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Regional Fighter Partnership

Options for Cooperation and Cost Sharing



**Joint Air Power
Competence Centre**

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FROM:

The Director of the Joint Air Power Competence Centre (JAPCC)

SUBJECT:

JAPCC Regional Fighter Partnership (RFP) – Options for Cooperation and Cost Sharing

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NATO is at a historical crossroads. Some nations are on the verge of recapitalising aging fighter fleets nearing the end of their useful life spans while others are looking to procure an initial fighter capability. Because global economic challenges will continue to put pressure on military budgets, now is the right time to consider a regional approach.

The Regional Fighter Partnership (RFP) concept highlights considerations for collective agreement amongst partner nations. The aim of the partnership is to provide a multi-role fighter capability to NATO in Europe. The RFP concept is designed as a cost effective solution for newer, smaller NATO nations to recapitalise Soviet era hardware and re-establish a modern, indigenous air policing and air defence capability while maintaining sovereignty and fulfilling national requirements for NATO Air Policing, precision strike and support to Land Forces. It is intended as a platform for discussion on what lies within the realm of the possible, given a fiscally constrained environment.

I commend this report to you, and welcome feedback and comment. Accordingly, please feel free to contact the JAPCC at ca@japcc.de.

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TABLE OF CONTENTS

PREFACE

Implementation Considerations.....	1
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CHAPTER I

Introduction

1.1 Aim.....	3
1.2 Objectives.....	3
1.3 Assumptions.....	3
1.4 A Vignette to Set the Scene.....	3

CHAPTER II

Governance and Organisation

2.1 Foundations of the Partnership.....	5
2.2 Modular Operational Concept.....	6
2.3 National Fighter Bases with Multinational HQ Staff.....	7
2.4 Operations Division.....	8
2.5 Logistics Division.....	8
2.6 Regional Fighter Training Centre.....	9
2.7 Regional Fighter Depot Centre.....	10
2.8 Deployed Detachment.....	10
2.9 NATO Logistics Support.....	13

CHAPTER III

Combat Capabilities

3.1 Air-to-Air.....	16
3.2 Air-to-Ground.....	17

CHAPTER IV

Maintenance Support

4.1 Specialised Skills.....	18
4.2 Training.....	18
4.3 Infrastructure.....	19
4.4 Support Equipment.....	19
4.5 Maintenance Support Options.....	20

CHAPTER V

Logistics Support

5.1 Logistics Infrastructure.....	22
5.2 Common Logistic Setup.....	22
5.3 Logistics Organisations.....	23
5.4 Logistic Support Options.....	23

CHAPTER VI	
Personnel Requirements	26
CHAPTER VII	
Funding and Cost Savings	28
CHAPTER VIII	
Advantages and Challenges	30
CHAPTER IX	
Summary	32
ANNEX A	
Case Studies in Regional Approaches	
1. Background.....	33
2. European Participating Air Forces (EPAF)	33
3. European Air Transport Command (EATC)	36
4. NATO Airborne Early Warning (NAEW)	37
5. C-17 Strategic Airlift Capability/Heavy Airlift Wing (SAC/HAW)	38
6. Tri-National Tornado Training Establishment (TTTE).....	39
ANNEX B	
List of Acronyms	41
ANNEX C	
References	43
LIST OF FIGURES	
Figure 1: Notional Fighter Partnership Organisation – Option 1: WSP	6
Figure 2: Notional Fighter Partnership Organisation – Option 2: NPLO	7
Figure 3: Comprehensive Pilot Training Timeline	11
Figure 4: Timetable/flying hours for Fighter Pilot	12
Figure 5: Continuation Training.....	12



Given the current economic situation, it is clear that nations will need to pursue partnerships to acquire and operate fighter aircraft capabilities.

PREFACE

“The [financial] crisis makes cooperation between nations no longer a choice. It is a necessity. Today, no European Ally on its own is able to develop the full range of responses to meet all security challenges ... I see three ways ahead: pooling and sharing resources; setting the right priorities; and forging closer links with industry and within Europe.”

NATO Secretary General Anders Fogh Rasmussen,
7 Feb 2011

Implementation Considerations

Some new NATO member nations in Central and Eastern Europe (CEE) will struggle in the future to maintain fighter fleets capable of performing Air Policing and other desired missions. Moreover, national sovereignty and the pride in one’s Air Force to remain relevant in the 21st Century create strong desires to recapitalise aging Soviet era fleets whilst producing a generation of professional airmen trained to NATO standards for tactics, techniques and procedures.

Considering the reality of scarce funding, however, national authorities have to cooperate more in today’s environment to procure new fighter aircraft capabilities along with properly trained crews and sustainment activities. Going about this as a single nation through a traditional bilateral procurement arrangement increases the risk of a ‘paper force’, more often grounded due to higher sustainment costs, lack of trained personnel, and a reduced number of aircraft on the ramp. A Regional Fighter Partnership (RFP) is an option to share costs across common fighter aircraft capabilities and their enabling aspects, including logistics, maintenance and training, whilst maintaining national sovereign command over these assets.

With regards to the NATO Secretary General’s quote above, NATO plays an important role in forging closer links through partnerships. The new NATO Strategic Concept states; “These partnerships make a concrete and valued contribution to the success of NATO’s fundamental tasks.”¹

1. North Atlantic Treaty Organization, 2010, p. 8.



Political and legal obstacles to organising a partnership are surmountable.

CHAPTER 1

Introduction

Since the inception of NATO, nations have sought multinational cooperation in building defence forces. Recent history has seen an increase in NATO partnerships with mutual benefit to the Alliance and participating nations. Given the fiscal austerity that lies ahead, nations will need to pursue additional partnerships to ensure maximum efficiency, interoperability and to maintain or acquire critical capabilities, such as fighter aircraft.

The new NATO Strategic Concept confirms the role of the defence of territories and populations of member states as a core Alliance mission and stresses the importance of visible assurances of security.¹ As an example, the Baltic States' Air Policing mission is the only form of NATO presence in CEE involving the deployment of military forces to secure the territorial

integrity of NATO members.² Whilst other nations conduct their own Air Policing, several CEE regional nations need to recapitalise their Soviet era fighter fleets that are at the end of their useful lifespans, to be able to continue their Air Policing mission. This is a historical crossroads and NATO has a collective understanding to build capability through multinational approaches. Now is the right time to consider a Regional Fighter Partnership (RFP) approach.

The concept goes beyond simply acquisitions; it is a proposal to transform partner states from a collection of small Air Forces into a more robust integrated force, supported by national authorities, NATO organisations, NATO member nations willing to offer assistance and industry, whilst developing a professional, air-mindedness³ that is consistent with NATO standards.

The concept envisions nations, working together, with a new generation of airmen and aircraft able to provide their own Air Policing, precision strike and

support to Land Forces produce a strong visible contribution to their populations, the Alliance and the European Union.

1.1 Aim

1.1.1 The aim of this paper is to describe a RFP concept to share costs across common fighter aircraft capabilities and their enabling aspects, including logistics, maintenance and training, whilst keeping national sovereign command over assets. The focus is on CEE nations willing to pool and share resources that supports basic national requirements for air policing, precision strike and Close Air Support (CAS) of ground forces.

1.2 Objectives

1.2.1 The objectives are to provide considerations for implementing a robust RFP in terms of integration and interoperability. To this end, this paper explored several multinational partnership examples to gain insights in order to articulate strengths and challenges for future endeavours. More specifically, it will describe:

- Organisational options; including roles and responsibilities for NATO, regional-participants, and collaborative opportunities for NATO Member-nations;
- A Multinational Headquarter and facility considerations within the region;
- Sovereignty related concerns and governance issues;
- Cost-sharing opportunities for training, maintenance and logistics to make best use of a multi-role fighter aircraft to develop and sustain capabilities;
- The strengths and challenges associated with this effort.

1.3 Assumptions

1.3.1 It is assumed that:

- Nations have a desire to build and sustain fighter aircraft as part of credible Air Power capabilities and as a visible demonstration of national security and collective defence of the Alliance;
- Nations are fiscally constrained;

- Nations are willing, subject to agreed caveats and constraints, to enter multinational agreements;
- Nations will maintain sovereign command over assets, relinquishing control only by mutual agreement;
- Other political and legal obstacles to organising a partnership are surmountable;
- Nations have a minimum level of infrastructure, indigenous training capacity, and ability to provide command and control for a multi-role fighter aircraft;
- Selected airfields have basic services available such as base services, crash and fire rescue, cross servicing, fluid handling, runway operations, Air Traffic Control, and meteorological support.

1.3.2 These assumptions are intentionally broad and are intended to limit the need for this paper to address political issues, although where necessary the political implications of a given situation are identified and discussed.

1.4 A Vignette to Set the Scene

Consider the new fighter pilot 5 to 10 years from today ready to step for his Mission Ready Checkride in a multi-role fighter during a deployed exercise; the briefed mission is a 4vX air defence sortie. His Examiner graduated the Instructor and Examiner Pilot Courses at the Regional Fighter Training Centre, formed as a partnership for Conversion and Advanced fighter training for the RFP member nations. As a Regional Fighter Training Centre graduate, he is at the top of his game with the latest tactics and procedures where he cross-pollinates these techniques at his home unit. The deployed Squadron is a mix of four nations with a combined total of 24 aircraft. Each nation deployed six jets to a neighbouring country for Joint Exercise 'BOLD PARTNERSHIP 20xx'. The Operations Division from the Regional Headquarters planned the exercise with the help of the Training and Exercise, Intel and Ops Support sections. Number 3 and 4 in the flight are from other countries, but they all know each other and have trained together before. English is the common language. The Ops-desk is run by the Detachment Commander (DETCO) from the Lead-Nation of this deployment. In all, there are six nations in the RFP, but only these four decided to participate in this exercise.

The other two opted out due to higher national priorities. Intel, life-support, admin, etc. are all shared functions by the participating nations. Including maintenance, there are 250 people deployed, whereas a single nation would have brought 140 people to fly 6 aircraft, on this deployment they only have 60–65 and they are part of a more robust, influential unit of 24 aircraft. Support equipment and spare parts were coordinated in advance by the Logistics Division in coordination with the NATO Maintenance and Supply Agency (NAMSA); and are all being shared to reduce the overall footprint and transportation and movement requirements. As the four pilots arrive at the jets, they are met by their respective nations' crew-chiefs; this is needed to ensure national airworthiness rules and authority to fly. However, the jet was just serviced by members from two other countries. Last night, the radar was repaired in the deployed back-shop by specialists from all four nations; they are all working from the same Technical Orders with the same repair procedures as if they were at their home station. This interoperability is achieved with the help of the Logistics Division, whose job includes establishing policy,

procedures, and maintenance and logistics publications for the partnership. Two days ago, the engine was removed and sent to the Regional Fighter Depot Centre for Depot-Level repair. The crew-chief is training his assistant who will launch the jet, he's a new member of the unit and recently finished his basic crew-chief training at the same Regional Fighter Training Centre where the Instructor Pilot trained. This centralised training hub trains several basic and advanced maintenance and logistic specialties that are used throughout the RFP. The goal is to create common understanding across several nations with regards to training, standards, syllabi, procedures and certification. In the end, the jet was launched, flown and recovered as a combined effort by the regional partnership. This level of interoperability and interdependence requires several key concepts to come together from across NATO.

1. North Atlantic Treaty Organization, 2010, p. 5.

2. Durkalec, 2010.

3. (Hayden, 2008) Although not specifically defined, Dr. Hayden describes Air-Mindedness as; "the lens through which Airmen perceive warfare and view the battlespace. Air-Mindedness has never been platform-centric, so it enables today's Airmen to think first about desired effects and then about the means of attaining them. It is a global, strategic mind-set providing perspective through which the battlespace is not constrained by geography, distance, location, or time."



Maintaining sovereignty over assets is a key factor in discussing partnerships.

CHAPTER 11

Governance and Organisation

Maintaining national sovereignty over assets drives several constraints on a partnership organisational and governance setup. This study explored several multinational concepts that have developed in the recent past to gain insights into cost-sharing aspects, chain of command setup, and find ways for a new fighter partnership to be more robust in terms of integration and interdependence. Examples include the C-17 Strategic Airlift Capability (SAC), European Air Transport Command (EATC) and the European Participating Air Forces (EPAF) Expeditionary Air Wing (EEAW). The advantages and disadvantages of these led to several broad conclusions in how a fighter partnership could be organised, trained and equipped.

This proposal is to develop a Multinational partnership that is supported by national authorities, NATO organisations, NATO Member Nations willing to offer

assistance and industry. The following organisational setup presents a notional example that has two possible options for NATO support: (1) through a Weapon System Partnership (WSP) committee (Figure 1); or (2) by creating a new NATO Production and Logistics Organization (NPLO) (Figure 2). These options will be discussed in more detail below.

The purpose of Figures 1 and 2 is to present an overview of what is possible and is not meant to be the only solution to building a RFP. In fact, variations to this proposal are inevitable as nations decide on their level of ambition, integration, and interdependence.

