



Woking and District Aircrew Association www.aircrew.org.uk/woking **Newsletter**

11 September 2020

Editorial

During last month's Zoom meeting, sadly only attended by 6 people, it was suggested that we might meet outside at Blackbushe in September. Now that the new change of virus rules has been announced, this will no longer be a feasible proposition. So it's back to Zoom again.

If Woking ACA is to survive the lockdown, members must experience the relaxed camaraderie which can only be nurtured by getting together. Whilst Zoom remains the only viable option, the future of the branch will be very uncertain unless more take part.

Newsletters inevitably rely on news and articles and I am grateful to Bill Bawden and Danuta Bildziuk for their inputs. Contributions are essential if Woking newsletters are to continue. It's up to you: if you want to keep Woking ACA together you will need to stir yourself into contributing to Zoom, the newsletter or, preferably, both.

Because the future of Chiltern's newsletter is uncertain, it has been suggested that the ACA's *Intercom* magazine might be resurrected as a worldwide electronic ACA newsletter to supersede both Chiltern and Woking newsletters. Whilst this might spread effort of contributing across a wider range of potential writers, it would still rely on local enthusiasm and contributions to be viable. As the potential editor, I await branch responses to judge viability.

This edition is padded with an extended look at two desktop flight simulators. I know this will interest only a minority, but at least there are some pictures of places many will recognise to demonstrate the impressive capabilities of today's home PCs.

I hope we will have enough material for another edition next month. Please play your part!

David Jackson

**ACAW Zoom Meeting
1400 September 15th**

Click [HERE](#) to join

UK Assistance to Beirut

As part of the UK's continued support of disaster relief operations in Beirut, an RAF C-17 carrying cold storage containers departed RAF Brize Norton and arrived in Beirut on 15 August. The cold storage containers, which can be used to store medical supplies, have been provided to the Lebanese Armed Forces who are facilitating the disaster relief response.



Cold storage containers being unloaded

This most recent assistance follows on from the survey of the damage to Beirut port conducted by HMS Enterprise. Assessing the damage to the port will act as a major step forward in helping to re-establish the strategic shipping hub, with the majority of the country's imports coming through the port it is vital that it returns to normal operations as soon as possible.

Earlier this week soldiers from the 2nd Battalion The Mercian Regiment, who had deployed from Cyprus on board HMS Enterprise, delivered and assisted in the construction of a field kitchen and accommodation tents. The tents will service 500 personnel of the Lebanese Armed Forces who are involved in providing assistance in the aftermath of the devastation.

Military advisors deployed to Beirut are continuing to work alongside the Lebanese Armed Forces to assess what further assistance the UK Armed Forces can provide.

source: RAF News website

Polish Airmen's Association UK

It's been a little while since our last update, however we have been busy working behind the scenes these past two months!

Saturday 5th September would have been the day of the annual Remembrance Ceremony at the Polish Air Force Memorial in Hillingdon.

Due to Covid 19 the ceremony was cancelled by the organisers, however we were there last Saturday to lay a wreath on behalf of our veterans and members of our Association.

A short film of the event: is [HERE](#).

Last Sunday, 6th September, Holy Mass was said for the fallen Polish Airmen and members of the Polish Airmen's Association UK at St. Andrew Bobola Church (with social distancing in place).

HE the Ambassador of Poland attended together with the Defence Attaché Colonel Mieczysław Malec, Colonel Norbert Czerbniak, Colonel Tomasz Fernecki and members of the Polish Airmen's Association.



Hammersmith and Fulham together with HE The Ambassador of Poland. Because of Covid 19 and current regulations we were unable to invite as many people as we would have liked to the opening. Details of the exhibition opening hours are on the attached poster.

The exhibition features most of the entries from the competition including an interesting display of first day covers relating to the Polish Armed Forces during WWII and will run until Thursday, 17th September. If you can't manage to get to POSK, please don't worry! There will be a virtual tour available....

Below is an image of part of the exhibition.



We hope to see you at the exhibition!



