Stirling orders were rapidly increased to 1,500 aircraft.

The Airport was photographed very frequently by German aircraft when it comprised the buildings of Short Bros, and Pobjoy on the northern boundary. Photographs included the Davis Estate and the site of the present "Tiger Moth" on the Chatham - Maidstone Road Junction with City Way.

In 1938 plans were lodged for a major new Factory to be built next to the North Hangar. Between the Factory and the Hangar was another building called the Erecting Shop and these buildings were well underway in 1938. These plans also included the single storey Office Buildings along the Southern edge of the New Shorts Factory. The design was almost art deco style similar to the Flying School Administration buildings constructed at the other end of the airfield.

The Canteen was built on site by Shorts employees (under the direction of Messrs. Connolly and Povey) with brick foundations, timber building and roof trusses, with an asbestos sheet roof. The Plans applied for in 1939 show a Canteen proposed backing onto the existing Mess Room.

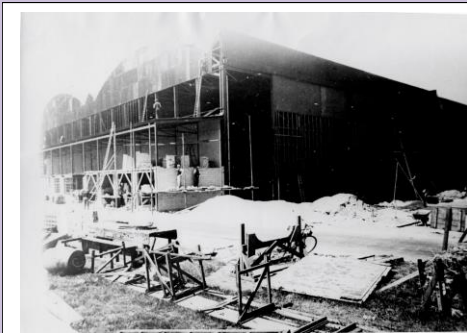
With another war looming Shorts began to speed up the construction on the Airfield.

Drawings held in the Medway Archives, dated 1938, show the first North Hangars and the low-level extension known as 'Shorts New Factory' in the plans. The 25' Erecting Shop filled in the gap and today this Shop is called the 25' Hangar (apparently the Hangars are so-called by a measure of the height from the first-floor ceiling to the eaves). It seems that it was this 25' Hangar construction that gave rise to the story that in June 1940 Stirling Bombers were being built inside it while it was being put up.

The new South Hangar, known as the 40' Hangar was rapidly constructed in 1939 backing on to the South side of the 'Black Shed' Hangar. The roof shape of the new Hangars is rounded rather than apex and this may be part of the reason why they have leaked ever since!

The company also opened a new factory in Knight Road, Strood to fabricate wings and tail planes. In the same year Pobjoy's Factory was extended and the Mess Room had already been extended. 19 September 1938, the S.31 conducted its maiden flight, piloted by Shorts' Chief Test Pilot J. Lankester Parker. On 14 May 1939, the first S.29, which had by this point received the service name "Stirling" after the Scottish city, performed its first flight.

On 14th March 1939 Their Majesties King George VI and Queen Elizabeth paid a visit. The half-scale model Stirling gave them a very impressive demonstration. The Queen was very impressed with the performance and asked the pilot Mr Piper, for further flights, while Mrs Hines (Staff Canteen) served tea.



Extensions to the Hangars and the low level factory being built in 1938

To be continued.....