2.1 Foundations of the Partnership

This RFP would be set up as a Memorandum of Understanding (MOU) organisation. Nations have learned much over the past several years and this partnership could be based on a combination of the EEAW and C-17 SAC MOU's, but with much greater detail in regards to collaborative training, logistics support, and

Regional Fighter Partnership (RFP) – Option 1: WSP

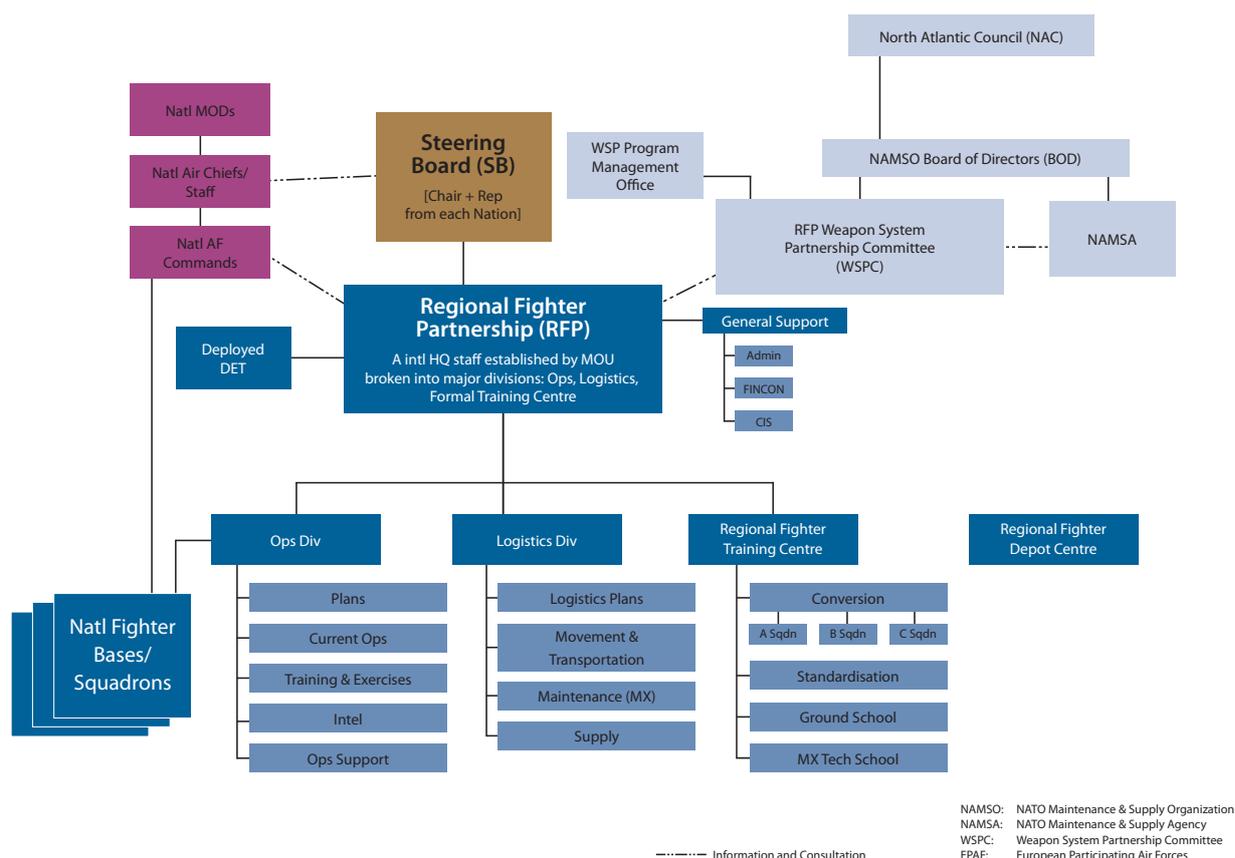


Figure 1: Notional Fighter Partnership Organisation – Option 1: WSP

maintenance operations. Each member nation would sign this MOU as it would define overarching procedures, rules and financing for the entire partnership. Working groups or project teams are created to work the details of setting up the organisation. Individual nations could have annexes to the MOU to spell out any national stipulations and local differences, but these should be kept to a minimum to encourage standardisation. Existing NATO bodies and structures are certainly a consideration for sustainment and brings buying power from across 28 nations to help reduce costs.

2.2 Modular Operational Concept

2.2.1 From its inception, each nation defines its own level of participation; from acquisition to support to deployments. In order to maintain national Operational Command (OPCOM) of assets, nations opt-in or opt-out of operations thus creating a ‘Modular

Operational Concept’. This is done by chopping assets through an official Transfer of Authority (TOA) (i.e. giving Operational Control (OPCON) over specific assets) to the RFP HQ staff for those missions, operations and/or exercises that the Steering Board decides to accept. Having a modular, opt-out option allows for flexibility at the national level, for sovereignty reasons, to operate autonomously at national fighter bases. From this, each country is responsible for their own part of the partnership which must be clearly outlined in the governance documents. Much of this concept is taken from the EEAU MOU.¹

2.2.2 The Steering Board (SB) is used as the partnership governing body where each nation is represented, policy decisions are made and overarching guidance is provided. Each nation gets a vote at the SB but the MOU must establish how this voting is conducted as there are advantages and disadvantages to unanimous versus majority voting rules. The EEAU uses unanimous

Regional Fighter Partnership (RFP) – Option 2: NPLO

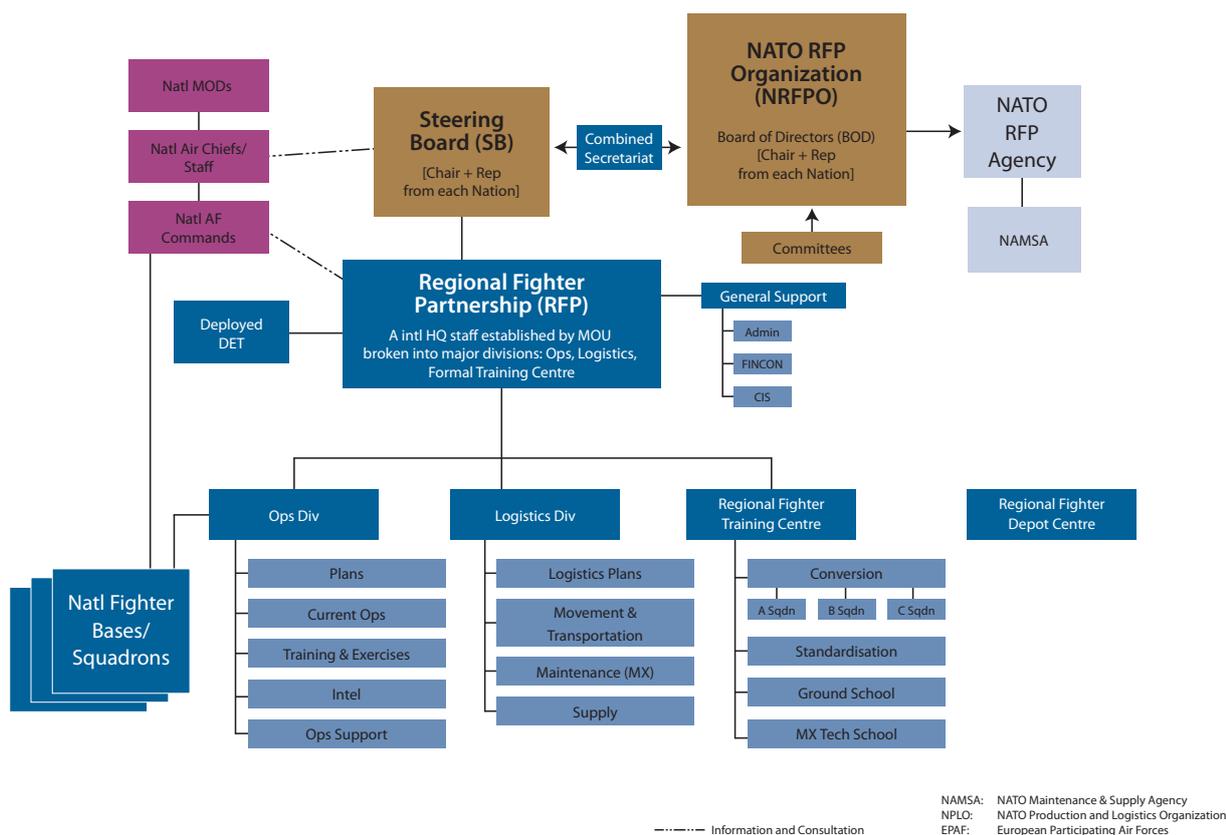


Figure 2: Notional Fighter Partnership Organisation – Option 2: NPLO

voting at the SB level. However, during a combined deployment, the SB delegates authority to a Lead Nation for operational decisions. With a modular concept where nations opt-in, they can also opt-out of certain aspects of any mission or operation by revoking their TOA. The MOU must articulate the balance as to when a sub-element of the partnership can make a decision on behalf of all the nations involved. The governing MOU must not preclude the independent execution of the participating nation's tasks or commitments. This allows for flexibility in a modular concept.

2.3 National Fighter Bases with Multinational HQ Staff

Having a Multinational HQ is what makes this proposal different from other multinational procurement programs. Nations will have fighter bases that are capable of autonomous operations, and national staffs will still

manage the day-to-day OPCOM of their respective Air Forces. But, a regional HQ is essential to realise the benefits of day-to-day interactions to lead the fighter partnership. This means that nations will have to send personnel to this HQ. But, it also requires collaborating nations, which are non-partnership nations, to offer assistance with expertise, mentors and instructors. Whilst some duplication of fighter capabilities is inevitable for sovereignty reasons, the partnership would realise savings by creating and jointly manning the central multinational Headquarter Staff to manage and consolidate common enabling aspects, including logistics, maintenance and training. Common standards, policies, syllabi, and procedures (Rules & regulations, Doctrine & Concepts) would be jointly developed and implemented together, creating a truly interoperable and integrated partnership. The RFP Headquarter Staff would act as the central point of contact for partnership interoperability and standardisation matters and to issue directives and/or recommendations ensuring

the highest level of standardisation. Naturally, NATO and member nations can support this effort with resident expertise. This central staff would be broken into an Operations Division, Logistics Division, and a combined Regional Fighter Training Centre. Additionally a central Regional Fighter Depot Centre could be stood up either utilising an existing depot facility or as a new facility for Depot level Maintenance. The following is a brief description of each of the major organisational components.

2.4 Operations Division

The Operations Division's role is to establish, plan and support the execution of partnership operations such as combined operational missions, training, and exercises. National operations of fighters, such as Air Policing, not chopped to the partnership are not part of this planning unless nations opt to participate in the event. The Ops Division would maintain a complete picture of all available chopped fighter assets. The Training and

Exercises section would be in charge of developing training policy, procedures, publications and standardised syllabi to be used by both the Regional Fighter Training Centre as well as the national bases. The Plans section would prepare concept of operations for combined operations and exercises. Intel and Operations Support sections would also be an integral part of the combined multinational Headquarters Staff.

2.5 Logistics Division

The Logistics Division would develop logistic policy and standardisation within maintenance and logistics practices and provide accreditation for maintenance and training certifications. This action provides the Regional Fighter Training Centre with syllabi for the critical skills training to individuals supporting common logistics and maintenance functions across the full spectrum of the fighter partnership. The Logistics Division, in conjunction with the NPLO support discussed earlier, could provide total asset visibility among



International fighter training ensures commonality.

the respective fighter partnership nations for spares support and maintenance scheduling. This division coordinates logistics between nations, contractor support and national organic capabilities.

2.6 Regional Fighter Training Centre

The Regional Fighter Training Centre would consolidate and provide member nations common fighter pilot conversion training and basic maintenance specialist training. The basic setup for this training centre are from lessons taken from the Tri-National Tornado Training Establishment (TTTE), which was a multinational air unit based at RAF Cottesmore in Rutland, England from 1981 to 1999². This Training Centre would be broken into the Conversion section, the Standardisation section, Ground School, and Maintenance Tech School sections. The Conversion section would be the flying element for any number of flying squadrons. The Standardisation section would be responsible for advanced follow on training, training of instructor pilots,

refresher training and conducting check flights; this may evolve into what the EEAW has with the Fighter Weapons Instructor Course (FWIT). The Ground School would teach student pilots academic concepts, doctrine, and basic knowledge items as well as conduct training in advanced simulators before moving to the flight line. The Maintenance Technical School would train several basic and advanced maintenance and logistic specialties that would be used throughout the RFP. Once again, there are opportunities for collaborating nations to share expertise and offer advisors and instructors to this centre to further develop professional airmen amongst the participating nations.

2.6.1 Pilot Training

2.6.1.1 Producing Airmen and a culture of solid Airmanship, or 'Air-Mindedness', throughout an Air Force can take up to one generation. To train a pilot to a satisfactory level of proficiency, for example 'Combat Ready' or 'Full Mission Capable', can take up to 5 years



Combat pilots hone their skills.

of continuous training. Additional time is required to train personnel for leadership positions in a squadron or a wing as Instructors, Flight/Mission Leads.³ This paper assumes that the basic pilot training is conducted separately from this partnership. Following Basic Pilot Training, Advanced Training is conducted on the aircraft used in day-to-day operations. Students receive an Instrument Qualification according to ICAO regulations and will employ/qualify on the Weapon System the first time to achieve a Basic Weapons Qualification. The ability to employ the aircraft in basic tactical scenarios/missions needs to be shown in order to graduate as 'Limited Combat Ready' or 'Mission Capable' pilot. After this phase, the pilot is ready for national service but still requires a full 'Mission Qualification'. In order to achieve this in this timeframe, the pilot has to exercise and to be trained in the full spectrum of the aircraft capabilities. Continuation training increases proficiency, knowledge, capabilities, and skill sets required to employ the weapon system to the fullest extent. Continuous, regular training preserves skills developed in formal training courses and builds aviation expertise. Figures 3–5 on page 11 and 12 show a representation of this training flow.

