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7th edition
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DRONE ASIA - Marina Bay Sands Exhibition Centre - Singapore - 5 April 2017

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CONFERENCE PROGRAMME

09.40 - 10.05 The Non-Military Drone Market: Potential & Challenges
Peter van Blijenburgh
UVS International



Bio

Peter van Blijenburgh, a Dutch national born in The Netherlands (1948), resides in Paris, France. He is the CEO of Blyenburgh & Co (B&C), a French strategic consultancy company & publisher, specialized in remotely piloted aircraft systems (RPAS). He is currently (2017) in his 11th two year mandate as president of UVS International (1997), a non-profit association registered in The Netherlands and operating out of offices in Paris, France, which represents more than 3800 companies & organizations involved with RPAS in 44 countries. Mr Van Blijenburgh is a member of the ICAO RPAS Panel, the European Commission (EC) RPAS Roadmap Implementation Coordination Group, EC U-Space Working Group, JARUS Stakeholder Consultation Body, EC-funded "DroneRules" & "SkyOpener" consortia, Advisory Board of the Belgian Royal Military Academy's EU Projects, Advisory Board of the EU-FP7 Darius Project, Advisory Board of MILIPOL, User Advisory Committee of the EU-Horizon 2020 "SafeShore" Project. Mr Van Blijenburgh has been implicated with RPAS/drones since 1987 and has supplied advisory services to corporate & governmental entities in Europe, the Middle East, Far East & U.S.A. He instigated and/or participated in multiple initiatives related to RPAS/drone regulations & standards. He is the founder of the International RPAS Coordination Council (IRCC), which federates 29 associations in 29 countries in the Global Access Initiative, and he is the editor of "RPAS: The Global Perspective", the well-respected annual RPAS/drone reference publication.

Abstract

This presentation will review the current status of the non-military RPAS/UAS/drone market worldwide and highlight the potential for safety and security applications, as well as the operational & logistical implications and challenges that are faced by police and security forces desiring to introduce drones.

10.05 - 10.30 PD-100 PRS & VRS with Black Hornet Nano-Sensors
Trond Jarle Roalstad
ProxDynamics (FLIR), Norway



Bio

Trond Jarle Roalstad is the manager for international ROAS/UAS sales at FLIR, Norway. Prior to this position he was a supervisor Prox Dynamics, Norway (which was purchased by FLIR in 2016). From 2001 to 2014 he was with the Norwegian Army, where he held various positions and participated in several operational deployments. Mr Roalstad is a graduate from the Oslo School of Management (Bachelor's degree, human resource management), the Norwegian Defence University (Defence human resource management), Hedmark University College (Organization, management & development, Sergeant School Norwegian Field Artillery).

Abstract

The PD-100 Personal Reconnaissance System (PRS) is the world's smallest operational Unmanned Aerial System (UAS) and has been used extensively in combat operations by numerous security forces in recent years. The PRS is an organic and individual, pocket-sized ISTAR solution for the modern war fighter (total system weight <1.4 kg) and has become regarded by its users as a "Game Changer" and "Life Saver". The PD-100 PRS compliments the use of larger airborne and ground-based sensors, enhancing situational awareness (SA) during both dismounted and mounted military tasks. The PD-100 PRS is compact and easily integrated with an operator's personal equipment. The PD-100 PRS utilizes Black Hornet nano airborne sensors weighing < 19 grams, equipped with EO or EO/IR cameras. These 'Black Hornets' are inherently safe, organic and extremely discrete, providing users with imagery/data day and night whilst remaining undetected. Based upon the operationally proven PD-100 Personal Reconnaissance System (PRS), the PD-100 Vehicle Reconnaissance System (VRS) is a future, vehicle-based immediate airborne ISTAR system for individual vehicle crews and mounted troops. The complete system is easily integrated and platform independent, providing uses with a beyond line of sight (BLoS) ISTAR tool. The PD-100 VRS will give vehicle crews sensor-first contact in urban and other complex operating environments. Easy to launch, operate and recover; the PD-100 VRS requires no launch/recovery systems and can be used on the move. The VRS will incorporate the extremely small and inherently safe Black Hornet nano airborne sensors, allowing the system to be operated almost anywhere at any time without the need for airspace coordination. The Black Hornet nano airborne sensor will be able to

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disseminate critical information through tactical CIS integration and will offer a superior organic and discrete airborne platform to provide users with enhanced Situational Awareness (SA) in a GPS-denied environment whilst remaining undetected.