As you are aware, we launched a competition in July for the 80th Anniversary of the Battle of Britain linked to the proposed exhibition planned for this month. The competition ended in August and we had a very good response with entries of a high standard.

We are delighted to announce that the exhibition is now open for viewing in the Gallery at POSK until Thursday, 17th September.

The exhibition was officially opened on Sunday afternoon by the Worshipful the Mayor of



'The Foreign Few'

An exhibition to mark the
80th Anniversary of the Battle of Britain

The exhibition will be open
7th to 17th September 2020
From 10:00 to 17:00

The Gallery
POSK. 240 King Street. London. W6 0RF

Due to the current government guidelines regarding Covid 19, only a limited amount of people can view the exhibition at one time.

For individual viewing, upon arrival, please contact Reception at POSK. Groups (of up to 5 persons max.) need to call beforehand on 020 8741 1940 to arrange a time for viewing.

N OVER ROOT THETA

or – How to fly further with a formula by Bill Bawden

1956 NOVEMBER					Time carried forward: 911.25 705.40 205.45	
Date	Hour	Aircraft Type and No.	Pilot	Duty	REMARKS (including results of bombing, gunnery, exercises, etc.)	Flying Times Day Night
NOV.1	15.05	CANBERRA 36. WT782	FLY. LT. BEADLE	NAVIGATOR	9. OP. CAIRO WEST AIRFIELD	1.00 4.10
4	15.35	CANBERRA 36. WT782	FLY. LT. BEADLE	NAVIGATOR	10. OP. HUCKSTEP BARRACKS, ALMAZA.	1.00 4.30

In 1956 I was a navigator on No 109 Squadron and in that October we moved from our UK base to Malta during the build-up to what became the Suez campaign. This is not the place to debate the merits or otherwise of what is now considered an ill-conceived and woefully-timed adventure, and my purpose here is to explain how some of the bombing operations in the opening phase to neutralise the Egyptian air and other forces were carried out.



Fg Off Bill Bawden 109 Sqn

No 109 Squadron was a target marker unit, but for the Suez campaign, this task was given to the other marker squadron, No 139, and we were allocated, to our vexation, to the bomber force. Our Canberra B6s were designed for two-man crew operation and to become bombers, another navigator, to act as visual bomb-aimer, had to be added to each crew. These new squadron members had to wear a chest parachute harness and occupy the “rumble seat”, the folding seat alongside the pilot designed for an occasional passenger.



In the build-up to hostilities, the airfields on Cyprus, the main base for the air operations, were filled to overflowing and this meant that the Valiant B1s, which had just come or were still coming into service, and the Canberra B6s, which had a longer range than the B2s, had to operate from Malta. This did not appear to be a problem for the Valiants, but for a Canberra to fly from Malta with a full bomb load to a target at Cairo, Ismailia or Port Said and return to Malta would normally have been beyond its range.

It was decided to overcome this problem by flying a cruise-climb technique and, by constantly adjusting the power settings, achieve the most economical fuel consumption throughout the flight and so bring the potential targets within range. As my keyboard does not include mathematical symbols or the Greek alphabet, I shall render the formula for this calculation as it was spoken, to wit, n over the square root of theta. Fortunately we did not have to use this raw formula for the actual flights and we navigators were supplied with a graph incorporating the two factors governing the most

economical power settings. One axis was graduated for the all-up weight of the aircraft ('n') and the other for the outside air temperature ('theta'). With these two values, their intersection on the graph would give the required optimum engine setting and, we were assured, give us the range to be able to return safely to Malta.

When it came to putting it to then test, this was how it worked. We climbed out to 37,000 feet and at Mach 0.72 and 7,250 rpm allowed the aircraft to drift upward in a gentle cruise-climb. Shortly after this the tip tanks, which did not have gauges and were used first, would empty and I would then get the pilot to read out the contents of the three fuselage and two wing tanks. The weight of this fuel was added to the standard weight of the aircraft and crew and, together with the bomb load, produced the current all-up weight. At the same time a reading of the outside air temperature was taken and various corrections applied to it to obtain a true figure. These two values were entered into the graph and the new engine setting obtained.