2.6.1.2 Combat pilots continue to hone their skills through participation in international exercises like Red Flag, Green Flag, Maple Flag, NATO exercises, Tactical Leadership Program (TLP) and other training. These deployments need to be conducted as a partnership as much as possible. Camaraderie builds as these pilots continue to meet each other in various venues of training and exercises and this leads to intangible benefits through cooperation. With the help of the F-16 MNFP, the EPAF formed the FWIT program. This is a 6-month course tailored after the USAF Weapons Instructor Course. FWIT is highly beneficial to the participating nations due to the fact that their advanced instructors return to operational units and instruct new pilots in the latest TTPs.

2.7 Regional Fighter Depot Centre

The Regional Fighter Depot Centre could be an already established depot within one or more partnership nations and would most likely be a stand-alone

entity with close ties to the partnership staff. This centre would provide the nations with Depot maintenance and training not possible at the national base level. Expertise from collaborating nations is essential in this effort to inculcate NATO standards throughout the partnership. Depot maintenance serves to support lower categories of maintenance by providing technical assistance and performing that maintenance beyond their responsibility. Depot maintenance provides stocks of serviceable equipment because it has available more extensive facilities for repair than are available in lower maintenance activities. Depot maintenance includes all aspects of software maintenance.⁷

2.8 Deployed Detachment

An option for this partnership would be to deploy together as a combined package in support of a coalition or NATO operation. The Steering Board would decide to accept a combined operation or exercise, and could designate a Lead Nation (LN) and a Detachment Commander (DETCO) to run the Deployed Detachment operation. The LN, DETCO and the Plans section would establish common Operating Procedures for ops, maintenance, admin, etc. without jeopardising national restrictions or mission efficiency. In this process, the final organisation and composition of the detachment is obtained and balanced among the contributing nations. Much can be learned from the EEAway way of deploying as a single unit. The EEAway has shown that contingency operations are possible as a partnership and allows them to save costs when the situation allows but they can also operate as strictly a national force in other situations. In this example, the LN integrates with existing Air Component Command and Control for ROE and tasking flow and national contributions remain under full command of the respective country. Nations then provide a TOA for OPCON to the appropriate international commander based on their national procedures which will include any national caveats to the ROE or specific operation/exercise. Nations save costs by reducing their footprint in theatre through shared facilities, maintenance when allowed, support equipment and personnel.



Multinational cooperation in a deployed detachment.

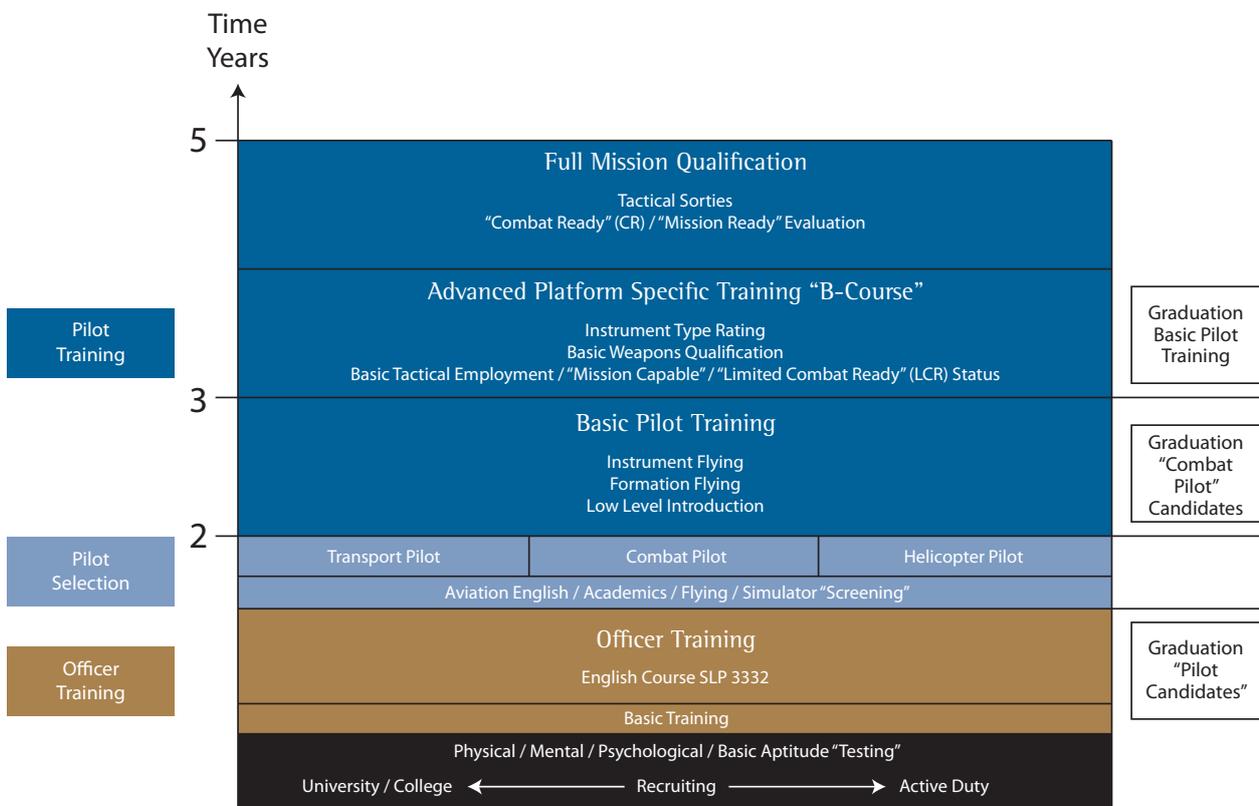


Figure 3: Comprehensive Pilot Training Timeline⁴

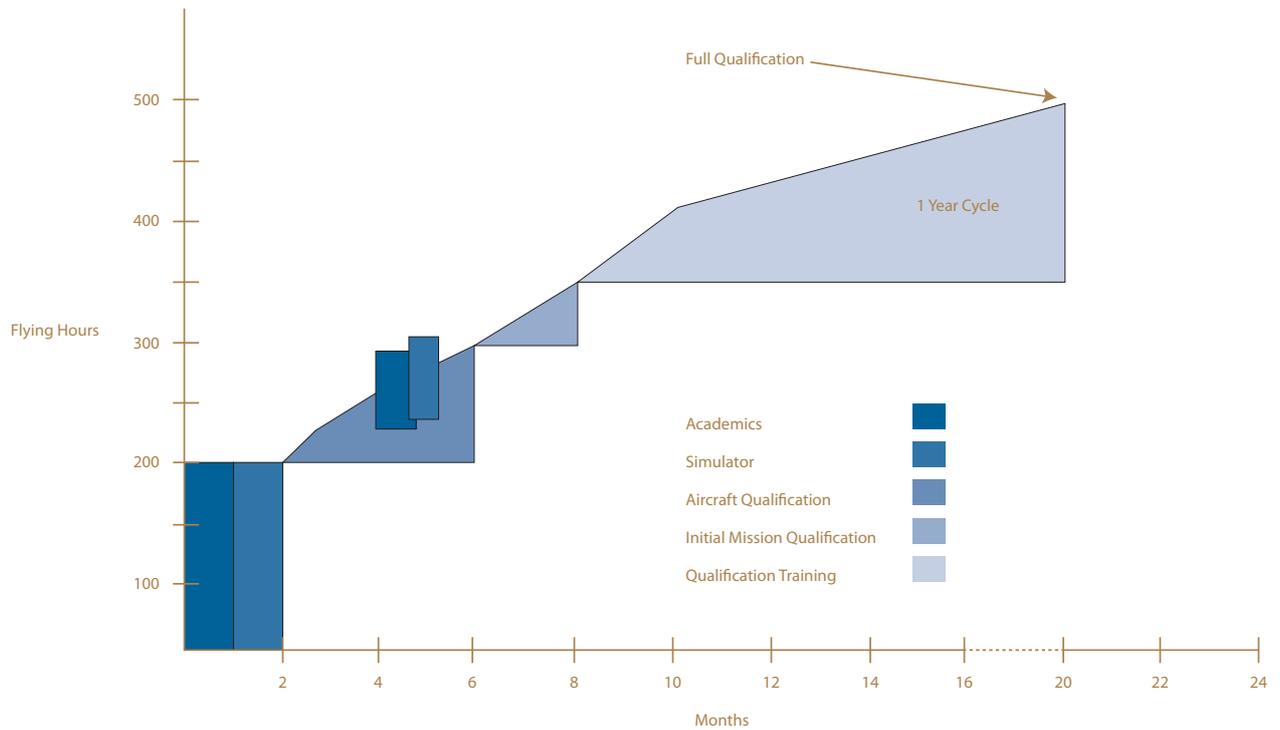


Figure 4: Timetable/flying hours for Fighter Pilot⁵

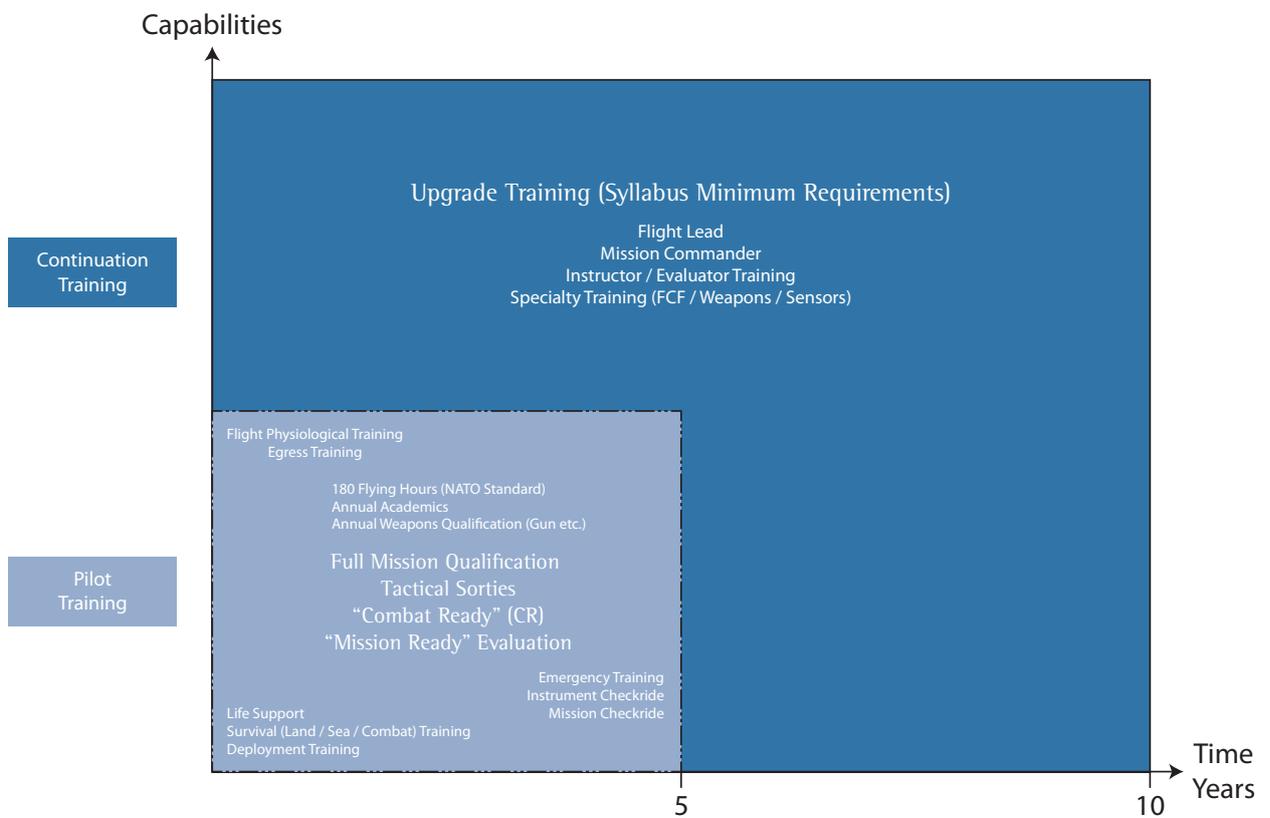


Figure 5: Continuation Training⁶

2.9 NATO Logistics Support

Substantial savings would be realised when partner nations come together to agree on a common configuration airframe, a common maintenance and logistics support contract, and supply aspects for the aircraft and related equipment. In terms of NATO support, the partnership has two main options detailed below.

2.9.1 NATO Production and Logistics Organization (NPLO) Option

2.9.1.1 One option involves setting up a new NPLO with a Board of Directors (BoD) and an executive agency for day to day operations. This would require a formal NATO Charter to be created and approved by the North Atlantic Council (NAC). A formal MOU, once signed and in effect, would then put the Charter into effect thus creating this new NPLO. The complete financial setup would have to be decided before hand thus a specific aircraft would have to be designated as well. The C-17 SAC/HAW case study is a useful example for how a NATO NPLO could be created to support a new fighter partnership. In the C-17 case though, NAMO owns the C-17 aircraft on behalf of the member nations. This is an important consideration and difference.

2.9.1.2 The NPLO BoD would typically meet twice a year and would consist of national reps from the member nations who would be responsible for aircraft acquisition, management and support of the RFP. For day-to-day operations a NATO Regional Fighter Partnership Agency (NRFPA) could be created as an execution body of the NPLO, which would be under the direction of a General Manager, responsible for major aspects of support to the fighter partnership. NAMSA would be involved with contracting for base support services at all the national bases and training centres. Each nation's base could have NPLO representatives located there to manage the program locally. The NPLO would provide standardised service and procedures for all members which would ensure interoperability at the lowest cost.