10.30 - 10.55 Indoor Mission Planning for Drones Supporting Police Task Forces in Unknown Environments
Prof.Dr.-Ing Uwe Meinberg
Brandenburg University of Technology, Germany



Bio Prof. Dr.-Ing. Uwe Meinberg, Head of Chair «Industrial Information Technology» at the Brandenburg University of Technology and managing director of a consulting company, is active more than 30 years in the field of «logistics & IT» and has been involved in about 400 dedicated projects (incl. 2014 Winter Olympic Games). Out of one of these projects, which dealt with the security in critical infrastructures (airports), the intensive study of unmanned aircraft systems has evolved in the context of logistics and other application scenarios since of 2009. Currently, the topics «Mission Planning», «Mission Evaluation (Big Data)», «Design and Dimensioning of UAS-based Distribution Systems» and thus directly connected «Exact/Precise Flights & Landings» are subject of industrial projects & research activities. Recently the competence centre «CURPAS (Civil Use of Remotely Piloted Aircraft Systems)» in the capital region was implemented under the direction of Prof. Meinberg.

Abstract Police task forces have to enter and to explore unknown objects e.g. in case of a terroristic attack or a taking of hostages. These missions are well known as being risky for the forces. In this respect the use of drones for exploration and patrolling is under discussion to achieve a higher level of safety for the forces and to increase the mission efficiency. Aside of technical specifications for the drones as 'tools', these systems have to operate autonomously due to the fact, that it is impossible for the forces to pilot a drone/drones due to their cognitive stress in these critical situations. The presentation shows the specific requirements for the planning of drone missions in respect of unknown environments, tactical guidelines, different roles for the drones and the necessity of ad-hoc-interactions. First results for a planning tool based on our cooperation with Special Forces will be presented.

10.55 - 11.25 COFFEE/TEA BREAK & NETWORKING

11.25 - 11.50 SwissDrones: It Is All About Safety
Dennis Menick
SwissDrones, Switzerland



Bio Dennis Menick has been involved in the drone sector since 2011, when he started working at Geocopter in The Netherlands, as a drone pilot. At the end of 2012, the the company was sold to Yangzhou, China. He worked in China and supported Swissdrones in Switzerland from 2012 and 2013. In 2013, Dennis signed his contract at Swissdrones Operating AG to be their principal pilot (250 hours flight experience). In 2014, Dennis became the company's sales & marketing manager. Swissdrones Operating AG, is a company specialized in the development and production of vertical take-off & landing remotely piloted aircraft systems (RPAS) for multiple applications.

Abstract This presentation will highlight the operational experience with the SDO 50 V2 VTOL drone since 2014 with the focus on safety and security. This drone has a double rotor system (2 x 2 intermeshing blades) which gives it a remarkable 45 kg payload capacity (for a total maximum take-off mass of 85 kg, including fuel). Standard payloads include the Geo-Info GL70A lidar system, the Leica RCD 30 Multispectral, the AisaKestrel, and the Merio Xender gyro-stablized gimbal with EO & IR cameras. The operational flight experience with this RPAS at the Basarnas Search and Rescue Institute in Jakarta, Indonesia will be presented.

11.50 - 12.15 Unobtrusive Drones: Hiding in Plain Sight
Nico Nijenhuis
Clear Flight Solutions, The Netherlands



Bio Nico Nijenhuis (30) studied Applied Physics and Engineering Fluid Dynamics at the University of Twente. During his studies he spent time in Malawi, Africa with local tobacco farmers, wrote his Bachelor thesis at CERN in Geneva, and did an internship at the Dutch Aerospace Laboratory NLR during his Master, where he developed and validated a novel theory for the aerodynamic Near Ground Effect. Soon after being handed an early prototype of a Robird by his professor, Nico founded Clear Flight Solutions in 2012. The company now has 20 employees and completely focuses on the development and operation of their Robirds and other (bird-like) RPAS technologies in wildlife control, wildlife protection, and safety & security.

