



# UK CHAPTER NEWSLETTER

August 2023

## Recognition for the UK Chapter

The past couple of months have brought me into contact with the activities of the AOC HQ in the USA. At a practical level, John Stubbington has been active in presenting material and evidence that supports our cases for receiving funding from the HQ. We are doing well and the income that we receive allows us to set-up and subsidise events such as a our annual Xmas dinner (see more later in this Newsletter to book your places). Swaz Bramley and I also collaborated on a submission to the AOC for a prestigious award for the Chapter. The great news for the UK Chapter was therefore the recent announcement of the AOC 2023 Awards, in which our former President has been recognised.

### **Hal Gershanoff AOC Silver Medal 2023 - Chris Howe MBE**

*The Hal Gershanoff AOC Silver Medal is presented to an AOC member to recognize outstanding service in furthering the goals of the Association or its Chapter organization(s). It is the highest award given to a member for dedicated service to the AOC at the Chapter, National/ International levels over a significant period of time.*

The Board have expressed our congratulations to Chris on behalf of our members.

## UK Chapter of the AOC - Past, present and Future?



In the last Newsletter, I used the diagram to show 9 areas where I thought we needed to understand how the Chapter could operate in the future. We have now discussed a few of these topics at Board meetings and have taken some actions to move forward. I promised to provide a brief update on these in future Newsletters, so here is the first of these.

- 1) **Finance:** This is under control. We have received some funding for our support to AOC Europe and will be getting funding based on our membership numbers. We think that we might seek additional income to fund more events. We already raise some from advertising job vacancies (*see later note on this*).
- 2) **Membership:** Membership is an area where we need to get a better understanding of the skills and interests of our members in order to drive activities in most of the other 8 areas. GDPR rules limit what can be held and used, so there may be a need to contact you to get your permission to assess some details (we have access to some basic details about you, but we don't know your backgrounds nor the region in which you reside).
- 3) **History:** Our members have a good track record in preserving information about the history of UK EW through the presentations they have given at various events and our links with organisations such as Defence Electronics History Society. There are some excellent written works on EW to which members have contributed, but we haven't got a formal system for keeping records of the history or who knows it! I have made contact with Dr. Tom Withington and Richard Scott, both of whom have excellent knowledge and contacts, in order to understand how we can capture, store and disseminate historical material (even if the history is what happened only a matter of days ago).
- 4) **Education and STEM:** The main AOC have some excellent material to support Education and STEM activities. We have been approached about the possibility of providing a tailored set of material for the organisations undertaking EW work in the UK, possibly with some form of accreditation for skills and knowledge. Prof. David Stupples has agreed to lead a small working group to investigate this.
- 5) **Visits and Functions:** Without realising the significance, I put these at the centre of my 3x3 grid. I now realise that these could have an impact on most of the other areas, so it is really important that we get them up and running again. We will be seeking ways to use Partnerships to get more events in place and in the diary. Dr. Sue Robertson is looking after this area for us.
- 6) **Advocacy and Advice:** Some of us are called to represent the EW community at various events or to contribute to things like magazine articles, but I perceive that we no longer have quite so many opportunities to influence the high-level thinking on EW. There is an element of 2-way linkage here: providing advice to the EW decision makers is a part, but we should also be providing advice to our members. This is an area where we might seek to engage the specialist knowledge of our members (but we will need your permission).
- 7) **Communications:** More work is needed across most areas!
- 8) **Partnerships:** It is essential that we use our links with industry, the military and academia to understand what is going on in the UK EW domain and to maximise the value of the AOC to members (individuals and organisations). Once again, we might need your help to understand more about where the members work and the links that already exist. Swaz and I are going to meet and set out a plan of action over the next couple of months.
- 9) **Benefits:** Hopefully, some additional benefits of being UK members of the AOC will be clear and worthwhile if we can get the other 8 areas working well.

## Latest EW News Roundup

(Kindly supplied by Dr Thomas Withington – Writer and analyst, editor of the Armada International EW webpage and newsletter)

### **China Wants to Eavesdrop on U.S. Comms, So It's Building a Secret New Spy Base in Cuba**

News comes to light that the Caribbean country will host a signals intelligence gathering station for the People's Republic of China.

<https://www.popularmechanics.com/military/a44130657/chinas-new-spy-base-in-cuba/>

### **Nominee for top U.S. military post notes shortfalls in electronic warfare integration**

General Charles Brown, the nomination for the next US chair of the Joint Chiefs of Staff, has highlighted urgent questions on shortfalls regarding electronic warfare integration across the US armed services.

