

# FINAL ANNOUNCEMENT



## Fifth International Conference on Electronic Warfare

# EWCI 2018

“EW : SHARE FOR SUCCESS”

13-16 FEBRUARY 2018

Venue : National Science Seminar Complex  
Indian Institute of Science, Bangalore



✉ [ewci@aoc-india.org](mailto:ewci@aoc-india.org)

🌐 [www.aoc-india.org](http://www.aoc-india.org)

## The Fifth EW International Conference India (EWCI 2018)

The Fifth International Conference on Electronic Warfare (EWCI 2018) is the latest event in the internationally acclaimed EWCI Conference Series in India, in the field of Electronic Warfare and related areas. The Conference is being organised by the much Awarded India Chapter of Association of Old Crows (AOC), Bangalore. The Conference has the active support of Defence Research and Development Organisation (DRDO), Government of India, Ministry of Defence and the Defence Public Sector Unit (DPSU), Bharat Electronics Limited (BEL), Bangalore. The Conference is envisaged to be of great use for Modern Armed Forces, Military Planners, Developers, Procurers, Testers, Trainers and Vendors of the latest EW Technologies and Systems. Past Conferences in the Series attracted large delegations from Indian Armed Services, DRDO, Defence PSUs, National and International EW Professionals. A large scale Indoor Exhibition will accompany the Conference, displaying the latest EW products from International EW Organisations. There will be an intense one-day Pre-Conference Tutorials preceding the Conference. The Conference is visualised to be an important platform for EW Professionals who would share the Research and Development output in the field of EW at the global level. Hence the theme of the Conference is chosen as **"EW : SHARE FOR SUCCESS"**.

### Technical Papers Presentation

The Conference attracts a large number of technical papers internationally with deep research content, covering all aspects of EW concerning exploitation of Electro Magnetic Spectrum for Electronic Attack (EA), Electronic Protection (EP) and Electronic Surveillance (ES) and related fields. Technical papers are invited in these areas including the following topics:

- Advances in EW Systems, Architectures, Techniques and Technologies
- EW Systems Modelling and Simulation
- EW & EO Threat Simulators, Testing & Evaluation
- Advances in ECM/ECCM Techniques, Expendable Repeater and IR Jammers
- Electro-Optic based EW Systems – Missile Approach Warning Systems & Laser Warning Systems
- Network Centric & Information Warfare, EW for Counter Terrorism Operations, IED Detection
- EW Antennas, Active Electronically Scanned Arrays (AESA) & Shared Apertures
- Radar Finger Printing, LPI Emitters Techniques for Interception and Countermeasures
- Communication DF Receivers, Digital Receivers, EW Signal Processors, Satellite Based EW Challenges
- SIGINT, RWR, ESM, Multi Sensor Warner, Directed Energy Weapons (DEW)
- EW Transmitters and Receivers, Microwave & Millimeter Wave Technology for EW
- Light Weight EW Systems for UAV, Aerostat & Other Platforms
- Emitter Location Algorithms, Program Management of Complex EW Systems
- EW Ops & Spectrum Management in Joint Services Operation Scenario and Challenges

### EWCI 2018 Schedule

DATE	EVENT
13 February 2018	Pre-Conference Tutorials
14 February 2018	Inaugural Session, Inauguration of Exhibition, Plenary Session, Invited Lectures, Technical Sessions, Cultural Programme (in the evening) and Conference Dinner
15 February 2018	Technical Sessions and Exhibition
16 February 2018	Technical Session, Exhibition and Closing Session

### Pre-Conference Tutorials

A one day Pre-Conference Tutorials by Eminent International Experts on Following Advanced EW Topics are arranged on **13 February 2018**. The Tutorials will be of immense value to the R&D and young EW Professionals to get in-depth exposure to the State-of-the-Art Technology.