2.9.1.3 Some of the main challenges to this option are:

- it would take a long lead time (several years);
- it requires NAC approval at a time when all NATO NPLOs are currently being re-organised and consolidated;
- more personnel and money required (as compared to the WSP option);
- more complex (requires Charter); and
- greater commitment by the partners (financial setup and aircraft decision before hand).

2.9.2 Weapons System Partnership (WSP) Option

2.9.2.1 The other option involves setting up a WSP. The activities of a WSP are directed by a Weapon System Partnership Committee (WSPC), chaired by one of the member nations. The WSPC would usually meet twice a year in a logistics forum to make collective decisions on policy issues for logistics support, configuration management and sharing of associated operational and administrative costs, based on mutually agreed cost sharing formulae. A WSP fits within a current NPLO, namely NATO Maintenance and Supply Organization (NAMSO) of which NAMSA is the executive agency.

2.9.2.2 The WSP option would be much easier to setup than a new NPLO. A WSP requires the approval of the NAMSO BoD's and the committee could be up and running in 3–4 months. Only two documents are required: a Program Direction (explains the 'What is to be done') and a Partner Agreement (explains the 'How to be done' including setting the rules for member nations).

2.9.2.3 The committee would work directly with NAMSA to manage all aspects of common logistics support for the aircraft and related equipment. NAMSA has a lot of experience with multi-year Contractor Logistic Support contracts and NAMSA would be the contracting body. From a contract management point of view NAMSA would be able to add value to the entire process, especially when it comes on overseeing and managing over a couple of years. WSPs constitute an integral part of NAMSO and share

in the juridical personality enjoyed by NAMS0.⁸ A WSP constitutes a legal framework for the participating nations and provides the vehicle to task NAMSA with any logistic tasking. Cost sharing elements are also part of the WSP set up.

2.9.2.4 The biggest challenge of a WSP is that the acquisition of a major aircraft weapons system is currently beyond the scope of NAMSA. This limitation is due to current policy restrictions at NAMSA. There could be ways around this however and the current NATO push to streamline 14 NATO agencies into 3 could represent a unique opportunity to merge NAMSA's current 'in-service' support role with an 'acquisition' role. Specifically, two possible solutions could be: (1) lobby NATO and NAMSA to remove these policy restrictions and increase NAMSA's portfolio to include aircraft acquisition, thus merging acquisition with in-service support functions, or (2) create a Program Management Office as a sub-element of the WSP, whose responsibility would be to cooperatively manage member nation's bilateral aircraft acquisitions. Further study and multilateral discussion would be required to truly assess these options and define a way ahead.

2.9.2.5 For either NATO logistics support option, NAMSA involvement would be substantial. Some benefits to utilising NAMSA include: Value Added Tax exemption, ability to combine purchase orders into higher quantities thus lowering the unit price for their customers (i.e. buying power), bidding procedure that creates international competition, and their established contacts with a source file of over 10,000 companies.

2.9.2.6 In either case, NATO support to the RFP is essential to help reduce costs and manage sustainment. The current effort within NATO to streamline agencies suggests that the most feasible option would be to create a WSP committee within the existing NPLO, NAMS0, and add a complete weapon system to their portfolio. An NPLO would play an important role in the acquisition and sustainment strategy of the RFP. Like the C-17 SAC, a NATO sponsored partnership helps to manage and mitigate risk. The benefit to

NATO is evident in that a robust integrated regional approach to sustain and grow air-mindedness produces a strong contributor to the Alliance. NATO must agree to forge these partnerships for Air Policing and future security challenges.

2.9.2.7 As already mentioned in the organisational structure, there is a real need for non-participating nations to collaborate with the Partnership. Participating nations may have considerable knowledge, however it may not be consistent with NATO standards, tactics or procedures. These nations require mentors throughout the organisation's leadership structures to help build a professional air-mindedness that conforms to western European standards of operations. Whilst not all NATO members have to agree to this partnership, some will benefit through mutual support of the partnership. Nations who possess critical capabilities such as depot level maintenance, training, and logistic expertise are able to contribute through collaborative efforts, cross-training, personnel exchanges or contributing people to regional facilities. There is an opportunity for collective support from nations who are not specifically involved in the acquisition of the aircraft.

2.9.3 Notional Timeline for Implementation

Achieving any realistic combat capability will require a phased approach for implementation. The time intervals specified begin at the point the nations have the financial capabilities and political will to pursue a regional approach.

2.9.3.1 Organisational Framework (0–24 months):

- Stand up a program office to define Statement of Requirements, investigate available options to include a fully contracted solution for short term combat capability and initial type training and full maintenance/logistics support; begin formulating an MOU;
- Define additional infrastructure requirements; begin contracting for new construction and required modification of existing infrastructure;
- Define Air Force organisational requirements to support/sustain flying operations.

2.9.3.2 Procurement and Contractor Support (24–48 months):

- Source and contract for new aircraft, simulators, support equipment, etc. Continue with infrastructure projects, including type-specific requirements for items such as engine bays, avionics facilities, warehousing, etc.;
- Source and contract type-specific pilot, maintenance and logistics training, as required;
- Stand-up unit(s) with a combined Contractor – Military support capability. Develop a transition plan to decrease reliance on contractor support/increase military capability for maintenance and sustainment;
- Stand-up Air Force organisational elements that support/enable combat capability.

2.9.3.3 Acceptance and Initial Operational Capability (48 months+):

- Receipt of new aircraft and equipment; and
- Execute gradual transition to full military capability, with reduced contractor support, as defined in the Integrated Logistics Support concept for the aircraft selected.

1. European Participating Air Forces respective MODs, 2004.
2. Parsons, 1999.
3. (USAFE/A3 Operations, 2009); The training section is an extract from the CONOPs recommendations to build air power capabilities in the Baltic Region and is directly applicable in this study as generic background information on fighter pilot training.
4. USAFE/A3 Operations, 2009.
5. (Portuguese Air Force, 2010) F-16 Syllabus.
6. USAFE/A3 Operations, 2009.
7. U.S. Department of Defense, 2011.
8. NAMSAs – NATO Maintenance and Supply Agency, 2011.



Air-to-Air missions would include the capability for fulltime air policing, intercept and air defence capability.

CHAPTER III

Combat Capabilities

The fighter aircraft chosen for the partnership should be primarily suited for frontline defence and Close Air Support missions. The operation of this aircraft will add to the nations' capabilities to conduct air policing, precision strike and Close Air Support. This paper avoids naming a specific aircraft to implement the concept. Instead, consider a 4th generation lightweight multi-role fighter aircraft capable of Air-to-Air and Air-to-Ground, all day and adverse weather operations. Just a few proven examples in this category include the: F-16 Falcon (Lockheed-Martin), JAS-39 Gripen NG (SAAB), and Rafale or Mirage 2000-5 (Dassault).

3.1 Air-to-Air

3.1.1 The Air-to-Air mission of this aircraft would include the capability for full time air policing, intercept and air defence capability. The aircraft would be an air supremacy fighter able to identify, document, and engage a variety of aircraft including similar high performance jet aircraft, helicopters, UAVs, and any number of other fixed wing aircraft at low or high altitude.

3.1.2 In combat operations, the capability for Air-to-Air self-defence would exist, and the aircraft capabilities and the training defined could lead to an indigenous, formidable air defence capability used for national Air Policing mission and more.



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Air-to-Ground capability includes precision strike and Close Air Support.

3.2 Air-to-Ground

3.2.1 Additionally, the aircraft envisioned would provide for an Air-to-Ground capability utilising an advanced targeting pod to conduct precision strike and close air support.

3.2.2 This Air-to-Ground capability would allow precision strike attacks against targets to include buildings, mobile missile launchers, tanks, armoured personnel carriers, armoured vehicles, unarmoured vehicles, personnel, and light maritime patrol craft. Such targets

would most likely be engaged during a limited homeland defence mission or during a deployed operation in support of NATO or other multinational requirements.

3.2.3 The potential exists to add external pods which could serve as a useful ISR platform. Specifically, full-motion video capability, especially with real-time downlink capability, would allow for detection, identification, and recording of suspicious activity. The ideal system would allow for both electro-optical and infrared capabilities to maximise its utility in night and poor weather conditions.



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Maintenance support requires specialised skills ...

CHAPTER IV

Maintenance Support

Maintenance support of modern weapons systems requires an organisational structure with specialised skills and infrastructure designed to meet the requirements of the equipment being maintained. This section provides an overall assessment of what might be required in order to establish and sustain a partnership fighter capability. The level of effort required by each of the countries involved will vary pending an assessment of their current organic capabilities and the overarching maintenance support concepts integrated throughout the partnership.

4.1 Specialised Skills

Maintenance technicians on modern weapons systems require expertise in three general categories, as follows:

- Aviation systems – All things mechanical, including the Airframe, Flight Controls, Engines, Landing Gear, Fuel System, Weapons pylons, Canopy, Escape System, Life support equipment, etc;
- Avionics and Electrical systems – All things electrical, including mission systems such as Mission Computers, Radars, Radios, Heads-up Displays, Stores Management System, Targeting/Forward Looking Infra Red pods, Electronic Warfare Systems, etc. This also includes loading and troubleshooting of the associated software for each; and
- Structures – All metal, machinist and refinishing work both on and off the aircraft.

4.2 Training

Maintenance training may vary depending on the complexity of the aircraft systems, however the following guidelines should apply for most modern weapon systems:

- Initial training on basic aircraft operations and maintenance varies between 12 to 18 months of formal



... and infrastructure.

- training, depending on the breadth of responsibility anticipated for the technician;
- A minimum 24 months of on-aircraft apprenticeship at the unit level would normally follow before achieving 'Journeyman Status'. During this phase, a technician would be limited to basic servicing functions and minor repairs under direct supervision by a fully qualified journeyman technician.

4.3 Infrastructure

4.3.1 Regardless of the maintenance option selected, at some point during organisational level maintenance stages, hangars will be required, capable of storing aircraft, providing sufficient space for on-aircraft maintenance activity and functional checks. Additional facilities may be required for minor off-aircraft work by structures technicians and those storing/maintaining life support equipment.

4.3.2 Intermediate level maintenance requires facilities for specialised automated support and test equipment for work on Weapons Replaceable Assembly and

Local Reproduction Authorized assemblies. Examples are avionics and software labs, hydraulic component test facilities, engine maintenance facilities, ground support equipment facilities, tire bay, weapons build up and storage facility, etc. An off aircraft facility is also required to handle all composite repair and refinishing tasks. The size can vary from a small component booth to a full aircraft paint facility, depending on the level of on-site capability required.

4.4 Support Equipment

4.4.1 Standard organisational support equipment will also require equipment maintenance and repair which should be considered in the acquisition phase. Standardisation is the key to achieving interoperability which is essential to mission success of any partnership. Exact equipment type and quantities will vary based on type and quantity of aircraft, as well as number of operating locations.

4.4.2 Intermediate level maintenance will require appropriate automated test benches for the testing,



F-16 exhaust inspection at deployed location.

troubleshooting, and repair. The type of equipment will vary with aircraft type and weapon system complexity, and it is generally procured directly from either the Original Equipment Manufacturer (OEM) of the aircraft or from the OEM of the system(s) in question. Such support equipment is normally highly specialised, requiring in-depth training and experience to operate but may allow for on-site maintenance of up to 75 percent of required maintenance actions.

4.5 Maintenance Support Options

4.5.1 Given the three levels of maintenance required to conduct and support operations of a modern weapons system in a sustainable fashion, the following options are commonly available to the end user:

- **Option 1 – Full Contractor Maintenance Support (CMS):** All on and off aircraft maintenance actions, including basic aircraft servicing functions are carried out by a qualified contractor. This would also necessitate provision of contractor personnel in support of deployed operations at Forward Operating Locations.

This option is typically found in static operational scenarios where the unit may not have an operational role.

- **Option 2 – CMS for Intermediate and Depot Level Maintenance, with organic Organisational Level Maintenance:** All intermediate and depot level maintenance actions are carried out by a qualified contractor, whilst basic organic level servicing tasks and minor repairs are carried out by nations organic blue suit maintenance personnel. This would require the contractor to provide deployable maintenance support to Forward Operations Locations on an as required basis.

This option has become more common with introduction of more complex weapons systems. The skills required to be effective at intermediate level support often take years to hone, thus organisations that are more static in nature may find it more cost effective to rely on Contractor support to maintain the specialised skills required for this level of support.

For those organisations that would prefer to grow their own organic capability, this option could also serve as a transition option whereby unit personnel gain hands on training and experience on intermediate level tasks alongside contractor personnel.

- **Option 3 – CMS for Depot Level, with organic Organisational and Intermediate Level Maintenance:** All depot level maintenance actions are carried out by a qualified contractor. Organisational and intermediate level maintenance actions are carried out by organic national unit personnel.

This is the most common posture of modern Air Forces, providing units with flexibility and control of ample manpower for both domestic and deployed operations. This option is considered the longest to achieve and the most costly to sustain in terms of organic capability due to the investment in developing and sustaining specialised skills, as well as the potential investment in specialised equipment.

4.5.2 Phased Approach: Achieving maintenance capability in support of operations will likely require a phased approach and will most likely require transitions between contract support and organic capabilities as the program evolves.



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Shared logistic support can lead to significant costs savings.

