




# annual REPORT



[www.japcc.org](http://www.japcc.org)

**Joint Air Power  
Competence Centre**

Cover Picture:  © US Air Force, Staff Sgt. Christopher S. Muncy

© This work is copyrighted. All inquiries should be made to The Editor, Joint Air Power Competence Centre (JAPCC), [contact@japcc.org](mailto:contact@japcc.org).

### **Disclaimer**

The views and opinions expressed or implied in the JAPCC Annual Report are those of the authors concerned and should not be construed as carrying the official sanction of NATO.

### **Terms of Use – Alteration, Notices**

The JAPCC Annual Report may be reproduced for instruction or reference under the following conditions:

1. You may not use it for any commercial purposes, nor may it be used as supporting content for any commercial product or service.
2. You may not alter, transform, or build upon this work.
3. All copies must display the original copyright notice and website address.
4. A complete reference citing the Annual Report must include the organization and publication title.
5. Any online reproduction must also provide a link to the JAPCC website [www.japcc.org](http://www.japcc.org), and the JAPCC requests a courtesy line.

Copyright information contained within the Annual Report made use of other parties' intellectual property in compliance with their terms of use, taking reasonable care to include the originator's copyright information. To obtain permission to reproduce, please contact the copyright owner of such material rather than the JAPCC. In case of doubt, please contact us.

### **Release**

The JAPCC Annual Report is distributed to NATO Commands, Nations, Ministries of Defence and relevant Organizations and is releasable to the public.

### **Published and distributed by:**

The Joint Air Power Competence Centre  
von-Seydlitz-Kaserne  
Römerstraße 140  
47546 Kalkar  
Germany

Telephone: +49 (0) 2824 90 2201  
Facsimile: +49 (0) 2824 90 2208  
E-Mail: [contact@japcc.org](mailto:contact@japcc.org)  
Website: [www.japcc.org](http://www.japcc.org)

 Denotes images digitally manipulated

Follow us on Social Media



# Foreword

Russia's unprovoked invasion of Ukraine on 24<sup>th</sup> February and the ongoing crimes committed against that sovereign state and its population are the defining geopolitical event of 2022. While NATO's focus was under debate in 2021, the issue has since crystallized. Member states have moved closer together with renewed vigour and focus. Finland and Sweden have applied to join NATO and national defence budgets are on the rise. The west debated the consequences of our possible reactions at every level. So, what does NATO's new normal look like? It certainly includes a drive for improved readiness and interoperability, not only within the Alliance but also between NATO and the industry. Large-scale exercises with shorter preparation times will also be key. For Air Forces, it is particularly important to improve our ability to gain and maintain Air Superiority and provide Integrated Air and Missile Defence. The JAPCC will continue to generate innovative ideas to drive capability development, readiness goals, and methods to achieve them.

This edition of the Annual Report summarizes the key developments, projects, and research, the JAPCC accomplished in 2022 and provides a glimpse into the work we will perform across the Air and Space domains for 2023 and the years to come. The studies and articles published over the last year are once again a testimony of the JAPCC's high level of performance, current with the times. The study 'Future Approaches to Red Air Delivery in NATO Air Forces in 5<sup>th</sup> Generation Fighter Training', for example, addresses the necessary adaptation from conventional Red Air training models in the context of changing requirements and tightening force structure. The 'Red Air' paper proposes we meet these challenges with the establishment of a new international Red Air Standards Division and, ideally, a dedicated Red Air Force. The paper on 'National Military Space Operations Centres' focuses on the structural and procedural requirements of future (or planned) National Space Operations Centres. Nationally owned and operated operations centres should be designed with interoperability in mind from the start. This is essential for

NATO member states' ability to collect and share space-based information at the speed of relevance, not to mention providing resiliency and redundancy.

From 11 to 13 October 2022, we held with great success our annual JAPCC Conference, themed 'Enhancing NATO Air and Space Power in an Age of Global Competition'. Senior military, industry, and academia representatives exchanged ideas on Air and Space Power-related challenges and requirements for future joint military operations. Our winter journal edition contains a thorough summary of their invaluable insights.

In line with our mission as catalyst for the transformation of NATO Joint Air and Space Power, we will continue to develop innovative ideas and future solutions in 2023. The 'Resilient Basing Workbook' – which I encourage national Air Force staffs to complete by mid-2023 – will lead to the Resilient Basing Enhancement White Paper in the autumn of 2023. This project is in response to the NAC's request from the 2022 NATO Summit to boost NATO's resilience to current and projected threats and strengthen overall interoperability. Not only will participants contribute to a holistic understanding of NATO resilience, the process will undoubtedly lead to increased national resilience.

In closing, I would like to thank our Sponsoring Nations for their great support during the past year. I would also like to encourage other nations not currently participating in the JAPCC to strongly consider an active role as a Sponsor or Contributing Nation. Your presence in the JAPCC provides access to a unique network of experts in the Air and Space domains and allows members to contribute to work that influences decision-making at the highest levels in our Alliance. With that in mind, I commend this 2022 JAPCC Annual Report to you. I trust you will find it relevant to your nation or organization. Feel free to contact us with questions, feedback, or requests for support at any time. Good Reading!



**James B. Hecker**

General, US AF, Director, JAPCC

# TABLE OF CONTENTS

<b>Foreword .....</b>	<b>3</b>
<b>JAPCC Background .....</b>	<b>6</b>
Vision .....	7
Mission .....	7
Contributions to Air and Space Power .....	7
Leadership and Structure .....	7
Personnel .....	9
Stakeholders .....	9
Support to the 'Pillars of COE Work' for NATO .....	9
Budgeting and Finance .....	9
<b>Key Developments .....</b>	<b>10</b>
Publications .....	10
Concept Development .....	12
Exercise Support .....	16
Education and Training .....	17
Active Engagements .....	19
Doctrine Development (Custodianship & Contribution) .....	24
<b>2023 Outlook .....</b>	<b>27</b>
Focus Areas & Future Projects .....	27
Events .....	29
<b>Conclusion .....</b>	<b>29</b>

This Page Intentionally Left Blank.

# JAPCC Background

The Joint Air Power Competence Centre (JAPCC) was formed on 1 January 2005 to provide a strategic level proponent for Joint Air and Space (A&S) Power that was missing in NATO.<sup>1</sup> Soon thereafter, the JAPCC was accredited as NATO's first Centre of Excellence (COE) and, as such, is charged with developing innovative concepts and solutions required for transforming A&S Power within the Alliance and the nations. Importantly, as the JAPCC is in support of, but outside of the NATO Command Structure (NCS), it can offer independent objective military advice across the spectrum of Joint A&S Power matters to NATO and national policymaking bodies and warfighting headquarters.

1. The Concept for the Joint Air Power Competence Centre, (31 July 2003, MoD Bonn) established that the JAPCC would serve as the COE for Joint Air and Space Power as reflected in the statement: 'This synergistic application of air, space and information systems from and for all services to project military power is summarized with the term "Joint Air Power"'. This is also reflected by the inclusion of Space, Cyber, and Electronic Warfare positions in the JAPCC Peacetime Establishment in the JAPCC Operational MoU.

Based on a Memorandum of Understanding (MOU), the JAPCC is sponsored by 14 NATO nations who provide a variety of experienced Subject Matter Experts (SMEs) that come from all services. The SMEs conduct collaborative research into areas in which the JAPCC's assistance is requested by leveraging their independent thought and a global network of experts that reach across the military, academic, and industrial spheres. The JAPCC disseminates the resulting analysis and solutions via studies, reports, journals, articles, seminars, panels, and conferences.

The JAPCC seeks to maximize its contribution to improving and transforming Joint A&S Power through a well-formulated engagement strategy. This strategy guides the Centre's approach to organizations within NATO and our Sponsoring Nations. It enables outreach to other national organizations and academia, allowing the COE to tap into a vast and diverse pool of Joint A&S Power experts.



## Director

General James B. Hecker (US AF)



Curriculum Vitae

[www.japcc.org/cv/james-b-hecker/](http://www.japcc.org/cv/james-b-hecker/)



## Executive Director

Lieutenant General Thorsten Poschwatta (GE AF)



Curriculum Vitae

[www.japcc.org/cv/thorsten-poschwatta/](http://www.japcc.org/cv/thorsten-poschwatta/)

## Vision

To be NATO's catalyst for the improvement and transformation of Joint Air and Space Power, delivering effective solutions through independent thought and analysis.

## Mission

The JAPCC, as a team of multinational experts, is to provide key decision-makers effective solutions on Air and Space Power challenges, in order to safeguard NATO and the Nations' interests.

## Contributions to Air and Space Power

To fulfil our mission, the JAPCC conducts its own research and advocacy and responds to the needs of NATO and its member nations. Our Programme of Work (PoW) comprises projects, activities, and tasks, which are dynamic in nature and are adjusted monthly

based upon approved Requests for Support (RfS). If you would like to send an RfS to check if JAPCC can facilitate a study on your topic contact us using the form provided on our website [www.japcc.org](http://www.japcc.org).

Independently, the JAPCC also hosts several major events, including the annual Joint A&S Power Conference, the biannual meeting of the Air Operations Working Group (AOWG), the Maritime Air Coordination Conference (MACC), one session of the biannual meeting of Air-to-Air Refuelling Working Group (AARWG), the JAPCC Steering Committee (SC) meeting, and the Senior Resource Committee (SRC) meeting.

## Leadership and Structure

The JAPCC is headed by the Director, General James B. Hecker (US AF), who leads the Centre since June 2022. General Hecker also serves as the Commander Allied Air Command and the Commander United States Air Forces in Europe and Air Forces in Africa (USAFE-AFAFRICA) at Ramstein Air Base.



