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AArtyP-5

NATO FIRE SUPPORT DOCTRINE

Edition B Version 1

NOVEMBER 2015

NORTH ATLANTIC TREATY ORGANIZATION

ALLIED ARTILLERY PUBLICATION

Published by the
NATO STANDARDIZATION OFFICE (NSO)

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NORTH ATLANTIC TREATY ORGANIZATION (NATO)

NATO STANDARDIZATION OFFICE (NSO)

NATO LETTER OF PROMULGATION

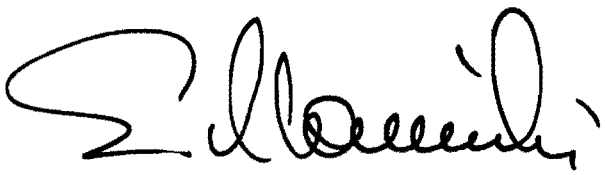
5 November 2015

1. The enclosed Allied Artillery Publication AArtyP-5, Edition B, Version 1, NATO FIRE SUPPORT DOCTRINE, which has been approved by the nations in the Military Committee Land Standardization Board, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 2484.

2. AArtyP-5, Edition B, Version 1, is effective upon receipt and supersedes AArtyP-5, Edition A, which shall be destroyed in accordance with the local procedures for destruction of documents.

3.

4. This publication shall be handled in accordance with C-M(2002)60.



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RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS

Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.

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RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]
BEL	BEL will not use, encourage or facilitate the use of or contravene in anyway to its international or national obligations relating to any device which may be qualified as antipersonnel mine or cluster-munitions according to international or domestic law.
ITA	In accordance to national law, Italy will not use any device which may be classified as anti-personnel mine according to the following definition "An anti-personnel mine is defined as a device which may be placed above, under, inside or next to any surface and adjusted or adapted with specific measures in order to explode, cause an explosion or release incapacitating substances as the result of the presence, the proximity or contact by a person". Moreover, considering military activities in a multinational scenario, cooperation of the Italian Armed Forces also with no signatory Nations of the OTTAWA Convention is permitted, with the provision that activities by Italian servicemen be compatible to the OTTAWA regulations.
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PREFACE

The successful planning and execution of military operations requires a clearly understood and widely accepted doctrine, especially when these operations are conducted by NATO or multinational forces.
This publication sets out fundamental doctrine for fire support and effects within the framework of Joint Fire Support (JFS). It expands the application of fire support and effects as well as the role of field artillery commanders within the context of AJP 3.2 (STANAG 2288) “Allied Joint Doctrine for Land Operations” and ATP 3.2.1 (STANAG 2605) “Allied Land Tactics”.
AArtyP-5 (STANAG 2484) is the doctrinal application of integrated fire support and effects in particular field artillery, whereas AArtyP-1 (STANAG 2934) addresses Artillery Procedures and AArtyP-3 (STANAG 2432) addresses Artillery Procedures using automated data processing (ADP) systems.
Other STANAG’s/AP’s may contribute to this publication on specific aspects of fire support integration to include:

STANAG 1034/ATP-04	Allied Naval Fire Support.
STANAG 1149/ATP-08	Doctrine for Amphibious Operations.
STANAG 2490/AJP 3	Allied Doctrine for Joint Operations.
STANAG 3700/AJP 3.3	Allied Joint Doctrine for Air and Space Operations.
STANAG 3736/AJP 3.3.2	Allied Joint Doctrine for Close Air Support and Air Interdiction.
STANAG 2999/ATP-49	Use of Helicopters in Land Operations - Doctrine.
STANAG 3805/AJP 3.3.5	Allied Joint Doctrine for Airspace Control.
STANAG 7189/ATP-3.3.5.1	Joint Airspace Control Tactics, Techniques and Procedures.

This publication offers the artillery commander and his staff a conceptual framework and a “common language” for the planning and execution of fire support within his concept of operations.
It is not the intention that AArtyP-5 (STANAG 2484) should restrict the authority of the manoeuvre commander. He is expected to organize the forces assigned to him and to plan and execute operations in a manner he deems appropriate to ensure unity of effort in the accomplishment of his mission. With the artillery commander, his staff and the availability of an existing artillery network he has also specialists to integrate the fire support provided by other services within the framework of JFS (e.g. air and maritime components).

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TABLE OF CONTENTS

SECTION VII – AMMUNITION CAPABILITIES

CHAPTER 5 – EFFECTS AND JOINT FIRE SUPPORT PLANNING

SECTION I – INTRODUCTION

SECTION II – PLANNING PROCESS

SECTION III – CONCEPT OF OPERATION

SECTION IV – CONCEPT OF JOINT FIRE SUPPORT

SECTION V – JOINT FIRE SUPPORT COORDINATION ARCHITECTURE & ROLE

SECTION VI – COORDINATION WITH OTHER COMPONENTS/BRANCHES

SECTION III – CHAIN OF COMMAND AND LOGISTICS

SECTION IV –FIRE SUPPORT SYSTEMS AMMUNITION

SECTION V – LOGISTIC PLANNING PROCESS

ANNEXES

CHAPTER 1
General Introduction

SECTION I – INTRODUCTION

101. General. This publication should be read in conjunction with AArtyP-1 (Artillery Procedures) and with AArtyP-3 (Artillery Procedures for Automatic Data Processing (ADP) Systems Interoperability).

102. Aim of AArtyP-5(B). The aim of this publication is to provide guidance to all staff officers involved in planning and conducting Fire Support as a part of Joint Fires (JF)/Joint Fire Support (JFS) as a part of the overall campaign plan.
It describes the capability and comprehensive baselines of C2 and provision of JFS as well as cooperation with the forces to be supported across the entire mission spectrum.

103. Scope of AArtyP-5(B). This publication addresses JFS personnel from all command levels and associated superior senior staff, including commanders.

SECTION II – ALLIED JOINT DOCTRINES

104. Allied Joint Doctrine for conduct of operations (AJP 3). Nowadays, the complexity of operations is increased since a significant presence of non-military participants is more common than in the past. The Alliance seeks to achieve its objectives through a comprehensive approach that requires effective coordination and cooperation among national governmental departments and agencies, non-governmental organizations (NGOs), international organizations (IOs), and the private sector in any alliance or coalition throughout an entire operation. In all circumstances, the commander and his/her task force find themselves to be part of an inter-related network that extends upward to the strategic level, downward to the tactical level and laterally to a range of military and civilian groupings and organizations.

105. Allied Joint Doctrine for Land Operations (AJP 3.2). AArtyP-5(B) is mainly based on AJP 3.2 Allied Joint Doctrine for Land Operations (STANAG 2288). It is assumed that the reader of this AP is aware of the content of all relevant publications which are mentioned in the related documents. It covers the doctrine for the employment of fire support in the overall framework of allied land operations.

According to AJP 3.2, the operational environment generally consists of factors and conditions that must be understood to successfully apply combat power, protect the force and complete the mission. The operational environment includes the sea, land, air and space, the adversary, neutral and friendly actors, facilities, weather, terrain, electromagnetic spectrum (EMS), and the information environment, which includes cyberspace, within the Joint Operations Area (JOA) and areas of interest.

There is now a greater range of actors and bystanders within the JOA and possibly beyond, who will be involved in, or will influence, the course of operations. Due to this complex operational environment, a comprehensive approach is required to coordinate the efforts of the Joint Forces with those of other organizations (for example, IOs and NGOs). An increased understanding of a comprehensive approach is required at the tactical level

to enable component commands to execute the operational commander's campaign plan. This will entail significant liaison and mutual understanding with other agencies and departments in the JOA. This will be particularly, but not exclusively, true for the land component that will need to liaise with other government departments (OGDs), IOs, and NGOs (where possible), the host nation and other interested parties (media, local businesses etc.). Many of these organizations will be represented at all tactical levels of command and will play a fundamental role in the environmental estimate.

Traditionally the Alliance has referred to a spectrum of conflict[1], ranging from stable peace, via humanitarian assistance to general war. This implied that there are discrete types of conflict with traditional 'war' against near-peers as the professional benchmark. This binary, linear, sequential view overlooked the inevitable concurrency and unique challenges posed by conflicts that have different characteristics. Discrete operational themes actually overlap and merge. Conflict can now be seen as a blurring of the distinctions between adversaries and the way they use force to achieve political goals. Future conflict will blend the lethality traditionally associated with state-on-state conflict and the protracted nature of irregular warfare. This mosaic of conflict is a backdrop for all land operations, the principal discriminator being the level of violence and complexity of actors engaged in the conflict. Alliance land forces must have the flexibility and agility of mind to move from one role to another with little warning.

The fire part also moves in a joint way. Therefore Joint Fires (JF) and Joint Fire Support (JFS) were established IOT ensure the most effective way to engage the adversary and a common planning of all available fire assets.

106. Allied Joint Doctrine for Joint Targeting (AJP 3.9). Joint Targeting is the process of determining the effects necessary to achieve the commander`s objectives, identifying the actions necessary to create the desired effects based on means available, selecting and prioritizing targets, and the synchronization of fires with other military capabilities and then assessing their cumulative effectiveness and taking remedial action if necessary. It is both an operational level and component level command function. The joint targeting cycle (JTC) has a logical progression that aids decision-making and provides the Joint Force Commander (JFC) with a methodology linking objectives with effects throughout the battlespace. It is flexible enough to be adapted to any desired military operation and across diverse functional areas, such as air interdiction and information operations. This process enables the JFC to most effectively employ allocated resources to achieve the assigned objectives. The indirect fire support personnel working at all levels are key enablers talking about all issues of indirect fire support IOT achieve the desired effects.

107. Land Targeting (ATP-3.9.2). Land Targeting is driven by the Joint Targeting Cycle. For more details see paragraph 113 and the current version of ATP-3.9.2.

SECTION III – JOINT FIRE SUPPORT (JFS) AND ITS EFFECTS

108. Joint actions. The ability of any actor – adversary, friend, neutral, belligerent or spoiler – to effectively use force, or the threat of force, to achieve a desired outcome is dependent upon his will to act, his understanding of the situation, and his capability to act decisively. Together, these elements determine an actor's military effectiveness.

[1] Spectrum of conflict is defined as the full range of conflict from stable peace to general war using violence as a discriminator on an ascending scale.

The cohesion within an organization is also an important facet of operational effectiveness. For example, it is collective will or resolve, ranging in strength from tacit acceptance through to absolute allegiance, which mobilizes a group of individuals in pursuit of a common goal. A group's cohesion reflects the extent to which those motivations bind individuals together, and inspire them to act in unison.

Joint actions involve the deliberate use and orchestration of military capabilities and activities to realize effects on other actors' will, understanding and capability, and the cohesion between them. It is implemented through the coordination and synchronization of the joint functions.

109. Joint functions. Joint functions provide a sound framework of related capabilities and activities grouped together to assist JFCs to integrate, synchronize, and direct various capabilities and activities in joint operations. Using joint functions, commanders, in conjunction with the strategic level of command, can determine force requirements. Common to joint operations at all levels of warfare are the functions command and control, intelligence, manoeuvre and fires, force protection, information operations (Info Ops), sustainability, and civil-military cooperation (CIMIC).

A number of subordinate tasks and related capabilities help define each function and some of them could apply to more than one function. For example, military engineering capabilities are applied across the joint functions and independently. In any joint operation, the JFC may choose from a wide variety of joint and service capabilities and combine them in various ways to perform joint functions and accomplish the mission. The operation plan/order describes the way forces and assets are used together to perform joint functions and tasks. However, forces and assets are not characterized by the functions for which the JFC is employing them. A single force or asset can perform multiple functions simultaneously or sequentially while executing a single task.

Ultimately, the JFC and his forces must be capable of attacking the adversary, either directly or indirectly, creating desired and avoiding undesired physical and psychological effects, and be able to sustain such operations for as long as necessary to achieve operational objectives. This is normally accomplished through the combination of joint manoeuvre and joint fires in conjunction with, where appropriate, other operational capabilities and a range of mechanisms and control measures.

The principal purpose of manoeuvre is to gain positional advantage in respect to the adversary from which force can be threatened or applied. Manoeuvre seeks to render adversaries incapable of resisting throughout all dimensions of the operational area effectively by shattering his cohesion rather than destroying each of his components through incremental attrition. Joint manoeuvre involves the assets of more than one component and may even involve strategic assets, temporarily made available for the operation. At the operational level joint manoeuvre is the means by which a commander sets the terms in time and space, declines or joins combat or exploits emerging developments. Joint manoeuvre is more than just movement with fires. It is the process by which combat power is focused where it can have decisive effect, to pre-empt, dislocate, or disrupt adversary operations. It involves trade-offs (e.g. speed versus time, width versus depth, concentration versus dispersion), and thus requires an acceptance of risk.

110. Fire Power. Firepower is a critical enabler of land combat on the battlefield, primarily through its relationship with, and contribution to, manoeuvre. The term firepower is commonly used to describe the collective offensive capabilities of a military force or, alternatively, the military capability to direct force at an enemy. Firepower destroys, neutralises, suppresses, demoralises and influences. It can be delivered by sea, land and

air platforms. It has physical, psychological and physiological effects. Firepower provides the force to amplify or enable the effects of tempo, simultaneity and surprise. Its effectiveness depends on its volume, accuracy, and its suddenness or unpredictability. It allows force to be applied precisely, different systems to be concentrated against a single task, and the rapid switching of fire between targets. The psychological and physiological effects of firepower are transient, and should be exploited by manoeuvre before they wear off. Hence effective operations require close coordination between firepower and manoeuvre. Firepower and manoeuvre are two of the Combat Functions, identified in (land) tactical doctrine.

111. Joint Fires (JF). Joint Fires (JF) is defined as Fires applied during the employment of forces from two or more components in coordinated action toward a common objective. It includes direct and indirect fires and is an effects-based approach to operations initiated at the operational level. JF planning is based on the Operations Planning Process (OPP), an analytical planning process applying the “top down principle”. It is oriented to the intended conduct of operations of the Joint Forces Commander (JFC). With regard to target selection, the process implies assignment of appropriate effects based on operative and possibly strategic requirements and capabilities, as well as judicial and political restrictions.

112. Joint Fire Support (JFS) and its Effects. Joint Fire Support (JFS) is defined as the coordinated and integrated employment of land-, air- and naval fire support platforms delivering indirect fires to achieve the required effects on ground targets to support Land Operations in the full spectrum of conflict. It encompasses the integration of indirect fires and effects in order to influence the adversary forces, installations or functions. Depending on national doctrine, the Joint Fire Support Element (JFSE) could either encompass influence elements as e.g. PSYOPS, CIMIC, EW or be incorporated in a wider cell dealing with overall influence activities.

JFS assists direct support of operations at the tactical level and support coordinated and responsive employment of the best-suited delivery system in the area of operations. Effect requests are mostly generated “bottom up” to the decision-making level that has the delivery systems and authority for assignment. JFS selects the best suited forces and assets from the entire range of delivery systems available. Consequently, JFS must be synchronized at the appropriate level to include synchronization with JF.

113. The Targeting Process. Targeting is a command responsibility that requires the personal time, energy and attention of the commander, who has to give clear direction for the aims, priorities and degree of effort to be accorded to targeting. Within NATO there are the Joint Targeting Process, the Air Targeting Process and the Land Targeting Process. The Land Targeting cycle is driven by the Joint cycle due to the joint assets required. Land Targeting is an activity by which the identification and engagement of targets is facilitated. It is a formal process comprising a series of activities and related products inherent to the operational planning process. It is based upon a continuous cycle of steps: decide, detect/track, deliver and assess (D3A) and takes place for targets being considered both for lethal and non-lethal engagement. This methodology provides a systematic approach to enable the generation of the right activities, at the right time, against the right targets, to create the desired effects. It is a dynamic process that, when required, allows activities to be rapidly adjusted to meet changing situations.
Targeting takes place throughout the OPP and may include single-component, joint or combined resources.
Indirect Fire personnel contributes to the Targeting Process.[2]

[2] The manner and amount differs from nation to nation.

For further details see AJP 3.9 “Allied Joint Doctrine for Joint Targeting” and AJP 3.9.2 “Land Targeting”.