The air temperature during these flights was always lower than the ICAN standard of minus 56.5 degrees centigrade which meant that the power had to be reduced, at first to (say) 7,230 rpm. Some twenty minutes later, and at similar intervals thereafter, the whole procedure was repeated. Each time the aircraft was a little lighter, at a higher altitude and the temperature a little lower and so the power settings were accordingly progressively reduced.



Canberra with Suez stripes

For the crew this posed a problem. The cabin heat was supplied from the starboard engine and so, perversely, the colder it became outside the less warm air was supplied to the crew area and it became very, very cold. Ice formed on the metal surfaces and I sat for long periods with my hands clamped around the shade of the Anglepoise lamp in order to retain some feeling in my fingers. All the crew members had piled on as much warm clothing as possible and we were further encumbered by a .38 revolver and an emergency pack

that included a purse of gold sovereigns, a silk map and a “gooley chit”.

I obtained a Blue Shadow radar fix crossing the Egyptian coast inbound and we levelled out for a few minutes, now at about 40,000 feet, for the bomb run. Having become 6,000 lbs lighter, we turned for the long haul back to Malta, gaining altitude a little more quickly for a while. With the engines throttled back into the 7,100s, I remember how unusually quiet it became, a serenity occasionally broken as one or other crew member stamped his feet to restore circulation. I set the radio compass on the Luqa beacon and, although the needle swung 45 degrees each way due to night effect, at least our base lay ahead.

Arriving overhead Malta at around 43,000 feet, the flight was far from over. The Canberra stream had taken off at 30 second intervals and now had to space to two minutes for landing. This was achieved by travelling the “trombone” by which the aircraft were flown outbound on an assigned track, each flying a little further than its predecessor in the stream, before turning through 180 degrees on to the inbound track to the approach fix now spaced at two minute intervals. Arriving at the fix at the allocated time, the aircraft descended on a designated heading in what was in effect a QGH pattern, although the weather

was perfectly clear on every flight. This was a signal to me to pack away all the paperwork and put up my jacket hood to protect against the rain shower as the ice on the overhead hatch melted. There followed a descending turn on to the QDM for the landing runway a Luqa or Hal Far.

We taxied in on what crews claimed were the fumes remaining in the tanks, some flights having clocked over 5 hours 30 minutes, a contrast to our usual sortie length of around three hours. On one occasion, one aircraft had both engines stop as it cleared the runway, having completely run out of fuel. Luckily he was the last one to land and there was no further problem.

I have Googled the formula I have quoted and other key words in an endeavour to check and verify my recollection of the events described and I could find very little that would help. This account is therefore based almost wholly on my memory of what happened sixty-four years ago and I hope it has stood the test of time. As an invoice would put it – E&OE.

Postscript. Some years later I went back to Egypt as a tourist to cruise the Nile and visit the antiquities. I judged it prudent to keep shtoom about my previous visits to the country.

Heard on the R/T

Tower: “What is your height and position?”

Pilot: “I’m five foot eleven and sitting front left.”

A VC10 Reborn ?

Kepler Aerospace aims to get former RAF VC10 flying again

Kepler Aerospace has purchased former RAF VC10, ZA150, from the Brooklands Museum Trust with a view to returning it to flight as refuelling aircraft.



VC10 ZA150 taxi run (Image: Brooklands Museum)

ZA150 has been kept in a taxiable condition at Dunsfold Aerodrome by the Brooklands Trust but

the decision was taken some time ago to dispose of the airframe and there was a danger that the aircraft would end up being scrapped.

Ownership of the aircraft has now been transferred to GJD Services Ltd, which acquired the airframe and two simulators on behalf of Kepler Aerospace and will carry out the work required to get the aircraft flight ready.

GJD is no stranger to former RAF aircraft having been involved with a deal to transfer former RAF Tristars to the US, although the deal ultimately fell through.