### Assistant Director

Air Commodore Paul Herber (NE AF)



**Curriculum Vitae**

[www.japcc.org/cv/paul-herber/](http://www.japcc.org/cv/paul-herber/)

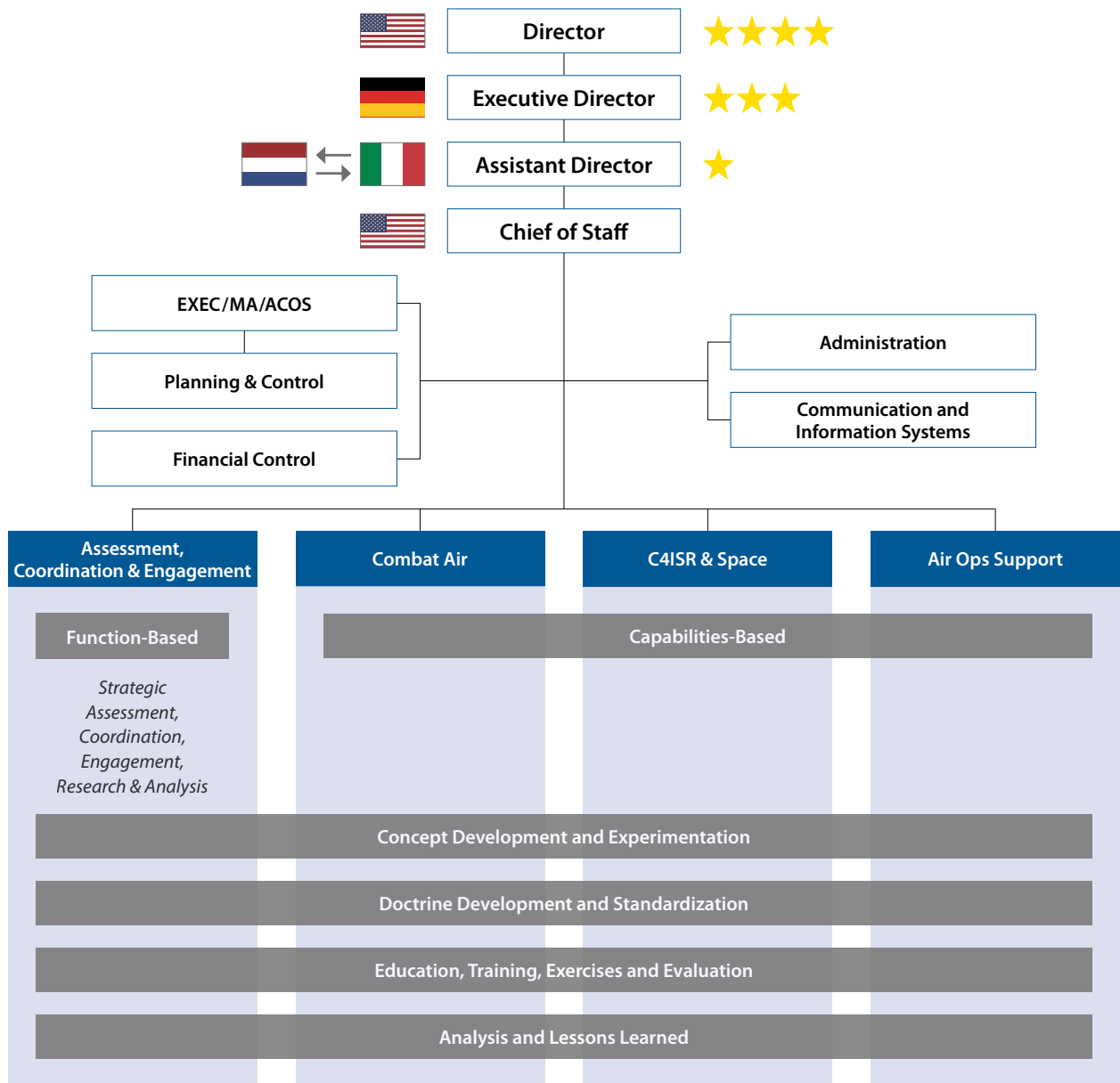
### Chief of Staff

Colonel Matthew E. Hanson (US AF)



**Curriculum Vitae**

[www.japcc.org/cv/matthew-hanson/](http://www.japcc.org/cv/matthew-hanson/)



The JAPCC’s Executive Director, Lieutenant General Thorsten Poschwatta (GE AF), also commands the German Air Operations Command (AOC) and the German Joint Force Air Component Headquarters (GE JFAC HQ).

On-site, Air Commodore Paul Herber (NE AF) serves as the Assistant Director (AD), and together with the Chief of Staff (COS), Colonel Matthew Hanson (US AF), provides day-to-day leadership for the JAPCC team.

The core of the JAPCC are four branches. We have one functional branch called Assessment, Coordination, and Engagement (ACE) headed by Lieutenant Colonel Markus Müller (GE AF). The branch manages engagement planning, our media outreach and publishing, and is basically the rudder that steers our organization. The other three capability-based branches are: Combat Air (CA), headed by Colonel Tyler Niebuhr (US AF); Air Operations Support (AOS) with Colonel Erik Rab (NE AF) in lead, and Command, Control, Computer, Communication,



Intelligence, Surveillance and Reconnaissance & Space (C4ISR&S), led by Colonel Maurizio De Angelis (IT AF).

**Structure Adaptation.** As of 1 November 2022, the JAPCC has adjusted its internal organizational structure in line with the 2022 Steering Committee (SC) decision and re-merged the former C4ISR and Space Branches back into one C4ISR&S Branch. Previously, in 2020, the JAPCC had established a separate Space Branch, but with NATO ACT's decision to establish a dedicated COE for Space in Toulouse, this is no longer necessary.

The JAPCC will still be staffed by Space SMEs within the C4ISR&S Branch, but their focus will be on the JAPCC's core mission – Joint Air Power – and the integration of space-relevant aspects for the optimal use of air power.

## Personnel

As in previous years, the JAPCC had to use its available resources wisely in 2022. Since only 51 % of the SME positions were filled, not every project we would have liked to work on could be supported. The staffing situation remains tight, even though the JAPCC's efforts in 2022 with respect to filling previously vacant service positions are beginning to show positive effects as early as the beginning of 2023.

The JAPCC continues to actively mitigate these short-falls through cross-utilization, internal education and training, and creative technological solutions. However, to better address the spectrum of A&S subject matter areas relevant to NATO, and to better support the Joint Warfare Centre (JWC) and major NATO exercise programmes, the JAPCC needs Sponsoring Nations to consider increasing their participation. In this sense, it is also important to encourage other nations to assume an active role in the JAPCC, either as a Sponsoring or a Contributing Nation.

## Stakeholders

The JAPCC's primary customers include NATO HQ, Allied Command Operations (ACO), Allied Command

Transformation (ACT), NATO Joint Force Commands (JFC), Component Commands (CC) and Sponsoring Nations (SN). However, the JAPCC also accepts RfS from other sources as workload and staff availability permit. With a track record of successful products and ever-increasing connections to industry and academia, the JAPCC continues to build upon its reputation as NATO's preeminent advocate for the transformation of Joint A&S Power.

## Support to the 'Pillars of COE Work' for NATO

Due to the breadth of A&S subject matter areas covered by the JAPCC, it is not practical for the Centre to be organized along the established model of the four 'pillars of COE work' for NATO. Instead, three of the JAPCC branches enable SMEs to contribute capabilities-based information across these pillars.<sup>2</sup> The ACE Branch has at least two posts dedicated to each of the pillars to facilitate the alignment of the JAPCC's POW to NATO's needs.

## Budgeting and Finance

As an MOU organization, the Sponsoring Nations approve the JAPCC budget at the annual Senior Resource Committee (SRC) meeting. The approved budget is shared amongst the Sponsoring Nations based on their Staff Officer representation. Following the MOU and the Financial Administrative Procedures developed by the SRC, the JAPCC may issue up to three calls for funds throughout the fiscal year to the Sponsoring Nations. Unused funds are credited to the Sponsoring Nations with the following year's budget. At the end of each fiscal year, the JAPCC provides an 'End of Year' Statement to the Sponsoring Nations.

<sup>2</sup> Two Pillars of COE work for NATO: 1. Education, Training, Exercise and Evaluation (ETEE), 2. Analysis and Lessons Learned (A&LL), 3. Doctrine Development and Standardization (DD&S) and 4. Concept Development and Experimentation (CD&E).

# Key Developments

The JAPCC is vigorously active in areas in which it has SMEs available. This section summarizes the organization's efforts in the past year in support of NATO's Joint A&S Power. However, due to size constraints, in this report are presented top-level summaries of activity. For more detail on any specific area, please visit our website or contact us directly.

## Publications

The Journal of the JAPCC, 'Transforming Joint Air and Space Power', published twice per year, serves as a medium for presenting relevant topics and stimulating innovative thinking at the strategic, operational, and tactical levels, as well as sparking debate on the evolution of Joint A&S Power.

In 2022, the JAPCC issued journal editions 33 and 34, bringing together a compendium of articles and providing unique insights, perspectives, and

ideas generated by thought-provoking contributions from senior leaders, JAPCC staff officers, and external authors. The dialogue the JAPCC leads will shape the transformation of Joint A&S Power within NATO, and increase leaders' knowledge to face the challenges of tomorrow.

In addition, the JAPCC published various A&S-related White Papers in 2022, which are summarized below. We encourage you to review the full papers for detailed insights and actionable recommendations.

**White Paper on 'Future Approaches to Red Air Delivery in NATO Air Forces in 5<sup>th</sup> Generation Fighter Training':** With the transition to smaller fleets of more capable 5<sup>th</sup> Generation fighter aircraft, NATO nations are challenged to maintain fighter proficiency while simultaneously supplying credible Red Air threat replication. This problem stems from the limited pool of pilots and aircraft available, and is exacerbated by the increasingly challenging tactics and technology of potential adversaries and the requirement to train 5<sup>th</sup> and 4<sup>th</sup> Generation integration. 4<sup>th</sup> Generation resources alone are insufficient to train 5<sup>th</sup> Generation forces to their full capability.

This study provides recommendations to deliver optimal Red Air capability in order to offer the most efficient and effective training for legacy, 5<sup>th</sup> Generation, and future aircraft.

NATO nations must pivot their training model to incorporate a broad range of existing opportunities and emerging technologies to improve future Red Air capabilities, including in-flight training against live adversary aircraft.