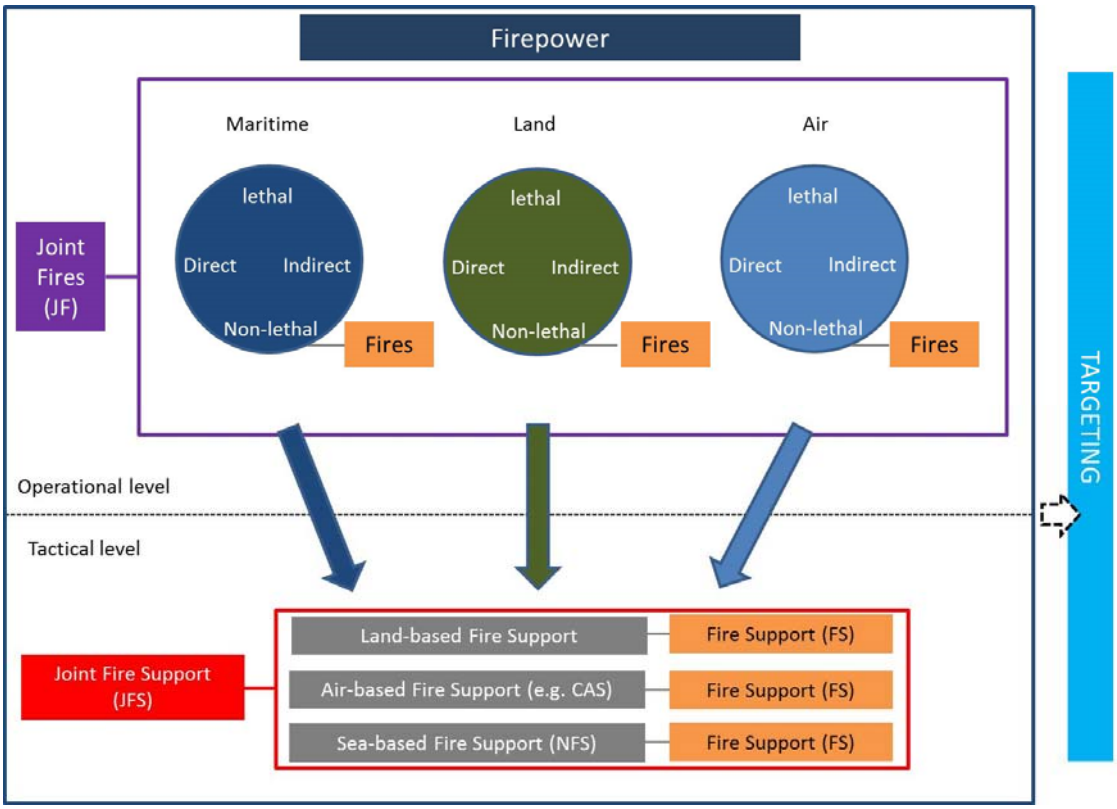

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Figure 1.1 – Firepower

Firepower is the overarching term to indicate that Joint Fires are used for lethal and non-lethal purposes, in a direct or indirect way and applied by the maritime, air and land component. (see also figure 1.1)

JFS is used as an overarching term to indicate the use of indirect systems for lethal or non-lethal purposes and applied by the maritime, air and land component.

FS is used to indicate the use of indirect systems for lethal or non-lethal purposes and applied by one single component.

Firepower and within JF and JFS contributes to the Targeting Process.

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CHAPTER 2

Role of land-based Indirect Fire Systems (IFS) as a part of JFS

SECTION I – INTRODUCTION

201. Aim. The aim of this chapter is to define the role of land-based Indirect Fire Systems and to describe its contribution to JFS within the land battle.

SECTION II - DESCRIPTION OF LAND-BASED INDIRECT FIRE SYSTEMS

202. Characteristics. Land-based IFS units are always embedded in the LCC. They are characterized by a very flexible organization in order to be able to deploy and operate in a highly centralized or decentralized manner. As a result of this flexible structure, land-based Fire Support units are able to perform efficiently in a complex operational environment. The main characteristics are its 24/7[3], all weather capability to acquire ground targets and achieve effects over a wide area and in depth. It should be able to deliver guided or unguided munitions in order to strike point or area targets.

203. Elements of land-based Indirect Fire Systems. It is a system of systems, and it includes the following five elements:

a. A family of Surveillance, Target Acquisition (STA) systems which are preferably linked to the wider ISTAR system,

b. A command, control and information system (C^2IS) which provides a command and control network over the battlefield and enables commanders of Fire Support Systems to act as fire and effect integrators also responsible for operational environment management in all dimensions,

c. Delivery platforms like mortars, guns, rockets and missiles launchers, combat or weaponized/armed unmanned aerial vehicles (UAV),

d. A variety of precision-guided, conventional and non-lethal munitions, including loitering munitions,

e. An ammunition resupply system.

SECTION III - ROLE AND PURPOSE OF LAND-BASED INDIRECT FIRE SYSTEMS

204. The role of land-based IFS is to support the ground manoeuvre forces with indirect fires and its effects as a part of Joint Fire Support (JFS).

The leader of the Joint Fire Support Element (JFSE)[4] at all levels - normally led by artillery personnel - is the Fire Support adviser of the manoeuvre commander and the expert to support manoeuvre forces with all types of fires.

[3] 24/7: Ability to function 24 hours a day and 7 days a week without interruption.
[4] JFSE are described under 402.

He is responsible for the integration, synchronization and coordination of fire support delivered by air, maritime and land effectors, in time, space and purpose, in support of the common land operational objective. It only emphasizes the fact that synchronization of JFS with the supported forces is essential. JFS may thus provide lethal or non-lethal effects in such a way as to have synergistic effects on land operations. Nevertheless, Fire Support Systems provide close and deep fire support, counter battery fire and contributes to the suppression of enemy air defences (SEAD).

205. The **tasks of land-based IFS** are based on the concept of operations and intent of the manoeuvre commander. These are the basis of the combat organization. In detail:

a. Allocation of available Fire Support assets (effectors and sensors).

b. Taking part in the intelligence cycle and STA.

c. Contributing to the Targeting Process.

d. Fire support and effects integration for planning and delivery of fires.

e. Command and Control (C^2) of all allocated Fire Support Systems.

f. Coordinating the Joint Fire Support effects.

g. Liaison and cooperation with other services, branches and combined forces.

h. Execution of combat service support.

i. Force protection.

CHAPTER 3

Command & Control Relationships and Tactical Tasks

SECTION I – INTRODUCTION

301. General. In order to exercise effective C², a commander must be aware of the C² relationships which exist between his unit and the formations and units allocated to him or supporting him for his mission.

SECTION II – COMMAND RELATIONSHIPS

302. Operational Command (OPCOM). The authority granted to a commander to assign missions or tasks to subordinate commanders, to deploy units, to reassign forces, and to retain or delegate operational and/or tactical control as the commander deems necessary.
Note: It does not include responsibility for administration.

303. Tactical Command (TACOM). The authority delegated to a commander to assign tasks to forces under his command for the accomplishment of the mission assigned by higher authority.

SECTION III – CONTROL RELATIONSHIPS

304. Operational Control (OPCON). The authority delegated to a commander to direct forces assigned so that the commander may accomplish specific missions or tasks which are usually limited by function, time, or location; to deploy units concerned, and to retain or assign tactical control of those units. It does not include authority to assign separate employment of components of the units concerned. Neither does it, of itself, include administrative or logistic control.

305. Tactical Control (TACON). The detailed and, usually, local direction and control of movements or manoeuvres necessary to accomplish missions or tasks assigned.

306. Administrative Control (ADCON). Direction or exercise of authority over subordinate or other organizations in respect to administrative matters such as personnel management, supply, services, and other matters not included in the operational missions of the subordinate or other organizations.

307. Coordinating Authority or Direct Liaison Authority (DIRLAUTH). The authority granted to a commander or individual assigned responsibility for coordinating specific functions or activities involving forces of two or more countries or commands, or two or more services or two or more forces of the same service. He has the authority to require consultation between the components involved or their representatives, but does not have the authority to compel agreement. In case of disagreement between the components involved, he should attempt to obtain essential agreement by discussion. In the event he is unable to obtain essential agreement he shall report the matter to the appropriate authority.

SECTION IV – FIRE SUPPORT SYSTEMS TACTICAL TASKS

308. General.

a. Once command relationships are established, the force commander assigns the Fire Support tactical missions. He bases his assignments on the advice of the FSO[5].

b. An assigned Fire Support tactical mission may be one of four standard Fire Support tactical tasks or a nonstandard Fire Support tactical task. The four standard Fire Support tactical tasks are Direct Support (DS), Reinforcing (R), General Support Reinforcing (GSR) and General Support (GS). Non-standard FS tactical tasks are developed when none of these standard tasks sufficiently addresses Fire Support tactical requirements and/or responsibilities.

c. A Fire Support tactical task describes in detail the support responsibilities of a Fire Support unit. The task also clearly defines the relationship of the FS unit with a manoeuvre unit or another Fire Support unit. It does not affect the organizational structure or the command relationships that results from that structure. Each standard Fire Support tactical task contains several inherent responsibilities[6] (see annex C for details).

d. Nonstandard Fire Support tactical tasks usually address changes that are needed in these responsibilities or additional responsibilities not addressed by the standard missions.

309. Direct support (DS).

a. DS is the support provided by a unit not attached to or under the command of the supported unit or formation, but required to give priority to the support required by that unit or formation.[7]

b. The DS mission is used to provide responsive indirect fires to a particular manoeuvre unit and thus primarily concentrates Fire Support needs on that manoeuvre unit. The DS commander is the FSO for the supported manoeuvre force. Fires are planned and coordinated with the manoeuvre unit and the DS commander positions his units where they can best support the scheme of manoeuvre. Because of this, a DS Fire Support unit's planning process and operations are significantly integrated with their counterparts in the supported manoeuvre unit. DS is the most decentralized standard Fire Support tactical task.

310. Reinforcing (R).

a. R is a tactical task in which one Fire Support unit augments the fire of another Fire Support unit.

b. Commanders use the Reinforcing task to add weight (fires) to a specific area or manoeuvre unit by designating one or more Fire Support units to augment the fires of another Fire Support unit. The reinforcing Fire Support unit will generally reinforce a DS Fire Support unit. A reinforcing Fire Support unit can reinforce only one Fire Support unit, but a reinforced battalion can be reinforced by more than one Fire Support unit.

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[5] This normally happens at the Brigade Level or higher.
[6] As e.g. to liaise with, to allocate sensors, to plan fires (complete list in Annex C).
[7] AAP 6 (STANAG 3680).

311. General Support (GS).

a. GS is a support which is given to the supported force as a whole and not to any particular subdivision thereof.

b. A FS unit in GS supports the manoeuvre force as a whole and remains under the immediate control of the applicable JFSE. This task ensures FS is immediately responsive to the needs of the manoeuvre force commander. Like the DS task, the GS task establishes a relationship between an FS unit and a manoeuvre unit. It is the most centralized of the standard FS tactical tasks.

312. General Support Reinforcing (GSR).

a. GSR is a tactical task in which an FS unit fires in support of the force as a whole and, on a secondary basis, provides reinforcing fire for another FS unit.

b. The GSR task requires the FS unit to furnish FS fires for the manoeuvre force as a whole and to reinforce the fires of another FS unit as a second priority. A GSR FS unit remains under the control of the applicable JFSE. The GSR task gives the manoeuvre force commander the flexibility to respond to a variety of tactical situations.

313. FS nonstandard tactical task. If an unusual tactical situation exists, or none of the standard FS tactical tasks accurately convey the manoeuvre commander's guidance for fires, he assigns a nonstandard FS tactical task to the FS unit. A nonstandard FS tactical mission may amplify, limit, or change one or more of the inherent responsibilities (as shown in ANNEX C), or it may spell out contingencies not covered by those responsibilities. If the revision is so complex that the standard FS task is no longer recognizable, a nonstandard mission statement will address each of the inherent responsibilities. Units sometimes use a nonstandard task when there are not sufficient FS to cover all the contingencies or if an FS unit is assigned with more than one functional task. It is also a means by which the commander can tailor his FS assets in anticipation of future operations. A nonstandard task may involve limitations or guidance concerning ammunition, positioning, or other critical factors.

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CHAPTER 4
Joint Fire Support (JFS) Capabilities

SECTION I – INTRODUCTION

401. Aim. The aim of the chapter is to describe the capabilities of all JFS assets by the environments land, air and sea. Alongside the land component's organic fire support capabilities there are fire support assets integral to other components, such as Air Power Contribution to Land Operations (APCLO) and Naval Fire Support (NFS).

SECTION II – JOINT FIRE SUPPORT C2 CAPABILITIES

402. Joint Fire Support Element (JFSE) [8] is the element[9] responsible for the overall planning, coordination and employment of all allocated JFS assets at all levels. It is the single point of contact for JFS coordination at all levels. This element should always be tailored to the mission and to the level of force and reinforced by all necessary liaison cells as required.

The JFSE at the different levels are:

a. Company Joint Fire Support Element (Coy-JFSE)

(1) Coy Fire Support Officer (Coy-FSO)[10]
(2) Forward Observer (FO) Team
(3) Forward Air Controller (FAC)[11]
(4) Other personnel tailored to mission (e.g. spotter)

b. Battalion / Battle Group Joint Fire Support Element (Bn- BG-JFSE)

(1) Bn Fire Support Officer (Bn-FSO)
(2) Other personnel tailored to mission (e.g. personnel to coordinate and/ or deconflict airspace)

c. Brigade (to Corps) Joint Fire Support Element (Bde-, Div- or Corps JFSE)

(1) Direction / Control cell
(2) Artillery Cell
(3) Army Aviation Cell (AHs) (if required)
(4) Air Forces Cell (if required)
(5) Navy Forces Cell (if required) *and*
(6) Airspace Control and/ or Coordination Cell
(7) Other cells tailored to mission (e.g. Air Defence cell or UAV cell)

SECTION III - SURVEILLANCE TARGET ACQUISITION CAPABILITIES

403. FS STA systems are designed to produce target data. They yield basic data and information for fire support as well as contributing to the development of situational

[8] This is a generic phrase not intended to replace any national term.
[9] Because of the experience of the artillery personnel, in the most cases it is artillery led.
[10] In some nations, this function is executed by the forward observer.
[11] The function is similar to Joint Terminal Attack Controller (JTAC).

awareness. FS STA assets will be used for non-FS intelligence collection tasks, but such use must be weighed against the need to acquire FS targets. Sensors not belonging to FS (e.g. sensors of recce unit) could also contribute to the target acquisition process.

FS STA uses ground and air systems.

The following assets are generally provided by FS units to perform these activities:

a. Radar systems for

(1) Target acquisition,
(2) Target engagement in the traditional fire support role or in the Counter Rocket Artillery & Mortar protection (CRAM) concept,
(3) Troop warning in the context of force protection engagement,
(4) Contribution to BDA.

b. Unmanned Aerial Vehicles (UAV's) for surveillance, target acquisition, target engagement and BDA,

c. Acoustic Weapon Location (AWL) Systems.

STA is contributing to and supporting the targeting process. It supports the land targeting cycle (decide, detect, deliver and assess). Acoustic, radar and UAV assets are key elements in developing targeting information in the decide, detect/track and assess phases (as well as the contribution of any persistent surveillance assets in range). STA assets are capable of acquiring and tracking targets cued by other ISTAR systems or as a result of the targeting process. The ability to track/monitor targets at long ranges creates more time before a decision point (DP) is reached. When linked to long-range attack systems, STA assets allow decisive engagements to take place as part of shaping operations. When targets are engaged in depth, there is usually an accompanying effect at lower tactical levels in the close battle, by enabling the lengthening of the friendly decision cycle. The sensor-to-shooter linkage is particularly effective when it is complemented and/or supported by an effects guidance matrix (EGM).

All of these assets are integrated in a system of systems supplementing and overlapping each other, often operating independent of weather conditions and time of day.

404. Enhancing of target acquisition. It becomes more and more important to enhance the target acquisition. This is reasoned by the fact, that the current and probable future missions are more often taking place in an urban/suburban environment and the risk for Troops in Contact (TiC) increases. Therefore precise munitions help to decrease the risk of collateral damages. But to use this kind of ammunition (especially GPS-guided munitions), it is very important to have an exact grid.[12]

SECTION IV - LAND-BASED FIRE SUPPORT CAPABILITIES

405. Land-based FS uses a variety of weapon systems and munitions (guided and unguided) in order to cover the entire battlefield with indirect fire delivering a variety of effects, as determined by the manoeuvre commander. There are three principal types of ground-based indirect fire weapon systems. These are:

a. **Mortars** use self-propelled, towed and man-portable equipment[13]. In general it is integrated in the Indirect Fire System and uses guided as well as unguided munitions.