<https://defensescoop.com/2023/07/11/nominee-for-top-u-s-military-post-notes-shortfalls-in-electronic-warfare-integration/>

### **Another technique to identify "unknown" satellites**

It can be harder to identify satellites that you might think. This article chronicles steps being taken to identify spacecraft that appear to be unknown.

<https://www.thespacereview.com/article/4624/1>

### **Hiding in plain sight: Warfare in the electromagnetic spectrum**

An opinion article highlighting the importance of joint thinking, doctrine and practice in the electronic warfare domain, a priority which will only increase as our societies becomes ever-more connected.

<https://www.c4isrnet.com/opinion/2023/08/01/hiding-in-plain-sight-warfare-in-the-electromagnetic-spectrum/>

### **Ukraine's invisible battle to jam Russian weapons**

Public awareness of the importance of electronic warfare is growing, with the ongoing conflict in Ukraine providing important illustrations and examples of how it is used.

<https://www.bbc.com/news/world-europe-66279650>

### **How Russia is acquiring Western components for loitering munitions**

Western manufacturers of vital microelectronics have worked hard to end their supplies of militarily important components to Russia, however, as this article shows, these are still finding their way into Russian military systems.

<https://plus.shephardmedia.com/analysis/decisive-edge-newsletter-digital-battlespace-july-2023/#article1>

## EDITORIAL - Killer Drones – Technicalities and Ethics

There is increasing reference in the media to 'Killer Drones' and 'Killer Robots'. These stories have attracted the attention of politicians and the public around the world. In my opinion, there is some confusion about what is happening, with a lot of opinions on the role of Artificial Intelligence and Machine Learning and interactions with humans. Perhaps the starting point for a discussion is to consider how a typical 'drone' operates, using the example of an Unattended Air Vehicle (UAV) and its key system elements (these principles are also applicable to UGV, USV and USuV operated on the ground or on/under the sea):

1. **Motion Control:** The UAV uses various approaches to control its motion, including wireless flight control, GPS co-ordinates and various kinds of inertial reference sub-systems. In most cases, the airborne platform essentially has freedom to move in 'open air' without constraints, relying on the operator to have some form of control or oversight, either pre-flight or through in-flight interventions. If the vehicle is to fly a pre-programmed path, the operation can be fully autonomous (i.e. there is no 'human in-the-loop').
2. **Situation Awareness:** In more sophisticated applications, the UAV may need to monitor the environment around it. The most obvious reason would be flying in an urban environment or in congested airspace. In either case, a combination of 'terrain databases' (like the 3D objects in Google Map) and short-range sensors (radar, cameras, lasers etc.) can be used to build up a picture of the 3D space around the vehicle. This might be transmitted back to an operator to assist with the flight control, or can be used onboard the UAV to modify the path to avoid obstacles and collisions. Many of the simpler and cheaper systems use visible light cameras and are limited to operation in conditions where good visibility exists, but sensor systems have also been developed and used on more sophisticated platforms in extremely poor visibility. Again, this Situation Awareness process could be autonomous and have direct input into the Motion Control process - this could be by following a set of algorithmic rules (which could be considered a simple form of AI).
3. **Mission Sensors:** Many of the UAV tasks require the vehicle to carry some specialised sensors, typically to search and locate objects of interest. The most commonly used sensors are cameras producing images or full motion video (synthetic aperture radars are also used on some larger military UAV). In most cases, the images are sent by datalink to a human observer who decides if there is something of interest. In many high-end systems, the image can be analysed by algorithms (or AI or ML) to recognize certain features. The mission sensor system can then be programmed to follow the image of interest, perhaps also including issuing commands to the Motion Control system, thereby adding a further level of autonomy. In most current UAV systems, the Mission Sensors operate in a way that is often called 'semi-automatic', 'semi-autonomous', or 'human-on-the-loop'.

- 4. Effector Systems:** The final element is to consider if the vehicle has been designed to take actions that have an effect on something in its vicinity. In an industrial or commercial application this might be the delivery of supplies or the use of a 'robot arm' to remove debris. In the military or paramilitary fields, the applications include hard-kill weapons (generally missiles), or some form of directed energy in the electromagnetic spectrum. The use of laser-designated bombs and missiles delivered from the UAV (frequently with target designation from the same UAV) is the most common military action taken by 'Effector Systems' on UAV (and that which attracts attention in the media). In general, the rules of engagement state that a human must confirm that the target is real and that no collateral damage will be inflicted (this type of operation is generally known as 'human-in-the-loop'). As noted above, the imagery may be analyzed automatically, and it is entirely feasible for the vehicle's own systems to track, designate and take effect on objects of interest without human intervention ('human-out-of-the-loop'); in fact, many guided weapons work like this and have been classified as 'fire and forget' since the 1970s or even earlier).