Midland, Texas-based Kepler Aerospace upgrades and re-engineers proven advanced aviation technologies in order to create highly efficient and economically viable satellite delivery systems.

<https://ukaviation.news/kepler-aerospace-aims-to-get-former-raf-vc10-flying-again/?fbclid=IwAR2kQjEN>

National Aerospace Library

You may not know about the National Aerospace Library at Farnborough that is administered by the Royal Aeronautical Society. This is a separate organisation to FASTA, which runs the nearby museum.

The [Library web site](#) gives free access lots of interesting historic and current information and is well worth a browse. There is also an option to sign up to receive their National Aerospace Library Newsletter.

The [library catalogue](#) is available on line and they offer some options to be sent books by post.

Unfortunately the library is closed to visitors during the COVID crisis, but once restrictions ease it will be well worth considering a visit, especially if you live not far away.

Battle of Britain Podcast

The National Archives, the RAF and the RAF Museum will release a collaborative bonus episode of On the Record at The National Archives to mark Battle of Britain Day on 15 September.

A trailer is on line [HERE](#).

Recent RAF Happenings

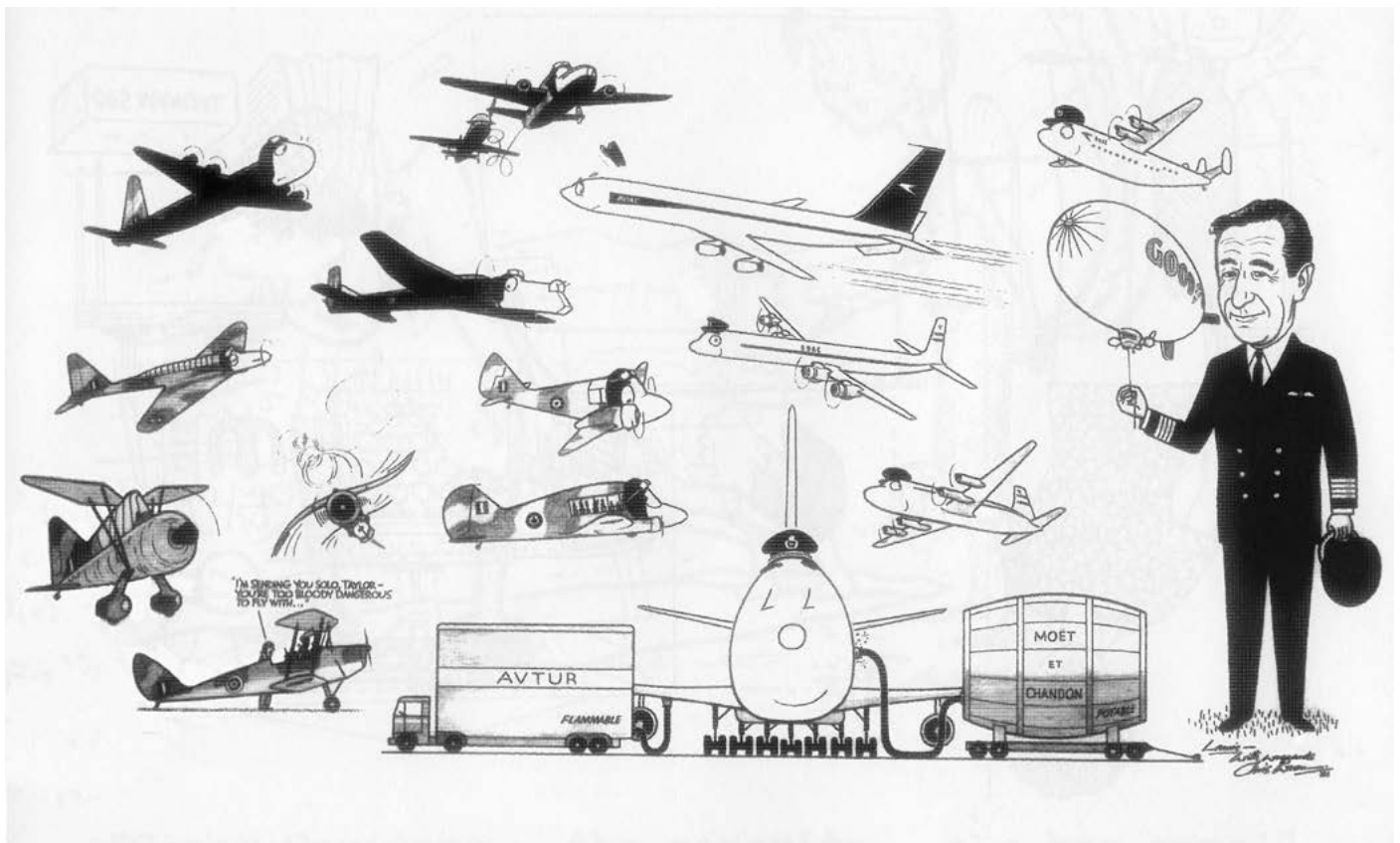
Lossiemouth Runway Renovation

To enable round-the-clock renovation of both runways at RAF Lossiemouth, the airfield has closed until later this year. The Eurofighter Typhoons forming the Northern QRA have moved to RAF Leuchars, Fife, and the training Typhoons to nearby Kinloss Barracks during this period.

Also at Kinloss are the P-8A MRA1 Poseidon aircraft mentioned in the May newsletter. Two more have now been delivered from the USA and these aircraft will also move to Lossiemouth when the works are completed.

New Remotely Piloted Aircraft for the RAF

The first three Protector RG1 remotely piloted air systems to replace the current MQ-9A Reaper have been contracted for delivery from the US makers, General Atomic Aeronautical Systems. These aircraft, with up to thirteen more in subsequent contracts, will be equipped with the UK-made MBDA Brimstone air-to-surface missile and Raytheon UK Paveway laser-guided bomb. These aircraft are due to come into service with a newly-reformed No 31 Squadron at RAF Waddington in 2024.



A Wren cartoon from Laurie Taylor's collection.