[12] For more details, especially the different categories see AArtyP-1.
[13] In some nations these assets do not belong to the artillery.

b. **Tube artillery** uses self-propelled and towed gun equipment and is characterized by a high responsiveness, accuracy, and the capability to deliver sustained fire. An extensive selection of munitions, coupled with sophisticated target acquisition assets permit the engagement of both point and area targets and a target effect adjusted to the tactical requirements.

c. **Rocket/Missile artillery** uses guided or unguided munitions to strike point and area targets. Long range munitions enable the engagement of high pay off targets throughout the depth of the battlefield. Furthermore it has the capability to deliver a very heavy weight of fire for a short period.

SECTION V – AIR-BASED FIRE SUPPORT CAPABILITIES

406. Fixed Wing. Airpower contribution to Land Operations of Fixed Wing Assets consists of Air Interdiction (AI) and Close Air Support (CAS).
CAS is an air action against hostile targets which are in close proximity to friendly forces and which requires detailed integration of each air mission with the fire and movement of those forces (AAP-6). The mission must always be supported by a qualified Forward Air Controller (FAC)[14] and is executed in direct support of ground forces, in offensive and defensive operations, to destroy, disrupt, suppress, fix or delay enemy forces where they are in close proximity to friendly forces. This team should be included in the Joint Fire Support Element (JFSE) in order to ease integration of all fire support assets (further details to be found in chapter V).

407. Rotary Wing. The primary missions of rotary wing assets are divided into two types of attack: Interdiction Attack (IA), and Close Combat Attack (CCA) and Rotary wing assets are also able to perform Close Air Support (CAS).
IA is a hasty or deliberate attack, either to divert, disrupt, delay, degrade, or destroy the adversary before they can be used effectively against friendly forces. IA is conducted at such a distance from friendly forces that detailed integration with ground forces is not required.
CCA is a hasty or deliberate attack by providing air-to-ground fires for friendly units engaged in close combat. Due to the close proximity of friendly forces, detailed integration is desirable but not always possible.

408. Combat Unmanned Aerial Vehicle (C UAV)/Weaponized/Armed UAV. C UAV (or Weaponized/Armed UAV) is an armed UAV that can be used in a reconnaissance role and/or combat actions.
The commander can use those assets to fly 24/7 operations throughout the Joint Operation Area (JOA) in direct support of own ground forces, in offensive and defensive operations.

409. All air missions flown in support of the Land Force Commander short of the Fire Support Coordination Line (FSCL)[15] are under control (e.g. positive control/procedural clearance) of the Land Force Commander.

SECTION VI - SEA-BASED FIRE SUPPORT CAPABILITIES

410. Some land operations may be supported by sea-based fire support systems as e.g.

[14] Applies analogously to Joint Terminal Attack Controller (JTAC).
[15] See chapter IV – section 8 for complete definition.

amphibious operations[16] and defence of coastal areas (contribution of the Maritime Component to Joint Operations). The coordination of naval fires happens at every level. Specialized naval fire support coordinators may be used for liaison through the Supporting Arms Coordination Center (SACC). If there is no allocated maritime fire support observer for ground troops, the JFSE has the additional responsibility of observing and controlling Naval Fire Support (NFS) in support of the land component. The NFS procedures and Amphibious Tactics, Techniques & Procedures (TTP) are described in detail respectively in ATP-04 and 08. A maritime fire support group consists of naval combatants assigned to support Land Forces operations ashore by NFS and guided missile support. Due to the multi-role character of many naval combatants, units of an escort/screening group may conduct fire support missions without being formed into a separate fire support group and vice versa. NFS can provide large volumes of immediately available, responsive fire support to Land Combat Forces operating near coastal waters.

SECTION VII - AMMUNITION CAPABILITIES

411. Nations use different munitions for target engagement. Comparable munitions can have a varying effect from lethal to non-lethal. The degree of interchangeability has to be determined in each case and in accordance with AOP-29. Of particular importance are ballistic data, the propelling charge system used and the performance data. The indirect fires munitions are divided into two different categories:

a. **Unguided Munitions**
It follows the ballistic trajectory. Their accuracy is directly attributed to the delivery platform (e.g. Topographical[17], Meteorological and Ballistic data). The ability to guarantee first round fire for effect is depending on the accuracy. The accuracy of the system can be improved through registration fires, calibration or/ and adjustment.

b. **(Precision) Guided Munitions ((P)GM)**
Munitions for which the effect and its point of delivery, in time and space, may be controlled, either internally or externally, after departure from the launch platform. PGM is divided into the following types:

(1) Laser-Guided Projectiles (LGP),
(2) Terminally Homing Projectiles (THP),
(3) Trajectory Correctable Munitions as e.g. Course Correcting Fuzes (CCF) or GPS guided munitions,
(4) Sensor Fuzed (Sub) Munitions,
(5) Loitering munitions[18] (LM),
(6) Video link lock on munitions.

Details concerning this specific topic are given in AArtyP-1 (STANAG 2934).

[16] ATP 08 Vol 2 – TTP for Amphibious operations – An amphibious operation is a military operation launched from the sea by a naval and landing force embarked in ships or craft, with the principal purpose of projecting the landing force ashore tactically into an environment ranging from permissive to hostile.
[17] Topographical accuracy encompasses accuracy at effector level (also known as Gun Location Error [GLE]) and at target level (also known as Target Location Error [TLE]).
[18] Loitering munitions: Munitions able to remain in position over a target area and to be reassigned a target in flight. During the attack phase the target can be aborted with the munition returning to the loitering mode. These munitions can be delivered by a wide range of platforms e.g. rocket launcher, plane or ship.

CHAPTER 5
Effects and Joint Fire Support Planning

SECTION I – INTRODUCTION

501. Aim. The aim of this chapter is to establish the essential elements of JFS planning and guidelines for the coordination of all FS, delivering lethal or non-lethal effects[19]. It must be seen in the scope of the land battle. It implies that the Land Component is supported and the other components are supporting as foreseen in NATO publications.

502. General. This chapter describes the principles and concepts of JFS planning, coordination and execution. JFS planning is the continuous process of analyzing, allocating and scheduling the use of FS assets. Effective JFS planning places the right elements of the different FS systems in the right place at the right time with the required effects and is synchronized with Joint Fires and with the Targeting Cycles. JFS coordination is used to integrate and coordinate land, air, and maritime fires to support the manoeuvre commander's intent and operations plan and is established by JFSE which is normally led by artillery personnel. The purpose of JFS coordination is to allow the maximum exploitation of all available FS assets while diminishing the risk of fratricide and/or collateral damage.
To facilitate this clearance of fire, Fire Support Coordination Measures (FSCM) and Airspace Control Means (ACM) should be used.

SECTION II - PLANNING PROCESS

503. The Land Component Command (LCC) provides planning of operations based on instructions/orders from the Joint Forces Command (JFC) as directed by COM LCC. The outcome of this planning process is implemented in the Concept of Operations (CONOPS), the Operation Plan (OPLAN) or Operations Order (OPORD) in coordination with other Component Commands, including required coordinating instructions. For the future JFS planning process, it is important, that initial guidelines especially for the decision-making authorities are already included, i.e. which level may decide on delivery systems employment dependent on the situation, mission, intensity, available delivery systems and Collateral Damage Estimate (CDE) Level. JFS represents a significant contribution to the manoeuvre commander's combat power. It is essential to have a concept of JFS that is synchronized with and supports the manoeuvre commander's concept of operations. The ultimate purpose of the JFS planning, coordination and synchronization is to optimize the use of all JFS assets delivering lethal or non-lethal effects. Although the concept shall be drafted by the JFS staff, the commander is ultimately responsible for ensuring that the application of JFS is synchronized with the other elements of his force.

SECTION III - CONCEPT OF OPERATION

504. The **JFS planning, coordination, and synchronization** ensures that all available lethal and non-lethal FS assets are employed in accordance with the commander's concept of operations. The JFSE chief at all appropriate levels is the primary staff officer

[19] See ANNEX A for details about effects.

responsible for the development, integration and synchronization of all FS assets into the concept of FS.

505. The concept of operation describes his intent and priorities for the FS. The **JFS plan** should reflect this concept of FS.

a. Intent for Joint Fire Support
The intent for JFS is the manoeuvre commander's declaration of what the FS assets must accomplish.

b. Joint Fire Support Priorities
The commander's guidance prioritizes the targeting effort, and clarifies the expected availability of FS assets for a given operation or period, and how resources should be allocated during the execution of the operation.

c. The commander frequently delegates authority for drafting of the concept of FS and the planning and execution of FS for the operation to the JFSE.

SECTION IV - CONCEPT OF JOINT FIRE SUPPORT

506. After the concept of the operation has been formalized by G3/J3 in cooperation with G2/J2; the JFSE will then finalize the Concept of Joint Fire Support.

507. The Concept of Joint Fire Support (principles)

In order to plan effective employment of FS assets, the FSO will rely on the following principles:

a. Early involvement of all liaison and command elements deployed within the scope of the JFSE (e.g. TACP Air Liaison Officer [ALO]) in order to guarantee integrated and effective planning of non-land organic FS assets,

b. Early and continuous planning (in order to effectively integrate FS with the scheme of manoeuvre),

c. Exploitation of all target acquisition assets (from own, higher and adjacent echelon),

d. Effective employment of FS assets and capabilities (lethal/non-lethal, lowest suitable assets capable of achieving required effects [economy of forces], integration of all restraints),

e. Air, naval and land coordination in order to minimize the risk of fratricide/collateral damage by deconflicting the use of the three dimensional battle space,

f. Rapid and proactive coordination in order to support the battle effectively,

g. Establishing coordinating measures as FSCM (see section 8 for details) or requesting other measures as ACM in order to speed up the target engagement process while safeguarding friendly forces,

h. Flexibility in order to facilitate future operations (e.g. contingency, sequel, branch, on order plan).

508. Concept of Joint Fire Support (contents)

The concept of JFS will encompass the following elements:

a. Allocation of JFSE - Land,

b. Integration of JFSE of other components as mentioned in applicable guidance,

c. Translation of the commander's intent and guidance into fire support tasks[20] for each engaged component (subparagraphs will be provided by the respective specialists integrated in the JFSE),

d. Projected changes to the allocation of FS assets based on approved concept of operations,

e. Coordination and synchronization instructions for the timely detection and attack of high-payoff targets (HPT) in accordance with the Joint Prioritized Target List (JPTL),

f. Setting of the clearance of fire process and definition of the type of fire that are pre-cleared,

g. Applicable Rules of Engagement (RoE),

h. Restrictions on ammunition expenditures, types of fires, areas of employment (in order to mitigate fratricide and/or collateral damages),

i. Meteorological (Met) and survey support guidance and dissemination to mortar units, if applicable,

j. Requirements for positioning of assets, the make-up of basic loads, the controlled supply rate, and required target damage and other applicable Combat Service Support (CSS) aspects,

k. Together with G3/J3, the boundaries, FSCM and any other control measures necessary to ensure coordination,

l. Release Authority.

509. Preparation of Orders

The form of the FS orders will be detailed in AArtyP-1 Artillery procedures document. Drafting must begin as soon as possible. It may be necessary to issue fragmentary orders to start time-critical actions quickly. Most often, this will be to move FS assets and redistribute ammunition.

510. Starting Movement

Movement begins on orders to position the force to execute the mission in accordance with the developing plan. The FSO must ensure the movement of supporting FS units provides continuously available and responsive effects.

SECTION V - JOINT FIRE SUPPORT COORDINATION ARCHITECTURE & ROLE

511. Foreword

a. Coordination is required at all levels of command from company level to Battle Group level. This level of coordination will be carried out by the Joint

[20] The tasks should include a purpose, methods and effects and describes what targeting objectives (e.g. delay, disrupt, limit, harass or destroy), fires must achieve on an adversary capability. The purpose describes why the task contributes to manoeuvre. The method describes how the task will be accomplished by assigning responsibility to observers or units and delivery assets and providing amplifying information or restrictions. Typically the method is described by covering three categories: priority, allocation, and restrictions. Effects quantify successful accomplishment of the task.

Fire Support Element. From Brigade and above, it may be necessary to restructure in order to support the lower Joint Fire Support Elements requirements.

b. It is worthwhile to define some basic terms that will clarify the key role played by JFSE in the integration of effects delivered by multiple FS elements.

(1) Coordination in the 3 dimensions and time
The fire support elements have to comply with applicable ACM in the JOA. If necessary, the land users can request additional measures if required to coordinate the fires and to avoid fratricide.

(2) Fire Support Coordination (FSC)
The planning and executing of fires must ensure that targets are adequately covered by a suitable weapon or group of weapons[21].

(3) Deconfliction of JFS
Coordination of the battlespace (air, sea and land environment) conducted by the JFSE to optimize the use of JFS assets in order to allow safe freedom of movement and delivery of fires and effects.

512. JFS processes. Fire support in the context of JFS follows a dynamic process strictly oriented to a predetermined procedural sequence whose contents might, however, be influenced by numerous factors dependent on the situation and mission. An essential characteristic of JFS is that calls for fire are generated “bottom up” to the command level which may decide on engagement or assign appropriate delivery systems. In this context, responsibilities and target engagement authorities (TEA) must be delegated as required by the situation so that engagement decisions may be taken at the lowest possible command level. The information obligation towards superior command levels remains unaffected.

a. **Process levels.** Calls for JFS affect four levels.

(1) REQUEST-LEVEL
The need for fire support arises at the request-level. This level requests an effect and ensures target surveillance until completion of engagement. Request-levels may include all tactical levels of national and international forces involved in a land operation.

(2) DECISION-MAKING-LEVEL
The respective decision-making-level may draw on forces and assets attached, directed to cooperate or assigned for JFS in the operations area. It checks the legal parameters, assesses and prioritizes calls for fire within conduct of operations, decides on deployment of delivery systems and ensures coordination. Decision-making authorities can be flexibly assigned to the command levels as directed and extend from unit level up to JFC level. The applicable RoE have an impact on the type and scope of fire support and the designation of decision-making authorities. In low intensity stability operations, decisions are generally taken at high levels. In high intensity operations, however, decision-making-levels must be low to ensure minimum JFS response times.

(3) PROVIDER-LEVEL
The provider-level has the responsibility for the tactical employment of the delivery system. Provider-levels are:

(a) For land forces: Artillery battalion, Artillery regiment, Infantry battalion (mortars), army aviation/air mobile task force.

[21] The weapon systems performing the mission could belong to more than one component.

(b) For air forces: Combined Air Operations Center (CAOC), Air Operations Coordination Center (AOCC).
(c) For naval forces: Maritime Component Command (MCC).

(4) EXECUTION-LEVEL
The execution-level has the responsibility for execution of weapons employment in accordance with the decision-making- and provider-level. Execution levels are for example:

(a) Howitzer units/ subunits.
(b) Mortar units/ subunits.
(c) Rocket launcher units/ subunits.
(d) Attack helicopter units/ subunits.
(e) Jet flight sections.
(f) Seagoing units (e.g. frigate), incl. on-board helicopters and airborne naval assets.

b. **JFS Process.** Starting at the request-level, JFS engagement always undergoes a seven-stage process:

(1) IDENTIFICATION
Target identification and target location can be provided by Coy-JFSE, manoeuvre forces (reconnaissance patrol, convoy etc.) special forces, ground-based and airborne ISR and other sensors. In the scope of RoE, targets located by radar and sound-ranging systems may require verification prior to engagement, using ground-based or airborne imaging sensors (eyes on target) to provide surveillance of target environment.

(2) REQUEST
Besides target data, calls for fire against identified targets comprise unanimous effects requirements. Effect requests always comprise evaluation of hazards to friendly and neutral forces and civilians associated with safety distances to be observed. This estimate of the situation is always part of the decision that should have Target Engagement Authority (TEA) IAW the operation order.

(3) PRIORITIZATION
On submission of several target reports, engagement of identified targets must be prioritized by JFSE cell chief IAW the force commander`s requirements and synchronized with the operation, among others with missions from the targeting process.