The same sort of set of processes can be applied to many other forms of 'unattended vehicles' whether they be operating on the land, on/under the sea, in the air, or in space. They also apply to all forms of autonomous systems, all of which will have some or all of the functions noted above. Some of the obvious ones are robot cars, robot delivery systems, robot manufacturing tools, robot luggage handling at airports etc.

At what point does the media apply the 'killer' term to these fully-autonomous or partially-autonomous systems? Certainly there are speculations about the wider concept of robots taking deliberate action without human control causing unexpected disasters (more recently these have been associated with fears of AI). Accidental action due to - for example - system failure is often portrayed as the fault of the 'boffins' who designed the system. However, the type of event that is most difficult to explain is an action that resulted in the loss of human life which was not intended and might have been avoided if a human was in control. The majority of 'killer drone' headlines arise where the action of the 'Effector Systems' affected innocent people irrespective of whether or not the action hit the 'valid' target.

In essence, the issues often become whether the object detected by a 'Mission Sensors' is the correct object of interest and if wider safety issues have been considered. Cheap weapons like rocket propelled grenades (RPG) can cause significant damage, so it would probably be accepted widely that someone with an RPG is a potential threat. Simplistically, a person using a RPG looks like a human carrying a 1m long tube over their shoulder. To an algorithm using camera imagery at long range, a person carrying a piece of drain pipe might look like an RPG operator. Clearly this sort of confusion is also possible in a system where a human decides to take action, so it shouldn't be an issue about whether a robot is involved in delivering the effect, but is actually about the decision-making process. In the case of an event involving a 'human-in-the-loop', the argument would be that it was the human who failed to properly assess the risks; in this case, the proper course of action is to hold the human accountable for their actions. It is hard to take similar steps against an algorithm.

So this brings the discussion into the field of morals and ethics where the fallibility of humans is considered differently to a mistake made by the 'unfeeling' logic of a fully-autonomous robot. Discussions around the use of what are now termed Lethal Autonomous Weapons (LAWs) have been growing, particularly in the last decade.

In passing, it is worth noting that any autonomous system may become a 'killer'. A robot car could make an incorrect decision and hit a pedestrian - this is an example that is frequently discussed regarding AI systems. However, even a robot package delivery system could cause harm if it inadvertently landed on a human. Despite the mounting evidence that autonomous systems make fewer errors than humans, there is a fear of these sort of events, but they do not attract quite the same attention as the 'killer robot' headlines that are associated with 'drones'. The course of action in the event of an accident in the commercial arena is most likely to be to pursue some sort of legal case against the designers, manufacturers or users of the robot.

Perhaps the greatest fear is that the autonomous systems can be made much more frightening and destructive if the user or creator of the robot has limited moral regard for human life. If this were to be the case, autonomous robots could be created and sent to cause horrendous damage; the fear of this is magnified because those robots will have no fear and will relentlessly pursue their mission (as in 'The Terminator' films). Drawing on another fictional reference, it is interesting to note the content of the Robot stories written by Isaac Asimov between 1940 and 1985. A key premise was the 3 Laws of Robotics, which lay at the heart of all development of the robots and controlled their autonomous actions. The first Law was that: "No robot may, through action or inaction, cause harm to a human". Ultimately, it seems impossible to rely on legislation on the use of LAWs, in the same way that laws failed to stop the use of other 'inhuman' weapons such as landmines, crossbows and incendiary arrows.

There is undoubtedly a debate needed about the risks or benefits of autonomous systems in the defence and security sector. Autonomous defensive systems are common and generally accepted (such as CIWS to protect ships from missiles and active protection systems for armoured vehicles). However, autonomous offensive systems are the area of most debate, often regarding rules, laws or restrictions on use.

It is a little paradoxical that the best form of defence against 'kamikaze' and 'killer' drones (be they air, land, sea or space vehicles) is likely to be weapon systems that employ autonomous or semi-autonomous detection, identification and engagement; (which may themselves inadvertently cause collateral damage). A whole class of these systems designed to defeat UAV have been the subject of concerted development; these are the systems known as Counter-Unattended Air Systems (CUAS). Apart from the fact that electromagnetic sensors lie at the heart of the detection and identification process, many of these utilise EW or DEW to neutralise or destroy individual drones or swarms of drones. In my opinion, the debate about such systems needs to include 'the EW community', even if the systems themselves may be considered a form of air-defence and therefore lie under the management control of people outside the EW community. I have suggested the CUAS topic as one for discussion at the EW Symposium at Shrivenham to be held in February 2024.