The JAPCC recommends that the nations establish a Multinational Aggressor Unit to provide NATO with an Air capability to support major exercises, experimentation and even the Tactical Leadership Programme (TLP). Additionally, such a unit could provide the basis for

Find all of our products at [www.japcc.org/publications](http://www.japcc.org/publications)

© JAPCC

standardizing Red Air presentation across nations, with the goal of increasing the quality of training, and reducing the inefficiencies of running scores of unit-level programmes. A unified Red Air Standards Branch could also serve as a clearinghouse to integrate and contract private Red Air on behalf of the Alliance or the nations.

**White Paper on ‘National Military Space Operations Centres’ (SpOC).** The JAPCC published this White Paper in July 2022 based on the recognition that daily life would be unimaginable without space-based products and services for both civilian and military purposes. All of NATO’s operational capabilities are

enabled one way or another by space-based capabilities. In spite of this, NATO as an organization does not have its own space capabilities. Rather, it coordinates those services by nationally owned and operated assets. Therefore, NATO is particularly reliant on its 30 member nations in the space domain. Because NATO space is effectively a conglomeration of all national contributions, it is necessary to ensure standardization and interoperability.

This study describes today’s general requirements for structures and procedures of a national SpOC, NATO’s requirements for information in the Space Domain,

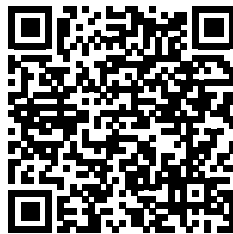


**Future Approaches to Red Air Delivery in NATO Air Forces in 5<sup>th</sup> Generation Fighter Training**



[www.japcc.org/white-papers/future-approaches-to-red-air-delivery-in-nato-air-forces-in-5th-generation-fighter-training/](http://www.japcc.org/white-papers/future-approaches-to-red-air-delivery-in-nato-air-forces-in-5th-generation-fighter-training/)

**National Military Space Operations Centres**



[www.japcc.org/white-papers/national-military-space-operations-centres/](http://www.japcc.org/white-papers/national-military-space-operations-centres/)

**Establishing a NATO-owned Intelligence, Surveillance, Target Acquisition, and Reconnaissance Capability**



[www.japcc.org/white-papers/nato-istar/](http://www.japcc.org/white-papers/nato-istar/)

and any resulting possible special requirements for the national SpOC. From NATO's perspective, if a nation is planning to establish a national SpOC, it should take NATO's needs for data, products, and services into account to the maximum extent possible.

This White Paper analyses a variety of aspects, like organizational, technological, and personnel, as well as Education and Training (E&T), the role of governmental, industrial partners, and especially standardization. The paper specifies activities of an ideal-type SpOC such as exchange and cooperation, and also discusses vision and possible future developments.

The paper's outcomes and recommendations are summarized in the DOTMLPF-I framework, which the JAPCC urges nations to consider for their national space centres.

National military SpOC are the core element of all national work in this domain. Since the SpOC is traditionally the central hub for voluntary exchanges with NATO, Alliance requirements can and should be incorporated into the internal structure to standardize systems and processes from the very beginning.

**White Paper 'Establishing a NATO-owned Intelligence, Surveillance, Target Acquisition, and Reconnaissance Capability':** The Alliance is facing a multi-polar international framework, in which emerging state and non-state actors are contesting order and security around the world. To respond to these challenges NATO must develop new 'tools' beyond its three main lines of effort: deterrence and defence, crisis prevention and management, and cooperative security. To that end, Secretary General Stoltenberg, aided by inputs gathered from across the Alliance, issued the NATO 2030 Initiative to convey a new strategy for the future of the Alliance.

NATO 2030 is an important starting point to analyse and understand the way forward. The Alliance must go beyond mere dialogue and take measurable actions to implement this new strategy. Considering the opportunities that new technologies offer in terms of information sharing, unlimited capacity for

data exploitation, and decision-making at all levels, ISTAR is presently the most critical technical, and operational challenge for the Alliance.

This task compels a new ISR mindset with both persistence and adaptability to anticipate and respond to future developments. The NATO Intelligence Enterprise (NIE) must undergo significant change, be adaptable to both conflict and conflict prevention, and take the experience gained through rapid acquisition and transition to implement new ideas and concepts.

Starting from a SHAPE Request for Support (RFS), this study provides recommendations for acquiring a new NATO-owned ISTAR capability in the near future to complete NATO Alliance Ground Surveillance Force (NAGSF).

Accordingly, the study suggests three main areas to develop a new NATO-owned ISTAR capability and to complement the already existing NAGSF:

- Development of a SIGINT capability in the air and land domains through the acquisition of new sensors, platforms and units;
- Enhance ISR space-based data acquisition assets through satellites;
- Substantial use of NATO common funds and use of existing systems adopted by nations.

A more detailed and classified version of this paper was sent to the requestor. Both versions are available by sending a request to [contact@japcc.org](mailto:contact@japcc.org).

## Concept Development

The JAPCC's support to Joint A&S Power concept development in 2022 included the following:

- NATO Multi-Domain Operations (MDO);
- Air Force Protection Support to NATO Allied Air Command (AIRCOM), Ramstein;
- Alliance Future Surveillance and Control (AFSC) Project;
- NATO Science and Technology Organization (STO) study (AVT-359);

- Hypersonic Operational Threats and Capabilities;
- Space Support in Operations;
- NATO STO AVT-329 study;
- GE AF/ACT study Artificial Intelligence (AI) in Air Command and Control (AirC2);
- NATO Force Protection Decision Support Tool Development;
- Freedom of Manoeuvre (FoM) in the Cyberspace Domain;
- Big Data Management in Intelligence, Surveillance and Reconnaissance (ISR) and New Technology Trends;
- Joint Personnel Recovery (JPR) in the Urban Environment;
- NATO STO HFM/AVT-340 study;
- STO-SCI-346 Space Risk Assessment activity;
- STO SCI-SAS-351 Space Deterrence Framework;
- STO-SCI\_SAS-ET-058 Space Deterrence Framework activity.

**NATO Definition for Swarm.** In support of the Joint Capability Group Unmanned Aircraft Systems (JCGUAS), the JAPCC hosted a series of workshops to develop a definition of the term 'swarm'. As a result of these workshops, the JCGUAS staffed a formal request to include the following definition into official NATO terminology: 'A swarm is a group of entities that exhibit coordinated behavior to achieve a common objective.'

**Multi-Domain Operations (MDO).** The JAPCC identifies MDO as the umbrella project across the organization, through which alignment of effort will produce strategic thought on how Allied nations can work together across all domains and environments. To spearhead this effort the JAPCC developed an MDO project team consisting of SMEs across all the branches of the organization. This organizational structure will allow the project team to diversify thought across the joint air power spectrum and leverage engagement with external working groups, other NATO COEs, ACT, and AIRCOM.

The alliance has the challenge of employing an interoperable force capable of rapidly synchronizing effects across a multi-domain battlespace to outpace its adversaries in a data-centric information age. To operate

at the 'speed of relevance', the alliance must increase political and military alignment and develop doctrine, standards, and TTPs supportive of realizing MDO. The alliance must become more agile and resilient by establishing a data-centric central Command and Control (C2) system and delegate enabling authorities to the lowest possible level. Additionally, NATO must promote a mindset shift towards a shared understanding and commitment to MDO through improved education and training. Finally, the alliance must accelerate the development, acquisition, and fielding of new technologies to enable rapid execution of the mission across the spectrum of conflict.

The JAPCC finds itself uniquely placed to function as a catalyst between ACT and ACO to promote the professional development of human performance and the advancement of policies, structure, doctrine and TTPs to overcome the inertia of inefficiencies due to compartmentalization (silo effect). Moreover, the JAPCC can promote emerging technologies and champion technological interoperability across all levels of the Alliance. The JAPCC will scope their efforts primarily through the Joint Air and Space capability lens with a focus towards domain interoperability.

The JAPCC has identified three primary Lines of Effort (LOE) for MDO: Human Performance, Technological Advancement, and Doctrine and Policy Development. In the coming year, the JAPCC will create sub-project teams, each devoted to advancing the three primary LOEs. Under each LOE the JAPCC will look for both near- and long-term projects to promote the advancement of MDO in NATO. In particular, under the Human Performance LOE we will focus on C2, Exercise Support, and Education and Training. For the Doctrine and Policy Development LOE we will target Policy, Standards, and Allied Joint Doctrine Publications to review and propose changes to institutionalize MDO into NATO guidance. Regarding our Technology LOE, the JAPCC will focus on the transition period between technologies in order to integrate legacy platforms and capabilities with new and emerging capabilities. These processes must function under the concept of continuous change management to help NATO progress towards truly integrated MDO between nations,

services, and government agencies. These lines of effort support the following Lines of Delivery identified in NATO's Warfare Development Agenda: Cross-Domain Command Concept, Development of Cross-Domain Leaders, Audacious Wargaming, Realistic Training, Multi-Domain Operations Concept, and Non-Kinetic and Kinetic Fires Integration.

**Alliance Future Surveillance and Control Project (AFSC).** The AFSC is a daring and innovative embracing new doctrine, in form of the Multi-Domain Operations (MDO) concept, and cutting-edge technology to provide C2 through a system-of-systems approach. This is the NATO programme where new insights in future C2 concepts are created and knowledge and capabilities of disruptive technologies are developed. The newest technological developments from industry are integrated in concept development right from the start.

The operational assessment, where JAPCC will play a part, will run from May to August. As with the initial operational assessment, JAPCC will contribute in 2023 to the different AFSC Program Office venues by contributing to multiple workshops on requirement development, requirement review, and operational assessment preparation by vignette development and gap analysis.

For the JAPCC this programme offers the unique opportunity to contribute with critical analysis of the concepts offered by industry to ensure the concepts satisfy NATO's needs, and are coherent with MDO concepts. On the other hand, insights into the latest technological developments by industry offer front row seats for the JAPCC to derive new ways to operating based on these new capabilities. Currently, the JAPCC only supports the programme's C2 segment. When a specific technical concept is chosen, other areas of expertise within the JAPCC, like unmanned aircraft, ISR/D, space, and cyber, will be much more involved to ensure the maximum exploitation of AFSC knowledge.

The programme aims to secure the AWACS capability beyond the retirement of the NATO AWACS fleet. The NATO AWACS fleet is scheduled to retire around 2035.

Consequently, the NAC tasked the Conference of National Armaments Directors (CNAD) to determine requirements and advice on options and possible ways to deliver a follow-on to the AWACS under the heading of the Alliance Future Surveillance and Control initiative, or AFSC.