(4) DECISION
Considering restrictions and RoE, targets must be evaluated at the respective decision-level as part of an integrated approach[22], and confirmed as targets or exempt from engagement, as required. This includes, among others, a legal review and comparison with target lists, Effects Guidance Matrix, Restricted Target List (RTL) and No-Strike-List (NSL). This decision-making process can take valuable time and should consequently be determined from the outset in the major formation SOP. If available, legal advisors (LEGAD) should be involved in the decision-making process from the beginning. Proper assignment of TEA and procedures is crucial for fast decision making IOT to ensure target engagement in a reasonable time.

(5) ASSIGNMENT
The most appropriate delivery system to achieve the desired effect is assigned for target engagement. If no delivery systems/forces are

[22] E.g. Evaluating the impact of weapons employment on other players and uninvolved elements in the operations area, e.g. the local population. This also includes evaluation of the target location accuracy with regard to the use of a planned weapon system.

attached or directed to cooperate, appropriate and available delivery systems/forces should be requested suitable to the level as part of the ordered or standardized reporting system (e.g. via Air Support Request (ASR)). For sea- and airborne delivery systems, assignment is generally the responsibility of the BG-JFSE subsequent to release by the responsible command levels (e.g. MCC, ACC).

(6) EXECUTION
Following the assignment of delivery systems, engagement is provided by direct cooperation of request-level and provider-level (e.g. Coy-JFSE – Fire Direction Centre (FDC) Artillery/Mortar, Aircraft, Ship). The decision-making-level orders establishment of communications and provides possibly required information (e.g. frequencies, call-signs etc.). The JFST establishes early contact with the delivery system and ensures the required information exchange. Target data and safety distances should be updated continuously. Direct cooperation has no impact on the information obligation towards superior coordination levels and supported manoeuvre forces.

(7) ASSESSMENT
Weapons employment and effects are followed by Battle Damage Assessment (BDA) and Re-Attack Recommendation (R/R) if necessary.

513. Joint Fire Support Elements. JFSE is the single point of contact for JFS coordination at all levels. It coordinates national and multinational reconnaissance assets, delivery systems from artillery, infantry (mortars), army aviation, air forces and naval forces/naval air forces contributing to JFS. The required JFS capabilities are integrated at the respective levels in the coordination elements/fire support elements. Major tasks of all JFSE are JFS planning, coordination and implementation as well as provision of advice to the commanders and headquarters. Close coordination of the JFSE with the manoeuvre forces is indispensable for operational success. The JFS personnel must know the supported manoeuvre forces doctrine and the effective RoE. JFSE establish communications with the manoeuvre forces in a timely manner to enable their participation in reconnaissance, operational planning and issuance of orders. There are the following JFSE for the different command levels:

a. **Company Joint Fire Support Element (Coy-JFSE)**

(1) Deployment level: manoeuvre company,

(2) Role:

(a) The Fire Support Officer (FSO) or in some nations the Forward Observer (FO) advises the manoeuvre company commander in all JFS matters, including risk assessment,

(b) Main tasks are target acquisition, location and identification, local airspace deconfliction and control of the fire of all platforms,

(c) Deconflict available FS resources at the lowest level when applicable,

(d) Liaise with applicable command and coordination level,

(e) Command, control and deploy the sub capabilities (e.g. TACP (FAC), FO) after coordination with manoeuvre commander when applicable.

(3) Skills:
Ability to advise a company commander, to call for fires (planned and unplanned) and to control and evaluate FS delivered by air, ground and naval FS assets by integrating all applicable coordination measures at his level.

b. **Battalion/ Battle Group Joint Fire Support Element (Bn/ BG-JFSE)**

(1) Deployment level: manoeuvre battalion or Battle Group (BG),

(2) Role:
- (a) The FSO advises the battalion/BG commander in all JFS matters, including risk assessment,
- (b) Plans, coordinates and prioritizes JFS IAW OPORD,
- (c) Coordinates reconnaissance assets attached/ directed to cooperate and weapon systems employment in time and space in its AOR IAW effective airspace control measures,
- (d) Works on Airspace Coordination and Deconfliction,
- (e) Requests weapon systems as needed,
- (f) Coordinates all deployed Coy-JFSE in its Bn/BG,
- (g) Integrates and coordinates all liaison and command cells provided by supporting elements when applicable,
- (h) Deconflicts and coordinates the employment of all available FS resources at Bn/BG level (e.g. prioritized employment of FS assets),
- (i) Liaise with applicable command and coordination level,
- (j) Request higher level FS reinforcement,
- (k) If necessary, be able to conduct mission analysis and to plan the employment of organic land FS assets and to disseminate JFS order.

(3) Skills:
Ability to integrate fires delivered by air, ground and naval FS assets, able to request and/or command and coordinate the employment of allocated STA assets; ability to elaborate a fire plan and to participate in the targeting loop; ability to apply and request ACM if necessary.

c. **Brigade (to Corps) Joint Fire Support Element (Bde-, Div- or Corps JFSE)**

(1) Deployment level: Brigade to Corps level,

(2) Role:
- (a) The Bde-, Div- or Corps JFSE chief advises the Brigade to Corps commander in all JFS matter, including risk assessment,
- (b) Plans, coordinates and prioritizes JFS in the context of conduct of operations,
- (c) Integrates, commands and coordinates all liaison and command cells provided by supporting elements,
- (d) Deconflicts the employment of all FS resources from air, maritime and land components,
- (e) Ensures liaison with applicable command and coordination levels,
- (f) Requests higher level FS reinforcement,
- (g) Conducts mission analysis, staff estimate and plans the employment of organic land FS assets, integrates all FS reinforcements provided by other components or higher levels,
- (h) Disseminates JFS plan including all FS resources provided by supporting components.

(3) Skills:
Ability to integrate fires delivered by air, ground and naval FS assets; to participate in the elaboration and dissemination of coordination measures applicable for the users of the 2nd and 3rd dimension as e.g. FSCM; ability to conduct current and future operations; ability to cooperate with intelligence cells in order to coordinate and integrate the employment of sensors in the comprehensive approach; ability to employ non-lethal effects in order to guarantee the dissemination of an integrated effects matrix; ability to elaborate fire plan and to participate in the targeting cycle.

514. JFS Command and Control Organization. Consistent with the command and control facility of the brigade or higher the JFSE must be able of shift and echelon operations. Depending on available reconnaissance and delivery systems, the composition of the JFSE can be tailored to the situation. At brigade level or higher, the direction/ control cell is mandatory.

The JFSE is to:

- Be proficient in national and multinational JF/JFS procedures (e.g. indirect fire, Naval Fire Support (NFS), CAS, CCA etc.),
- Know national and multinational doctrine of land-based, airborne and sea-based reconnaissance and delivery systems,
- Know the basic principles of NATO Operations Planning Process (OPP),
- Be able to assess and implement OPORD and FRAGO with regard to JFS as well as consider parameters and results of the targeting process as part of own planning,
- Know, propose, decide, prioritize, manage, provide and implement measures of airspace control/coordination in the area of responsibility of the brigade/ division, including their effects on fire support,
- Coordinate available JFS reconnaissance assets and weapons systems in space and time, taking account of associated operational procedures,
- Estimate the Collateral Damage (CDE) based on the required effects estimate using various platforms,
- Assess, validate and prioritize reconnaissance results and effects requests, task suitable available delivery systems and instruct the subordinate JFSE to cooperate with the fire support weapon systems.

The JFSE chief ensures that the force commander is advised on the possibilities of JFS platforms, including risk assessment, by providing the required input. He suggests and implements appropriate operational measures while taking decision-making restrictions into account. He is responsible for the cooperation of the JFSE with centers and cells of the respective C2 facility and superior/ subordinate JF/JFS elements.

JFS knowledge is represented in the JFSE. Direct interactions among the divisions reduce the time required and ensure effective one source high quality fire support. The instruction and coordination process must be positively acknowledged by all JFSE and implies cooperation with external cells and centers. The possible tasks of the cells including their primary functions can be as follows: **(These tasks are only examples and can differ from headquarter to headquarter)**

Direction / Control cell:

- Overwatch completion of JFSE tasks and units/formations attached/directed to cooperate (e.g. artillery formations, attack helicopters etc.),
- Coordinate cooperation of JFSE cells with external cells and centres as well as with the superior ground forces command level,
- Prioritize and synchronize employment of JFS platforms,
- oversee the status of weapon systems (using an availability matrix when required),
- Maintain the decision matrix,
- maintain a JFSE situational map,
- Ensure information flow to the Operations Centre (TOC/JOC)[23] and military intelligence centre,

[23] TOC: Tactical Operations Center, JOC: Joint Operations Center.

- Coordinate mission planning/ area management with J3 brigade/division, and update parameters from the targeting process.

Artillery Cell:

- Plan and oversee artillery employment and coordinate employment with other JFS weapon systems,
- Advise on employment and risk assessment of ground-based weapons systems,
- Coordinate employment of airborne/ground-based land forces reconnaissance assets attached/ directed to cooperate, including required ACM,
- Provide availability of ground-based platforms status,
- Process requests from the superior formation,
- Assess/forward effects report from ground-based weapon systems,

Air Forces cell (if required):

- Provide and maintain communications with AOCC/(C)AOC[24],
- Call available airborne weapons systems via AOCC/(C)AOC,
- Advise on employment and risk assessment of CAS,
- Plan, request and oversee execution of CAS,
- Assign weapon system for CAS to the respective Coy-JFSE (e.g. JFST),
- Coordinate CAS with additional assets (e.g. for SEAD)[25],
- Request, assign and oversee employment of CAS weapon systems,
- Coordinate CAS using airborne reconnaissance assets and other weapons systems,
- Request necessary changes to Airspace control,
- Assess and forward effects reports and reconnaissance reports from air forces.

Naval (Maritime) Forces cell (if required):

- Establish and maintain communications with MCC[26],
- request available sea-based JFS weapon systems from MCC,
- Advise on employment and risk assessment of JFS sea-based weapon systems,
- Request, assign and oversee employment of sea-based JFS weapon systems,
- Direct sea-based JFS weapon system to cooperate with respective Coy-JFSE,
- Coordinate employment of sea-based JFS weapon systems with other JFS weapon systems,
- Coordinate CAS using airborne reconnaissance assets and other weapons systems,
- Request necessary changes to Airspace control and assign available airspace coordination measures to naval (maritime) forces weapon platforms,
- Forward reconnaissance results from maritime operational forces.

Army Aviation cell (if required):

- Maintain, contact and coordinate the employment of helicopters,
- Check availability of attack helicopters (AH),
- Advise on employment and risk assessment of AH,
- Direct AH to cooperate with the respective Coy-JFSE on CAS, CCA,
- Coordinate employment of AHs with airborne reconnaissance assets, other JFS weapon systems and additional support means (e.g. SEAD),
- Oversee, assess and forward weapon effects report and reconnaissance results,

[24] AOCC: Air Operations Coordination Center, (C)AOC: (Combined) Air Operations Center.
[25] SEAD: Suppression of enemy Air Defence.
[26] MCC: Maritime Component Command.

- Coordinate terrain management requests from airmobile task force logistic resources with the brigade e.g. Forward Operating Base (FOB) or Forward Arming and Refueling Point (FARP).

Airspace control/coordination cell:

- Establish and maintain communications with AOCC/Joint Airspace Coordination Centre (JACC),
- Advise decision-makers, cells and centres on airspace control,
- Provide airspace coordination IAW effective ACO[27],
- Forward ACM[28] activation,
- Incorporate changes to ACO of superior elements (AOCC/JACC),
- Run queries and prepare requests in connection with ACO,
- Forward ACM activation requests/coordination of major formation to AOCC/ JACC,
- Coordinate/ synchronize airspace requests/changes related to airspace control in the assigned airspace,
- Maintain and hold communications with Army/Air Force Air Defence Cell or Air force Defence Centre,
- Possibly implement army air defence relevant measures/parameters or the Air Defence Centre for JFS needs.

515. Interaction with other cells and centres. The JFSE on Bde/Div/Corps-level should be - whenever possible - accommodated in one room. Direction and personal interaction with JFS relevant cells and centres – e.g. Military Intelligence Centre, Operations Centre (TOC/JOC), planning cell – should be ensured on short distances. All involved personnel should contribute to active cooperation and coordination. As for reconnaissance planning and control, airspace coordination and targeting, regular meetings in the framework of the battle rhythm are required for close coordination. The meetings should be attended by a permanent group of participants that might be enlarged depending on the situation. If required, available communication means should be used (e.g. conference lines, VTC, chats etc.).

Tactical Operations Center (TOC)/Joint Operations Center (JOC):

In an effects-based approach, JFS is an integral part of operations and a major contribution to reconnaissance, escalation, de-escalation and shifts of main effort in an operation, both directly ahead of friendly forces and in depth of the battlefield. In over-expanded areas, JFS will frequently be the only instrument of the force commander allowing rapid action and response. As a consequence, close interaction between TOC/JOC and the JFSE is mandatory for a successful conduct of operations. Therefore, the JFSE should be installed close to the TOC/JOC. Whenever possible, information should be exchanged between the commander TOC/JOC and the head (chief) of the JFSE.

Military Intelligence Center/Geo-information Affairs:

Successful fire support is based on close cooperation of reconnaissance means and platforms in an operation. At brigade level or higher, this should be ensured by interaction of Military Intelligence Center/Geo-information Affairs and the JFSE. Cooperation refers mainly to:

- Reconnaissance planning and control,
- Airspace coordination for airborne reconnaissance means,
- Mutual information exchange (e.g. situation reports),
- Assessment of target location, accuracy,

[27] ACO: Airspace Control Order.

- Target reports generated by forces and assets from intelligence collection and reconnaissance.

For JFS, it is important to identify information requirements from Military Intelligence Center (MIC) that cannot be met by JFS coordination elements or assigned reconnaissance means. This is especially true for availability of imaging reconnaissance for target verification or target environment monitoring prior to employment of weapon systems IAW RoE (eyes on target).

Airborne reconnaissance mission planning is of high relevance. The MIC collects airborne reconnaissance systems mission planning and is responsible for coordination, harmonization and submission of the planning data to the JFSE airspace control/ coordination cell. In doing so, planning, updates, changes or requests for airborne reconnaissance system missions should be submitted as early as possible to ensure on time availability. Without approved airspace control, airborne reconnaissance systems will not be employed.

The JFSE transmits assessed and summarized situation information and target reports as contribution to the MICs situational awareness status. The MIC feeds the JFSE with the situation of the major formation and provides geo information data required for JFS.

In the framework of operations, intelligence and reconnaissance forces contribute considerably to target data collection. Reconnaissance results should be assessed in near real time IOT identify information, since target data is time critical information and consequently must have the required quality for integration into the JFS effects-based process without delay at the appropriate level.

Besides assessment of target identification and other framework conditions (e.g. distance to civilian infrastructure or friendly forces), the evaluation of the target location accuracy of the employed reconnaissance means is of particular importance to prevent collateral damage. In this context, the JFSE must know and consider the target acquisition accuracy of all deployed reconnaissance means. Along with possible required target verification by a second reconnaissance system, various target data from the deployed reconnaissance means must be assessed with regard to coordinates to quality and weighed up against each other. As a result, the target coordinates to be selected for engagement should be determined. Within the assessment process, close cooperation with the MIC might become necessary, since this is a matter of proven geo-information quality (Geospatial Intelligence).

Taking into account the available forces, the tactical situation and technical capabilities, methods of cooperation between the MIC and JFSE should be specified in staff operating procedures. These procedures should consider the integration of JFSE into periodic military intelligence reporting as well as methods of cooperation in time-critical target engagement situations.

Liaison Elements:
Using appropriate communication means, the JFSE must have at least the following internal and external links to be employed simultaneously:

- Link to subordinate JFSE,
- Link to centers and cells of the superior level C2 facility,
- Link to Command Posts of weapon systems and reconnaissance means attached or directed to cooperate,
- Link to Joint Fires coordination elements of superior command,
- Link to coordination elements of other Component Commands (CC).

516. Employment of Weapon Systems in JFS Operations. The sections below represent coarsely the sequences and particular characteristics of weapon systems employment to allow the classification or a common understanding of JFS. The related effective manuals, AJP´s, STANAG`s, SOP`s, effective RoE`s etc. are binding for weapons systems employment.

a. Artillery Employment:

Employment of artillery units implies employment of the C2 and weapons control system (if available). It ensures real-time cooperation of all C2, reconnaissance and weapon systems in the integrated artillery system.