#### TUTORIAL 1 : Airborne SIGINT Operations

Signals Intelligence (SIGINT) is a fundamental capability of the Electronic Warfare (EW), determining the Electronic Order of Battle (EOB), which encompasses the localisation and the identification of the Radars and Comms Nodes associated to the Weapon Systems and the Networks displaced in the adversary territory. SIGINT equipment are installed on board large aircraft, provided with powerful Signal and Data Processors, Monitors, large capacity Data Recorders, supervised by a number of skilled Signal Corps operators, for delivery of the mission-recorded data to the further SIGINT Ground Base analyses.

Modern Comms and Electronic Signals equipment are adopting a number of Electronic Protection Measures (EPM) to their Signal Generation Techniques (such as Spread Spectrum, SDR, LPI, Cognitive Waveforms etc.) in order to prevent (or at least strongly reduce) their detection and classification from the SIGINT Aircraft, operating remotely. This new situation has to be tackled by adding to the mission a number of specialised (either ELINT or COMINT) drones which are addressed by the SIGINT A/C towards the presumed zones provided with

the above equipment in order to provide better detection, recording and Change Detection information of their signal transmissions. The Tutorial deals with the technical requirements of the Aircraft and drones SIGINT signal processing (SP) and equipment and shows some relevant solutions provided by Elettronica S.p.A. - Roma, Italy.



The Speaker **Dr Andrea De Martino** graduated in Nuclear Engineering (Electronic Track) and Ph.D. in Automatic Control Systems. He worked in Selenia S.p.A from 1972 to 1985 where he was involved in design of variety of Radar Systems. Since 1985 he worked in Elettronica where he developed New EW Products, Microwave to EFA-DASS. He currently holds position of CTO in Elettronica, Italy. Dr De Martino is a patent holder and author of the book "Introduction to Modern EW Systems" and many

Technical Papers on Radar and EW.



The Co-Speaker **Mr Alessio Campana** served as combat pilot in the Italian Air Force from 1994 to 2000 and while in service, obtained the Master Degree in Telecommunication Engineering at Roma Tor Vergata University in 2002. As Engineer in Telecommunication, he covered multiple technical and managerial roles in GSM/UMTS Networks, LTE Radio Networks and Senior Technical Trainer. In 2010, he joined Elettronica, Italy, as Senior Engineer, as Research and Development System Project Manager for Electronic Warfare Solutions. Currently, he is in the Corporate Chief Scientist Office as Senior Expert for CONOPS and Operational Scenarios, with an additional role of Technical Proposal Manager for Capability Marketing and Business Development activities.

## **TUTORIAL 2 : Electronic Warfare Applications Vs DRONE/UAV/RPV Proliferation - Protection against Hostile RPV, EW Evolution and RPV Uses**

UAV/RPV proliferation has resulted in an increased EW threat requiring protection and also as the platform capable to expand EW applications to improve the projection of EW assets. In urban environment, for irregular/asymmetric confrontation or terrorism protection, the use of EW EA has an advantage avoiding the risk of collateral damages, applying a proportionated response. General requirements of such a protection system will be presented, combining sensors as Radar, EO/IR cameras, and EW equipment working in combination, to defeat this threat. Military UAV or small UAVs on open range or urban environment need this multisensor detection combination to avoid false alarm and high probability of detection at long ranges even against very low radar cross section flying objects with different approaching profiles.

Contribution of EW Electronic Attack assets on this confrontation is achieved by special EA/Jamming modes, spoofing/deception, tracking/identification, supplantation, that can be also included as part of the inventory of Ground/Land base EA stations. Implementation of multifunctional ESM/ELINT equipment, lighter and modular scalable architectures compatible for UAV, POD or platform integrated EW equipment, result in efficient overall approach. This technology is combined with interoperability, cooperative uses. Compact EW Digital Receiver based ELINT/ESM equipment architecture suitable for lighter equipment and higher integration is also reviewed together with main component, building block evolution.