The programme is in phase 2 of stage 1: the study of selected AFSC High-Level Technical Concepts by capability architectures and related project architectures including down-selection of the preferred AFSC capability architecture. In 2022, industry forwarded possible technological solutions corresponding to three operational concepts. These technological concepts represent the latest and most innovative technology that the western industry is capable of delivering. Going away from a platform or sensor-centric approach, the concepts presented sensor and platform-agnostic architectures, giving maximum flexibility, adaptability, and survivability to the operator. The financial and technical assessments of these concepts will be finished in the second quarter of 2023.

**NATO STO AVT-329 NexGen Rotorcraft Impact on Military Operations.** As part of Next Generation Rotorcraft Capability (NGRC), a NATO-STO project, the JAPCC has provided support to finalize the NATO Classified (NC) Operational Assessment (OA). This OA is part of the Applied Vehicle Technology (AVT) 329 activity on 'NexGen Rotorcraft Impact on Military Operations'. The objective of AVT 329 is to technically evaluate the impact of emerging technologies, operational environment, systems, and methods that might affect tactical concepts and doctrines and military needs in developing a trade space supporting national decisions for the NGRC.

**NATO STO-359 Impact of Hypersonic Operational Threats on Military Operations and Technical High-level Requirements.** With JAPCC as co-chair, this study commenced focusing its efforts on military applicability, with the OODA loop (Observe, Orient, Decide, Act) as the baseline reference. Phase 1 was published early in 2022, and Phase two is planned for completion in the first half of 2023. Although many

facets of hypersonic threats and capabilities have been analysed in the past four years, there are still aspects that need further scrutiny.

**NATO Force Protection Decision Support Tool (FPDST) Development.** On the 8<sup>th</sup> of December 2022, the JAPCC and Cunning Running Software Limited delivered a highly successful 'Proof of Concept' brief as the final event of the JAPCC's FPDST project. This event marked the completion of work initiated by a Request for Support (RfS) from NATO Air Command that required the JAPCC to explore the feasibility of automating the process by which the Force Protection (FP) challenges facing the Air Component are analysed; this process is often referred to as 'The FP Estimate'. The Estimate is a structured way of working through a problem in order to derive a solution. However, it needs to be undertaken by individuals with training and experience and is a time-consuming process.

At the time of the request, an incident during a NATO exercise had brought FP into focus as NATO Air suffered a catastrophic (exercise) loss due to flawed FP decisions based on flawed information. This incident not only highlighted the validity of early Air Power theory, but refocused attention on real-world incidents such as the 2012, Taliban attack on Camp Bastion; where the subsequent incident report cited failings in FP decision-making as a major causal factor.

As demonstrated, the FPDST can capture Enemy capabilities, deduce Friendly force requirements, generate the FP Order of Battle, build a FP Estimate and create a report together with a full supporting presentation. All of this is done by guiding the user through a standards-based process which is underpinned by fully configurable databases. The software can handle dependencies between Force Elements (FEs) and automatically identify support requirements for those FEs. Outputs are then automatically generated in standard, editable formats (Word/PowerPoint).

For the first time, the FPDST will enable headquarters to task subordinate units to work with the software to better understand the FP challenge specific to their location together with the FP capabilities necessary to

mitigate them. In turn, headquarters will be able to build and maintain a comprehensive 'library' of individual locations that once consolidated, will provide the FP overview necessary to allow proper senior-level FP decision-making.

Now that the proof of concept is complete, the next step is for interested nations, installations, or headquarters (NATO or national) to work with the software developer to operationalize the product. The JAPCC will remain in an advisory capacity and can facilitate contact with Cunning Running for any interested parties who wish to take advantage of this opportunity to improve force protection while reducing the associated time and cost.

**NATO STO-SCI-346 Space Risk Assessment.** The continued provision of military data, products, and services from space-based capabilities is vulnerable to a wide array of threats. To minimize possible limitations or even total failures, the focus of this 3-year project (2021–2023) is to define and investigate the risk of terrestrial and environmental hazards to space assets and their impact on current and future NATO operations. One Space SME of the JAPCC supports this activity. A JAPCC Space SME is involved to develop a Risk Management Matrix (probability of occurrence versus damage caused) to operationalize results (quantitative and qualitative).

**NATO STO-SCI-350 NATO Alliance Small Satellite Constellation Effort (ALLSAT).** The JAPCC's Space SMEs supported NATO STO efforts to plan, design, and build the three-satellite ALLSAT constellation. This a critical first step to ensure NATO accelerates technology development and highlights the benefits of interoperability of future military capabilities in the Space Domain essential for the Alliance.

**NATO STO SCI-SAS-351 Space Deterrence Framework.** The Space Deterrence Framework was convened in 2019 to investigate what actions NATO could undertake to deter aggression in the Space Domain. Over the course of three years the Space SMEs have participated in multiple planning conferences and finally conducted the first-ever involvement of space in

a war game. This was conducted at the strategic level by ten ambassador representatives to understand what NATO can do to deter aggression in the Space Domain. This was the first and only space exercise or wargame dedicated to Space in ALL of NATO. Its objective was to determine the complex nature of how an Article 5 could and would be declared as a result of aggressions in the Space domain. At the 2021 Brussels Summit the allies agreed that an attack in space would constitute an attack on all, however they did not indicate what level of an attack would constitute the basis for an article 5 response, hence the importance of this War game. Further war games are planned to occur in '24 and '25 at the operational and tactical levels. The war-game in '25 will be tied to the well-known Schriever Wargame in Colorado with a dedicated focus on NATO, a first time for a Schriever Wargame.

## Exercise Support

Exercise support is a key mission area for the JAPCC. The JAPCC leads teams drawn from across NATO to provide Red Air support to exercises and experiments, as such capability is not resident at the Joint Warfare Center (JWC), Stavanger.

The JAPCC supported the following exercises in 2022:

- Joint Project Optic Windmill, Operations Control Group;
- Mare Aperto, two SMEs observed the exercise to prepare MDO inputs 2023;
- Nimble Titan 20/24, Wargame Control Group and Analysis Team;
- Ramstein Ambition 2022, OPFOR Air, SBAMD, Space, Cyberspace, and ALI support;
- Steadfast Jupiter 2022, OPFOR Air, Space, and Cyberspace Support including Development WS, Scripting WS and Phase III Execution including EXCON Training.

**Exercise support STJU 2022.** In line with the formal agreement with JWC, JAPCC supported STJU22 throughout the whole exercise cycle, including exercise development, scripting, training, as well as during the actual

execution. The focus was on creating realistic and complex scenarios, including Cyber and Space aspects, and providing the OPFOR team for the exercise.

**Nimble Titan 24.** Campaign Design Conference (CDC), Competition Event Design and Planning Workshop, and Competition Event December '22. Nimble Titan (NT) is a two-year global missile defence campaign of experimentation providing a forum for policy-makers and military leaders to examine regional and global cooperative missile defence challenges. It is the only venue of its kind that brings together multi-national policymakers and military leaders to discuss and explore missile defence issues. NT is a US Strategic Command (USSTRATCOM)-sponsored event executed by USSTRATCOM's Joint Functional Component Command for Integrated Missile Defence (JFCC IMD). They included military and policy personnel from Belgium, Canada, Denmark, Finland, France, Germany, Japan, the Republic of Korea, Kuwait, the Netherlands, Oman, the Kingdom of Saudi Arabia, Spain, Sweden, the United Kingdom, NATO International Staff, the Competency Centre for Surface-Based Air and Missile Defence (CC SBAMD), US DOS AVC, US JS J5 & J8/JIAMD, USCENTCOM, USINDOPACOM, USNORTHCOM, USSTRATCOM, JFCC IMD, USSF, SDA and MDA. JAPCC supports this series of experimentation by providing the Deputy of the Wargame Control Group (WCG). The WCG creates a scenario from the member's desired learning objectives. JAPCC also provides subject matter expertise in the Design, Analysis and Reporting Team.

**Joint Project Optic Windmill (JPOW).** JPOW is a bi-national GE-NE-led exercise which enjoys strong support from US EUCOM and the US Missile Defence Agency. JPOW has already proven to be a valuable tool in supporting NATO air operations by improving planning and C2 procedures throughout the domain of IAMD. JPOW distinguishes itself from other exercises by including a Concept Development and Experimentation (CD&E) phase in the overall exercise set-up. This segment, which precedes the execution phase, offers the participants the unique opportunity to demonstrate, practice, evaluate and validate different IAMD programmes and concepts. Doctrine, Techniques,



Tactics and Procedures can be developed, tested, validated, improved upon and tested again in an experimental environment. The implementation of lessons identified (from the CD&E phase) in the execution phase allows for immediate feedback and, subsequently, a steep learning curve.

JAPCC supports the exercise preparations and execution with SBAMD expertise in the Operations Control Group. JAPCC is responsible for the JPOW Academics day, during which the participants are prepared for current and (near) future Battlefield scenarios. JAPCC supports the scenario generation and is the custodian for the exercise's 'Blue Weapon System Handbook'. During the execution of the exercise JAPCC SME(s) performs HICON and EXCON duties. Occasionally JAPCCs (NE) Assistant Director acts as Exercise Director.

**Ramstein Legacy (RaLy).** RaLy aims to be a NATO live Exercise in line with SACEURs Deterrence and Defence of the Euro-Atlantic Area. It incorporated several existing live NATO exercises into one AIRCOM-led exercise on biennial basis. It contains a Tactical Data Link network, live flying threat assets and has the possibility to incorporate live Electronic Warfare. RaLy normally also includes a live firing phase. JAPCC SME supports AIRCOM A7 during the exercise preparations. This encompasses Education & Training of participants. During the exercise the JAPCC SME performs HICON and EXCON duties.

**Mare Aperto.** This is the leading annual Italian Navy exercise at sea. Participating assets included a significant number of ships, submarines, fixed-wing, rotary wing, and amphibious capabilities from multiple NATO countries, including NATO standing Naval groups operating in the Mediterranean Sea. The exercise tested forces against multidimensional threats and domains to enhance the Maritime Component Commander's desire to build multi-domain capabilities within the Carrier Strike Group and the associated projection of Air Power. The JAPCC participated in the exercise with two observers from the Combat Air branch. The Italian Navy is looking for future cooperation in the planning phases of the exercise, related explicitly to Air Power projection and MDO.