Target engagement using artillery weapon systems is generally subject to the following steps:

- A Call for Fire (CFF) is transmitted by a Coy-JFSE to the JFSE on a higher level.
- The JFSE checks suitability of artillery weapon systems taking into account the effective RoE and constraints. If there are constraints, the target report is transmitted to the next higher level.
- If artillery weapon systems can achieve the desired effects request, the target report is forwarded to the artillery formation operations center by the JFSE. If target engagement by artillery is not possible, the JFSE requests or orders suitable weapon systems from the available spectrum.
- Together with the implementation order, the Coy-JFSE receives the order to monitor weapon systems employment. For implementation of specific effects requests (e.g. suppress/ blind), the Coy-JFSE cooperates directly with the weapon system Fire Direction Center.
- The JFSE inform the manoeuvre commander of the provision of fire support.
- Following weapon system employment, the Coy-JFSE provides Battle Damage Assessment (BDA) and transmits an effects report to the JFSE. Engagement is repeated as required.
- Dependent on FSCM and airspace coordination orders, it might be necessary always to inform the JFSE in artillery fire support operations irrespective of the decision levels.

For allied artillery units equipped with interoperable Automatic Data Processing (ADP) systems, cooperation is ensured by the artillery formations ASCA[29] liaison teams. ASCA teams allow automated data exchange between the different C2 and weapons control systems. Cooperation with allies that have no C2 and weapons control system or ASCA is ensured by artillery liaison officers using voice or digital radio in the standardized formats provided under STANAG 2934.

b. Mortar Employment:

This does not include embedded mortars (e.g. light mortars within infantry companies).

Provision of fire support by mortars is mostly based on voice and digital radio.

Target engagement using mortars is generally subject to the following steps:

- A CFF is transmitted by a Coy-JFSE to the JFSE on a higher level.

[29] ASCA: Artillery Systems Cooperation Activities Program.

- The JFSE checks suitability of mortar systems taking into account the effective RoE and decision reservations or constrains. If there are constraints, the target report is transmitted to the next higher level.
- If mortar systems can comply with the effects request, the JFSE transmits a fire mission to the Coy-JFSE when the decision-making level authority is handed over to the formation level in the context of issuance of orders or the RoE allow weapon systems employment for self-defence (Troops in Contact; TIC). The fire command specifies the fire unit, ammunition consumption and method of fire.
- The JFSE are in close contact with the supported units/subunits of the formation and provide information about the planned/ongoing fire support operations. After receipt of the fire command, the Coy-JFSE may check the target location and adjust fire. It selects the appropriate technique of fire for fire support and cooperates directly with the FDC.
- If a target cannot be engaged by mortar due to inadequate range or lack of availability, inadequate effect or precision, the JFSE forwards the target report and requests fire from another appropriate weapon system.
- On completion of engagement, the Coy-JFSE provides (BDA and transmits an effects report to the JFSE. Engagement is repeated as required.
- Dependent on FSCM and airspace coordination orders, it might be necessary always to inform the JFSE in mortar fire support operations irrespective of the decision levels.

c. Air Force Employment

For CAS, employment of fixed wing assets is principally pre-planned. However, they may also be made available or reassigned on short notice and thus unplanned basis in the context of an “Immediate Air Request”.

Pre-Planned Air Request: Within operational planning, JFSE request Pre-Planned CAS. To this end, the Air Support Request (ASR) is submitted to LCC via the respective superior command levels. The superior command levels prioritize or reject the ASR due to operational planning considerations.

From the corps/LCC, the prioritized ASR´s are transmitted via the Battle Field Coordination Element at the CAOC and included in air operations planning in accordance with the set priorities. Air operations are ordered in the ATO. ATO´s specify air operations for a period of 24 hours. For considerations as pre-planned support requests, ASR´s must be submitted to CAOC no later than 72 hours prior to the beginning of the respective ATO day. The sooner and more detailed support requests are planned and submitted using ASR, the higher is the probability that CAS with appropriate weapon systems is assigned by CAOC. It is important that CAS is included in operational planning not only as a reserve, but as a part of OPLAN with desired effects.

Immediate Air Request: Short-term requests for CAS frequently arise in operations. If this happens between 72 hours and 16 hours prior to the beginning of an ATO day, CAOC will try to include ASR in the ATO as a change. In doing this, CAS can still be adjusted with regard to the number of delivery systems and weapons.

For responsive CAS request, AOCC can reassign air assets or request additional aircraft via CAOC. In this case, it is not sure whether the ammunition of reassigned aircraft is suitable for target engagement, since air

interdiction sorties can also be reassigned. Immediate ASRs are submitted via the Tactical Air Request Net (TARN) and can be directly submitted to the AOCC by the request level (Coy-JFSE, air-to-ground), the information being distributed to the intermediate levels.

The JFSE Air Force Cell permanently monitors the radio- data traffic. As long as there are no objections from the JFSE or superior levels, the ASR is considered as approved. This does not release the Coy-JFSE from the obligation to inform the manoeuvre forces and superior JFSE. For more details on Immediate Air Request sequences see ATP-3.3.2.1.

d. Attack Helicopter (AH) Employment:

Employment of AH for JFS follows the basic principles of the respective effective national and NATO regulations.

Principles of AH Employment: Army aviation/ airmobile task force provide support within JFS, using AHs. Depending on the situation, they can be reinforced by airmobile command and control, reconnaissance, SEAD/EW and might require support by ground- or sea-based effectors.

Employment of AHs requires early planning. As a rule, planning takes 72 hours at the LCC level and 48 hours at the brigade level. Extensive preparation times might be reduced by early identification of possible operations areas (time/space) and effects requests like in contingency planning. In doing so, required airspace coordination measures can be initiated and planning factors issued to the airmobile task force. This is supportive for requesting short-term operations.

Employment in Close Combat Attacks (CCA): Direct fire support to land forces under fire (TIC) is based on the CCA procedure. Using a standardized target designation procedure (see ATP-49), fire provided by AHs is directed into the target by using pocket cards (CCA card). The request can be submitted directly at a specific frequency and/ or through the JFSE. Weapons release and effects control are in responsibility of the AH crew commander.

Employment in Interdiction Attacks (IA): Employment in Interdiction Attacks inherits pre-planned employment to provide direct tactical fire support to land forces in their area of interest. As a rule, AHs are directed to cooperate with the manoeuvre forces. Manoeuvre forces effects requests should be identified in terms of time/space during the planning phase and specified more precisely for the individual targets by direct coordination (ground-to-air) during ongoing operations. The respective AH crews are responsible for weapons release and effects.

Employment in Close Air Support (CAS) Operations: Employment of AHs in CAS operations is the pre-planned employment coordinated on site by the FAC to provide direct support to the ground forces. To this end, the Coy-JFSE assigns targets to the AHs. Weapon release and consequently effects control (BDA) are the responsibility of the FAC. For details see AJP 3.3.2.

e. Naval Force Employment:

A precondition for involvement of naval forces in the JFS process is the tie-in of the JFSE Naval Forces Cell with command and control of naval units and formations, using fielded C2 information systems, tactical data links (e.g. Link 16/11B) and/or communications links, including NATO link HFEM (HF-E-mail) in accordance with STANAG 5066.

Planning Process: In the planning process, the JFSE Naval Forces Cell assesses LCC OPORD for navy-specific issues. The focus is on:

- Decision reservations with regard to effectors,
- Fire position areas (Naval Fire Support (NFS) boxes) for naval units,
- Impact of RoE on naval effectors employment,
- Integration of naval reconnaissance means into the integrated intelligence collection and reconnaissance system,
- Impact of employment of naval drones and aircraft including ship-based helicopter-borne missiles on airspace coordination above the AOR.

The fire mission is accomplished in direct cooperation between the Coy-JFSE and the ship. In accordance with ATP-04, NFS is principally provided at my command.

SECTION VI - COORDINATION WITH OTHER COMPONENTS/BRANCHES

517. General. It is mandatory that either lethal or non-lethal effects induced by FS actors or other actors e.g. Electronic Warfare (EW), Psychological Operations (PSYOPS) are integrated in a combined and synchronized effects matrix.

This wide coordination/integration is normally a top-down process but it could be necessary to execute this comprehensive approach at a lower level in order to deal with complex environment and engagement methods.

518. The **cells** with which JFSE have to interact are:

a. **Legal Advisor (LEGAD) and Political Advisor (POLAD)**

(1) LEGAD

The JFSE, when applicable, has to liaise with LEGAD regarding ROE, targeting, and other aspects in order to ensure that any action is carried out in accordance with international laws and the laws of armed conflicts.

(2) POLAD

The main mission of the POLAD is to follow the political situation from a local, national and international perspective and as a result their evolution and possible implication on the conduct of operations. The JFSE, when applicable, must liaise with POLAD cell regarding the campaign`s effects while conducting targeting process or during the staff estimate as well as to be aware of all caveats when employing multinational assets.

b. **Targeting Cell of the higher level headquarters**

The JFSE has to liaise with the higher headquarters' targeting cell if applicable in order to coordinate its own battle rhythm with the higher headquarters' targeting process. It must ensure that all requirements are taken into account by the higher echelon and all the assigned targets have effectors allocated. Liaison is mandatory to permit the continuous refinement of the targeting process and to stay in line with the evolution of the overall operation plan.

c. **ISTAR assets in coordination with the G2/J2**

The JFSE has to liaise with the Intelligence cells in order to have

(1) Updated target array,
(2) Latest Intelligence Preparation of the Battlefield (IPB) products,
(3) Updated adversary Course of Action (COA) and capabilities,
(4) Mandatory inputs for the targeting cell,
(5) Coordinated employment of all collection and dissemination assets,

(6) JFSE employment supporting the Intelligence, Surveillance and Reconnaissance (ISR) assets.

d. **Information Operation (Info Ops)**
Info Ops is a coordinating and integrating function and not a capability, it encompasses capabilities or techniques such as PSYOPS, Information Security (INFOSEC), EW, Computer Network Operations (CNO), and Key Leader Engagement. In order to coordinate, integrate and synchronize his own IO Plan with the overall operational plan and the resulting long and short term effects, the FSO will liaise with the higher or adjacent echelon IO cell.

e. **Civil-Military Cooperation (CIMIC)**
The JFSE should liaise with the CIMIC representative in order to be aware of CIMIC plans and to integrate these into the targeting concept.

f. **Press Information**
The JFSE must liaise with the Public Affair Officer (PAO), owing to the importance of Media on the modern battlefield in order to clarify any situation concerning effects from Indirect Fire Systems (e.g. collateral damages).

g. **Meteorological Support**
Most FS assets require Met support. Fire Support units, Air Force and Army Aviation usually provide their own Met, however, there is some interchangeability. It is the responsibility of the JFSE to coordinate and to position the embedded Met sections, if they belong or are allocated to Fire Support units. Planning and use of the Met section begins with the manoeuvre commander's intent, the guidance of the JFSE, and the battlefield weather conditions if needed. During the planning, full consideration must be given to the commander's concept, mission priorities, tactical situation and security, prevailing winds, location of units supported, future operations, location of other Met sections, and communications facilities. The primary consideration is that the Met station must be located where the sounding of the atmosphere best represents the Met needs of the supported units. Since more and more nations are going to use model data, a Weather Analysis Center (WAC) has to be allocated to the Met station. The format to transport this data is Meteorological Gridded Message (METGM) which is described in STANAG 6022. The format to request and to specify the Met data from a WAC is described in STANAG 4103. Until MET organization assets and FS C2 systems are able to perform with STANAG 6022 format, it is acceptable to perform with METBM (STANAG 4061), METCM (4082) and METTA (STANAG 4140) format.

h. **Engineers**
The JFSE has to liaise with own, adjacent and/or higher engineer cell in order to ensure that Fire Support minefields have been approved by the commander on one hand and coordinated, synchronized and integrated in the engineer obstacle plan on the other hand. The same coordination applies when firing elements are involved in infrastructural damage such as bridge destructions etc. The JFSE must also liaise with appropriate command channels in order to disseminate location information of the minefield for safeguarding own troops and avoiding an unplanned reduction of the freedom of movement. Finally the JFSE must finally be prepared to strike own obstacles in order to deny adversary’s breaching activity or to facilitate the neutralization of an adversary blocked or engaged in it.

SECTION VII– BATTLEFIELD MANAGEMENT AND COORDINATION MEASURES

519. General. Battlefield Management (BM) is the use of means and measures that enable the dynamic synchronization, prioritization and deconfliction of activities across all dimensions of an assigned area of operations within the battlespace. It comprises dimensions of land, sea, air and space, EM spectrum, information and time. BM is an operations function and a broad topic that covers all the three spatial environments: land, sea and air. The interaction of the three environments necessarily gives BM its complexity. The purpose of BM is to maximize freedom of action and minimize constraints for all battlespace users, while managing and reducing the risk of fratricide. Because the FS are key users, authority for the detailed coordination and execution of various aspects of BM will often be delegated by the manoeuvre commander to the Fire Support Adviser within the JFSE. A key fires task, carried out by the Airspace Control and/or Coordination Cell is the coordination and deconfliction of airspace, when ground-troops, surface-to-surface fires, and CAS/CCA are simultaneously prosecuting targets in close proximity to each other. BM is achieved by establishing controls on deployed forces in order to coordinate all aspects of their activities. These consist of boundaries, Fire Support Coordination Measures (FSCM), Airspace Control Means (ACM), Weapon Control Orders (WCO), terrain allocation and other restrictive tools that enhance friendly force safety whilst enabling manoeuvre and maximizing terrain use.

FSCM and ACM are used to coordinate and integrate land, air, and maritime indirect fires to support the manoeuvre commander's intent and operations plan. The purpose of FSCM and ACM is to allow the maximum exploitation of all available FS assets while ensuring the safety of own troops against the effects of own fires.

In the event that fires or the effects of fires are outside the area of responsibility (AOR) or close to the boundaries, permission/coordination by liaison must be obtained prior to execution.

It also implies that when requested to clear fires, the command controlling that zone of operation has a clear responsibility to provide either clearance or denial of clearance to execute those fires.

There are:

a. **Permissive Measures** which have the purpose of facilitating the attack of targets. With the establishment of a permissive measure, no further coordination is required for the engagement of targets affected by the measure. Permissive measures for example include Fire Support Coordination Line (FSCL), Free-Fire Area (FFA) or Coordinated Fire Line (CFL).

b. **Restrictive Measures** which have the purpose of providing safeguards to friendly forces or objects. The establishment of a restrictive measure imposes certain requirements for specific coordination prior to the engagement of those targets affected by the measure. Restrictive measures for example include Restrictive Fire Line (RFL), No-Fire Area (NFA) and the Restricted Fire Area (RFA).

520. Fire Support Coordination Measures (FSCM). In the event that fire or the effect of fires may fall outside the commander`s own battlespace, permission must be obtained prior to its execution. Therefore, when requested to clear fires, the commander controlling that AO has a responsibility to provide either clearance or denial of clearance to execute those fires. All FSCM are established on the authority of the manoeuvre commander and their fire support adviser of the JFSE. Commonly used FSCM are:

a. **Fire Support Coordination Line (FSCL)**
Within an assigned area of operations, a line established by a land or amphibious force commander to denote coordination requirements for fires by other force elements which may affect the commander's current and planned

operations. The FSCL applies to fires of air, ground or sea weapons using any type of ammunition against surface or ground targets. The establishment of the FSCL must be coordinated with the appropriate commanders and supporting elements. Attacks against surface or ground targets short of the fire support coordination line must be conducted under the positive control or procedural clearance of the associated land or amphibious force commander. Unless in exceptional circumstances, commanders of forces attacking targets beyond the FSCL must coordinate with all affected commanders in order to avoid fratricide and to harmonize joint objectives. Note: In the context of this definition the term "surface targets" applies to those in littoral or inland waters within the designated area of operations.

b. **Coordinated Fire Line (CFL)**
The CFL is a line beyond which conventional, indirect, surface fire support means may fire at any time within the boundaries of the establishing headquarters without additional co-ordination.

c. **Free-Fire Area (FFA)**
The FFA is a specific designated area into which any weapon system may fire without additional co-ordination with the establishing headquarters.

d. **No-Fire Area (NFA)**
The NFA is an area into which no fires or the effects of fires are allowed except if temporarily authorized by the establishing authority or if an adversary force within this area engage our forces.

e. **Restricted Fire Area (RFA)**
The RFA is an area in which specific restrictions are imposed and in which fires that exceed those restrictions are not delivered without co-ordination with the establishing headquarters.

f. **Restrictive Fire Line (RFL)**
The RFL is a line established between converging friendly forces (one or both may be moving) that prohibit all fire or effects from fires across the line without coordination with the affected force.

g. **Airspace Coordination Area (ACA)**
A restricted area or route of travel specified for use by friendly aircraft and established for the purpose of preventing friendly aircraft from being fired on by friendly forces.