## Interesting EW-related Information

Thank you to those who responded positively to my suggestion that we could put useful and interesting material (or links to it) on the website. I set up a pilot scheme with password access for members, but I have established that we need to get some formal permissions in place regarding author's rights and things like the use of pictures. No such restriction exists on a newly written piece with no external references, which is why I included the Editorial article on Killer drones. Let me know whether I should include similar pieces in future Newsletters.

## Interesting Crow-related Information

Andy Stove sent me a couple of pictures of the 'Old Crow', which is a bar in Portland Road, Hove. The picture of the crow is inside the bar; Andy noted that it seems much more ferocious than the ones on our logos! Perhaps it is because it is an Offensive Autonomous Attack weapon, while so much of our experience is with the more passive Defence and Surveillance variants.



*{I noted that the vehicle outside was also 'black'.}*

This started me off on one of my random searches for interesting information about Crows. Apart from finding a few other "Old Crow" pubs, I found that there is a UK tour of an Americana band called "Old Crow Medicine Show" starting on October 30th with big shows in London, Glasgow and Manchester. I don't know them, but anyone interested in Americana could go and do us a review, making sure that they get some pictures with AOC symbols visible.

My garden is home to a number of Corvids, most of which are black and stealthy (they hide in the tall trees). We have noticed a single young crow who acts as a lookout for other crows and reports whenever we put food out on our bird-feeders. He usually acts in unison with a single Magpie who performs a similar function for the local magpies. When the 2 ISTAR birds spot a potential target, they call in the larger strike package which then, in turn, attracts the attention of the local Jackdaws. The acoustic environment is soon cluttered, congested and contested.

## Future Events/Visits

- **DEHS 2023 Conference** - Swindon - Thursday 26 October 2023.
  - 2023 DEHS Conference 'Engineering Radar' and AGM
  - STEAM, Museum of the Great Western Railway
  - *More details and Application form at the back of this Newsletter*
  - *(Note that members of the AOC can attend at the discounted rate of £15)*
- **UK Chapter Xmas Dinner** - RAF Club, London - 8 December
  - **Full details attached to this Newsletter**
- **Visit to 'Y' Squadron, Royal Marines** - Plymouth, Autumn 2023
  - *In planning stage at the moment, with Dr. Sue Robertson leading*
  - *More details to be sent out as soon as we know more*
- **Electromagnetic Warfare 2024**- Shrivenham, 27-28 February 2024
  - [EW Symposium at Shrivenham](#)
  - Note date change. This has moved from November 2023 to avoid clashes with other events.
- **AOC Europe 2024** – Oslo, 13 - 15 May 2024
  - <https://www.aoceurope.org/>

## Career Opportunities

Our website now contains the first new Job Vacancy since I became President. It comes from Draken and is associated with the development of their EW training capability, in this case within KSA. [EW Job Vacancies](#)

We know that there are many opportunities in EW-related activities. Many are advertised through traditional communication paths and newer ones such as LinkedIn. We would like to increase the awareness of these opportunities by specifically routing them to our members. Darren Nichols <mailto:darrennicholls137@gmail.com> has agreed to act as point of contact for all those interested in posting vacancies on the website. Please contact Darren directly for more details.

## Bottom-line message

**Book your place at the Xmas dinner!**

***Full details on the following page and on the website.***

Steve Roberts

AOC UK Chapter - President - Email: [steve.vespasian@gmail.com](mailto:steve.vespasian@gmail.com)

**Keep Checking out the UK Chapter website at: [www.ukaoc.org](http://www.ukaoc.org)**





## CHRISTMAS DINNER 2023

**Royal Air Force Club, 128 Piccadilly, London W1J 7PY**

**Friday 8 December 2023**

The AOC UK Chapter Board is pleased to confirm that the annual AOC UK Chapter Christmas Dinner will be held in the Royal Air Force Club, Piccadilly (Hyde Park end) on **Friday 8 December 2023**. All AOC members, their partners and guests will be most welcome at this very enjoyable festive occasion. Let us make this a grand occasion with as many as possible attending as we will also recognise the achievements of Chapter members and units.

The outline programme for the evening is:

1800: Pre-dinner drinks in the 601 Sqn room (formerly Victoria bar)

1900: Christmas Dinner in the President's Room.

Carriages as required.

Dress: Gentlemen, Black Tie & Miniatures preferred; Ladies, as appropriate.