CHAPTER V

Logistics Support

The backbone of every successful organisation is its Logistics operation. Logistics support is an area where significant cost savings could be achieved if the partnership takes the right options and tackles some recurring issues. “The best way to achieve economy of effort is to integrate logistics efforts as closely as possible to avoid costly redundancies in logistics forces, infrastructures, distribution networks, and supplies.”¹ In the interests of clarity, logistics is defined in this paper in terms of the following key areas of concern to a potential fighter partnership: Supply Chain Management (SCM) for spares, movement and transportation requirements, Fuels and Lubricants, logistics planning operations (deployment, sustainment and redeployment), Weapons and weapon loading, and all aircraft maintenance functions and operations.

Multinational logistics in air power is complex, requiring different degrees of cooperation, interoperability and standardisation in order to properly manage collective responsibilities. The application of these factors should serve to streamline SCM, consolidate and coordinate transportation and lift requirements, provide a common picture and understanding of logistics plans and help achieve and maintain efficiencies within maintenance operations. With proper application of multinational logistics, the organisation should optimise its logistical footprint and realise significant cost sharing and logistical efficiencies in a resource constrained environment, a feat that individual nations otherwise would not be able to achieve on their own.

Logistics support of modern weapons systems tends to have transitioned from fully organic logistical support organisations to more Contractor Logistic Support arrangements. Many OEMs have developed

world-wide networks of support, offering a wide range of options for the end user to choose from. The desire for the level of autonomy will likely be driven by existing capability and affordability within the collective national partnership.

5.1 Logistics Infrastructure

Logistics requirements in support of operations will depend largely on the level of reliance on the OEM. That said the typical infrastructure capabilities and requirements a logistician looks for in a fighter air base may look like this:

- Warehouse facilities: Facilities are required for the receipt, handling and storage of aircraft parts and equipment. Depending on the aircraft systems and classification issues, facilities may need to contain a classified storage capability. A separate warehouse facility may also be required for hazardous items such as aircraft paint, de-icing fluid, gas cylinders, Petroleum, Oil and Lubricant (POL) products, corrosives, etc;
- POL facilities: Fuel, oil, Liquid Oxygen and Nitrogen storage, handling and dispensing facilities;
- Explosive storage facilities: A properly sited explosive storage facility is required for storage, handling, build-up and maintenance of aircraft weapons, chaff, flare, etc;
- Logistics Enterprise System: Aircraft parts and equipment associated with modern weapons system require comprehensive tracking of maintenance and handling. Modern Logistic Enterprise type systems are commonly used for these purposes. In addition to logistics requirements, such systems facilitate management of stock, and support establishment of replenishment rates, calculation of the mean time between failures, serial number tracking of repairable items, etc. which could be used by the Logistics Division to manage negative trends to the benefit of the entire partnership.

5.2 Common Logistic Setup

5.2.1 From a strategic perspective, a fighter partnership logistics operation should be fast, flexible and agile, optimising both national support lines as well

as host nation support chains to effectively respond to the logistical needs of the partnership. On the surface, this may seem relatively easy, however, we believe that, how the organisation is structured and how it functions are linked to several key factors. The logistics set up will largely be dependent on Basing options (centralised main operating base vs decentralised national basing strategy), Host nation support (beddown capabilities, infrastructure, etc.), airframe configurations (like aircraft vs dissimilar airframes or configurations), interoperability of aircraft systems and ground support equipment, and potential deployment requirements (both within or outside NATO borders).

5.2.2 In the field of common logistics support for aircraft there are some recurring issues which must be addressed in order to effectively manage collective responsibilities. For example, nationally divergent aviation laws which apply to the certification of military personnel, equipment, and aircraft parts, makes sharing of maintenance (personnel and tools), aircraft spares and the aircraft themselves a problematic issue. The lack of standardised training, certifications, and even basic understanding and applications of a common language could result in major impediments to multinational logistics operations. As an example, during the 2009 BOLD AVENGER exercise, the EEAW concept was widely implemented with 21 F-16s and 238 personnel. The detachment shared mission support equipment and “any of our F-16s can be put in a Dutch mobile shelter, pulled by a Norwegian tractor and served with Danish equipment, whilst the Portuguese secure the jet.”² Each nation took around 35 people rather than 60 due to the shared beddown arrangements. The nations have differences in weapons and logistics which limits the amount of sharing like Crew Chiefs and armament procedures, but other areas are being shared by 4-man elements, where 2 are qualified from the country’s jet and two are shared. Other considerations had to be enforced such as maintenance inspections and exceptional release of the aircraft to fly due to the responsibility of the respective nation to ensure there remains a key link to national airworthiness standards.

5.3 Logistics Organisations

5.3.1 The characteristics of the fighter wing will deeply influence the potential cost savings, efficiencies and footprint of logistics support. Ideally we would pool resources from different nations or organisations to create a logistics/maintenance capability. This might effectively reduce the individual contributor's footprint on the ground and force more interoperability. It makes sense that pooling capabilities will also effectively reduce the manpower requirement, reducing the footprint. Effective use of host nation support will also effectively reduce the footprint and could prove more cost effective whilst making it possible to maintain the same level of capability. Reduced footprint means reduced lift and reduced costs for other support requirements such as feeding, lodging, etc.

5.3.2 It may seem obvious that multinational logistics and maintenance support should be easier to manage between countries using identical airframes, modifications, configurations and weapon systems, but even with all aspects being equal, there are plenty of other challenges to overcome in a multinational environment with respect to individual nation's standards, proficiencies, certifications and skill sets. If we can overcome those challenges, maintenance and sustainment of a fleet of aircraft by a multinational organisation should prove more efficient, and show multiple cost and scheduling benefits across the participating nations.

5.4 Logistic Support Options

5.4.1 There are four main options under two alternative approaches we see for organising a common logistics support. The first approach uses national organic capabilities under Role Specialist Nations (RSN), Lead Nation (LN), or a Multinational Integrated Logistics

Unit set up. The second approach would be Third Party Logistics Support, primarily Contract Logistics Support (CLS).

5.4.2 Role Specialist Nations (RSN)

With the RSN approach, a nation may have particular logistic strengths and capabilities which enable it to volunteer a particular logistic function; for example, jet-engine maintenance. This approach allows nations to contribute specialised capabilities to the partnership, allows for smaller footprints for each nation, but requires significant trust in abilities of each partner, strict training and certification standardisation and interoperability requirements. There are considerable cost-sharing benefits to this approach but there also considerable risks. In the event that a nation falls out of favour with the other nations and national interests preclude a particular deployment, those specialties would have to be completed by the other nations which would negate some of the cost sharing benefits.

Strategic Airlift Capability as an example of an effective partnership.



5.4.3 Lead Nation

A LN might accept responsibility, or be designated as the responsible agent for procuring and providing all logistics support/maintenance across an agreed spectrum of logistic support for the entire fighter partnership. This might be levied on a nation if the beddown location is within their particular nation for the fighter partnership unit or any part thereof. It might also be the best solution for a deployed detachment in exercise or expeditionary operation. In a limited sense, this is the method of the EEA and described above in the Operational CONOPs. This is a proven method and could be implemented on a larger scale whilst considering the other Logistic methods such as the Multinational Integrated Logistics Unit described next.

5.4.4 Multinational Integrated Logistics Unit

Under a Multinational Integrated Logistics Unit, the logistics units supporting the fighter partnership would be manned by specialists from all the partnership nations. Whilst this would be a fully integrated

approach, each nation defines their logistics/maintenance specialties a little differently, which could lead to redundant capabilities or gaps. This approach, like the RSN requires significant trust in abilities of each partner, strict training and certification standardisation and interoperability requirements. The partnership will have to set common standards for all these issues. This effort requires significantly more management between nations of specific capabilities and training. Due to the increased integration of the work force, the benefit is cohesion and common understanding among the participating nations. Cost savings are in manpower and overall footprint, but challenges in language, training and certifications.

5.4.5 Third Party Logistics Support

A Third Party Logistic Support concept allows for contract logistics support. Contractors theoretically would compete and commit to a range of support options for peace time activities. Several conduits exist which could potential help build a contracted Logistics framework for support. NATO Maintenance and Supply

Third party logistics in support of a multinational task force.



Agency (NAMSA) could be asked to negotiate the contract. A possible NAMSA engagement could be in form of a NAMSA Weapon System Partnership WSP; this constitutes a legal framework for the participating nations and provides the vehicle to task NAMSA with any logistic tasking. Cost sharing elements would also be part of the WSP set up. Funding would be multinational and financial part of the nations will depend on the number of aircrafts they operate.

5.4.6 Contract Logistics Support

A variety of logistic support options are possible, depending on the level of investment and autonomy the end user desires. OEMs have come to realise that on going life-cycle support of weapon systems is actually more lucrative over the long term than the original sale of the aircraft. CLS has developed into a growing trend with more modern and complex aircraft. As with maintenance, a few options should be considered when developing the life cycle support strategy of new aircraft, as follows:

- **Option 1 – Full Contract Logistics Support:** OEMs of the equipment in question, be it aircraft systems, repairable aircraft parts or support equipment, generally have all of the equipment and expertise required to properly troubleshoot and repair subject items. Many have developed efficient and comprehensive networks with transportation companies around the world to maximise the speed at which parts are transported to/from operating locations, and usually are able to return repair parts/assemblies

in the shortest possible time to meet end user requirements. A full CLS option would significantly reduce requirements for a robust logistics organisation. It can also reduce or even negate the requirement to purchase aircraft spare assemblies and parts, as in many cases a contractor will include, using contractor-owned aircraft spares, the provision of repaired assemblies/parts in ‘firm fixed price contracts’, commensurate with negotiated availability and performance measures. This option may appear costly at first, but when amortised over the life cycle of the weapon system is not significantly more than organic capabilities. Furthermore, it significantly reduces the lead time required to establish Initial Operational Capability/Full Operational Capability (IOC/FOC) for an operational unit. Such contracts also make provisions for support to deployed operations, including into theatres of conflict, thereby reducing operational risk.

- **Option 2 – Partial Contract Logistics Support:**

Where an organisation desires to make use of an organic logistic and/or maintenance support capability, the degree of CLS can vary anywhere from full support for a fixed period of time, to partial CLS for initial provisioning and IOC. The issues of spares ownership, management of repair parts and common/bulk items, shipping/handling/tracking of repairable items, etc are all processes that can be negotiated during the weapons system procurement stage.

1. Gorman, *Multinational Logistics: Managing Diversity*, 2000.

2. (Fulber, 2009); Commander Van Eeckhoudt, Belgium Detachment Commander stated after the exercise.



Steering Committee discussing manpower and maintenance issues in a partnership.

CHAPTER VI

Personnel Requirements

Personnel requirements have not been fully studied in this paper and more work is needed to make an accurate estimate for the number of people needed for assignment within and outside a partnership nation. It should be clear that nations will need to assign forces to shared organisations of the partnership program that exist in other countries. In general, manpower includes several groupings (Operations, Maintenance, Support, Training and HQ Staff).

The Operations grouping is mainly a function of crew ratio to the number of primary aircraft assigned. For fighter aircraft, this ratio is typically in the range of 1.5

to 2.0 trained pilots per aircraft. This number allows for a sufficient number of pilots to man a squadron whilst providing a depth of experience for the assigned pilots. Having fewer pilots would create a situation where non-flying duties impinge on the pilot's abilities to adequately prepare for the core mission. A greater number of pilots will proportionally decrease training continuity and provide inadequate experience for aircrew.

The greatest manpower requirement will be in the maintenance and support force. The maintenance grouping includes organisational and intermediate maintenance for the aircraft. Support includes depot maintenance, central logistics support, administrative support, and base operating support. This is also the area of greatest opportunity to share resources within



Manpower in the maintenance and support force of a multinational partnership can be shared, reducing the deployed footprint.

the partnership as explained in the previous two chapters on maintenance and logistics. Base support and administrative support are positions that would already exist for current fighter fleets.

Determining the manpower requirements for training is a function of the programmed flying and maintenance training required. Again, this is an area where manning positions can be shared across the partnership and effectively reduce the number of manpower slots needed if nations attempt to procure, train and sustain fighter fleets on their own.

Additional manpower would be needed to staff the International Headquarters staff including the Operations Division, Logistics Division, and the Training Centre. Since this manpower would come from all

the partners the equivalent manning in each nation could be reduced accordingly to avoid duplication. Thus with a combined staff the overall number of personnel required by a nation is less than if that nation had to go it alone, resulting in cost savings. This area needs more study, but initial manning for the headquarters would be approximately 100 individuals including contributions from Non-Partner nations as mentors and expert advisors.

While several speculative statements are presented in this section, only a detailed analysis will verify the qualitative benefit to shared manpower positions assigned to other countries.



The acquisition, employment and maintenance of a single aircraft type for a Regional Fighter Partnership would lead to significant cost savings.

CHAPTER VII

Funding and Cost Savings

Costs lie where they lay. Fundamentally, nations would incur all costs directly tied to national commitments but in principle would share a variety of the common operations, training and maintenance costs attributed to the partnership's mutual agreements. Therefore, expenditures for the mutual establishment, operation and administration of the RFP would be considered a shared cost and those related to the exclusive national interests would fall back upon the respective nation. NATO STANAGs 3113, 3430 and 2034 offer guidance on support and logistic assistance as well as 'replacement in kind' arrangements. There will be costs that are not always shared. In these cases, nations will cover other costs associated with deployments, sustainment, and redeployment of their resources as well as all pay,

allowances, travel, and accommodations for their forces. Expenses for the mutually agreed operation, maintenance and administration are shared costs. Participant nations have the responsibility for accounting and auditing. Within the HQ staff is a Financial Control (FinCon) element to manage these aspects of the activity and determine the cost-share formulas and valuations as needed.