The Speaker **Mr. José Miguel Pascual Ruiz** is a Telecommunication Engineer and has lead technological innovations at INDRA in SIGINT/ELINT, DRFM and Digital Reception Technology presently deployed on INDRA EW products. Mr. Pascual has been involved on most of Spanish Intelligence and EW Tactical programs. Mr. Pascual has authored many Technical Papers. Presently he is Technology and Industrialisation Director at INDRA, Spain.



The Co-Speaker, **Mr David Lázaro Loscos** is a Computer Science Engineer and has lead multiple Digital Reception innovative developments for INDRA EW products. He has worked as System Engineer in multiple international projects based on RWR / ELINT / ESM Indra products based on digital reception technology, also participated in international study groups on LPI radar detection and digital reception technology. He is Area Director at INDRA, Spain, in charge of the definition and

development for new EW Sensors.

## **TUTORIAL 3 : Cross - Eye Jamming - Problems and Potential**

The concepts underlying cross-eye jamming were patented in the late 1950s, but it was only in 2000 that the first cross-eye jammers suitable for operational use were publicly disclosed. This tutorial will describe cross-eye jamming in terms of both the traditional phase-front analysis and more modern analyses. From this introduction, the unique attributes which have led to the long-term interest in cross-eye jamming will be highlighted. Comparisons to other jamming techniques with similar capabilities will be made to emphasise the unique benefits achievable by cross-eye jamming. The significant challenges associated with implementing practical cross-eye jammers will be analysed to provide an indication of their magnitudes, and possible solutions to these challenges will be described and evaluated.

The tutorial will include descriptions of measurements which have been performed, by a laboratory simulation to confirm that cross-eye jamming actually works and to prove that the modern analyses of cross-eye jamming are correct. A proof-of-concept system, which was implemented and successfully tested against a monopulse radar, will also be described and evaluated.



The Speaker **Dr Warren du Plessis** received the B.Eng. (Electronic), M.Eng. (Electronic) and Ph.D. (Engineering) degrees from the University of Pretoria in 1998, 2003 and 2010 respectively, winning numerous academic awards including the prestigious Vice-Chancellor and Principal's Medal. He has been working in EW and radar since 2006 and is currently Associate Professor at the University of Pretoria, South Africa. Prof. du Plessis is a Senior Member of the IEEE and a Lifetime Member of the AOC. He is author of 46 journal and conference papers. While best known for his work on cross-eye jamming, Prof. du Plessis has also published in a number of other fields related to EW including thinned antenna arrays, communications intelligence (COMINT), and the role of EW and its relationships to other similar fields.

#### Tutorial 4 : Cost Effective, High Performance Networked ELINT Systems for C4ISR Missions

Border and coastal surveillance is a high priority for each country to counter a large number of threats to its economy and sovereignty. Collected information from various sensors is securely transmitted through radio networks to a command and control station where it is processed and used to build and maintain a common situation awareness picture of the operational environment. The network is known as command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR). Using exemplary ELINT missions, we show in the tutorial that the requirements for the Army, the Air Force and the Navy are similar and therefore it will be possible to bring these organisations together through a common C4ISR network that can be overlaid to legacy networks and evolve with time to replace them. ELINT and radio technologies and systems that make the C4ISR network cost effective and achieve high performance are discussed. Establishing a common C4ISR network for the three organisations enables tight collaboration between them resulting in efficient strike capabilities and the creation of cross domains expertise much needed in the battlefield.



The Speaker **Mr Hafedh Trigui** has received a Bachelor degree of Electrical Engineering from the National Engineering School of Sfax (Tunisia), a Master degree in Information Treatment and Processing from the University de Nice Sophia Antipolis (France) and a Ph.D in Electronics and Communications from the Ecole Nationale Supérieure de Telecommunications (Paris, France) in 1994, 1995 and 1999 respectively. He has been involved in modem, antenna and wireless communications network design activities at Telecom Modus, Arraycomm, TenXc Wireless, Cartiza Networks and Reverb Networks. In 2010, he joined the Electronic Warfare department of Ultra Electronics TCS, Canada where he is involved in a number of Systems, R&D and Products Management activities.