**Ramstein Ambition.** The JAPCC supported the preparation of this AIRCOM exercise in 2022 with an OPFOR Air team as a part of Exercise Control (EXCON), however, the exercise was cancelled on short notice. Like in the last years, it is intended to support this event again in 2023.

## Education and Training

In 2022, the JAPCC supported NATO Education and Training in the following areas:

- Air Force Protection (FP) partnership with the European Air Group (EAG);
- Air FP Support to the Baltic States;
- Common Education & Training Program (IAMD);
- Cyberspace Support;
- Education and Training on Space;
- German BMD Seminar;
- JPR Education and Training;
- NATO Advanced FP (Practitioners) Course;
- NATO Force Protection Training (Introduction to Force Protection in NATO Course);
- NATO Joint Electronic Warfare Course;
- NATO Red Air Capability Study in response to RfS of IT AF;
- Surface-Based Air and Missile Defence.

### Common Education & Training Program (CET-P)

**Basic IAMD Training.** This CET-P is an initiative originated by COM CAOC Uedem, acknowledged and supported by COM AIRCOM, to get NATO Air C2 and SBAMD forces in compliance with NATO procedures. CAOC Uedem and the JAPCC, in close cooperation with the Competence Centre Surface-Based Air & Missile Defence (CCSBAMD) and the Integrated Air & Missile Defence COE developed a basic IAMD training plan. This training forms a minimum knowledge base for NATO Integrated Air and Missile Defence.

The CET-P Basic IAMD training focuses on the tactical level and contains lessons learned regarding NATO C2 tasks and responsibilities, SBAMD air planning, tactical data links, air reporting, and current threat intelligence. Due to the training's popularity, the training

cadre developed a 'train the trainer' model to overcome the limitation of available training spots and export the needed training to the nations.

JPACC hosted the first three sessions of the Basic IAMD training in March, May, and November of 2022, with the participation of over 75 students, approximately 50% as trainers, from 18 countries.

In 2023 the IAMD COE will take over the lead for the CET-P, with the JAPCC remaining in a supportive role, i.e. instructor support and SBAMD briefings. This IAMD training proved to be a welcome reinforcement to NATO Education and Training opportunities, and has become one of the pillars supporting NATO IAMD.

**Air Force Protection (FP) partnership with the European Air Group (EAG).** JAPCC continues its close collaboration with the EAG on Air FP subjects. Areas of mutual interest in 2022 included work to incorporate the EAG's work on Air Mobile (Force) Protection (AMPT) Teams into future NATO Air FP Doctrine, the development of the Force Protection Decision Support Tool (FPDST) and the delivery of an Air FP Planning Module during the EAG's VOLCANEX Exercise. This event also incorporated a test of the Proof of Concept for the FPDST and discussed in further detail elsewhere.

**NATO Force Protection Training (Introduction to Force Protection in NATO Course & NATO Advanced FP [Practitioners] Course).** The JAPCC continues to act as the Office with Principal Responsibility (OPR) for NATO FP Courses and is responsible for the delivery of the P5-40, 'Introduction to Force Protection in NATO Course' (P5-40), as well as the 'Advanced Force Protection (Practitioners) Course' (N3-155). During 2022, the JAPCC successfully delivered three Introductory and two Advanced Courses, representing approximately 400 JAPCC person-hours.

The introductory course remains in the top three of NATO School Oberammergau courses in terms of both student satisfaction rating and the consistently high numbers of students who attend the course. The

JAPCC delivers approximately 50% of the lessons and all of the confirmatory syndicate work provided in this course. The Advanced Course was designed and delivered by the JAPCC at the request of Allied Command Operations as the Requirements Authority and is designed to equip personnel for FP Staff Officer appointments at the operational level in both NATO and National Headquarters; the JAPCC delivers all of the teaching on this course.

**Air FP Support to the Baltic States.** This activity is an annual follow-on from the highly successful extended visits to the region in 2015 and 2016. These visits, driven by the then JAPCC Director, were delivered in direct support to the Baltic Air Policing (BAP) Mission. The purpose of the visits was to conduct detailed analysis and make subsequent recommendations on the Security and Force Protection (FP) posture of Baltic Air Bases, Radar Sites, and C2 facilities. This initial and highly successful engagement, leading to structural changes in the region, has now evolved into the delivery of an in-depth and intellectually demanding FP package, for the three Baltic Air Forces officers, delivered at the Command and Staff College in Vilnius, Lithuania.

The package is a development of the JAPCC-authored and run Advanced FP (Practitioners) Course, however, tailored to be both Air FP specific and Baltic Region focused. Given events in Ukraine and the renewed attention to reassurance, this package remains extremely well received and a request for a repeat of the package in 2023 is imminent. Furthermore, it is a practical example of the JAPCC's contribution to broader, more operationally focused NATO activity. Finally, the Air element of the Military Academy of Lithuania is seeking closer ties with the JAPCC-facilitated Joint Air and Space Power Network (JASPN).

**JPR Education & Training.** Continuing a tradition since 2021, the JAPCC has supported NATO/EDA Education and Training, providing Staff member/Instructor to 'Joint Personnel Recovery Staff and Leadership Courses' and 'NATO Air-Centric Personnel Recovery Operatives Course'.

### **Discipline Alignment Plan (DAP) 2021 as Outcome of 2021 Annual Discipline Conference.**

Since May 2016, JAPCC has maintained the role of Department Head (DH) for the 'Space Support to NATO Operations' discipline. As the DH for Space, the JAPCC coordinates findings and develops solutions for the Education & Training (E&T) requirements identified by the requirements authority (SHAPE DCOS SDP). The 5<sup>th</sup> Annual Discipline Conference (ADC) was the first full plenum meeting after the recognition of space as an operational domain in NATO during the London Summit. In accordance with the significant changes made therein, changes in the JAPCC's role as DH must also be reported: The legacy 'Space Support to Operations' discipline has been renamed to the domain-level 'Space' discipline, and the 2021 Discipline Alignment Plan (DAP), authored by the JAPCC and published by the ACT, Joint Forces Development in May 2022, was the last under the JAPCC's leadership. The new NATO Space COE will assume the role as DH on 19 January 2023.

### **Space Lecture at Tactical Leadership Programme (TLP) Albacete/ESP.**

NATO's TLP is increasing the effectiveness of nation's Air Forces in the field of tactical leadership and conceptual and doctrinal initiatives. A JAPCC SME for Space gave lectures on 'NATO and the Space Domain' to participants of the Support Course and attendees of the Intel Course to give the possibility to TLP's academic courses to remain aligned with the NATO directives and relevant in the NATO community.

### **SWEDINT Joint Synchronisation Course (JSC) – Cyberspace Lectures.**

The course is to facilitate the transition from planning to execution in exercises such as TRIDENT and STEADFAST and teach how to successfully synchronize time, space, forces, and effects to create decision superiority and overwhelm an adversary, whilst protecting the force. Looking forward to Sweden becoming a NATO member, the JAPCC reached out and delivered a presentation for the course with the aim to enhance the capacity of the practitioners to undertake their roles and responsibilities of joint synchronization more effectively.

## **Active Engagements**

The JAPCC continues to actively engage with various air power stakeholders through working groups and other face-to-face meetings. These engagements included but were not limited to:

- 13<sup>th</sup> Cyber Conflict Conference;
- 3AF IAMD Conference;
- 3<sup>rd</sup> Romanian Military Thinking Conference;
- AAR Systems Advisory Group (AARSAG);
- ACT SEE Capability Area Group (CAG) Meetings – NATO Defence Planning Process 2022–2026;
- Aerospace Capability Group 2 (ACG2);
- Aerospace Capability Group 3 (ACG3);
- AFSC development (preparation of ops assessment);
- Air Operation Working Group (AOWG);
- Air Transport Working Group (ATWG);
- AirC2 Cluster;
- Aircraft Cross Serving Servicing Conference;
- Aircraft Servicing and Standard Equipment Working Group (ASSEWG);
- Air-Cyber Mission Assurance;
- Air-to-Air Refuelling Working Group (AARWG);
- Alfredo Kindelán International Seminar and Working Group;
- Annual Joint Air and Space Power Conference;
- CAOCs Inter-Services Coordination Meetings;
- CCDCOE Annual discipline conference & CYCON;
- Close Air Support (CAS) Conference;
- CZ Conference Future Air Force – New Generation Aircraft;
- EAG Cyberspace WG;
- European Safety & Security Professionals Network;
- Finnish Air Power Conference;
- German Workshop concerning Sensors for hypersonic capabilities;
- ISR Capability Study;
- IT AF AI Study concerning the use of AI within C2;
- JISR and Big Data;
- Joint Air and Space Power Network (JASPN) Meeting;
- Joint Personnel Recovery (JPR);
- JTAC Program Manager Workshop;
- Maritime Air Coordination Conference (MACC);
- NATO BiSCSWG (Space);
- NATO Electronic Warfare Advisory Committee (NEWAC);

- NATO Electronic Warfare Working Group (NEWWG);
- NATO Space Centre of Excellence (on request);
- NATO SWEDINT Joint Synchronization Course;
- NATO's Long-Term Military Transformation (LTMT);
- NE MDO Kick-off Seminar;
- NEASCOG WG on Cyberspace Mission assurance;
- NIFC Cyber Conference;
- NRDC-ITA MDO Seminar;
- NSO Course 'Space Coordinators Course' (test run);
- SATCOM Threat Assessment Study;
- Think Tank Forum (TTF);
- TIDE Sprint 40;
- White Paper Planning in JADO.

**Annual Joint Air and Space Power Conference.** As every year since inception, the JAPCC hosted the annual Joint Air and Space Power Conference in Essen, Germany, from 11 to 13 October 2022 under the topic 'Enhancing NATO Air and Space Power in an Age of Global Competition'. Benefiting from more than three hundred participants and keynote speeches from DSACT and other dignitaries, a multinational team of esteemed speakers and panellists addressed this year's conference theme in four distinct panels.