The Dinner will cost £50 per head, including wine and port at the table, this cost includes a very substantial subsidy from Chapter funds and is for members and their first guest only, who will be given priority. If members wish to bring additional guests, please email Phil Davies for the price for non-Members. Members wishing to attend should complete the proforma below and send it by e-mail to Phil Davies (or simply send Phil the information via email), early notification is appreciated for planning purposes. The preferred method of payment is by bank transfer to the UK Chapter account. Payment details will be provided on submission of attendance details. All payments to be made no later than Monday 27<sup>th</sup> November 2023. Having made a commitment to the RAF Club, we regret that payment for the dinner will still be due in the event of a late cancellation after Monday 4 Dec 2023. Early booking is recommended as the President's Room is limited to 60 places.

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To: Phil Davies

E-mail: [phildavie@aol.com](mailto:phildavie@aol.com)

Mobile: 07387 200554

I wish to attend the AOC UK Chapter Christmas Dinner on Friday 8 December 2023.

Name: \_\_\_\_\_ AOC Membership No: \_\_\_\_\_

Guest(s): \_\_\_\_\_

Telephone: \_\_\_\_\_ E-mail: \_\_\_\_\_

Any special dietary requirements (e.g. vegetarian)? \_\_\_\_\_



# 'ENGINEERING RADAR' DEHS 2023 CONFERENCE THURSDAY 26 OCTOBER 2023

The 2023 DEHS Conference 'Engineering Radar' and AGM will again be held at STEAM, Museum of the Great Western Railway, Fire Fly Avenue, Swindon, SN2 2EY ([www.steam-museum.org.uk](http://www.steam-museum.org.uk)). Tea and coffee will be available from 10.00am, Registration will open at 10.30 and lectures will end around 15.30. The DEHS Annual General Meeting will be held during the day.

The morning lectures begin with 'Big Iron: Engineering Ground Radar', presented by DEHS Chairman Dr Phil Judkins (to include Lutkin's early masts, Merryweather's fire engines and the massive Chain Home masts, through to the Fylingdales golf balls and pyramids), and then Prof. Simon Watts will focus on 'AEW Radar'. There will be two lectures in the afternoon; the first by Clive Kidd on 'Engineering Radar in the Royal Navy in WW2', and Dr Nina Baker will then present her latest researches on 'Women in Countermeasures'. During the day, Bawdsey Radar will show their virtual reality programme of the Chain Home towers at Bawdsey, and there will also be a display of equipment under restoration.

**For drivers, a map is available on the STEAM website; and DRIVERS PLEASE NOTE – Swindon is a complex town to navigate by road, and especially so at morning and evening rush hours. If in doubt, come by train if you can!** For those who opt to come by train, Swindon is easily reached via the London Paddington/ Bristol line, and STEAM is 10 - 20 minutes' walk from Swindon Railway Station. Turn right outside the Station, stay on the right-hand side pedestrian path and keep going until you come to a pedestrian sign that directs you through the GWR tunnel that connects to the Churchward site. Your route will pass English Heritage HQ and Thomas Homes apartments, soon leading to STEAM Museum. The link [www.steam-museum.org.uk](http://www.steam-museum.org.uk) shows where to park and instructions on how to get free parking – see <https://www.steam-museum.org.uk/visit/parking/>.

Please send completed forms as soon as possible, and not later than **Friday 15 September**, together with cheques made out to 'DEHS' for **£15 per person for members of DEHS and partner organisations the Association of Old Crows, Bawdsey Radar Trust, and Malvern Radar and Technology History Society, or £20 for non-members** (morning coffee, sandwich lunch and afternoon tea included) to:

**Keith Thrower OBE, 9 The Conifers, Lyefield Court, Emmer Green, Reading, RG4 8AQ**

**Online payment:** as an alternative to mailing forms and cheques, please email scan/image of form to [kthrower17@gmail.com](mailto:kthrower17@gmail.com) and pay online via: PayPal to [treasurer@dehs.org.uk](mailto:treasurer@dehs.org.uk), or BACS transfer to DEHS account No. 77535235 / Sort Code 55-70-10, with Ref "2023 Conference [Your surname & initials]".

## BRING AN EXHIBIT OF INTEREST TO DISPLAY AT THIS CONFERENCE

We look forward to seeing you!

**Please note that we normally acknowledge bookings by e-mail; we will do so by post ONLY if you enclose a Stamped Addressed Envelope**



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**I will be attending the DEHS Conference and AGM on Thursday 26 October 2023:**

Name(s): .....

Address: .....

.....Postcode: .....

E-mail: .....Tel: .....

I have paid by: cheque / PayPal / BACS transfer [Please underline as appropriate]