Abstract Clear Flight Solutions offers the world new strategies in bird and wildlife control management, by keeping the sky free from birds. For military aviation it results in reduction of bird strikes while the safety of crews and passengers is enhanced. Our solution: fighting nature with nature. Creating birds is our speciality. Our Robirds are truly unique remotely controlled robotic birds of prey, with the

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realistic appearance and weight of their living counterparts. With a flight performance comparable to real birds, the instincts of birds is triggered. Through the combination of silhouette and wing movement, chasing off birds becomes fully controllable. Clear Flight Solution makes sure that the man on the ground is in control of what happens in the air. While deceiving birds, imagine what else Robirds can do for safety and security by providing highly unobtrusive drones based on nature. Through the presentation the audience will see the benefits of reducing bird strikes in military aviation and the increase of safety in aviation, and imagine a new level of safety & security possibilities.

12.15 - 12.40 Drone as a Flying Spectrum Monitoring Unit for Public & Homeland Security Purposes

Luc Haerberle
Colibrex, Germany



Bio Luc Haerberlé has occupied various positions in the telecommunication, test & measurement and safety industry, for example as Director Asia/Pacific Broadcast for Rohde & Schwarz in Munich or as Sales & Marketing Director at Dräger Safety France. In these positions Luc has often contributed to conferences and workshops for organizations like the Asia-Pacific Broadcasting Union (ABU) or the ITU. In 2013 Luc joined the German LS telcom group being in charge of developing a new subsidiary (Colibrex) involved in the RPAS/Drone industry. As specialized drone operator Colibrex is offering airborne radio frequency measurement services worldwide, as well as further measurement applications like frequency monitoring using drones. Based on the longstanding expertise of its mother company LS telcom towards dynamic databases and licensing processes, Colibrex has also invested ahead of the curve and recently launched Drone-Flight-Check, a drone registration and authorization management database & app. As Managing Director of Colibrex, Luc is developing these both activities in various countries and represents the company in international organizations. Luc Haerberlé holds a Double French-German degree in business administration for technical goods.

Abstract Efficiency and quick reaction time in spectrum management and spectrum monitoring are becoming key elements of public, homeland and military safety. Then illegal transmissions or perturbation of the frequencies used meanwhile by so many entities represent concrete threats in today's world. Several techniques of spectrum monitoring have been implemented since long time but all of them are very much dependent from where you can position the "sensors". High positions on buildings for ex. or as alternative mounting on fixed or transportable masts are typically used. With the development and sophistication of drones or UAS/UAV as flying platforms, new possibilities are offered to optimize monitoring networks. A monitoring antenna that can be deployed at an altitude of for ex. 100m can allow the identification of radio frequency signals that might not been detectable at ground level or even in the top of a building. When it comes to long-term application (several hours of monitoring) the use of a tethered drone is a very unique and suitable alternative to conventional UAS which have a limited flying time due to their battery capacity. Such a spectrum monitoring unit on a tethered drone has been developed by Colibrex/LS telcom. The purpose of the paper presented at Drone Asia is to show the concept of a drone flying monitoring system and the various possible ways of operation: stand-alone for simple frequency violation detection, as a complementary network of sensors to achieve directional finding and geo-location of the illegal transmitters, on a tethered system to enable longer monitoring time and as easy-to-deploy system for ex. to protect airports, large industrial areas, political events, national boundaries or any other sensitive areas.

12.40 - 13.30 LUNCH & NETWORKING

13.30 - 13.55 The Use of Drones for the Surveillance of Harbour Areas

Frederic Chesnin
Pilgrim Technology, France



Bio Frederic Chesnin is the co-founder of Pilgrim Technology and a designer of multi-rotor drones. He is a mechanical and electrical engineer, an expert in QA/QC in the Oil & Gas and Marine sectors, and recognized by major companies. After experience in Project Management on EPC international contracts and sourcing in Asia, he is, since 2011, in charge of development of the market for inspection by drones at Pilgrim Technology. He designs tailor-made solutions including drones and data processing. Building on this strong experience in the field of inspection Pilgrim Technology, with its trademark Eagle-View develops multirotor drones to be used as tools in the industrial, security, and military sectors.

Abstract In order to tackle the challenges of the new century, new tools are required for survey and patrol purposes. These tools must be small, have a short deployment time, be adapted to their mission, affordable, and user-friendly. Pilgrim Technology, based on its marine & offshore experience, has developed, in the context of the various security threats (incl. piracy), an effective drone-based solution for the monitoring of harbour areas, which will become operational in the Gulf of Guinea in 2017. This presentation will present this system and its capabilities.