#### Plenary Talks on 14 February 2018

- ★ **Current Trends in EW Technology**  
**Lisa K. Frugé-Cirilli**, President  
AOC International, USA
- ★ **Challenges in Development of Next Generation EW Systems**  
**Dr A K Singh**, OS and Director  
DLRL, DRDO, Hyderabad, India
- ★ **Current Technology EW Systems-Development to Production in Indian Scenario**  
**Dr A T Kalghatgi**, Director R & D  
Bharat Electronics Ltd., Bangalore, India
- ★ **Modern Trends in Airborne EW / EO Systems – An Indian Overview**  
**Dr K Maheswara Reddy**, OS and Director  
DARE, DRDO, Bangalore, India

#### Invited Talks on 14, 15 & 16 February 2018

- ★ **Trends in International Developments of Electromagnetic Spectrum Operations**  
**Dr Sue Robertson**, AOC International Region 1 Director
- ★ **EW Training with Software-Defined Radio (SDR)**  
**Prof. Warren du Plessis**, University of Pretoria, South Africa
- ★ **Hostile Drone Protection System and EW UAV Applications/Equipment**  
**J.M.Pascual Ruiz and D.Lázaro**, INDRA, Spain
- ★ **Ideas and Approaches on the Past and the Future of SWaP SIGINT Receiver Architectures**  
**Volker Brands and Mark Reinhard**  
L3 Technologies, Narda Safety Test Solutions GmbH, Germany
- ★ **ELINT/ESM Systems for Unmanned Air Vehicles**  
**Hafedh Trigui and Robby Miles**, Ultra Electronics TCS, Canada
- ★ **Counter-Drone Solutions : The Multi-Domain, Multi-Spectral Approach**  
**Alessio Campana**, Sr. Eng. Sci. Office, Elettronica S.p.A., Italy

#### Delegates Registration

Registration Fee	Indian (Includes GST)	Foreign USD
Tutorial	Rs 6,000	\$ 250
Conference	Rs 15,000	\$ 450

#### Concessions Offered:

- **10%** on the Registration Fee for Early Bird Registration (Registration before **30 November 2017**).

- **40%** on the Registration Fee for AOC India Chapter

Members (Membership taken before 30 November 2017) and Serving Indian Armed Services Personnel.

- **50%** on the Registration Fee for College Students and Faculty.

- Authors presenting Technical Papers also need to pay Registration Fees.

#### Souvenir and Proceedings

Tariff for Advertisements	Indian (Includes GST)	Foreign USD
Back Cover	Rs 60,000	\$ 1500
Inside Front and Back Cover	Rs 50,000	\$ 1250
Special Page	Rs 25,000	\$ 700

A Souvenir (A4 size, Multicolour) containing messages from Dignitaries, Abstracts of Technical Papers, Invited Articles, Exhibitors Index and Advertisements from EW Organisations will be published. Soft Copy of the Conference Proceedings and both Soft and Hard copies of the Conference Souvenir will be

made available for all the Delegates. There is an excellent advertisement opportunity in the Souvenir.