The panels addressed and explored: the challenges and threats in the competitive environment and the implications for security; the consequences for deterrence and defence, the future trends and challenges to fulfilling the demands for technically advanced systems, interoperability, and technical standards; the industry's perspective along with new approaches to multinational defence planning, common-funded solutions, and stimuli to reinforce industrial cooperation; and, lastly, NATO forces' adaptation, posture, and development of capabilities to face future scenarios and trends and provide successful defence of the Alliance's interests and territory. All the panels generated questions on how the Alliance might best evolve and enhance Air and Space Power capabilities to support NATO in fulfilling its three core tasks: deterrence and defence, crisis prevention and management, and cooperative security.

**Think Tank Forum (TTF).** The 8<sup>th</sup> Joint Air and Space Power Think Tank Forum took place from 23–24 March 2022 in a virtual format, again due to COVID restrictions. The main objective was to bring together national Air Warfare Centres, national HQs/staffs, and A&S-related academic institutions to share information and insights regarding A&S Power challenges and to engage in collaborative discussions on current and future trends facing the Alliance. As in 2021, the group recognized thirteen topical areas for fostering multinational collaboration and preventing duplication of effort.

**Joint Air and Space Power Network (JASPN) Meeting 2022.** On 23<sup>rd</sup> November 2022, the JAPCC hosted the 9<sup>th</sup> edition of the JASPN Meeting, aimed at developing better synergies within the A&S Power community. Complementary to the TTF where the national entities are invited, the JASPN Meeting brings together NATO and European Union organizations. Its main objectives are to share insights and information regarding the transformation of Joint Air and Space Power, to review and identify potential areas of cooperation, and to reduce to the minimum the likelihood of duplication of effort. This year we hosted a diverse group of multinational organizations that included NATO HQ, NATO Allied Air Command (AIRCOM), European Union Military Staff (EUMS), Movement Coordination Centre Europe

(MCCE), European Air Transport Command (EATC), European Defence Agency (EDA), European Air Group (EAG), Competence Centre for Surface-Based Air and Missile Defence (SBAMD COE), Command and Control COE, FRA AF C2, and Air Operations COE.

The main discussions focused on Red Air/OPFOR provision as a significant part of the NATO fighters training, MDO, JPR, FP, AAR, ISR, C-UAS, ACS, Resilient Basing, Space-based support, Alliance Future Surveillance and Control (AFSC), Hypersonic, and IAMD.

**Concept Development and Experimentation (CD&E) Conference.** To facilitate alignment with the CD&E pillar and to monitor ACT activities on the Warfare Development Agenda and related MDO topics, JAPCC participated in an annual conference held in October 2022 in Hungary. The theme of the conference was focused on the contributions of CD&E shaping the future of war development and improving warfighting in light of the new NATO Strategic Concept. For the JAPCC, this conference represented an opportunity to discuss new and emerging topics of NATO's future efforts, as well as various CD&E tools to support the development of warfighting, with the added benefit of re-establishing relationships with the ACT and other stakeholders. In the future, this conference can serve as a venue for JAPCC to introduce and present its approach to MDO.

**Strategic Foresight Analysis (SFA) Workshop.** As part of the series of SFA Workshops, the 2022 workshop aimed to identify key factors and events influencing the trajectory of future trends to ensure that the military instrument of power is fit for purpose in the future. The time horizon refers to 'NATO in 2040'. The topics were based on the ACT's 'Strategic Foresight Analysis 2017'. The workshop findings will inform the 'Strategic Foresight Analysis 2023'. Apart from the networking opportunities, JAPCC benefited by ensuring that Air and Space expertise was considered and properly represented in the SFA.

**European Safety & Security Professionals Network.** This organization brings together specialists from industry, academia, and the military. Its purpose is to



***Director of the JAPCC, General James B. Hecker delivering a special address at the Joint Air and Space Power Conference 2022.***

share ideas, discuss challenges and ultimately create, or update best practises. The JAPCC participated in the Safety and Security Professionals Network Seminar in April 2022 and delivered a JAPCC Mission Brief. The benefit to the JAPCC POW from this event has been the development of a collaboration between JAPCC FP and a Dutch commercial organization called Risk Challenger, which own proprietary software application that enables Risk Management (RM) across large organizations. While the JAPCC has successfully delivered a Proof of Concept of the FP Decision Support Tool (FPDST) during 2022, the long-term objective remains the incorporation of both RM and Explosive Blast Analysis into a single FP problem analysis tool. The facilitation by The Hague University of Applied Sciences (THUAS) of the Safety and Security

Professionals Network also provides a mechanism for the JAPCC to develop both the Asset Protection Handbook and, eventually, an International Standard for Asset Protection.

**Aircraft Cross-Servicing (ACS).** JAPCC contributed to the 24<sup>th</sup> Aircraft Servicing and Standard Equipment Working Group (ASSEWG) and the 6<sup>th</sup> Aircraft Cross Servicing Conference (ACS). Both were held in the first week of October 2022. JAPCC submitted a custodian report in which the ratification and implementation status of STANAG 3430 (Cross-servicing) was briefed. Furthermore, specific attention was requested with involving National Military Airworthiness Authorities (MAA) to engage with ACS representatives aiming to identify changes to the cross-servicing STANAG. Next steps are, with support of AIRCOM A4, to integrate airworthiness related guidelines in the existing STANAG.

During the ACS conference various cross-servicing related experiences were shared, such as Combined Air Policing, Multinational Aircraft Loading Teams, and Agile Combat Employment (ACE). JAPCC participated in a syndicate that was tasked to identify ACS-related ACE requirements. An important observation is that revitalizing ACS is still a challenging endeavour. The current ACS implementation status is not yet mature enough to meet ACE requirements. Therefore implementing full ACS needs more emphasis within NATO.

**Joint Personnel Recovery (JPR).** JAPCC has provided support through several meetings to the Multinational Capability Development Campaign (MCDC) biannual project (2021–2022) to develop a Self-Evaluation Guide (JPR SEG), as an annex to the previously issued JPR Guidebook. It provides a useful means to examine existing PR programmes at the national, organizational, or unit level, and identifies potential capability gaps and interoperability shortfalls well ahead of crisis or conflict.

**Air-to-Air Refuelling (AAR).** JAPCC continued to lead NATO's Air-to-Air Refuelling Working Group (AARWG) in support of the NATO Air Force Armaments Group

(NAFAG) and Military Committee Air Standardization Board (MCASB). In this role, the AARWG completed the promulgation of an updated technical and procedural standard for AAR Signal Lights in Hose and Drogue systems. Additionally, JAPCC continued to conduct presentations focused on the education of AAR experts and increasing interoperability within the AAR enterprise worldwide, including participation at the AAR Systems Advisory Group Annual Conference and the 2022 Military Airlift and Air Refuelling Conference. The AAR SMEs continue to meet with NATO HQ IS-DI and EDA on a quarterly basis to ensure that the strategic direction of the three agencies remains pointed in the right direction. The AARWG maintains a paused status under the MCASB as several nations are negotiating the way forward for a few minor items within the Terms of Reference.

Importantly, the AAR webpage received an update. However, the new website software mandated an update to the programming of the AAR Technical Compatibility and Clearance Matrix. This change in coding required a complete rebuild of the compatibility matrix. Website programming completed in October 2022, with the previous Compatibility Matrix providing continuity during the interim period. Beginning in October 2022, the JAPCC AAR SMEs began inputting the national and organizational information required to populate the new Technical Compatibility and Clearance Matrix that has been completed in winter 2022. Simultaneously, the AAR SME, in the role of AARWG Chairperson, began a project estimate with NCIA to explore implementing a modern solution to the AAR Matrix. NCIA is currently developing options for the AARWG for spring 2023.

**Air Transport (AT).** During 2022, the JAPCC was actively engaged with the ATWG. The working group has met once in June, focussing on reviewing the STANAG portfolio, the liaison reports, and to exchange information and terminology. The STANAGs under custodianship are Tactics, Techniques, and Procedures related to NATO Air Movement Operations, NATO Air Transport Operations, and NATO Airborne. The ATWG has evaluated its responsiveness to the needs of the AT community. The Development of a

proposal aiming to standardize the training of Combat Control Teams (CCT) in Conventional Operations not belonging to Special Operation Forces (although not accepted by the Military Committee Air Standardization Board (MACASB) for the second time in 2021) is still supported by some nations, including Italy, France, and Portugal. Due to the current worldwide events the second meeting of the ATWG, initially planned for December 2022, had to be postponed to February 2023. Finally, the ATWG no longer receives secretarial support from the MCASB as of the summer of 2022. This has increased the workload of the JAPCC.

**AIRC2 Cluster Kalkar and Uedem.** The JAPCC is located at the barracks at Kalkar, where also the GE JFAC HQ, the GE Air Operations Command, and the Air C2 Training Element are located. The base is only five km away from CAOC Uedem. This geographical proximity of national and NATO Air C2 elements offers the exceptional opportunity to share ideas and knowledge and discuss developments in the realm of Air C2 with a huge diversity of SMEs. Being part of this network, JAPCC stays aware of current C2 developments and challenges, essential for the development of relevant products. In return, JAPCC informs the staff at the CAOC Uedem and the German units about the latest high-level conceptual developments like MDO or AFSC.

This offers the tactical level the unique opportunity to maintain awareness and even, when necessary, to contribute to the actual and future developments from an early stage. The AirC2 cluster will in particular look into developments around the JFAC. In times of crisis or conflict, NATO will stand up a JFAC in order to plan and execute the Air part of a Joint operation. Training, preparation, stand-up, and execution of NCS and NFS JFACs have to be standardized and streamlined in order to ensure frictionless initiation, execution, and, if required, seamless handover from one JFAC to another. The cluster will not rewrite doctrine, policies, or operational concepts. Rather, the cluster intends to support existing processes with practical solutions for the work floor in the fields of training, preparation, and execution. Furthermore, the cluster

will highlight problem areas and shortfalls and develop mitigations or solutions. Due to ongoing developments in the Ukraine and the aftermath of the Covid-19 epidemic, the AirC2 cluster was acting at a low level this year. The intent is to significantly increase the activities of the cluster in 2023.