A major advantage to this concept is the effective cost savings to the member nations, which is a recurring theme throughout this paper. In the European Union, the December 2008 'Declaration on strengthening military capabilities' highlighted the need for greater cooperation between EU Member States in developing military capabilities together: "we undertake to seek new methods for developing and optimising our capabilities, and will accordingly explore the pooling of efforts, specialisation and sharing of costs."¹



This report goes on to say that a number of EU Member States would save money by pooling more of their military equipment, especially aircraft, which are very expensive to maintain. But pooling the support operations for fighter aircraft and transport planes could yield even more savings.² The total amount of cost savings would depend on a multitude of variables that would need to be decided beforehand, but specifying actual figures is beyond the scope of this paper. For that a detailed financial analyses would need to be conducted that addresses aircraft Life Cycle Costs in a partnership versus a national operation.

Cost savings would certainly be realised whenever RFP nations employed together for an exercise or operation through the sharing of equipment, spare parts and personnel. Several on-going and good examples however do exist that demonstrate general cost saving advantages of partnering.

The EPAF is one such example. The reason for the evolution of the EPAF in the early 1970's and the unprecedented teamwork of the four NATO members was almost exclusively a question of money. Relying on the principle of economics-of-scale, it was possible for these four nations to purchase state-of-the-art fighter aircraft at a lower price per craft. Though the EPAF was mostly an acquisition partnership, if the concept could be expanded to include the sharing of logistics, maintenance and training, as proposed in this paper, further substantial cost savings could be realised.

Another aspect of cost savings of the EPAF can be seen during its deployments. For example, in 2002, Danish, Norwegian and Dutch Air Forces each deployed 6 F-16's to Manas Air Base to carry out support missions in Afghanistan. The combined detachment of 18 F-16's was only possible because the three countries operated the same aircraft and had been educating and training their pilots together for years. By sharing maintenance facilities and logistics, each participant's logistics bill was reduced to almost a third.³

Another example of cost savings has to do with logistics support. Nations have reported that utilising NAMSA for contract logistics support is highly advantageous with cost savings as high as one-third of the cost as compared to national contracting options. A Weapons System Partnership under NAMSA would increase NAMSA's buying power even further, resulting in more savings being passed on to the member nations. This alone can result in substantial cost savings for all members over the long run, which is key to sustainability and the path to total weapon system affordability.

Ideally, the proposed RFP stands to significantly reduce costs as a whole by pooling assets when feasible, sharing infrastructure, sharing staff functions, sharing logistical and maintenance support and consolidating and coordinating all purchases, beginning ideally with weapon system procurement through the purchasing of support equipment and fuel.

1. European Union Institute for Security Studies, 2009, p. 78.

2. European Union Institute for Security Studies, 2009, p. 79.

3. (Devold, 2003); Norway Minister of Defence, Speech given at the seminar OPEN ROAD 2003: US Transformation – Implications for the Alliance.



Through active participation, cooperation and collaboration, obstacles to a Regional Fighter Partnership can be overcome ...

CHAPTER VIII

Advantages and Challenges

The various facets of a complex organisation such as a RFP make it difficult to specifically identify advantages and challenges without exceptions to each. As such, this is a short list of the generalised advantages and challenges that are plausible to a variety of partnership cases.

These considerations will have to be taken into account by potential partners. But, the bottom line is that a regional partnership solution, as described, may

be the only economically feasible option for CEE nations to obtain a vital capability which would be hard to acquire, and more importantly sustain and operate in the long run, individually. The most important thing is that individual nations will always maintain sovereign command over their fighter assets. Through active participation, cooperation and collaboration the individual national concerns can be addressed and overcome in order to form this partnership. In the end the advantages of regional cooperation outweigh the challenges associated with it.

Partnership Advantages	Challenges
Interoperability and information sharing for a common understanding	Cooperation and trust can be difficult to establish
Strengthens international relationships	Individual nation's standards, proficiencies, certifications and skill sets may need to conform to partnership standards



... and compromises reached.

Partnership Advantages	Challenges
Allows smaller nations to acquire capabilities and contribute, as a partnership, with the influence of a larger nation	Loss of some autonomy; issue of sovereignty difficult
Visible contribution to Nation, the region and NATO	Dependence on other nations
Optimise limited resources, reduced deployed footprint, shared manpower positions	National caveats and 'Red Card' holders
Cross-pollination of standards	Danger of some member nations falling out of favour with each other or their national interests significantly diverge
Provides a more effective NATO capability, whilst at the same time, more cost-effective	Liability and legal concerns when problems arise
Identify and leverage common air operations interests	Decision making more difficult
Build, maintain and improve core air power capabilities	Language skills must be accommodated
Enhance competencies	Manpower requirements outside national boundaries
Realise economies of scale and reduced life cycle costs	Legal considerations to resolve claims and disputes not specifically governed by the MoU



Regional Fighter Partnership: A cost effective solution.

CHAPTER IX

Summary

In conclusion, this paper briefly described considerations for implementing a multinational RFP concept where costs are shared across common capabilities and enabling aspects, such as logistics, maintenance and training, whilst nations always maintain national sovereign command over the fighter aircraft.

It provides possible organisational structures, encompassing theoretical constructs designed solely to enable the partnership, such as a centralised Regional Fighter Training Centre, Regional Fighter Depot Centre and multinational headquarters staff with an Operations Division and Logistics Division. NATO support was described in two possible forms: (1) by setting up a new WSP or, (2) by creating a new NPLO; either of which would manage all aspects of common logistics support for the aircraft and related equipment. To optimise the effectiveness of this partnership, nations must work closely with one another on several different levels, ensuring trust, cooperation, interdependence and interoperability to accomplish the mission.

The construct described in this paper provides a cost effective regional solution that is necessary if newer, smaller NATO nations in the Central and Eastern

Europe region wish to recapitalise Soviet era hardware and to re-establish a modern, indigenous air policing and air defence capability.

It must be stressed that this concept is not an acquisition program through one or more bilateral arrangements; it's a proposal to transform partner states from a collection of small Air Forces into a more robust integrated regional approach to sustain and grow air-mindedness on their own, to take care of itself, and thus be a strong contributor to the Alliance. The constituted force can, in effect, be a major actor and serious partner within a European or NATO coalition. It is clear that NATO plays an important role to forge closer links through partnerships. The new NATO Strategic Concept states: "These partnerships make a concrete and valued contribution to the success of NATO's fundamental tasks."¹

Whilst it probably generates more questions than it answers, this paper is intended to be used as a platform for discussions focused on what is within the realm of possible, given the fiscally constrained European environment we live in today.

1. North Atlantic Treaty Organization, 2010, p. 8.

ANNEX A

Case Studies in Regional Approaches

1. Background

Close cooperation, partnerships and collaboration build trust among nations. Partnering on a multinational endeavour requires nations to trust each other even when national sovereignty of the weapon system is an overarching priority in the partnership. Procurement of a common weapon system is sensitive enough, but to make it more robust in terms of training, maintenance and logistics, requires a higher level of interdependence than just being friends with your partners. In the end, trust is key to a robust partnership that is highly integrated and interdependent.

The Prague Summit Declaration in 2002 envisioned three concepts to improve acquisition within the Alliance; these new concepts are “multinational efforts, role specialisation and reprioritisation.”¹ The NATO Air Defence Committee (ADC) recently held a conference dealing with “NATO and Partners, Regional Approaches to Building Common Competencies and Core Capabilities.”² The objectives, inter alia, were to introduce and elaborate on NATO and national concepts/programmes geared to building common competencies and to investigate how regional approaches could be applied to support and improve them. There was general consensus that regional approaches have advantages as they strengthen international relationships; identify and leverage common air operations interests; build, maintain and improve core capabilities; optimise limited resources; and enhance competencies. It was also noted that regional approaches have disadvantages. For instance regional efforts may require the adaptation of national laws or even a certain loss of sovereignty depending on the areas of cooperation. Moreover, the level of cooperation sought differed based on the status/aspirations of the respective nation. The ADC proposed that it may act as facilitator and develop a ‘tool box’ (e.g. NATO Analytical Air Defence Cell studies, fact finding missions, etc.), as the basis for tailored support of Partner Nations on

Regional Approaches. It is this proposal that could be adopted as a starting point to form the needed oversight for a robust fighter partnership. The first tasks of this body would be to describe the NATO policy on building a partnership that allows for national sovereignty of assets.

2. European Participating Air Forces (EPAF)

The roots of EPAF evolved during the early 1970’s when four NATO countries; Belgium, Denmark, Norway and the Netherlands formed the EPAF alliance and announced that the F-16 would be their fighter of choice. At the time, the reason for this unprecedented teamwork was almost exclusively a question of money. Relying on the principle of economics-of-scale, it was possible for these four nations to purchase state-of-the-art fighter aircraft at a lower price per craft. The US formed the F-16 Multinational Fighter Program (MNFP) creating a partnership with Belgium, Denmark, The Netherlands, and Norway (European Participating Governments – EPGs and European Participating Air Forces – EPAF) to build the fighter aircraft. This partnership was built upon a MOU signed by each nation’s Minister of Defence. The MOU established shared responsibility for program management, participation, charges, production, and development. MNFP is a co-operative program implemented through the FMS process under the framework of the MOU.³ The European F-16 users bought a total of 348 aircraft. It was this basis of commonality that led to close cooperation between these nations and ultimately the framework that became the EEAW.⁴

Several other initiatives flowed from the initial purchase agreement that allowed for group purchases and other joint programs. One significant program is the Mid Life Upgrade (MLU) modernisation program which began in the mid 1990’s and should last beyond 2010. This program has made it possible for the EPAF nations to be equipped with the F-16 fighter and “maintain them in service until 2020.”⁵ Included in the MLU was a Third Party Transfer agreement which meant EPAF partners could share even more.⁶ This agreement allows for nations to fly other nation’s aircraft.

However, flying another nation's aircraft is based on bilateral agreements between those nations, and currently only allowed in advanced training such as FWIT. In real world operations, political limitations and restraints prevent the use of another nation's aircraft. Certain exchange of services are based on existing NATO STANAGs. This only adds to the efficiencies gained from the partnership and eases crew and aircraft spare scheduling during deployed operations and training exercises.

Another program was the creation of the FWIT (Fighter Weapons Instructor Training). In the early 1980's there was a need for the European F-16 community to train their very experienced pilots to become Qualified Weapon Instructors who would take care of the tactical training and standardisation of their pilots (similar to the USAF Weapons Instructor Course but tailored to the needs of the European F-16 countries). Besides a cost reduction for training per nation; "This course, theoretical as well as practical, standardises all the flight procedures and gets the fighter pilots of the four EPAF countries accustomed to carrying out missions together. It also encourages tactical thinking and exchange of experiences."⁷ FWIT helped create and institutionalise common operating procedures for all the F-16 flying squadrons of the EPAF nations. FWIT also led to the sharing of TTPs (Tactics, Techniques, and Procedures) between the nations. The F-16 MNFP and the U.S. State Department made a significant contribution when the U.S. agreed to export elements of the Multi-Command Manual (MCM) 3-1; the classified volumes of aircraft specific TTPs. This was a significant connection between how U.S. pilots were flying their F-16s and how the Europeans were flying. Additionally, the U.S. Office of Regional Security and Arms Transfers signed an agreement to allow the EPAF to further share information, equipment, parts and even pilots among different nations. These events were critical to open the path for further cooperation.⁸ The US created an export version of the classified F-16 MCM 3-1 which went far to establishing further commonality. FWIT laid the ground work for the eventual EEAW but it was real world experiences that ultimately led to the creation of the EEAW.

During the Balkans crisis in the mid 1990's the Netherlands and Belgium deployed F-16's to the region and to optimise their human and material resources they, together with Luxembourg, created an organisation of cooperation called the DATF (Deployable Air Task Force). This detachment proved its effectiveness during Operation Allied Force over Kosovo in 1999, where the DATF carried out 11.6% of the NATO missions.⁹ Denmark, Norway and Portugal joined the DATF agreements in 2000.

The conflict in Afghanistan again led to the formation of a mixed EPAF detachment.¹⁰ In 2002, Danish, Norwegian and Dutch Air Forces each provided 6 F-16 MLU to the DATF to carry out support missions in Afghanistan from Manas Air Base. The detachment of 18 Dutch, Norwegian, and Danish F-16s, supported by a Dutch tanker aircraft, that replaced 18 US and French air-fighters, was possible precisely because the three countries operated the same aircraft and had been educating and training their pilots together for years. In addition, by sharing maintenance facilities and logistics, each participant's logistics bill was reduced to almost a third.¹¹ Instead of setting up three logistics and support organisations, each one for 6 aircraft, Denmark, the Netherlands and Norway could set up one common organisation in support of 18 aircrafts. Applying the same principles Belgium and Portugal used the DATF agreement to set up a bi-national detachment of C-130 transport planes in Kabul.