13.55 - 14.20 The Use of Drones in the Private Security Industry

Christian de Suner
Prosegur, Singapore



Bio Christian de Suner is a management professional with 16 years of international experience spanning Singapore, China, Spain and Mexico in various industries. Within the security industry, he led the integration of PROSEGUR GROUP's first acquisitions in Asia, and established a strong footprint in Singapore. In Shanghai, he led a joint venture whose capacity numbered more than three thousands security officers, and later set up an independent security company wholly owned by PROSEGUR. He is currently spearheading the implementation and development of manned guarding and CIT solutions for Asia Pacific, working to evangelise Prosegur's latest security technology solutions to regional markets. Christian holds two university degrees: Diploma in Business Administration and BSc in Actuarial and Financial Sciences by ICADE University, Madrid (Spain).

Abstract Examples and business opportunities offered by drones in the private security industry. How these devices can provide support to the existing security operations or create new security solutions.

14.20 - 14.45 The SafeShore System for the Detection of Drone Threat Agents for Maritime Border Surveillance

Geert De Cubber
Royal Military Academy, Belgium
On behalf of the SafeShore Consortium



Bio Geert De Cubber received in 2001 the degree of Master in Engineering at the Vrije Universiteit Brussel (VUB), with as specialization Electro-Mechanical Engineering. He then obtained a PhD. for his research in the field of 3-dimensional reconstruction of natural scenes perceived by mobile robots. This PhD. and the associated research project were part of a joined research effort between the Vrije Universiteit Brussel and the Belgian Royal Military Academy (RMA). Currently, Geert De Cubber is a researcher working in the department of Mechanics of the Royal Military Academy, where he is leading the research activities of the research group on robotics for high-risk applications. The specialization of this research unit is the development of unmanned vehicles (aerial and ground robotic systems) for high-risk applications like search and rescue and humanitarian demining. The robotics for high-risk applications research unit doesn't only perform state-of-the-art fundamental research in the domain of robot perception and navigation, but also applies this research on the terrain. Geert is the coordinator of the European ICARUS project which deals with the development of unmanned tools (aerial, ground and marine robots) which can assist search and rescue workers to save human survivors after a major crisis (earthquake, tsunami, typhoon, shipwreck). Specializing further on the drone systems, Geert is now also the coordinator of the European project SafeShore, which deals with the development of a border surveillance system, capable of detecting small drones.

Abstract As national regulators are increasingly opening up the access to airspace for drones, the number of drone operations is rising dramatically in recent years. However, one cannot be blind to the fact that besides all the advantages offered by drones, this new technology also brings with it some serious threats related to the safety, privacy and security of the citizens. Moreover, a regulatory framework for managing the drone operations can only be credible if there is a means of policing the access to airspace, which means that it must be possible to detect illegal operations. Therefore, the European Commission decided to fund the SafeShore project, which focuses on the detection of threat agents like drones in a marine border surveillance scenario. The main objective of the SafeShore project is to cover existing gaps in coastal border surveillance, increasing internal security by preventing cross-border crime such trafficking in human beings and the smuggling of drugs. It is designed to be integrated with existing systems and create a continuous detection line along the border. One of the treats to the maritime coast are small drones which can carry explosives or which can be used for smuggling drugs, boats and human intruders on the sea shore. Their low cost and very small signature makes them a favorite platform for smugglers and terrorists. The mini-drone Radar Cross Section is too small to be detected by the regular costal radars, which is where SafeShore comes in.

14.45 - 15.10 Automating the Inspection and Monitoring of Assets

Erol Cagatay
Robot Aviation, Norway



Bio Erol Cagatay has broad experience from industry and international business from Europe, the Middle East, North America, and Asia. He has a professional background from aviation and other industries in technical and business positions. Before taking on a role at Robot Aviation, he was hired in at growth companies in Norway for strategy and business development. Throughout his career he has added value to companies such as Airbus, Siemens and National Air Services. Erol holds an MBA from INSEAD, a MSc in Aerospace

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Engineering from the Georgia Institute of Technology, and a BSc in Aerospace Engineering from The University of Texas at Austin, USA.