Flight Simulation at Home

This brief personal overview of the history of flight simulator programs for home computers 'flown' by David Jackson follows his piece on professional simulators in the last edition.

1982 Microsoft Flight Simulator



The first home-PC-based flight simulator I came across was Microsoft Flight Simulator, which first came out in 1982. As you can see from the above screen shot, this gave a monochrome wireframe view of the cockpit and an artificial world. Nevertheless, it was a giant leap forward in visual programming on that generation of computers and seemed at the time to be hugely impressive. But with control only via the keyboard, it was far from a realistic simulation.

1984 Microsoft Flight Simulator 2



Two years later, the 1984 version retained the imaginary wireframe world, but added 4-colour graphics and mouse and joystick control.



1988 Microsoft Flight Simulator 3

The 1988 edition improved the graphics, but retained a flat-earth world view and remained more of an arcade game than a real experience of flight. More aircraft were added and the underlying simulation was further improved. But colour displays were limited in both colour range and resolution and processors were only capable of limited throughput, so real-world realism remained a distant dream.

1989 Microsoft Flight Simulator 4



The 4th iteration introduced sound, random weather, new aircraft and primitive dynamic scenery (eg vehicles moving at airfields) now that display resolutions had reached 800x600 pixels. This generation also introduced a facility for customising aspects of the simulation.

1993 Microsoft Flight Simulator 5



The 1993 edition added textures and still higher resolution to the graphics with scenery that started to relate to the real world. An update in 1995 added further elements of realism to the world and third-parties were offering increasingly-detailed cockpit and scenery add-ons.

1996 Flight Simulator for Windows 95



FS95 was the first version to run inside Windows and included improvements in graphics with a significant improvement in frame rate and additional aircraft types. Freeware and paid add-ons added much to the experience

1997 Flight Simulator for Windows 98

The 1997 release added helicopters for the first time and expanded real-world detail in the scenery. By the end of the year, sales topped 1 million.