See Annex B for details and graphic representation.

521. Airspace Control Means (ACM). ACM are a procedural method of defining a specific volume of airspace for a given time and purpose. Fire Support planning identifies those ACM that need to be requested by the Airspace Control and/or Coordination Cell to support ground operations. ACM reserve airspace for specific users, restrict the actions of airspace users and/or require users to accomplish specific actions. They are also used to identify friendly forces and to avoid the risk of being engaged by friendly GBAD. Commonly used ACM are:

a. **Coordination Level (CL)**
Definition: “An altitude or height used to establish airspace control responsibilities primarily to deconflict airspace users.” The CL is an altitude below which Air Force controlled traffic must be coordinated with army aviation through the airspace coordination centre, and above which army controlled air traffic must be coordinated with air force agencies to minimize the disruption of each user`s operations and collisions between fast and slow

traffic. The CL is procedural means to separate fixed- and rotary-wing aircraft by determining an altitude below which fixed-wing aircraft normally will not fly.

b. **High Density Airspace Control Zone (HIDACZ)**
The HIDACZ is airspace of defined dimensions, designated by the Airspace Control Authority, in which there is a concentrated employment of numerous and varied weapons and airspace users. It offers a short-term volume or airspace within which a ground commander can exercise freedom of action for specified users (e.g. for CAS/CCA) A HIDACZ may be permanently established but not activated until specific criteria are met or created for a particular operation or phase of battle.

c. **Restricted Operating Zone (ROZ)**
Definition: “Airspace of defined dimensions, designated by the Airspace Control Authority in response to specific situations and/or requirements within which the operation of one or more airspace users is restricted.” A ROZ is one of the principle ACM used by the fire support advisor when deconflicting fires from air users. It offers a short-term volume of airspace (usually smaller than a HIDACZ), reserved for a single activity, within which the designated commander can exercise complete freedom for the specified activity. A ROZ may permanently be established but not activated until specific criterias are met or created for a particular operation or phase of battle.

d. **Weapon Engagement Zone (WEZ)**
Definition: “In air defence, airspace of defined dimensions within which the responsibility for engagement normally rests with a particular weapon system.”

e. **Base Defence Zone (BDZ)**
A BDZ is a zone established around airbases to enhance the effectiveness of local GBAD systems. BDZ have specific entry/exit and identification friend or foe (IFF) procedures associated with them.

f. **Air Routes (AR)**
AR are bidirectional routes established to direct support traffic aircraft through air defences, providing minimum risk passage. Pre-planned AR are mainly based on the existing route structure operating in the region.

g. **Surface Kill Boxes (SKB)**
When established, the primary purpose of an SKB is to allow air assets to conduct interdiction against surface targets without further coordination with the establishing commander and without terminal attack control. An SKB will normally be established for AI missions. However, this does not restrict CAS missions inside established SKBs if all CAS requirements are met. When used to integrate air-to-surface and surface-to-surface indirect fires, the SKB will have appropriate restrictions. The goal is to reduce the coordination requirements whilst maintaining maximum flexibility and preventing fratricide.

For further details see ATP-3.3.2.1Tactics, Techniques and Procedures for Close Air Support (CAS) and Air Interdiction (AI).

Note: For more details see ATP-3.3.2.1 (STANAG 7144) Tactics, Techniques and Procedures for Close Air Support Operations and AJP 3.3.5 (A) (STANAG 3805) Doctrine for Joint Airspace.

522. Weapon Control Orders (WCO). WCO describe the relative degree of fire control of surface-to-air weapons. The resulting weapon control status (WCS) is the degree of freedom given to that weapon system (air or ground) under any particular WCO, and will vary depending on the tactical situation. The Airspace Control and/or Coordination Cell must have the ability to receive WCO and disseminate WCS for all platforms. The WCO are defined as follows:

a. **Weapons Free**
"Weapons systems may be fired at any target not positively recognized as friendly." This is the least restrictive WCO.

b. **Weapons Tight**
"Weapons systems may be fired only at targets recognized as hostile." Positive identification (PID) can be achieved through a number of means, including visual identification or meeting other designated hostile act criteria supported by track correlation.

c. **Weapons Hold**
"Weapons systems may only be fired in self-defence or in response to a formal order." This is the most restrictive WCO.

523. Deconfliction. There is potential conflict between aircrafts (e.g. when providing CAS) and direct and indirect fires. The JFSE and the AOCC are the primary players in integrating and deconflicting e.g CAS or INTEL. Should further conflictions subsequently arise, FAC and personnel of the JFSE provide final control to ensure a reasonably safe operating space for aircraft to manoeuvre and attack targets. Deconfliction can be executed by formal and informal ACM using time-, lateral-, altitude deconfliction methods. Different types of fires have to be deconflicted IOT ensure safety e.g. for airplanes, helicopters or UAV´s. The most important areas of deconfliction are the following:

a. **Deconfliction of ground-based Fires with Air Force**
When deconflicting fires with air, both trajectory and maximum altitude of the munition must be considered. An appropriate ACM or FSCM will be established to encompass all the airspace required by the weapon system for the specific operation. This does not stop air or aviation from entering the ACM to prosecute targets in support of the manoeuvre commander but ensures that aircrafts within this airspace are controlled. This maximizes the flexibility of the ground commander in using the airspace during the operation, whilst ensuring safety of other air users, including civilian air traffic. The establishment of a ROZ or HIDACZ is the normal, but not the sole, method of fires and air deconfliction.

b. **Deconfliction of ground-based Fires with Aviation**
When deconflicting fires with aviation, ROZs should be established around both the gun or launcher and target, therefore minimizing restrictions and ensuring own force safety. These ACMs should always be pre-planned and nominated for the ACO. It is also possible to impose immediate ROZs for use in TICs and short-notice situations, by clearing airspace through the appropriate chain of command. Once a ROZ is imposed, the initiating ground commander has the controlling authority for that airspace whilst it is activated.

c. **Deconfliction of Surface-to-Surface Missiles**
Missiles cannot be positively controlled for deconfliction and with a small cross section can be difficult to track on radar or visually acquire by other airspace users. Therefore, procedural ACMs are used during planning and will be included on the ACO. Procedural ACMs might include:

- Establishing ROZ above launch, target or holding areas.

- Establishing corridors covering the flight path from the launch area to the target.
- Using time deconfliction by employing the weapon at a time when the area from launch point to target is free of friendly aircraft.

d. **UAS or Loitering Munitions**
The established principles of airspace management used in manned flight operations also apply to UAS or Loitering Munitions. These operations will be covered by the AOC in the Airspace Control Plan (ACP). Pre-planned UAS or Loitering Munitions operations should be included in the ATO to provide safe separation of both manned and unmanned aircraft as well as preventing by friendly forces. Loitering Munitions can come in many forms but they are generally small, non-re-useable platforms that are launched from ground platforms against surface targets. Typically, they fly at 100 – 250 kts with a likely radius of effect of 150 – 300km and loitering time at maximum range of several hours. They can usually be re-directed in flight and may carry a sensor that can provide real-time imagery of the ground to a ground-based controller. However, they are very unlikely to be able to detect and avoid airspace conflictions and, being small and 'disposable', are also very unlikely to carry transponders or any other equipment that could enable their position to be displayed on airspace control systems. Consequently, deconfliction of loitering munitions from other airspace users will inevitably be based on Procedural control methods and the allocation of appropriate ACM. As for other long range weapon systems or UAS, these could involve a ROZ around the launcher position, a transit corridor of some sort to either a target or a holding area, and possibly a further ROZ or HIDACZ covering the target area itself. For pre-planned operations, all details and the ACM required should be published in the ATO/ACO as appropriate, but for responsive use of these munitions, processes and procedures for real-time deconfliction must be developed and established within theatre.

Airspace deconfliction TTPs for CAS operations are covered in detail in ATP-3.3.2.1.

524. Dynamic Procedural. To allow BM to react to the unexpected (including enemy action) procedural measures may be developed in order to enable synchronized and focused actions which will better achieve the required effect. The Dynamic Procedural approach to BM still requires a pre-established architecture based on FSCM/ ACM/WCS etc. but presupposes that these measures can be quickly activated and deactivated. This will enable synchronized activity within the battlespace, with the flexibility quickly to respond to changing circumstances. The volume of battlespace which this method can effectively control is finite, as the larger and busier the volume gets, the less responsive this method of control will be. The use of GMLRS 'walls' is an example of dynamic procedural. A wall can be routinely established, but with sufficient planning time planning (1-24hrs) the trajectory can be calculated to enable aircraft to fly below it. Where a more dynamic response is required (<1hr) a simple 'solid' wall is established; this increases GMLRS freedom of action but can constrain the use of air.

Note: For more details see ATP-3.3.5.1.

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CHAPTER 6
Fire Support in Land Operations

SECTION I – INTRODUCTION

601. General. JFS must always be seen in the context of Land Tactical Operations. Land tactical operations are described in AJP 3.2 “ALLIED JOINT DOCTRINE FOR LAND OPERATIONS”.

The comprehensive approach.
Due to the complexity of the operational environment and the presence of multiple acting entities and agencies, NATO seeks to achieve its objectives through a comprehensive approach that requires effective coordination and cooperation among national governmental departments and agencies, non-governmental organizations (NGOs), international organizations (IOs), and the private sector in any alliance or coalition throughout an entire operation.

Campaign themes.
Predominant campaign themes are combat, security (operations to enable stabilization, including counter-insurgency (COIN), as probably the most demanding variant), peace support operations (PSO) and peace military engagement. In general, their respective position on the spectrum of conflict is reflective of the prevailing levels of violence and therefore will guide the operational design and force structures including the JFS structure. These positions are not fixed to the spectrum of conflict, but are indicators of the overall level and intensity of violence. Commanders at the tactical level will still need to be prepared for violence even at the more peaceful end of the spectrum of conflict. Therefore the commander will also have a need for support by JFS.

Joint approach to operations.
NATO recognizes that military success relies on a joint effort, usually with components and other force elements brought together under a unified command structure and a single campaign plan. Also in the area of fire support, it becomes more and more important to work in a joint and combined environment. Therefore Joint Fire Support is the new approach regarding effective fire support.

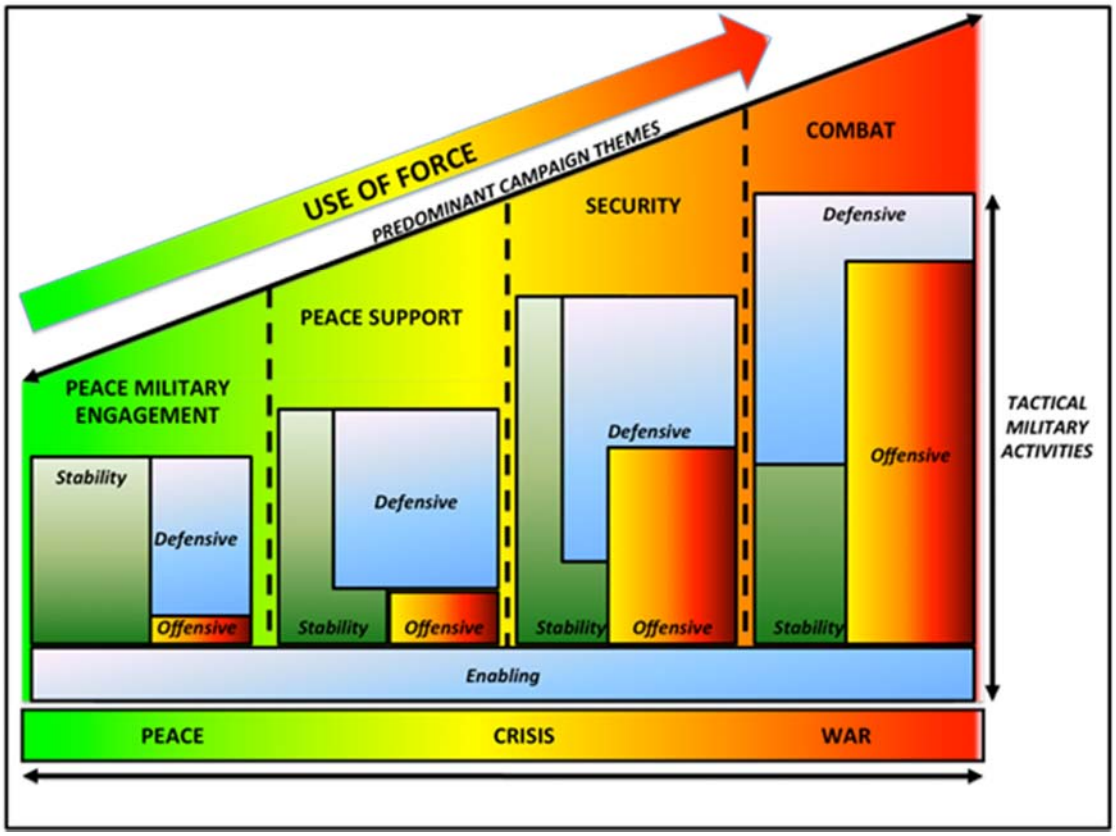

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Figure 6.1 – Predominant Campaign Themes

602. Range of Tactical Activities. Land forces will undertake a wide range of tactical level activities. The tactical activities are divided into the following[30]:

a. **Offensive activities:**
Activities in which forces seek out enemy forces in order to attack them;

b. **Defensive activities:**
Activities that resist enemy offensive activities;

c. **Stability activities:**
Activities that seek to stabilize the situation and reduce the level of violence. They impose security and control over an area while employing military capabilities to restore services and support civilian agencies; and

d. **Enabling activities:**
Tactical activities that link, support, or create the conditions for offensive, defensive and stability activities.

[30] Taken from AJP 3.2 Allied Joint Doctrine for Land Operations Lexicon.

Undertaken within a campaign at the tactical level, all these activities may be conducted simultaneously in the same operation. The balance between types of activities gives a campaign its predominant character. All those activities can take place in special environment (e.g. urban area) or in special circumstances (e.g. arctic conditions).

Land tactical activities are listed in the table below. Tactical activities are tangible undertakings that can be assigned to units and sub-units, usually through specific tactical tasks.

Stability activities involve both coercive and cooperative tasks that include establishing a secure environment to build essential services in conjunction with indigenous groups or NGOs. They may occur before, during and after offensive and defensive activities and may be the main effort of a campaign.

Offensive and defensive activities are physical activities that create effects in the physical and subsequently the psychological domains.

Just as offensive and defensive tactical activities are accomplished through tactical tasks, such as “destroy”, “seize” or “block”, stability activities will be accomplished through a series of tactical tasks, such as vehicle check points, observation posts, framework[31] patrolling, cordon and searches, humanitarian aid, and reconstruction to name but a few.

Each of the four types of tactical activities is accomplished through the assignment of tactical tasks. These are normally the tactical tasks assigned to units and below. An example of the types of tactical tasks (often equating to mission task verbs) that support their respective tactical activities is given in the table below:

TACTICAL LEVEL	OFFENSIVE ACTIVITIES	DEFENSIVE ACTIVITIES	STABILITY ACTIVITIES	ENABLING ACTIVITIES
TACTICAL ACTIVITIES	Attack Raid Ambush Exploitation Pursuit Break-Out Feint Demonstration Reconnaissance in Force	Defence Delay	Security and Control Support to Security Sector Reform (SSR) Initial Restoration of Essential Services Initial Governance Tasks	Reconnaissance Security Advance to Contact Meeting Engagement Link-up Withdrawal Retirement Relief of Troops in Combat and Encircled Forces March Obstacle Breaching & Crossing

Notes:

1. Security and control refers to the establishment of a safe and secure environment, in which other non-military agencies may operate and assist in the operational and strategic objectives.
2. Initial restoration of services and governance tasks will see military forces, at least initially, conducting tasks that (re)build civilian infrastructure and conduct or assist with certain aspects of governance such as provision of health care, rule of law enforcement and humanitarian aid.
3. Enabling activities link or lead to other tactical activities and their effects. For example, an advance to contact leads to an attack (and an eventual effects such as “seize”) and a withdrawal leads from one defence to another defence.
5. Each of the tactical activities are realised through tactical tasks and effects that normally comprise of a mission statement (see text on following pages). Enabling activities will be issued in mission statements in terms of “conduct…”. In order to prosecute them, enabling activities will be broken down into supporting or constituent tasks for subordinates. For example, security will be assigned as a covering force or guard force and supporting tasks assigned. See STANAG 2287 for mission tasks for further details.