These real world experiences led to further discussions amongst the EPAF nations that a more comprehensive, deployable, combat entity was needed and the result was the creation of the EPAF Expeditionary Air Wing (EEAW) on 9 July 2004. Several strengths of the EEAW are: (1) Flexibility: F-16 detachments can be setup from just two or all of the EPAF nations "using in common the weapons systems, critical equipment and personnel from all the signatory countries, even if there are some from the latter that are not deployed".¹² (2) Details: The EEAW MOU and various CONOPSs can be applied to address in detail all aspects of a deployable strike package including command and control, logistics, transport and operational planning. (3) Capabilities: The EEAW has an extensive and comprehensive

range of capabilities including: air defence, ground attack, optical and digital aerial reconnaissance, day and night. (4) Procedures: since flight procedures are the same, all the teams of the EEAW nations can fly together, thus optimising the use of resources on the ground. (5) Political and military ambition: politically, it provides great stature to the partner nations. "The constituted force can, in effect, be a major actor and serious partner within a European or NATO coalition."¹³ Militarily, the EEAW is a cohesive and inter-operable air component structure. The strengths of the EEAW all originate from the aircraft and cultural commonality that was required to make the partnership a success. This will be required for any future fighter partnership as well.

The EPAF is not without its challenges and limitations however. Recently the EPAF nations have slowly been diverting on the standard of the F-16, especially with software update M5+. Now several nations have different modifications which limits the amount of sharing that can take place between nations. Other limitations include political issues, qualification and certification issues with personnel and spare parts, and budget constraints. In fact most exercises will now be supported from home base instead of deploying in EEAW packages. The long term impact of not fully exercising or deploying together may limit the value of the EEAW.¹⁴

In a Dutch paper on the evaluation of the effectiveness of the EEAW, concern is voiced over the fact that over time, the cooperation and value of the EEAW has watered down. Both operationally and logistically, participating countries have become more and more independent and synergy effects have been marginalised.¹⁵ Contributing factors are (amongst others) nationally diverting stringent aviation laws that now also apply to the certification of military personnel, equipment, aircraft parts, etc. Additionally, political decision making issues result in staged deployment of EPAF/EEAW partners, effectively limiting the option for combined deployment of assets and equipment.¹⁶ This was the case during the EEAW deployment to Kandahar where only some ramp space sharing and a few ground equipment units were shared. Everything else was nationally separated.

Evidence suggests that further drifting apart of the EPAF nations has occurred. This is due to different operational tactics, ROE, National Caveats, release ability of data. Therefore combined operational mission planning, execution and debriefing is seriously hampered.¹⁷ It seems that, currently, combined use of ground equipment, the occasional use of specialists (like aircraft painters or sheet metal workers) and very limited exchange of spare parts is the highest achievable cooperation.¹⁸ Whether these challenges can be overcome remains to be seen. A future fighter partnership can learn a lot from both the successes and the challenges of the EPAF, which is still the closest thing to a fighter aircraft partnership in Europe today.

Because of the approval by the USA for third party exchange of parts and information among the EPAF F-16 community, the EEAW could develop and flourish. For the F-35, this is blocked by the USA and only bilateral agreements with the USA are allowed. This may hamper future cooperation in an EEAW-like environment depending on the type of aircraft procured and the national restrictions placed on third party transfer of parts and information.

A second Dutch paper refers to the evaluation of the EEAW logistic concept during BOLD AVENGER 2009. Due to the fact that the deployment was to Karup AB in Denmark (an F-16 base), and with very extensive Host Nation Support (HNS), synergy effects could not be clearly identified compared to the concept of deploying to a 'bare' base. However, the small amount of spare parts, tools and equipment that was deployed for the exercise was remarkable. It was partly contributed to the extensive HNS as well as to very short logistic LOCs within Europe.

The EEAW deals with issues of sovereignty when they arise and manages these issues through modular participation. The EEAW will develop a deployed Concept of Operations (CONOPs) whenever two or more EPAF nations agree to deploy as a package. This CONOP will cover Rules of Engagement (ROE) and issues of sovereignty and include command and control, particularly operational command versus operational control. Typically, national caveats are known in advance of a

deployment and can be agreed upon and spelled out. Then the deployed detachment commander can be given operational control of the assets and authority in accordance with the established ROE. The EPAF MOU covers broader issues, such as incident responsibility and legal liability, and serves as an excellent starting point for any future fighter partnership.

3. European Air Transport Command (EATC)

The A400M programme encouraged four European NATO Nations; Belgium, France, Germany and the Netherlands, to establish a European Air Transport Command (EATC).¹⁹ (Luxemburg has since joined the EATC). EATC aims to gradually transfer and integrate within one single multinational command all relevant national responsibilities, staff, training, maintenance and other support activities. Since EATC's key aim is to manage the planning, mission generation and execution of the combined Air Transport capabilities, nations will have to transfer parts of their national authority if the EATC is to achieve its goals. IOC was announced on 1 Sep 2010 but FOC isn't forecast until 2012 timeframe.

The key to the creation of the EATC was the focus on budget sharing. The unity of effort that will be achieved results in less personnel to accomplish the

same job, which saves money. The strength of the EATC will be through the efficient use of essential resources through better coordination of over 200 military aircraft (Air Transport and Air-to-Air Refuelling aircraft) from various bases in Europe. A unique result of this is the creation of a diplomatic free zone for the participating aircraft within the airspace of the four nations which will only result in further efficiencies.

Several opportunities exist for the EATC. The EATC can be the model military organisation and an example for others to aspire to join. Spain is an observer and is taking the steps to join and the UK is interested as well. If more nations eventually join, the EATC has a chance to become the 'Air Mobility Command' for Europe. The EATC has the opportunity to further integrate their maintenance, training, and logistics systems, but this will take time. The EATC recognises this and their long term goal is: "The command will also focus on developing a joint doctrine, training and education, as well as equipment standardisation and maintenance of the fleet."²⁰ The introduction of a multinational A400M unit with multinational crews would go a long way in realising this goal.

Several key weaknesses of the EATC however should be pointed out. Most operations into a crisis or combat zone remain entirely under the jurisdiction of each partner country. Also, to ensure national sovereignty,

NATO owned E-3A AWACS based at Geilenkirchen, Germany.



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the nations have agreed to hold back VIP transport, all helicopter transport, and search and rescue operations. Nations also have the right to opt-out under their revoke power. This transfer of authority and national legal framework was a real challenge to EATC implementation and took 3 years to solve.



Future challenges facing the EATC include: national caveats and full transfer of authority; full integration of all nations operational commands; a common Information Technology backbone; an EATC formal treaty so other interested nations can join; continued force support issues; and the standardisation of operational training and national procedures.

The EATC represents an unprecedented level of European defence cooperation in the domain of military Air Transport arena. Though it is only in its early phases, the EATC serves as a model for cooperation in other military domains including the fighter aircraft arena.

4. NATO Airborne Early Warning (NAEW)

Studies directed by NATO commanders in the 1970's showed that an Airborne Early Warning (AEW) radar system would significantly enhance the Alliance's air defence capability. The Defence Planning Committee signed a memorandum of understanding in 1978 to buy and operate a NATO-owned AEW system.

NAEW consists of two operational Components under full NATO command:

- First is the multinational NATO E-3A Component at Geilenkirchen, Germany. It operates 17 Boeing E-3A Airborne Warning and Command System (AWACS) aircraft and three Trainer Cargo Aircraft (TCA) with

integrated international crews from 15 NATO nations. It has the ability to rapidly deploy airborne surveillance, command, control and communication for NATO operations. The E-3As operate from the main operating base (MOB) at Geilenkirchen, and three forward operating bases (FOBs) located at Trapani, Italy, Aktion, Greece and Konya, Turkey. There is also a forward operating location (FOL) at Orland, Norway.

- Second is the Airborne Early Warning Squadron Number 8 of the British Royal Air Force (RAF) at Waddington (United Kingdom), with seven Boeing E-3D aircraft. The E-3D Component, is manned only by RAF personnel.

A major strength of the NAEW is due to the MOB concept. This allows for a fair burden or cost sharing in support, logistics, spare parts, training, etc., which would be difficult to accomplish if the AWACS aircraft were spread out any more. The 15 nations who participate in this collective programme get fully interoperable equipment. They also get reduced acquisition and operating and maintenance costs through a combination of economies of scale, common logistics, and shared manpower commitments. Another advantage of NAEW is that the AWACS and TCA aircraft provide NATO with a lot of visibility. Despite a relatively limited capability in terms of cargo moving capability, for example, the three TCA aircraft have consistently been used by NATO for humanitarian and crisis response operations. Both of these strengths could be realised by a fighter partnership as well.

Because it is a NATO owned and funded operation, NATO AWACS falls under the NATO command structure, which ironically is its biggest constraint. It can be difficult to obtain consensus from all 28 NATO members on the North Atlantic Council on when, where and how to deploy or utilise the E-3 aircraft. Such a NATO funded organisation would be difficult to set up in today's fiscally constrained NATO environment. It is easier to create and govern an MOU organisation today that can perform missions for not just NATO but also under EU, UN, or national auspices. An example of this is the C-17 Strategic Airlift Capability and the Heavy Airlift Wing in Hungary.

5. C-17 Strategic Airlift Capability/ Heavy Airlift Wing (SAC/HAW)

One solution to the declared NATO shortfall of strategic airlift was the creation of the 12 nation C-17 Strategic Airlift Capability/Heavy Airlift Wing (SAC/HAW) partnership. The HAW is a multinational military unit comprised of (NATO Airlift Management Organization) NAMO-owned, Hungary-flagged C-17 aircraft and other assets and personnel assigned by the participants under the terms of the SAC MOU. The SAC/HAW partnership has made it possible for participating nations to have a strategic airlift capability, one that would be hard for them to acquire on their own. Though many aspects of this airlift partnership are vastly different from a prospective fighter partnership it is useful to pull out a few strengths and challenges that can be useful to a fighter partnership.

According to the MOU, each SAC participating nation pays for a portion of the aircraft, supporting infrastructure and operating costs, allowing the nations to share a pooled fleet.²¹ Each nation's share of the budget is proportional to its share of the flying hour potential of the HAW.²² This creates a fair burden sharing situation and allows member nations to participate according to their specific requirements. The fleet is only 3 aircraft and currently there are no plans for expansion. A fighter partnership fleet would involve many more aircraft and ownership of them, unlike the SAC/HAW, would most likely be national. Costs could be similar however, since a light-weight fighter costs less. The supporting infrastructure of a fighter partnership could be similar to the SAC/HAW setup if the MOB concept was developed.

SAC aircraft acquisition, management, and support is achieved through the NATO Airlift Management Organization (NAMO), a NATO Procurement, Logistics or Services Organization (NPLSO) established by the NAC on 29 September 2008. On behalf of the 12 SAC Nations, NAMO owns the aircraft and other related equipment, with oversight provided by a 12-Nation Board of Directors. A similar NPLSO could be created to support a future fighter partnership though aircraft

ownership and sovereignty would be a limiting factor. Further, the NATO Maintenance and Supply Agency (NAMSA), on behalf of NAMA (the executive body of NAMO), provides a wide range of services, in areas such as contracting, information technology and communications, finance and accounting, and transportation. NAMSA could be heavily involved with a fighter partnership as well.

SAC has also joined the C-17 Globemaster III Sustainment Partnership, which provides support to all C-17s in service around the world.²³ This helps ensure standardisation and interoperability with other C-17s thus enhancing partnerships and mission effectiveness, as well as long term cost savings. A similar support contract would most likely be offered with a future fighter acquisition and would allow partnership members the same benefits enjoyed by the SAC.

Having a single MOB with a single logistics and maintenance support structure simplifies operations and creates cost savings that would not be possible if nations acquired their own asset. If a fighter partnership was set-up with the MOB concept, a similar setup could be created. With all the challenges of a centralised fighter partnership MOB however, a new setup would need to be created to support a national basing concept. The A400M program could be a model for this type of setup, though this remains to be seen. Given the recent round of defence cuts however, close cooperation for supporting the A400M will likely be demanded by the nations. All of this close coordination, integration, and unity of effort results in substantial cost savings and efficiency.

The SAC/HAW C-17s are all based at Papa in the host nation of Hungary. Hungary, as the flag nation, has the responsibilities associated with registering, marking (applying insignia), certifying initial airworthiness, and oversight of continuing airworthiness of the C-17 aircraft. Hungary also has the duty of submitting diplomatic clearance requests for missions performed by the HAW around the world. This setup would again be difficult to apply to a fighter partnership if each nation wants to register and certify their aircraft for reasons of sovereignty.



NAMO-owned, SAC/HAW C-17A based at Papa, Hungary.

Although SAC relies on certain NATO support structures, it transcends military and political alliances like NATO and the EU. For example, NATO or any other international organisation cannot directly task the HAW, but they can request support through one of the participating nations.²⁴ The SAC Steering Board (SAC SB) provides oversight of the SAC Program and consists of one permanent representative or an alternate representative of each participant. Each member of the SAC SB has one vote and all decisions are taken unanimously. In the event that the SAC SB is unable to reach a timely decision on an issue, each SAC SB representative refers the issue to its higher authority for resolution.

The HAW/CC is delegated OPCON by the participants, in order to command the HAW and conduct operations with NAMO-owned C-17 aircraft, associated materials, equipment, and all personnel contributed by the participants to the HAW. This governance model is unique and though it works for an airlift partnership, it would be difficult to apply to a fighter partnership in which national sovereignty is desired.

Any participant may for national security or vital foreign policy reasons, opt out from a mission by notifying the HAW/CC, and inform the participants through the SAC SB prior to mission execution. This opt out option is identical to the EATC setup and would most likely be needed for any fighter partnership as well.

By pooling resources, working together, and fairly sharing costs the C-17 SAC/HAW program has been a success and a model for future common asset partnerships.

For fighter partnership however, differences in mission, geography and sovereignty make it difficult to apply many of the successful setups.