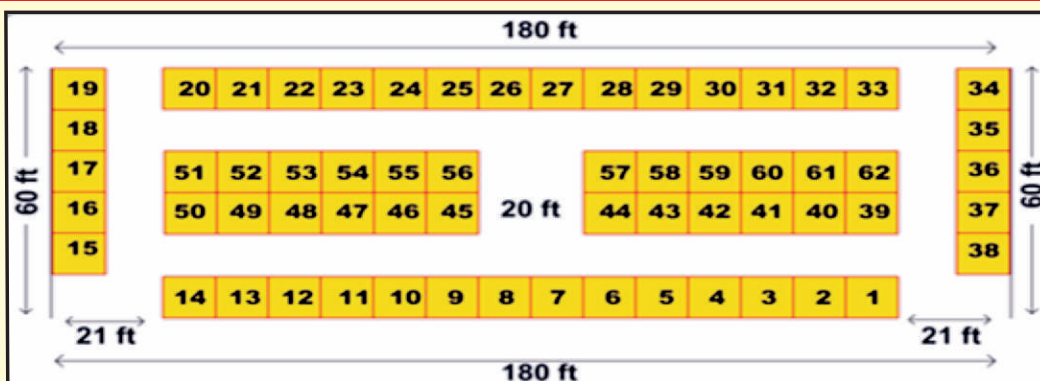
## Technical Exposition

The Indoor Exhibition organised at the venue of the Conference during **14 - 16 February 2018** is an extraordinary opportunity for EW Organisations for showcasing EW Systems and Sub-systems, Components, Models, Software and Multimedia Presentations. **More than 60 booths (3m x 3m Shell Type)** are available for booking. About 50 EW organisations from more than 15 countries are expected to participate in the Exhibition. The Exhibition will be visited by not only the Delegates for the Conference but also by Professionals, Experts and decision makers and users from the Indian EW field. This gives an excellent business opportunity and allows interacting with various vendors, EW Professionals, R&D Organisations and Armed Services from global participation.

## Sponsorship

Exhibition Sponsorship	Indian (INR) Includes GST	Foreign (USD)	Free Benefits as part of Sponsorship
Diamond	8,50,000	20,000	3 Booths, 8 Delegates
Gold	6,50,000	15,000	2 Booths, 6 Delegates
Silver	5,50,000	13,000	2 Booths, 4 Delegates
Bronze	3,00,000	8,000	1 Booth, 2 Delegates
Booth	1,50,000	4,000	1 Booth
Delegation Kit	5,00,000	12,500	4 Delegates
Dinner	3,50,000	10,000	3 Delegates
Lunch on Day 1 or 2 or 3 or 4	2,50,000	7,000	2 Delegates
Cultural Programme	1,75,000	4,000	1 Delegate
Hi Tea	1,25,000	4,000	1 Delegate
CD Facia	1,25,000	4,000	1 Delegate

## Technical Exhibition Layout



## Mode of Payment

All payments are to be made by Demand Draft or Banker's Cheque drawn in favour of "The Association of Old Crows (AOC) India Chapter" in Indian Currency. Bank Transfers are also accepted. Particulars for Bank Transfers are: **Vijaya Bank**, HAL 3rd Stage, No. 42, 80 Feet Road, Bangalore – 560075. **Account Number: 134800301000508, MICR Code: 560029051, IFSC Code: VIJB0001348.**

## About Association of Old Crows (AOC) India Chapter, Bangalore

AOC, head quartered at Virginia USA, is a prestigious association of Electronic Warfare and Information Operations professionals. The AOC and its Chapters world over are bringing together the experts and the organisations in the field of Electronic Warfare through its programs including International Conferences, Seminars and Expositions. Considering the importance of Electronic Warfare in modern war scenario and with the vision of providing an institute for the Indian Electronic Warfare professionals, AOC has inaugurated its India Chapter during the International Conference on Electronic Warfare (EWCI 2010), held in Bangalore during 9 to 12 Feb 2010. The Chapter is registered with Registrar of Societies, Bangalore, Karnataka. AOC has enrolled over 200 professionals within one year of its operations. The incumbent (founder) president of AOC India Chapter, Dr U K Revankar, won the prestigious "The International Achievement Award" by the AOC, USA and the India Chapter is recently awarded as the "Best Growing Chapter" award. The India Chapter has been organising the very successful EWCI series of International Conferences and EWWI series of National Workshops in alternating years.



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CMD, ADTL, Bangalore

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Former Director (R&D), BEL, Bangalore

## KEY CONFERENCE ORGANISING MEMBERS OF AOC INDIA CHAPTER

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#### Dr U K Revankar

Former Director, DARE DRDO, Bangalore  
President, AOC India Chapter Bangalore

### Conference Co-Chairs

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Director (R&D), Bharat Electronics Limited

#### Mr TN Yadgiri Rao

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## FOR MORE DETAILS PLEASE VISIT OUR WEBSITE OR CONTACT

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