Abstract With the miniaturisation of technological components aboard aircraft, a more effective avenue has been opened to inspect and monitor assets, and to provide surveillance and security over large areas. There is a need for end customers to have a complete system that will enable them to approach this task more effectively. In this presentation, Robot Aviation will outline the Unmanned Aircraft System used to monitor high voltage power lines together with their collaboration partner. The automation is an important ingredient in further increasing the cost effectiveness of using UAS to perform the tasks, and to accelerate the introduction of UAS in industrial applications.

15.10 - 15.40 **COFFEE/TEA BREAK & NETWORKING**

15.40 - 16.05 **The Advantages & Challenges of Using Drones for Mapping & Surveillance in Indonesia**

Prof. Dewayany Sutrisno
Geospatial Information Agency, Indonesia
On behalf of Indonesian Society for Remote Sensing, Indonesia



Bio Dewayany Sutrisno is professor in spatial information systems, has a PhD in coastal & marine management, a master degree from The University of New South Wales Australia un Remote Sensing. Professional work deals with spatial information systems with a strong background in remote sensing & spatial environmental modelling. Professional experience: The President of Indonesian Society For Remote sensing (2010 – now), Researcher in spatial information system interest in developing spatial environmental modelling for management at Geospatial Information Agency (1994 - now), lecturer in spatial planning in Bogor Agricultural University (2006 – now), lecturer at Geographic Olympiad National Training Center (2012 – now), chief editor in the scientific journal Globe (2016-now), peer review of other national scientific journal, i.e geoid, Marine research in Indonesia, and international journals such as International Journal of Digital Earth, guest lecture at National Chiao Tung University, National Cheng Kung University, National Central University - Taiwan, guest lecture in some national universities.

Abstract Mapping & surveillance are the crucial issues for an archipelagic country like Indonesia. The issue become increasingly important now that government policy states to start mapping on the village scale. This implies much more detailed mapping. Many methods have been used to obtain the detailed information, e.g. using terrestrial, high resolution satellite images and drone imagery. However, to accelerate the mapping of more than 83,000 villages in Indonesia, a participatory approach may also offer solutions. So, we can note the importance of drones for mapping in Indonesia, not even talking about post-disaster surveillance or social economic activities that need to be monitored. This presentation will assess the advantages and the challenges of using drones for mapping and surveillance purposes in Indonesia, how this technology may assist the government to implement its national programmes, and the requirement to have a regulatory regulation in place to make this possible.

16.05 - 16.30 **The Military Use of UAS and the Functional & Technical Synergies with Security Applications**

Pascal Secrétin
Thales, France

THALES



Bio Pascal Secrétin, born the 19 December 1971, he has 20 years airborne and intelligence operations background in Africa, Afghanistan, Bosnia within the French Armed Forces from platoon leader, company commander, G3 and J3 officer up to armament programme officer for all optronics and robotics for special forces and MI agency equipment. Pascal Secrétin joined Thales in In 2012 and has held several positions: a) System engineer (C4I, UAS integration in the French information systems) and bid manager 2012-2013; b) Complex bid manager (French Scorpion program) 2013-2014; c) Capture leader for must win Thales 2014-2016; d) Product line manager Surveillance & Small UAS and responsible for BD land & UAS products. He is a graduate of Saint Cyr military academy, IHEDN Joint Staff College, SUPELEC.

Abstract The biggest challenges for regular armies and security forces lie in the struggle to neutralise asymmetric threats, including non-state forces equipped with conventional defence capabilities. With no respect for international laws or geographic boundaries, these forces are able to project their power anywhere, even in our own countries, and are a very real threat to civilian populations, critical infrastructure and essential operators. The latest-generation of mini-UAS from Thales ensures the highest level of airworthiness certification for the customer and meets all the requirements of three broad mission types:

- Frontline intelligence and reconnaissance for engaged ground forces
- Border surveillance and homeland security
- Surveillance of critical infrastructure for essential operators

What are the functional & technical synergies between the military products and civil applications?