6. Tri-National Tornado Training Establishment (TTTE)²⁵

The Tri-National Tornado Training Establishment (TTTE) was a successful multinational fighter aircraft training base at RAF Cottesmore, England for 20 years. A memorandum of understanding establishing the unit was signed in 1979 by the United Kingdom, Germany and Italy, and the unit came into existence on 29 January 1981. The unit was manned by personnel of all three participating nations, trained 300 crews a year when at its height and consisted of three, later four squadrons of Tornados. All servicing was done by RAF ground crew.

The TTTE was responsible for the initial training of all Tornado aircrew as well as providing additional courses for experienced aircrew. Funding was allocated according to work share in the project, accordingly Germany 42.5%, Great Britain 40% and Italy 17.5%. The post of Officer Commanding TTTE rotated through the nationalities, having the title of Chief Instructor.

Split into different flying units, the flying element of the TTTE was the Tornado Operational Conversion Unit which comprised 'A', 'B' and 'C' Squadrons, commanded by a German, Brit and Italian respectively, and the Standards Squadron, responsible for advanced training, instrument rating checks and special tasks (for example training the instructors and refresher training).



The TTTE was a successful multinational MOU organisation based at RAF Cottesmore, England.

Also assigned to the TTTE was the Chief Ground Instructor, again the post rotated through the nations, who controlled four principal types of training aid; the Basic Flight Simulator, the Full Mission Simulator, the Nav-Attack Systems Trainer and the Basic Avionics Procedures Trainer. This enabled mixed nationality sorties to be done, further fostering relations between the three nations.

In the post-Cold War era, the three nations decided that they would be better served performing their own type training. Whilst the Eurofighter project has followed the example of the Tornado programme in many ways, the TTTE model was not adopted. Rather the Eurofighter partners (Germany, Italy, Spain and United Kingdom) have chosen to run national training schemes. Further study is needed on both the TTTE and the Eurofighter programme to capture their successes and challenges which could be applied to any future Regional Fighter Partnership.

1. NATO Prague Summit, 2002.
2. (Air Defence Committee Heads of Delegation in EAPC format, 2010); This committee recently changed their name to the Air and Missile Defence Committee (AMDC).
3. F-16 Multinational Fighter Program Office, 2010.
4. Lt Col Goossens, 2010.
5. Donnet, Lt Col, BEL Air Force, 2008.
6. Office of Regional Security and Arms Transfers, 2008.
7. Donnet, Lt Col, BEL Air Force, 2008.
8. Office of Regional Security and Arms Transfers, 2008.
9. Donnet, Lt Col, BEL Air Force, 2008.
10. Lt Col Goossens, 2010.
11. (Devold, 2003); Norway Minister of Defence, Speech given at the seminar OPEN ROAD 2003: US Transformation – Implications for the Alliance.
12. Donnet, Lt Col, BEL Air Force, 2008.
13. Donnet, Lt Col, BEL Air Force, 2008.
14. Tankink, Col, NLD Air Force, 2010.
15. Boele, Maj, NLD Air Force, 2010.
16. Boele, Maj, NLD Air Force, 2010.
17. Boele, Maj, NLD Air Force, 2010.
18. Boele, Maj, NLD Air Force, 2010.
19. Seven NATO Nations are together procuring the Airbus A400M: Belgium (7), France (50), Germany (53 with plans to sell 13 leaving 40), Luxembourg (1), Spain (27), Turkey (10) and the UK (22); in addition also Malaysia has ordered 4 aircraft. After recent delays, first delivery is now expected by 2013 and by 2020, these 7 Nations should operate 170 aircraft between them. The EATC was proposed by the European Airlift Study as a further evolutionary consequence of the EACC/EAC, but not all EACC/EAC participants could agree on its development and thus only four nations signed the MoU of the EATC.
20. Dutch Ministry of Defence, 2010.
21. Zazworsky, Col, USAF, 2010.
22. Zazworsky, Col, USAF, 2010.
23. Zazworsky, Col, USAF, 2010.
24. Zazworsky, Col, USAF, 2010.
25. (Parsons, 1999) and (Jet-Prints.com).

ANNEX B

List of Acronyms

AAR	Air-to-Air Refuelling	EAPC	Euro-Atlantic Partnership Council
ACCS	Air Command and Control System	EATC	European Air Transport Command
ADC	Air Defence Committee	EEAW	EPAF Expeditionary Air Wing
AGS	Alliance Ground Surveillance	ENJJPT	Euro-NATO Joint Jet Pilot Training
AHWG	Ad Hoc Working Group	EPAF	European Participating Air Forces
AP	Air Policing	EPGs	European Participating Governments
AT	Air Transport	FMP	Fighter Management Program
AWACS	Airborne Warning and Command System	FMS	Foreign Military Sales
BoD	Board of Directors	FOB	Forward Operating Base
CAS	Close Air Support	FOC	Full Operational Capability
CEE	Central and Eastern Europe	FSTA	Future Strategic Tanker Aircraft
CJEF	Combined Joint Expeditionary Force	FWIT	Fighter Weapons Instructor Training
CLS	Contract Logistics Support	IOC	Initial Operational Capability
CMS	Contractor Maintenance Support	ISAF	International Security Assistance Force
CONOPs	Concept of Operations	JAA	Joint Aviation Authorities
CRR	Capabilities Requirements Review	JAPCC	Joint Air Power Competence Centre
DATF	Deployable Air Task Force	JAR	Joint Aviation Requirements
DETCO	Detachment Commander	LN	Lead Nation
DRR	Defence Requirements Review	MAP	Membership Action Plan
EAC	European Airlift Centre	MCCE	Movement Coordination Centre Europe
EACC	European Airlift Coordination Cell	MCM	Multi-Command Manual
		MLU	Mid Life Upgrade
		MNFP	F-16 Multinational Fighter Program

MOB	Main Operating Base	OEM	Original Equipment Manufacturer
MOU	Memorandum of Understanding	OPCOM	Operational Command
NAC	North Atlantic Council	OPCON	Operational Control
NADC	NATO Air Defence Committee	PfP	Partnership for Peace
NAEW	NATO Airborne Early Warning	POL	Petroleum, Oil and Lubricant
NAHEMA	NATO Helicopter Management Agency	RFP	Regional Fighter Partnership
NAMA	NATO Airlift Management Agency	ROE	Rules of Engagement
NAMO	NATO Airlift Management Organization	RSN	Role Specialist Nations
NAMSA	NATO Maintenance and Supply Agency	SAC/HAW	Strategic Airlift Capability/ Heavy Airlift Wing
NAMSO	NATO Maintenance and Supply Organization	SALIS	Strategic Airlift Interim Solution
NATINADS	NATO Integrated Air Defence System	SAR	Search and Rescue
NATO	North Atlantic Treaty Organization	SB	Steering Board
NBC	Nuclear, Biological and Chemical	SCM	Supply Chain Management
NC3A	NATO Consultation, Command and Control Agency	SDSR	Strategic Defence and Security Review
NCS	NATO Command Structure	SNR	Senior National Representative
NPLO	NATO Production and Logistics Organization	TCA	Trainer Cargo Aircraft
NPLSO	NATO Procurement, Logistics or Services Organization	TLP	Tactical Leadership Program
NRFPA	NATO Regional Fighter Partnership Agency	TOA	Transfer of Authority
NRFPO	NATO Regional Fighter Partnership Organization	TTPs	Tactics, Techniques and Procedures
NSIP	NATO Security Investment Programme	TTTE	Tri-National Tornado Training Establishment
		UAS	Unmanned Aircraft System
		WSP	Weapon System Partnership

ANNEX C

References

Aerospace and Defense News. (2009, Nov 17). Retrieved Nov 23, 2010, from ASDNews.com: http://www.asdnews.com/news/24538/European_Defense_Squeezed_by_Economic_Difficulties_Indifference.htm

Air Defence Committee Heads of Delegation in EAPC format. (2010). *Support to Regional Approaches in Air Defence*. North Atlantic Council, Air Defence Committee. North Atlantic Council.

Boele, Maj, NLD Air Force. (2010, Nov 16). Netherlands Air Staff, Logistics Branch. (E. Bogaards, Lt Col, NLD Air Force, Interviewer)

Devold, K. K. (2003, January 13). *Damn the Torpedoes, Full speed ahead*. Retrieved Nov 23, 2010, from www.norway.org/News/archive/2003/200301devold.htm

Donnet, Lt Col, BEL Air Force. (2008). *EEAW: Embryonic Component of Future European Air Combat*. Retrieved Nov 23, 2010, from French Joint Staff College: www.college.interarmees.defense.gouv.fr/.../DONNET_LCL_A2_article_Tribune_V3_ENMFT.pdf

Durkalec, J. (2010, Dec 15). Retrieved Feb 2011, from The Polish Institute of International Affairs: http://kms1.isn.ethz.ch/serviceengine/Files/ISN/125949/ipublicationdocument_singledocument/03aa6466-bd4b-4afd-8cb3-0b1f5621a946/en/a216-2010.pdf

Dutch Ministry of Defence. (2010, Sept 1). *European Air Transport Command Fleet at Eindhoven*. Retrieved Nov 24, 2010, from Defense-Aerospace.com: <http://www.defense-aerospace.com/cgi-bin/client/modele.pl?shop=dae&modele=release&prod=117754&cat=3>

EPAF Expeditionary Air Wing Steering Committee. (2010). *European F-16 Fighter Cooperation*.

Eurofighter. (2011). *Eurofighter Consortium Structure*. Retrieved Feb 2011, from Eurofighter Typhoon: [http://](http://www.eurofighter.com/eurofighter-typhoon/programme-organisation/consortium-structure.html)

www.eurofighter.com/eurofighter-typhoon/programme-organisation/consortium-structure.html

European Participating Air Forces respective MODs. (2004, Jun 28). Memorandum of Understanding for the Establishment of the EPAF Expeditionary Air Wing. Istanbul, Turkey.

European Union Institute for Security Studies. (2009). *European Security and Defence Policy: The First Ten Years (1999–2009)*. Paris: European Union Institute for Security Studies.

F-16 Multinational Fighter Program Office. (2010, Nov). Introduction Brief. United States Air Force.

Fulber, M. (2009, Oct). EEAW at Exercise Bold Avenger 2009. *The Ramstein Sword*, p. 19.

Gorman, F. (2000, Oct). *Multinational Logistics: managing diversity*. Retrieved Nov 24, 2010, from BNet; CBS News: http://findarticles.com/p/articles/mi_m0IBo/is_3_24/ai_68507644/?tag=content;col1

Gorman, F. (2000). *Multinational Logistics: Managing Diversity*. *Air Force Journal of Logistics* (Fall 2000).

Hayden, D. D. (2008). *Air-Mindedness*. *Air & Space Power Journal* (Winter 2008).

Jet-Prints.com. (n.d.). *Jet-Prints.com*. Retrieved Feb 2011, from TTTE – Tri-National Tornado Training Establishment: http://www.jet-prints.com/verb_ttte/index_e.html

Joint Air Power Competence Centre. (2010, Sept). *Governance of NATO Common Air and Space Assets. Three Air Power Considerations within a Comprehensive Approach*, 8–14.

Labott, E., & Lawrence, C. (2010, Nov 20). *NATO agrees on missile defense system for most of Europe, the U.S*. Retrieved Nov 23, 2010, from CNN.com: <http://edition.cnn.com/2010/WORLD/europe/11/19/us.nato.summit/>

Lt Col Goossens, P. (2010, Oct). BEL Air Staff. (D. Pedersen, Interviewer)

NAMSA – NATO Maintenance and Supply Agency. (2011, Jan). *NAMSA's Customer Support Structures*. Retrieved Jan 2011, from NATO Maintenance and Supply Agency: http://www.namsa.nato.int/customers/customer_sup_e.htm

NATO Prague Summit. (2002). *Prague Summit Declaration, (2002) 127*. Prague: NATO.

North Atlantic Treaty Organization. (2010). *Strategic Concept For the Defence and Security of The Members of the North Atlantic Treaty Organization*. Lisbon.

Office of Regional Security and Arms Transfers. (2008, Mar 18). Third-Party Transfer Authority for F-16 Multi-national Fighter Program. Washington, D.C.: United States Department of State.

Parsons, G. (1999). *TTTEnd of an era*. Retrieved Feb 2011, from Air-Scene UK: <http://www.airsceneuk.org.uk/hangar/1999/ttte/ttte.htm>

Portuguese Air Force. (2010). F-16 Syllabus.

Stanford University. (2010, Jun 8). *Sovereignty*. Retrieved Nov 24, 2010, from Stanford Encyclopedia of Philosophy: <http://plato.stanford.edu/entries/sovereignty/>

Tankink, Col, NLD Air Force. (2010, Nov 16). Netherlands Air Staff, Chief Fighter Branch. (E. Bogaards, Lt Col, NLD Air Force, Interviewer)

U.S. Department of Defense. (2011, Jan 31). *Definitions*. Retrieved Feb 2011, from Maintenance Policy and Programs: <http://www.acq.osd.mil/log/mpp/definitions.html>

USAFE/A3 Operations. (2009). *Concept of Operations to Develop Combat Aviation Capability in Estonia, Latvia, and Lithuania*. Ramstein AB, Germany.

Valasek, T. (2009, Jun 09). *What the economic crisis will mean for European defence*. Retrieved Nov 23, 2010, from Centre for European Reform: <http://centrefor-europeanreform.blogspot.com/2009/06/what-economic-crisis-will-mean-for.html>

Zazworsky, Col, USAF. (2010, Nov). Heavy Airlift Wing Commander. (Efraimsen, Maj, USAF, Interviewer)



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