1999 Flight Simulator 2000



MFS 2000 added a 'pro' version with additional aircraft. Improved graphics including terrain elevation proved a challenge for anything but high-end computers whilst the introduction of GPS added a modern feel to IFR navigations. This version also introduced weather effects including rain and snow for the first time. By now the program, included over 20,000 worldwide airports (some with detailed modelling) and had good coverage of navigation aids to allow fairly-realistic airways flying and instrument approaches. The arrival of Concorde in the simulator was another significant feature.

2002 Flight Simulator 2002



The 2002 edition added improved cockpit displays, computer controlled air traffic and air traffic control to add to the sense of realism. Improvements to the underlying physics of flight further added to the credibility of the simulations whilst optimisations to the code reduce stuttering of the display.

2003: A Century of Flight



The 2003 release celebrated the centenary of the Wright Brothers and included a model of their Wright flyer that helped to show just how much flight controls and available power had improved since the early days. Weather simulation and the quality of the graphics continued to improve.

2006 FSX



FSX added additional modern aircraft, missions and improved multi-player facilities to allow formation flying with others linked over the internet. The extra facilities challenged many lower-specification computers. Later versions of this release added multi-player air racing and additional missions as well as improving coverage of detailed real-world scenery.

Development of MFS ceased in 2014, but additional aircraft and scenery continued to be developed by 3rd parties, much of which was freeware.

1995 X-Plane

Laminar Research started development of their X-Plane PC-based flight simulator in 1995. This simulator took a different approach to the physics of flight and claimed more-realistic handling characteristics as a result. As with MFS, the program had facilities integrating 3rd-party options and grew greatly in popularity after MFS left the scene.

In 2009 Laminar Research introduced a mobile version compatible with phones and tablets and using standard-fit accelerometers to provide control inputs by tilting the device.

The latest 11.50 version of X-Plane for the PC (just out) has worldwide coverage and some detailed cities and airports, but 3-D elements of landscapes elsewhere are largely generic. Many main roads are accurately positioned over the terrain, but detailed roads within settlements are often far from realistic. However, the range of add-in detailed scenery is impressive already and improving all the time, whilst extra landmarks and airfields get added with each iteration. It is an impressive program with much to offer, especially for IFR procedures and visual flying around airfields and was the platform of choice until Microsoft burst back on the scene on 18 August this year, of which more below.

Derivatives of X-Plane have been certified for use in real flying training, which underlines just how much progress has been made in simulation of cockpits, systems and real-world navigation on home computers.

Laminar Research is headed by Austin Meyers, who is clearly an aviation and programming polymath. He has also produced the [Xavion](#) app for the iPad, which provides both an independent moving map and a secondary instrument display in real flight. It also can generate a pathway-through-the-sky display to an airfield (if available) in the event of an engine failure by using live wind information to compute the flightpath required. His demonstration on the internet looks most impressive and makes persuasive arguments for private pilots to invest in a copy.

2020 Microsoft Flight Simulator 2020

Microsoft has just released what is arguably the most comprehensive world simulation which combines

Bing maps satellite data with terrain-elevation data to generate a base terrain covering the whole world. On top of this it uses cloud-based artificial intelligence to convert satellite images of buildings and trees into 3-D objects on the terrain. Some major cities and airfields are individually modelled in detail, but the AI elements give a very realistic rendering which is good enough for visual map reading. This is a major step forward and has allowed me to land light aircraft on local airstrips located by map reading as in the real world.. Even our local community centre is readily identifiable.

A major step forward is the option to use live weather for your location. This product was released just as a major hurricane struck Texas and a number of videos on YouTube show just how realistic this proved for simulator pilots who tried flying through it.

At present there is a relatively-limited choice of airliners and business jets with a reasonable selection of light aircraft. Helicopters are promised soon, whilst 3rd-parties are busy developing add-in airfields, scenery and aircraft. So far there are no fully-modelled military aircraft, unlike X-Plane and FSX. No doubt these will appear in time.