Figure 6.2. Tactical Activities and Tactical Tasks (Not all inclusive)

[31] Framework patrolling helps to secure an indigenous area and its population through the presence of a military force. They are normally conducted in an overt fashion.

603. **Four recognized types of Area of operation.**

a. **Contiguous-Linear Battlespace** (e.g. Gulf War – Cold War)

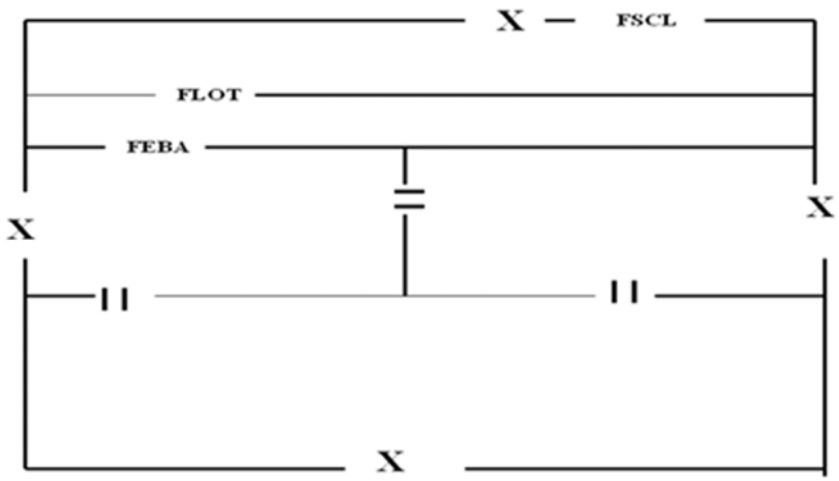

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Figure 6.3. Contiguos-Linear Battlespace

b. **Contiguous-Non-Linear Battlespace** (e.g. Bosnia)

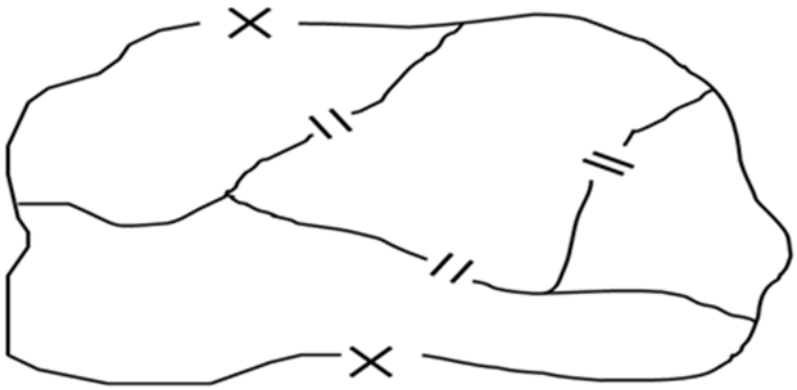

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Figure 6.4. Contiguos-Non-Linear Battlespace

c. **Non-Contiguous-Linear Battlespace**

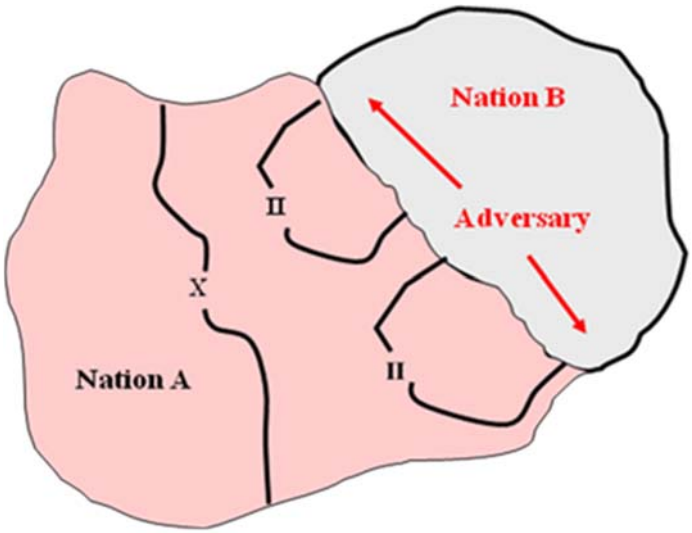

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Figure 6.5. Non-Contiguos-Linear Battlespace

d. **Non-Contiguous-Non-Linear Battlespace**

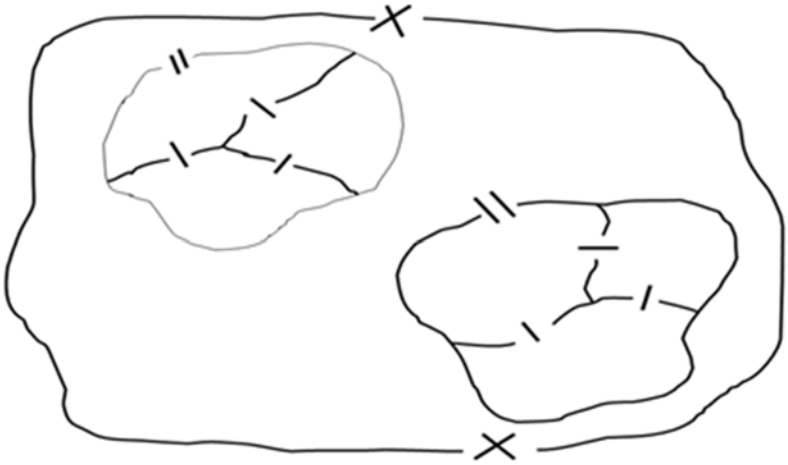

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Figure 6.6. Non-Contiguos-Non-Linear Battlespace

SECTION II - FIRE SUPPORT IN LAND TACTICAL ACTIVITIES

604. Foreword.

a. All details of the below mentioned tactical activities can be read in ATP-3.2.1.

b. All the tasks depicted in the paragraphs below will always, when applicable, cover all the indirect fires (lethal or non-lethal) delivered by all available JFS platforms and sensors participating to the overall joint campaign.

c. The JFS sensors will always play a key role in some core functions as contribution to the creation of the Common Operational Picture (COP) and BDA.

d. All applicable FSCM and ACM must be timely defined/requested/ disseminated by all levels to allow speed for operations and to minimize risks of fratricide while not jeopardizing the joint campaign.

e. The complex operational environment nowadays demands from the sensors and delivery platforms next to traditional area effect, the capability of high precision delivery as well as the capability to deliver fire close to own troop with the need to define risk estimate distances.

f. The need for accuracy emphasizes the operational requirement to master all internal and external factors influencing on the ballistics (e.g. Met, target and gun grid location).

605. Operational Framework.

a. The Operational Framework provides a means of visualizing operations and aids coordination. It is most commonly used in the formulation and description of courses of action, and hence concepts of operations. The framework is used to describe how the missions of subordinate formations relate to each other by time, space, function, purpose and geography. It should primarily be viewed in terms of the purpose of the forces involved: what is considered will be decisive, and how other actions relate to that act by shaping conditions or sustaining the force. This is the purposive framework, which should be used for most operations. In some circumstances it may be simpler or clearer to describe operations primarily by their location in relation to the main force. This uses the geographic description of deep, close and rear operations. In straightforward operations, typically at lower tactical levels, operations may be described simply in terms of the Core Functions.

b. Since the Operational Framework aids the commander in his description of missions to his subordinates, the particular framework used by one commander is not necessarily linked directly to that of another. An operation which is decisive in the execution of one commander’s mission might, for example, be a shaping task within his commander’s concept of operations. What is important is that each commander can visualize and clearly describe the actions he requires on the battlefield, in the way that he anticipates them unfolding in time, space and desired effect. That is the function of the Operational Framework.

606. Offensive Activities.

a. **General.**

In an attack, JFS assets may be required to deliver preparatory, covering and defensive fires. These tasks will occur in the close, rear and deep area of operations and may include

(1) Provide information from FS ISTAR assets as part of the intelligence collection plan and the targeting process.
(2) Conduct deception fires to confuse the adversary forces as to the location of the objectives,
(3) Conduct intense and concentrated preparatory indirect fires with available JFSE before and during the initial stages of the attack.
(4) Conduct suppressive fires to isolate the objective of the main attack and to help fixing adversary forces during supporting attacks.
(5) Provide suppression fires IOT allow attacking formations to close with the adversary forces.
(6) Conduct Suppression of Enemy Air Defence (SEAD) missions, some of which are appropriate for non-lethal attack assets.
(7) Provide counter-battery fire to diminish or stop the adversary forces' ability to effectively employ FS.
(8) Execute deep supporting fire in concert with other assets.
(9) Deny, through e.g. electronic attack or lethal fires, adversary use of critical C^2, FS, intelligence systems or any other critical assets/facilities.
(10) Provide destructive fires.
(11) Conduct missions in support of the deception plan.

b. **Attack.**

(1) Preparation fire is delivered to prepare a target for an assault. It is an intense volume of fire, normally delivered on a time schedule.
(2) Suppression by direct and indirect fires, electronic attack or smoke on adversary personnel, weapons, or equipment prevents effective fire on friendly forces. Suppression fires help to isolate the objective of the main attack and help to fix adversary forces during supporting attacks. Suppression allows manoeuvre forces to close with the adversary forces and destroy him with organic direct fire.
(3) Blocking fires isolate the main objective and fix other forces in the main defensive belt for the supporting attacks. Scatterable Mines (SCATMIN) may be used[32] if necessary; but minefield locations must be coordinated and disseminated to all units.
(4) Obscuration and screening fires obscure manoeuvre forces from direct adversary observation. This may be achieved by using smoke and/or jamming.
(5) Illumination fires may be used to support manoeuvre forces throughout the battlefield. Possible applications and control of illumination fire are detailed in AArtyP-1.
(6) SEAD is critical for all operations involving air assets. Air, armed and attack helicopter operations in support of combat operations require SEAD fires against the many antiaircraft systems that may accompany the adversary force's forward elements. SEAD fires may be developed into a program of fires supporting friendly air operations, Joint Air Attack Team (JAAT) operations, and support to air corridors. Electronic attack assets that jam Air Defence (AD) radar systems may execute SEAD. Locating adversary AD weapons and facilities is critical to effective

[32] In accordance with applicable international or national laws or conventions regulating the conduct of armed conflicts.

SEAD. Electronic Warfare Support Measures (ESM) and other target acquisition sources should be used to detect and track all relevant SEAD targets. ACM and Phase Line (PL) may be used to coordinate SEAD efforts.

(7) Deception fires are normally required to support deception operations.

(8) Counter battery fire is normally aimed against specific adversary JFS functions. The destruction, neutralization, and suppression of adversary JFS systems should:

(a) Prevent the adversary forces from disrupting our attack formations with counter-preparation fire, thus ensuring our freedom of manoeuvre.

(b) Prevent the adversary forces' ability to provide effective counter battery fire which would degrade friendly FS.

(c) Eliminate or reduce the adversary's FS capability to mass indirect fires. Counter battery fire need not be limited to FS. However, air support, electronic attack, attack helicopters, and NFS, if available, may be used.

(9) Deep supporting fire. The targeting for deep attack in support of the commander's concept of operations and scheme of manoeuvre must focus on the adversary's capability to shift resources to defend, reinforce his positions, or counterattack. These fires help block adversary movement of reserves, destroy his Command, Control and Communication (C3) facilities, and prevent the escape of retreating elements.

c. **Raid & Ambush.**

Taking into account the available timeframe, the range of the operating area and the way the force will be projected:

(1) JFS platforms may support those activities by delivering long distance precision fires (e.g. GMLRS) or deploying some FS assets in direct support of the combat units.

(2) JFS sensors will also be involved in the preparation (target acquisition or intelligence collection). The JFS sensors will maintain constant surveillance of the raid objective in order to ensure the adversary situation remains unchanged and within the capabilities of the raiding forces and will afterwards participate in the BDA process.

d. **Pursuit.**

The tasks are almost the same as the one defined in subparagraph “attack” but some considerations have to be highlighted:

(1) Fires and ISTAR may be directed in depth and also to the flanks and rear.

(2) Fires should be massed on adversary choke points and key terrain to canalize, slow, and block the adversary movement.

(3) Suppression fires should be used to fix bypassed adversary pockets of resistance until friendly manoeuvre elements are safely past and follow-on forces can deal with them.

(4) Special attention must be given while delivering fires (especially with high dud rate or mines sub munitions) in order to avoid the creation of “undesired” obstacles and barriers to our own forces.

(5) JFS assets should be positioned well forward and displaced continually.

(6) Some available air assets (e.g. fixed or rotary wing) should be on ground alert.

(7) FSC should be completed early. On-order measures should be used to facilitate rapid emplacement and movement of assets. Consideration

should be given to placing RFLs between the leading force elements and the remainder.

(8) Sustainment of the force is primarily an exercise in the movement of assets. The ability of the CSS structure to move forward with fuel, ammunition, and maintenance support determines the limits of advance for the force and JFS elements.

(9) Aerial resupply for units in exploitation is a planning option for consideration to sustain the operation.

e. **Exploitation.**

The tasks are almost the same as the one defined in subparagraph "exploitation" but some considerations have to be highlighted:

(1) Integrated and coordinated use of available ISTAR assets.

(2) Responsive FS for both encircling and direct pressure forces.

(3) Provide fires to slow the adversary's retreat and to allow the enveloping force to catch up (If SCATMIN[33] is used to slow the retreat, ensure safety zones are properly disseminated).

(4) Provide fires to stop reinforcements.

(5) Use smoke to slow and disrupt the retreat.

(6) Use hasty planning and engagement procedures to increase responsiveness.

(7) Provide fires to fix bypassed forces until follow on elements can engage. Consider appropriate FSCM around bypassed pockets of resistance.

(8) Use air assets for flexible man-in-the-loop terminal control and immediate BDA.

(9) Plan RFL(s) when necessary between the converging enveloping and direct pressure force.

(10) Plan for increased petroleum, oil and lubricants (POL) and ammunition usage (use adversary resources when possible).

(11) Air transportation of supplies may be required.

(12) Engage C^2 elements with lethal and non-lethal means in order to defeat the adversary will to reorganize.

f. **Break-out.**

(1) If land FS platforms are included within the encircled forces, they should support the assault element in its attempt to break out and then participate to the security of the perimeter.

(2) JFS platforms from outside should support the break-out operations by delivering high precision fires and the subsequent link-up with friendly forces.

(3) Available ISTAR assets will help the encircled commander, when possible, and the commander from outside in the elaboration of real time COP and target acquisition.

(4) Special considerations must be given while delivering JFS with the troops in contact (e.g. danger close procedure for FS).

[33] See footnote 20.

g. **Deception and demonstration.**
JFS platforms assist the commanders deception and demonstration operations by providing deception or deterrence fires, false Communication and Information System (CIS) transmissions and movement in support of a ruse, deception or demonstration giving a false impression of the commander`s intent.

h. **Reconnaissance in force.**
(1) JFS sensors will contribute to the accomplishment of the reconnaissance in force by participating in the elaboration of the COP.
(2) JFS platforms must also be prepared to deliver lethal or non-lethal fires when the reconnaissance elements engage the adversary forces in order to seize an opportunity or when they are engaged by those forces.