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16.30 - 16.55 New Tools for Security & Safety Missions

Francis Duruflé
ECA Group, France



Bio Francis Duruflé, an electronic engineer, joined the Remote Reward group (French private equity fund) to take over the design center for the wireless, WiFi and GSM circuits of Setpmind based in Cannes (France). In 2006, as part of the Remote Reward group, Francis Duruflé joined the start-up company Infotron, which designs, develops and manufactures mini-drones for civil applications. He took over the management until the acquisition by ECA Group (Group Gorgé) of this French leader of the mini-drone sector. In 2009 he founded UVS France, which in 2013 became the Professional Federation of Civil Drone (FPDC), of which he is today the vice president.

Abstract The recent deployment of Remotely Piloted Aircraft Systems (RPAS) for civil applications has been tremendous over the past few years. Development of such small fully automated flying platforms was mainly driven by technology miniaturization and the endless increase in miniaturization of integrated circuits. Micro- and mini-RPAS have started to be proposed for security mission such as surveillance or reconnaissance. Along with this evolution the development of new payloads have increased the system capacity to achieve more and more complex and performing missions. The result is seen through dedicated exhibition such as Milipol in which RPAS exhibitors are increasing every two years. The presentation will go through some major current applications in civil security and Homeland Security. Then we will also propose some hints about the expected future of drones for new missions.

16.55 - 17.20 Drone Training for Security Forces. Rules versus Necessity

Angus Scott
Scottcopters Ltd, Hong Kong



Bio Angus Scott, BA (Hons) served the last 34 years in both the British Army as an infantry officer & as a senior police officer in the Hong Kong Police Force. He is a certified EOD Improvised Explosives Device Disposal Operator since 1988. Angus has undergone NITAC packages for Northern Ireland counter-terrorist operations, trained at the small arms school in Warminster and held specialist posts in both the British Army & Hong Kong Police Force. In 2013 he formed Scottcopters™ and developed drone training for the public wishing to fly commercially. He has lectured at conferences in China on two occasions in 2015/16 on regulatory framework developments. Since late 2015, Angus Scott has taught commercial drone certification courses to various civil agencies & construction firms (e.g. Reuters News Agency, Gammon Construction, Leighton Asia) and performed aerial work for CBS and many others. Angus saw that there was a gap in the knowledge and skill base of security services, including Fire Services and Police Forces in South East Asia. After training the head of the Surrey Police UAV unit in the UK and its success operating both in and around Gatwick Airport, he saw the need to drive the same methodology home in Hong Kong & Southeast Asia. Scottcopters then developed training programmes for Hong Kong Government departments, starting with the 3D mapping training and piloting for the Planning Department. Angus developed bespoke training for the Hong Kong Police Disaster Victims Identification Unit (DVIU), Hong Kong Fire Services High Angle Rescue Team (HART) & the Fire Services Mountain Rescue Team. Furthermore, he has been consulted by relevant Police units on ECM development and implementation to mitigate airborne threats when Internationally Protected Persons attend outdoor functions and in compliance with ICAO and local regulations.

Abstract The necessity for the coming together of Law Enforcement, Security Agencies, Regulators and Nationally Qualified Civil training entities is absolute. You will all have heard on 24th January 2017, how the so-called Islamic State is using drones against coalition forces in Syria. English terrorist channels later released a video with the title translated as “The Knights of Dawawin,” instead choosing to use the Arabic word for “administrative bureau.” In the 38-minute video, ISIS is shown conducting suicide bombings in Mosul. However, the highlight and premise of the video is the footage of Islamic State militants using drones to carry & drop bombs on American coalition forces. Scottcopters assesses that in addition to terrorist and criminal entities, political elements could use drones to destabilize population centres by embarrassing the dignity of IPPs on state visits by using relatively cheap and widely available technology. They could drop harmless white powder to cause a panic or could hang insulting banners under their aircraft. Under ICAO law and the laws of all participating nations it is an offence for a person to interfere with an aircraft in flight or cause danger to persons by so doing. This applies to law enforcement personnel without exception. This issue needs to be discussed at the highest levels and swiftly with your relevant departments of Justice as to whether an exception or exemption for operational reasons can be utilised and cooperation with participating nations and ICAO member states needs rationalizing swiftly. Then the civil partners who are now developing drone micro-radar, interceptors and focussed beam Electronic Counter Measures can be allowed to partner with Governments rather than doing it on a clandestine level. These technologies need to be legalized, ratified and shared by member states and their respective LEAs. Scottcopters is willing and able to coordinate resources and concepts, both legal and practical on a consultancy basis.

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Prosegur	Singapore
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