**Support of Joint Forces Command Naples.** JAPCC supported the JFC Naples' request to provide Space expertise to its 24/7 Space Desk supporting the operation in Ukraine. The JAPCC provided vital support to the operation by submitting multiple Space Support Requests and Space-related Requests for Information, while providing daily briefings to the JFC leadership on how Space was being utilized or impacted in the war. JAPCC was originally requested to support for 14 days, however due to the outstanding support was asked to extend to 28 days.

**TechNet Europe 2022 Conference on Future Application of AI in Military Operational Environment.**

The employment of the Artificial Intelligence (AI) technology is on the rise globally. The European Union issued a comprehensive AI policy and NATO decided on its AI strategy last October. Therefore, the conduct of military operations in the future may rely on a wide range of AI applications. As AI could soon become a commodity in the preparation and execution of military operations, it will alter military structures, C2 procedures, and C4ISR disciplines. As a leading beacon of the Joint Air and Space Power transformation, the JAPCC was invited to nominate a panellist to present and discuss with other AI and military SMEs the opportunities and challenges for future military operations.

**SHAPE JISR Common Development Plan (CDP).**

Following SHAPE J2 RfS, JAPCC contributed to SHAPE JISR Common Development Plan (CDP) with research and study in ISR. Accordingly, the results were summarized in the ISTAR WP.

JAPCC personnel fill chairmen, co-chairman, and panel positions on numerous NATO steering bodies, as well as provide custodianship to a number of NATO doctrine documents, as highlighted on next page.

## Chairmanships

- Air Operations Working Group (AOWG);
- Co-Chair the Maritime Air Coordination Conference (MACC);
- Co-Chair the NATO STO AVT-359 Study about Hypersonic Capabilities;
- Doctrine, Organization, and Interoperability (DOI) Panel, NATO Force Protection WG;
- Exercise STLE21, Development of ICC Products, ATO and ACO;
- NATO Air Transport Working Group (ATWG);
- NATO Air-to-Air Refuelling Working Group (AARWG);
- Nimble Titan 20/24, Wargame Control Group and Analysis Team;
- Operations Control Group Joint Project Optic Windmill (JPOW);
- OPFOR Air, SBAMD, Space, Cyberspace, and ALI Support to Exercise RAAM21;
- OPFOR Air, Space and Cyberspace Support to Exercise STJU22.

## Panel Member/Working Group

- Air Capability Group 3 and NATO Electronic Warfare Air Group;
- Allied Future Surveillance & Control Project Group (AFSC PG);
- Aviation Committee (AVC);
- BMD Operational User Group (BMD OUG);
- CNAD/NAFAG/ACG3 – Aerospace Capability Group on Survivability;
- Cyberspace Annual Discipline Conference;
- European Air Group Cyberspace Working Group;
- Force Protection Working Group (FPWG) and Force Protection Advisory Group (FPAG);
- GE WG on Communication and C2 in Missile Defence;
- Helicopter Inter Service Working Group (HISWG);
- Helicopter Operations from Ships other than Aircraft Carriers Working Group (HOSTAC);
- Integrated Air and Missile Defence Policy Committee (IAMD PC);
- Joint Capability Group Unmanned Aircraft Systems (JCGUAS);
- Joint Capability Group Vertical Lift (JCG VL);

- Joint Capability Surface-Based Air and Missile Defence (JCGSBAMD);
- JPR Forum;
- Maritime Operations (MAROPS) Working Group;
- Maritime Tactical Operation (Fixed-Wing) Working Group (MTACOPS WG);
- Maritime Unmanned Systems Steering Board (MUS SB);
- NATO AEW&C Program Management Organization Board of Directors (NAPMO BOD);
- NATO Army Armaments Group/Joint Capability Group Vertical Lift (NAAG/JCGVL);
- NATO Bi-Strategic Command Space Working Group (BiSCSWG);
- NATO Cooperative Cyber Defence COE (CCD COE) 14<sup>th</sup> International Conference on Cyber Conflict;
- NATO Counter-Unmanned Aircraft Systems Working Group (C-UAS WG);
- NATO Science for Peace and Security (SPS) – The Vulnerabilities of the Drone Age: Strategic Foresight Planning for 2035;
- NATO Special Operations Headquarters (NSHQ) in Support of Air Development Program (ADP) for SOF Aviation;
- NE Knowledge Network on SBAMD;
- NE SBAMD Policy Group;
- NEWAC/NEWWG – NATO EW Concept & Doctrine;
- Personnel Recovery/Search and Rescue Working Group (PR/SAR WG);
- STO AVT 329 study (Next Gen Rotorcraft Impact on Military Operations);
- STO SCI-353 Study Group (C-UAS Mission-Level Modelling & Simulation);
- TIDE Sprint Events.

## Doctrine Development (Custodianship & Contribution)

Over the last year, the JAPCC led and/or participated in the following doctrine efforts:

- MC 064/12 NATO EW Policy;
- MC-0610, FP Policy for NATO-Led Operations (Custodian);
- MC-0656, Policy for FP of Alliance Forces (Custodian);



- MC 485/2 NATO SEAD Policy (Custodian);
- AJP-3.3 Custodian;
- AJP-3.6 (NATO Joint EW Doctrine);
- AJP-3.14 Allied Joint Doctrine for FP (Custodian);
- AJP-3.3.2(A) Allied Joint Doctrine for Close Air Support and Air Interdiction;
- AJP-3.3.3 Air-Maritime Coordination;
- AJP-3.7 Allied Joint Doctrine for Recovery of Personnel in a Hostile Environment;
- ALP-4.3 Air Forces Logistic Doctrine and Procedures;
- ATP-3.3.2.1 Tactics, Techniques and Procedures for Close Air Support and Air Interdiction;
- ATP-3.3.2.2 Joint Terminal Attack Controller Program;
- ATP-3.6.2 EW in the Land Battle;
- ATP-3.6.3 EW in the Air Battle;
- ATP-3.3.3.1 Maritime Air Coordination Procedures;
- ATP-3.3.4.1 Tactics, Techniques and Procedures for NATO Air Movement Operations (Custodian);
- ATP-3.3.4.2 Air-to-Air Refuelling (Custodian);
- ATP-3.3.4.2.1 SRD 1 Guide to Obtaining AAR Clearances and Compatibility;
- ATP-3.3.4.2.2 SRD 2 Recommended AAR Aircrew Certification and Currency;
- ATP-3.3.4.2.3 SRD 3 Tanker Capabilities;
- ATP-3.3.4.2.4 SRD 4 Tanker/Receiver Clearance Compatibility Matrix;
- ATP-3.3.4.3 Tactics, Techniques and Procedures for NATO Air Transport Operations (Custodian);
- ATP-3.3.4.4 Tactics, Techniques and Procedures for NATO Airborne Operations (Custodian);
- ATP-3.3.4.5 AAR Boom-Receptacle Requirements;
- ATP-3.3.4.6 AAR Pro-Drogue Characteristics;
- ATP-3.3.4.7 AAR Signal Lights in Hose and Drogue Systems;
- ATP-3.3.6 NATO FP Doctrine for Air Operations (Custodian);
- ATP-49 (STANAG 2999) Use of Helicopters in Land Operations (Custodian);
- AD-80-25 ACO Force Protection Directive (Custodian);
- MPP-02 Vol I Helicopter Operations from Ships Other Than Aircraft Carriers (HOSTAC);
- MMP-02 Vol II Multinational Through-Deck and Aircraft Carrier Crossdeck Operation (MTACCOPS);
- AASSEP-13 Allied Aircraft Cross-Servicing Publication (Custodian);

- Functional Planning Guide for Joint Air Operations Planning (FPG AIR);
- Cyberspace Discipline Alignment Plan (DAP);
- NATO IAMD Policy;
- NATO Concept of Employment (CONEMP) Digitally Aided Close Air Support (DACAS).

**Custodian and Update of NATO SEAD Policy.** The aim of this project was to review the NATO MC 485 SEAD Policy and empower NATO commanders, staff, and forces to conduct successful Suppression of Enemy Air Defences (SEAD) operations within rapidly evolving, congested, contested, and constrained battlespaces; across geographical areas and climates; considering state and non-state actor threats while incorporating all available NATO and NATO Partner force capabilities, regardless of domain or component.

As a key enabler of Air Superiority, SEAD requires the careful synchronization of diverse effects throughout the force and must be incorporated from the onset of Joint Force planning. It is recognized that, due to the rapid evolution of the threat environment, Integrated Air Defence Systems (IADS) have continued to increase in complexity, especially where there are elements of the so-called Anti-Access/Area Denial (A2/AD) environments and strategies.

JAPCC, under the direction of the NATO Electronic Warfare Advisory Committee (NEWAC), led a Tiger Team as the custodian of the SEAD policy review and subsequent update. The team developed solutions and coordinated inputs with the NEWAC, the NATO Electronic Warfare Working Group (NEWWAG), and the Aerospace Capability Group 3 (ACG3). The final version was sent to and approved for implementation by the International Military Staff (IMS) in August 2022.

**Custodianship and Revision of AJP 3.3 Air and Space Operations.** In June 2022, the Study Draft 3 was released successfully to all nations and concerned NATO organizations. We received a total of 659 comments by September 2022. After initial processing by JAPCC, a first Writing Team (WT) was organized in Ramstein, at the end of October 2022, to discuss the remaining comments. However, due to

time constraints, not all comments could be discussed, adjudicated, and implemented. Therefore, the JAPCC and a small group of experts from NATO nations continued to incorporate the remaining comments to finish this task by the end of February 2023. As a following step, a Harmonization Draft will be prepared and submitted for approval. Without significant delays, the AJP-3.3 Edition C could be ratified by mid-2023.

**Custodianship of ATP-49 and Rewriting (New ATP 3.2.49) Use of Helicopters in Land Operations.**

JAPCC, as the custodian, has completed a full restructuring and rewriting of the document. The ATP-49 will become the ATP-3.2.49; the old content of the document is now divided over 18 separate documents and their respective (new) STANAGS. Where needed, obsolete information was deleted and current information was added to bring the document up to current NATO standards.