Virtual reality headsets will be a major step forward for MSFS2020 later this year and allow realistic viewing with head movement rather than having to use mouse or keyboard to look around. I hope the piggy bank isn't empty by then.

Despite the complexity of the scenery and underlying simulation, the program runs fairly well on my

10-year-old PC (albeit with a 2-year old fast graphics card), but the big airliners cause big stutters due to the extra systems modelling and are unflyable at times, particularly in near complex cities and major airfields.

X-Plane v MSFS2020

Each program has its strengths, so a serious simulator pilot will probably want to have both. MSFS2020 is superior on scenery, but X-plane simulates aircraft systems and controls much more comprehensively. With add-on scenery in X-Plane, there is little to choose for airline flights, but for recreation the realism of MSFS2020 scenery is a clear benefit.

X-Plane has just released version 11.50, which increases frame rates on my system by about 50% and makes control much smoother and responsive. Restarting and changing flights is much slicker in X-Plane and, at present, X-Plane hosts a much wider range of aircraft. Elements of each program are better than the opposition, but overall they are true competitors. This may change, of course, as both develop further over time.

There are many YouTube videos of X-Plane and MSFS2020 on the web if you would like to see the programs in action. If you are tempted to buy one, be careful to check first the specifications of computer required - both are similar,.

Meanwhile, here are some comparisons of X-Plane and MSFS2020 visuals:

X-Plane

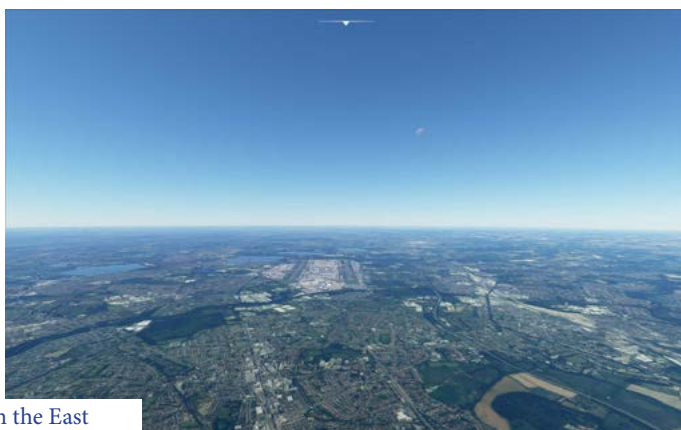


Fairoaks from the South



Heathrow from the East

MSFS2020

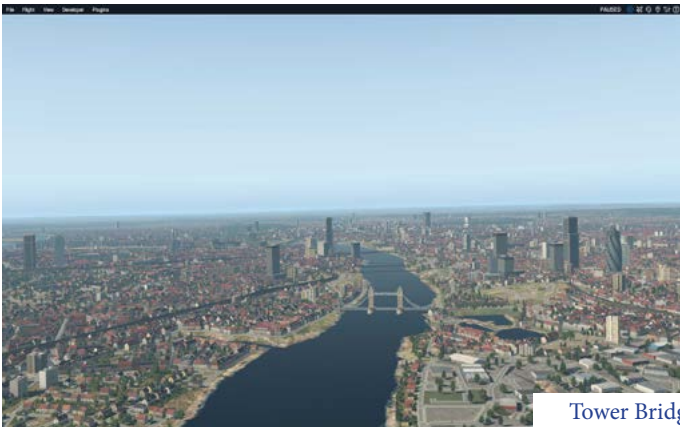


X-Plane

MSFS2020



Farnborough from the South East



Tower Bridge from the East



Tower Bridge from the East



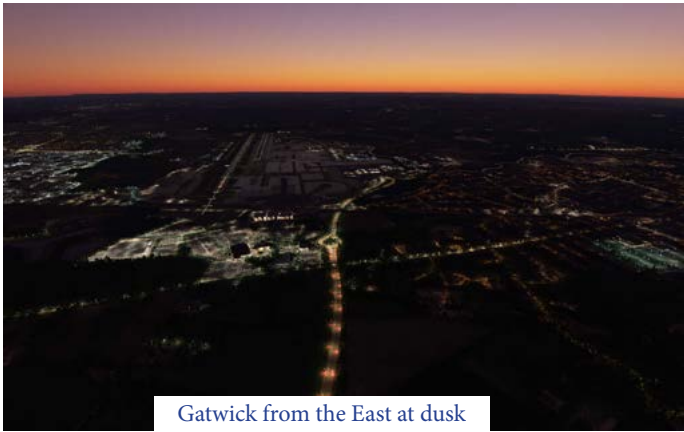
and some more from MSFS2020 of places that some of you may recognise



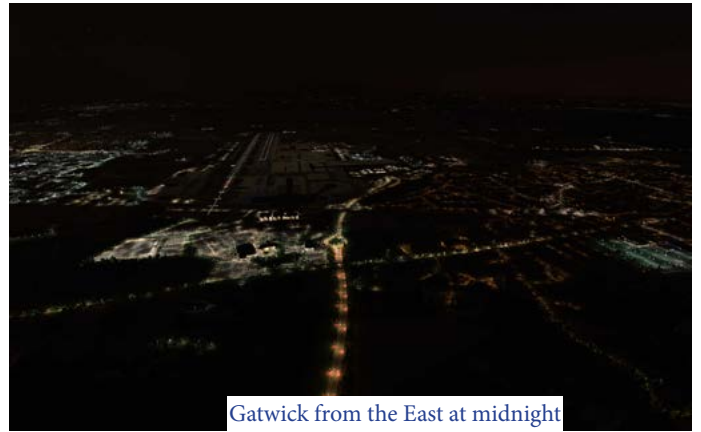
Heathrow from the East



Gatwick from the East



Gatwick from the East at dusk



Gatwick from the East at midnight



Thruxton



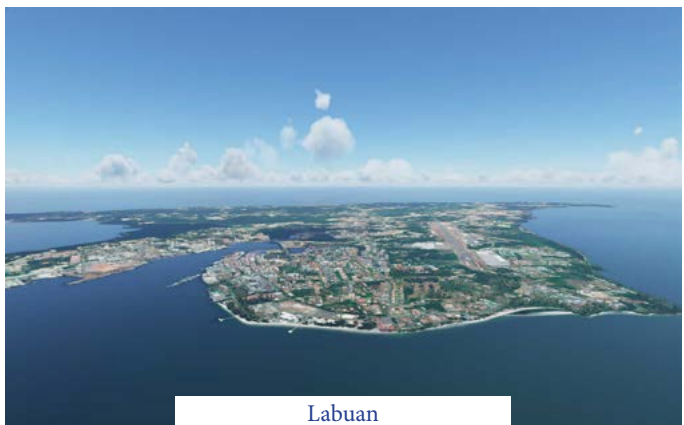
Popham



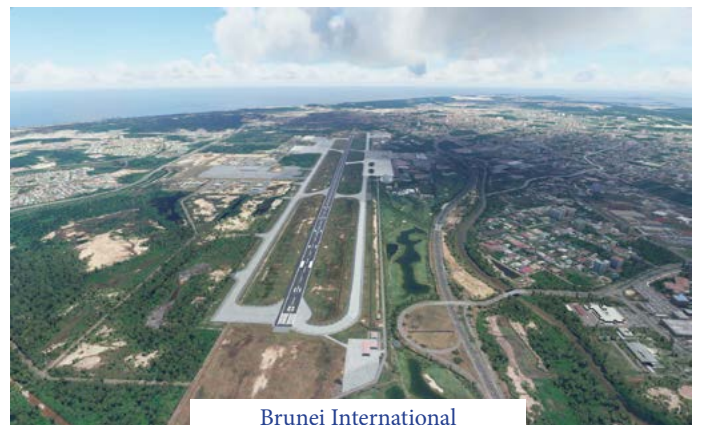
Blackbushe



Christmas Island



Labuan



Brunei International