# 2023 Outlook

## Focus Areas & Future Projects

**Introduction.** JAPCC regularly reviews and transforms its Focus Areas, PoW, and organizational structure to ensure that it can continue to address current and future challenges and to provide key decision-makers effective solutions on A&S Power challenges, to safeguard NATO and the nations' interests. The JAPCC Focus Areas are approved by the SC at their annual meeting. In the broadest sense, the JAPCC could address any topic or capability within the realm of A&S Power, but closely following current developments throughout the world and within NATO. This section provides a preview of known events, ongoing development, and prioritization for 2023.

**White Paper Development 'Operational Planning in MDO' (in progress – 2023).** NATO has embraced the MDO concept to face the challenges of future threats and the future battlespace. The aim is to be able to orchestrate and synchronize military with non-military activities, across all domains and environments, to enable commanders to deliver converging effects at the speed of relevance.

The air component is unique when it comes to effect generation. The attributes of air, like speed, reach, and a flexible and effective standing C2 structure led by operators with a joint and multi-domain mindset, make the air component and its capabilities a key element in NATO's MDO concept. The Air Component is able to create effects theatre wide, across JOA boundaries, day and night. However, a solid planning process is key to maximizing effects by air capabilities across all domains and to ensure the optimal employment of often scarce air resources or high-value assets throughout the operational theatre. If this is not achieved, NATO will lose the key capabilities to leverage the advantages of MDO.

As the MDO concept is now in full development, there is nothing written in stone yet. This offers the JAPCC the opportunity to contribute with ideas,

recommendations and possible solutions. Currently, there is the tendency to approach the concept mainly from a technological perspective. This is understandable as technology will be a key enabler to increase NATO C2 agility. However, MDO is at its core a matter of coordinating and integrating activities across domains. Therefore, in the next step, MDO has also to be developed towards an operational concept with the necessary C2 constructs and arrangements. To generate effects at the speed of relevance, planning has to be more flexible, faster, and collaborative. Through this White Paper, the JAPCC will try to identify the factors of influence on planning to finally recommend possible ways and means to execute planning to leverage, implement, and operationalize the concept of MDO.

**Resilient Basing Workbook & Questionnaire.** In response to an RfS from the Royal Netherlands Air Force (May 2021) to better analyse the current resilience status of Alliance members against a full spectrum of threats, the JAPCC published the Resilient Basing Enhancement Workbook. The Workbook intends to take a comprehensive approach across civilian infrastructure and military installations, thereby enabling organizations to identify their strengths and vulnerabilities, and challenge them to mitigate identified shortfalls. This workbook challenges nations to self-evaluate their resilience by answering a series of questions and share their findings, including mitigating strategies, via an embedded response sheet. During the summer of 2023 the JAPCC will assess received inputs, identify lessons learned, and inform nations about the results in a White Paper.

**Asset Protection Handbook.** One of the biggest single challenges, as discussed in the 2021 JAPCC White Paper 'NATO Force Protection on a Knife-Edge', is the current lack of expertise and experience in the FP field. This coupled with an overemphasis on exquisite air platforms without the commensurate investment in warfighting enablers, such as FP, risks the

future of NATO's resilience. The incessant debate between well-meaning but mistaken non-specialists who are unfortunately (and through no fault of their own) placed to FP posts within NATO is one example of this difficulty.

The Asset Protection Handbook Project is designed to capture the core of FP knowledge developed within NATO since the Cold War and meld it with knowledge and best practices from Academia and Industry in the field of Safety & Security Management and Industrial Security (the civilian equivalents of FP). The purpose of setting down this information in a single publication is to create a foundation for considering the issue of Asset Protection. This, in turn, will create a set of robust underpinning principles and supporting practices for FP. The outcome should be to remove the need to regularly revisit and reword FP publications, which is currently the case and delivers little if any advancement. This project has gathered momentum throughout 2022 and will be delivered towards the end of 2023.

**Exercise and Experimentation Support.** JAPCC will continue to contribute substantial support to NATO exercises in 2023 by providing highly dynamic and realistic Opposing Forces (OPFOR) Air, Space, and Cyber-related play in support of NATO exercises. The expertise brought by the JAPCC OPFOR Air Team in (multi-layered) Air Defence, Tactical Ballistic Missiles, Space, Cyber, and Intel play will be an integral part of the upcoming exercises such as Ramstein Ambition 23 (RAAM23) at DACCC, in Poggio Renatico, and Steadfast Jupiter 23 (STJU23) at the Joint Warfare Centre (JWC), in Stavanger. The JAPCC continues to support the JWC in developing and updating exercise scenarios with the latest developments in joint warfare with regard to air, space, and related cyber aspects.

**Quantum Technologies.** As one of NATO's recognized Emerging Disruptive Technologies (EDT), Quantum Technologies will influence the future of warfare and military. The JAPCC's aim is to assess the extent of this influence on the future of Air and Space Power through a series of articles in its forthcoming journals.

**White Paper 'Freedom of Manoeuvre (FoM) in Cyberspace.'** Cyberspace is a dynamic and constantly evolving domain. For the projection of A&S Power, the ability to continue to operate in Cyberspace in a contested environment is essential for the highly technical planning, C2, and execution of modern operations, as well as future MDO. Therefore, gaining and maintaining the requisite degree of FoM in Cyberspace is vital to achieving the commander's intent.

The project aims to introduce the readers to the fundamentals of Cyberspace operations in modern conflict. In battles where the adversary is not always known nor the threats readily apparent, the ability to secure this domain completely is unlikely, increasing the requirement for forces to be able to fight through and succeed in an ever-increasingly contested environment. Understanding and leveraging Cyberspace through the successful exploitation of emerging trends and technologies is imperative. NATO and its partners need, more than ever, comprehensive insight into the increasingly contested Cyberspace environment, now and for the foreseeable future. The WP was completed in 2022, and will be published early in 2023.

**White Paper 'Multinational Enterprises.'** Impact of globalization on Air and Space Security – The influence of multinational private security companies on global security is growing. In some cases, they are taking on an increasingly independent role, which could grow further in the future. Satellite imagery, satellite communications, UAV services, and strategic air transport are, for example, areas in which multinational enterprises could challenge the Air and Space domains. The aim is to provide in a White Paper an outlook on possible challenges and impacts that such companies may pose in future conflicts.

**White Paper 'Joint Personnel Recovery (JPR) in an Urban Environment.'** Urban areas present a complex environment for military operations and have the potential to fundamentally alter the way JPR is planned and conducted. The challenges inherent in operating in an urban area are sufficiently different and complex from current models that they require commanders

and their staff to give due consideration to the unique requirements of the urban environment. This project aims to characterize the urban environment and identify promising current and future technologies and operational concepts that can inform NATO and the nations about an understudied but very real military challenge. Additionally, the project intends to encourage JPR stakeholders to significantly improve all four phases of the PR system (Preparation, Planning, Execution, and Adaptation), and provide recommendations to update the ETEE.

**Drone Drills.** Government agencies, military installations, industrial facilities, and critical infrastructure have mostly recognized the problem of potential drone intrusions and the inherent danger they project and have begun to invest into drone defence systems and incident response procedures to cope with the threat. This project aims to recommend measures that need to be taken immediately when a drone incident occurs until a countermeasure can be applied, similar to providing first aid in an accident scenario until the paramedics arrive. This immediate response should be part of any drone response plan. These measures should be practicable on a regular basis and with little effort. The project also aims to propose cost-effective and easy-to-implement preliminary measures in support of immediate drone response.

## Events

**23 March 2023: Think Tank Forum (TTF).** The 9<sup>th</sup> TTF will take place from 23 March with a preceeding Ice-breaker in the evening of 22 March to bring together national Air Warfare Centres, national HQs/staffs, and A&S related academic institutions to share information and insights regarding A&S Power challenges and to engage in collaborative discussions on current and future trends facing the Alliance.

**13–14 June 2023: Steering Committee (SC)/Senior Resource Committee (SRC) Meetings.** The annual SC meeting serves as a platform to update the Sponsoring Nation Air Chiefs or their designated Flag/General three primary lines of effort (LOE) Officer representa-

tives on the JAPCC PoW, the Director's priorities, and the current state of the Centre. This meeting also provides an opportunity for the Committee to offer strategic guidance that will inform the future PoW.

The SRC oversees legal, financial, personnel, infrastructure and other administrative matters on behalf of the SNs and immediately follows the SC and is set up to review the previous day's meeting decisions and the normal budget review, including previous year summary, and current year execution.

### **10–12 October 2023: JAPCC Joint Air and Space Power Conference, Congress Centre Essen, Germany.**

The 2023 Annual Conference themed 'Enhancing Deterrence and Defence Through Joint Air Power – Credible, Capable, and Available' will again be the flagship event of the JAPCC. This is your opportunity to hear from senior military and civilian leaders from across NATO and the nations on these topics of extreme importance to air power professionals. Please join us to engage and contribute to a robust discussion aimed at strengthening and enhancing the Alliance.

### **November 2023: Joint Air and Space Power Network (JASPN) Meeting.**

In November, the JAPCC will host the 10<sup>th</sup> edition of the JASPN Meeting, aimed at developing better synergies within the A&S Power community. Complementary to the TTF where the national entities are invited, the JASPN Meeting brings together NATO and European Union organizations.

## Conclusion

Thank you for taking the time to read the 2022 JAPCC Annual Report. We hope you have found this report informative and that it has given you a greater understanding of and appreciation for the value and relevance of the JAPCC to the Alliance.

For more information on the JAPCC, please contact us via email at [contact@japcc.org](mailto:contact@japcc.org) or visit our website at: [www.japcc.org](http://www.japcc.org). Join us on **Twitter (@JointAirPower)** and **LinkedIn (@JAPCC)** as well!





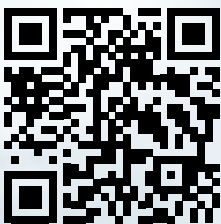
# Joint Air & Space Power Conference

20  
23



## Enhancing Deterrence and Defence Through Joint Air Power

Credible, Capable, and Available



SAVE THE DATE  
**10–12 October 2023**  
**Essen, Germany**



[www.japcc.org/conference](http://www.japcc.org/conference)

**Joint Air Power  
Competence Centre**



## **Joint Air Power Competence Centre**

von-Seydlitz-Kaserne

Römerstraße 140 | 47546 Kalkar (Germany) | [www.japcc.org](http://www.japcc.org)