607. Defensive Activities.

a. **General.**
The JFS plan for defensive operations should make provision for the following:
(1) A security operation forward and to the flanks of the main defence area (MDA), such as a covering force action.
(2) A continuous deep operation against specific targets and/or organizations within boundaries.
(3) The main defensive battle is the decisive engagement and is fought in the MDA. It may be conducted as mobile defence or area defence, or both in concert.
(4) Reserve operations in support of the MDA.
(5) Rear operations to ensure continuity of support.
(6) A transition to offensive operations.

b. **defence.**
The tasks of JFS assets and sensors are:
(1) Deliver fires during all phases of the defence in support of troops in contact (TIC).
(2) Attack adversary forces in depth before they can be committed to the main battle.
(3) Support the covering force.
(4) Disrupt adversary preparations for attack by engaging its critical elements.
(5) Separate attacking adversary tanks from dismounted infantry.
(6) Engage adversary artillery and forward air defence elements.
(7) Cover barriers, gaps and open areas.
(8) Neutralize or isolate adversary forces that have penetrated the defensive area.
(9) Impede the movement of adversary reserves.
(10) Support counter-attacking forces.
(11) Assist in battlefield surveillance and target acquisition with a focus on the HPT's.
(12) Use SCATMIN[34] to block adversary approach routes.
(13) Defend own gun positions by direct fire.

c. **Delay**
The tasks of JFS assets and sensors are:
(1) Provide deep supporting and counter battery fire to attack adversary forces at maximum range,

[34] See footnote 20.

(2) Support battle positions and strong points,
(3) Support limited counterattacks,
(4) Cover or create obstacles, barriers, gaps, and flanks with fires and SCATMIN,
(5) Organize and position JFS platforms in order to provide uninterrupted FS throughout the delaying operation,
(6) Cover and screen withdrawals of own troops,
(7) Provide immediate and accurate support in order to fix the adversary leading elements,
(8) Mass fires to slow down the adversary as he deploys to concentrate for attack of our delay positions,
(9) Use air assets to help friendly forces disengage and slow advancing adversary forces, particularly to provide opportunities to reposition FS assets.

608. Stability Activities.

a. **General.**

(1) Main challenges are the asymmetric threats and continuous shifts in the level of violence or intensity of operations present in the Area of Operations (AOO) that require a force with a highly versatile structure. The JFS elements are also facing huge AOO that is often non-linear, non-contiguous. As a result, it demands that the commander allocates scarce assets at a very low level providing DS whilst also retaining the capability to carry out deep fires in order to shape the AOO.
(2) JFS assets assist commanders in carefully balancing deterrent force with combat power to accomplish the stability operation or the support operation and to protect the force.
(3) The main challenge for JFS assets while delivering lethal effects in stability operations is to minimize collateral damage in order not to jeopardize the long term objective of this kind of operation.
As a result it stresses the importance of a real time and high precision target acquisition process in order to match the requisite, as the need to further develop new munitions with scalable warheads for example.
(4) Precision munitions provide the commander with an important capability. There is often a need for high precision delivery in order to neutralize pinpoint target close to “neutral” parties or close to own troops in difficult environment (e.g. urban).
(5) Non-lethal capabilities extend the range of firepower options and are particularly valuable in both stability operations and support operations as they enhance the ability to apply force in proportion to the threat and allow discrimination in its use. They expand the number of options available to confront situations that do not warrant using deadly force but require soldiers to use overwhelming, decisive power to accomplish their missions. Many capabilities exist that create non-lethal effects on personnel or materiel as e.g. irritating, non-penetrating projectiles, high-pressure water devices, smoke, and obscurants.
(6) JFS assets can also provide deterrent effects e.g. illumination for demonstrating deterrent capability, for observing congested areas, for supporting friendly base security, or in support of patrolling manoeuvre forces.
(7) The high decentralization of JFS assets and sensors may require dispersed deployments in insecure environments which may need force protection.

b. **Security and control.**
The tasks are:
With the JFS Sensors:
(1) Participate to the global monitoring, control, guarding and surveillance of the AOO.
(2) Contribute to the elaboration of the COP in order to assess how the involved parties respect e.g. buffer, neutral or protected areas.
(3) Be prepared to engage critical targets in order to show the force or support combat actions.
(4) Participate to some specific operations e.g. search, convoy in order to be able to conduct fires when necessary.
(5) Participate in base protection by deploying a warning and counterstrike capability when necessary.

With the JFS Platforms:
(1) Support the manoeuvre units with lethal or non-lethal fires while attempting to separate hostile forces or to enforce restricted areas.
(2) Demonstrate a show of force in e.g. crowd control operations, violation of resolution.
(3) Deliver warning shots in case of violence escalation in the AOO to demonstrate the resolve of own troops.
(4) Participate in base protection with lethal or non-lethal capabilities.
(5) To be the main lethal or non-lethal reserve force for a large set of operations.
(6) Provide JFS to manoeuvre units while executing cordon, search, road block, patrol or convoy operations.

c. **Support to security sector reform.**
The tasks of JFS assets and sensors are.
(1) Act as a mentoring team in order to assist the training of regular armed forces.
(2) To secure highly critical sites (e.g. disarmament sites).
(3) To participate in base protection.
(4) With JFS sensors monitor the disarmament operations, disbanding of irregular forces as all the movement of demobilized or displaced persons.

d. **Initial restoration of services and initial governance tasks.**
Not applicable except if FS units are re-roled in a non-core function.

609. Enabling Activities.

a. **Reconnaissance.**
The JFS elements will contribute to this operation by gaining information and providing it to the relevant staff elements.

b. **Security.**
(1) The JFS sensors will provide early and accurate warning of adversary dispositions and activities.
(2) The screen forces could be reinforced by JFS Sensors in order to gather intelligence and contribute to the target acquisition process.
(3) Some JFS elements could be part of the guard force in order to contribute to the attrition and the striking of adversary elements.
(4) In function of the combat power needed for the covering force, some JFSE could allocate in order to contribute to the successful execution of the mission.

Considering JFSE are scarce, the commander must only allocate assets if the potential gain outweighs the potential risk of loss.

c. **Advance to contact.**

(1) JFS sensors will contribute to situational awareness, assist with the identification of targets on known or suspected adversary locations, danger areas, and support future operations as well as reserves and logistics sites,

(2) Some JFSE could be prepositioned in the scope of the covering force and/or advance guard in order to be prepared to deliver lethal fires when necessary and to significantly increase the firepower of those elements. Due to the tempo, the elements will not be deployed but ready to react on very short notice,

(3) JFS platforms could execute deep fires in order to disrupt adversary communications and logistic units or possibly to help the seizing of crossing site, in particular, a bridge or defile,

(4) JFSE could participate in the monitoring and protection of the flank in support of the flank guard.

d. **Meeting engagement.**

Due to the fact that a meeting engagement is an unintended action, it is worthwhile to point out that the bottom up approach for JFS will guarantee maximum success by encouraging initiative at the lowest tactical level, reacting with a shortened staff estimate and available timing. A meeting engagement is also an ideal situation in which to make use of SCATMIN[35] to restrict the adversary's freedom of manoeuvre.

e. **Link-Up.**

Detailed coordination is necessary before any JFS engagement due to the presence of friendly converging troops. The emphasis will be on the establishment of FSCM and ACM as well as the use of high precision indirect fires in order to mitigate the risk of fratricide.

f. **Withdrawal.**

To support the withdrawal, a maximum number of JFSE should be positioned in order to monitor and deliver fires on the AOO to keep the interference of adversary operations on own troops to the minimum. Specific attention should be given to monitor the movement of adversary troops in order to intervene if a by passing manoeuvre is detected.

In this specific situation, we will position Coy-JFSE (FOs) to overwatch friendly movement.

g. **Retirement.**

During a retirement operation the force is out of contact but should be able to react responsively in case of unexpected trouble. A part of JFSE and FS should be positioned in a way that they can monitor and deliver fires on the AOO.

Specific attention should be given to monitor and detect any unattended movement of adversary troops in order to promptly intervene when necessary.

h. **Relief of troop in combat.**

(1) **General.**

(a) Special considerations will be given to global coordination and the handover of all collected intelligence and targets,

[35] See footnote 20.

(b) Special attention must also be given for command hand over of the JFSE between supported and supporting forces,

(c) JFS Commanders must ensure a smooth exchange of standing operating procedures in order to mitigate the risk of misunderstanding,

(d) A coordinated and synchronized employment plan of the JFS sensors has to be set up in order to provide an accurate and complete COP during the relief operation.

(2) **Forward passage of lines.**
The JFSE has to deploy as early as possible on their initial combat positions close to the line of passage without interfering with manoeuvre units in order to participate in the handover. All the FS elements will closely cooperate and coordinate with their in place elements in order to ensure smooth and efficient support during the operation.

(3) **Rearward passage of lines.**
The supporting JFSE should deploy in order to provide supported forces with the maximum of support during the rearward passage of lines. The main challenge for the JFS planners is to minimize the risk of a disrupted FS while the supported JFSE are moving rearward in order to redeploy beyond the relief line and without interfering the withdrawal of relieved manoeuvre units.

(4) **Relief in place.**
The relieving JFSE will be deployed as soon as possible but before the relief in place begins. The combat positions will be coordinated by the relieved commanders. The relieved JFSE will withdraw after the relief of the troop in combat is complete.

(5) **Encircled forces.**
The challenge for this operation is to mitigate the risk of fratricide for converging forces by an increased coordination and employment of precision munitions. As a consequence a key role will be played by all the JFS sensors to update permanently the COP and to acquire possible targets with small target location error.

i. **March.**
In this kind of operation, the main effort will be to monitor the route in order to update the COP and especially identified choke points as e.g. mountain pass, or assessed dangerous area such as the crossing of urban area. Consideration must be given to plan deployment areas alongside the route in order to react responsively with shortened preparation time if the head, flank or rear elements encounter unattended adversary elements.

j. **Obstacle breaching and crossing.**

(1) **General.**
Special considerations will be given to the overall coordination problems in this particularly crowded area of operations as well as the collection of accurate intelligence concerning adversary combat position or crossing site location. The identification of HPT e.g. JFS assets or C² facilities will represent one of the focal point of the targeteer.

(2) **Support force.**
The JFSE will be involved in the establishment of an updated COP as well as the preparation and the dissemination of target plans. The main effort will be to fix the adversary defending positions, to participate in the deception plan and to obscure (eventually irritate) when necessary the crossing area in order to hamper the conduct of the adversary defence activities while enabling the breaching one. The JFS platforms positions

will allow them to support the whole crossing operations as well as the initial phase of the assault operations to avoid any disrupted fire support.

(3) **Breaching force.**
Some JFS sensors and eventually platforms will be embedded in this force in order to be able to conduct all opportunity fires as required in this close combat action.

(4) **Assault forces.**
JFSE will be integrated in the assault force, so they can occupy the first combat position after the crossing site allowing the rest of the JFSE to cross under the protection of a consistent FS umbrella.

610. Specific environments and tactical challenges.

a. **Limited visibility.**

(1) **General Description.**
Conditions of reduced visibility induced by night, bad weather (e.g. fog, heavy rain, dust) or terrain characteristics (see specific environment description for further details).

(2) **Environmental Consequences for Joint Fire Support.**
In limited visibility conditions, JFS employment could be hampered by limited observation/conduction of fire capability.

(3) **Fire Support Considerations.**
Night vision capability of JFS assets
(a) for movement,
(b) for employment,
(c) for conducting and assessing the fires,
(d) for resupply,
has to be considered.

b. **Wood and forest.**

(1) **General description.**
The term ‘wood and forest’ will be used to describe expanses of terrain which are completely covered by trees or where the majority of the area is wooded and where vehicle movement is largely restricted to roads, clearings and fire breaks, necessitating different tactics to those employed in more open terrain.

(2) **Environmental Consequences for Joint Fire Support.**
In wood/forest environment, JFS employment could be hampered by:
(a) Reduced tactical mobility.
(b) Difficult positioning of JFS assets and force protection difficulties due to concealment possibilities.
(c) Need for support to very small scale and dispersed manoeuvre units.
(d) Ballistics problems (e.g. high angle, crest clearance, limited munitions capability).
(e) An increased difficulty to locate target and/or to conduct fire due terrain features, poor visibility, echoes.
(f) Increased risk of CIS and Global Positioning System (GPS) affiliation problems.

(3) **Fire Support Considerations.**
In order to resolve those challenges, recommendations are:
(a) The employment of highly mobile JFS assets.
(b) Planning of firing and observation positions integrating limitations of material resources.
(c) Considering. deployment of JFS assets from individually to multiple assets positions,

(d) Highlighting employment limitations (e.g. reduced capability for airburst munitions, premature detonation due to thickness canopy, sensors limitations).
(e) Considering increasing the number of observers, improving general visibility, general situation awareness and observation of fall of shot. This will enable redundancy and a possible reduction of fratricide.
(f) Deploying relay, directional antennas.

c. **Built up/Urban area.**

(1) **General Description.**

The collective term built-up areas refer to towns, villages, hamlets, industrial areas and the associated infrastructure. The extent of their influence on operations depends on structure, density and size. Built-up areas are normally at road intersections and often form political, cultural and industrial concentrations. Furthermore, the largest part of the population usually lives in built-up areas.

(2) **Environmental Consequences for Joint Fire Support.**

In urban environment, JFS employment could be hampered by:
(a) Reduced tactical mobility.
(b) Difficult positioning of JFS assets and force protection difficulties due to concealment possibilities.
(c) Need for support very small scale and dispersed manoeuvre units.
(d) Ballistics issues (e.g. high angle, crest clearance, need for highly technological munitions).
(e) An increased difficulty to locate target and/or to conduct fire due terrain features, poor visibility, echoes.
(f) Increased risk of CIS and GPS affiliation problems.
(g) Presence of non-combatants or protected persons.
(h) Presence of protected sites or Toxical and/or Industrial and Material sites.

To conclude, we have to mention that there will be an increased number of time sensitive targets.

(3) **Fire Support Considerations.**

In order to resolve those challenges, recommendations are:
(a) The employment of highly mobile JFS assets for inside positioning and heavy JFS assets for outside positioning.
(b) Planning of firing and observation positions integrating limitations of material resources as well as difficulties induced by terrain characteristics such as limited cartography, poor visibility, echoes. The use of blue force tracking system.
(c) Considering deployment of JFS assets from individually to multiple assets positions.
(d) Highlighting employment limitations (e.g. increased of delay fuze, premature detonation of proximity, increased use of PGM, increased need for scalable munitions, sensors limitations).
(e) Considering increasing the number of observers, improving general visibility, general situation awareness and observation of fall of shot. This will enable redundancy and a possible reduction of fratricide. This very complex operational environment demands an accurate target acquisition process which requires a wide range of sensors (e.g. FO/FAC, Mini UAV, robots) in order to cross check the collected data. Special attention must be given to grid location and coordination.
(f) Deploying relay, directional antennas.

(g) Increasing information campaign and employing loitering munitions in order to mitigate collateral damage.
(h) Disseminating proper FSCM and ACM in order to decrease risk of unattended effects on protected or dangerous sites.
(i) The decision cycle (locating – assessing [ROE-clearance of fire-LOAC]- striking) must be shortened in order to seize any fleeting opportunities to strike time sensitive targets.

d. **Cold weather and arctic conditions.**

(1) **General description.**

Cold weather operations involve unique weather and climate considerations. Summer has long periods of daylight; while winter has long nights, deep snow, and extreme cold. Spring thaws turn low-lying areas into a morass of mud, which severely degrades surface mobility. Weather phenomena such as whiteouts and greyouts cause loss of depth perception, which increases the hazards of driving. Ice fogs often form over troop concentrations and disclose their location. The adversary force is equally affected by these extreme conditions of subzero weather and snow.

(2) **Environmental Consequences for Joint Fire Support.**

In cold weather/arctic conditions, JFS employment could be hampered by:

(a) Reduced tactical mobility.
(b) Difficult positioning of JFS assets.
(c) Ballistics problems (subzero munitions limitations, use of WP on snow, limited effectiveness of certain munitions).
(d) An increased difficulty to locate target and/or to conduct fire due terrain features, poor visibility (greyouts and whiteouts for example).
(e) Reduced battery life for dismountable assets.
(f) Reduced CIS performance due to icing antennas.
(g) Force protection.

(3) **Fire Support Considerations.**

In order to resolve those challenges, recommendations are:

(a) Winterization of all material resources, the use of self-propelled ground JFS assets.
(b) Taking advantage of daylight period for reconnaissance and preparation. Consider also the need for snow clearing in firing positions, ammunition sites and command post.
(c) Highlighting employment limitations (e.g. subzero limitations munitions, long-lasting and increase the use of airburst munition, coloured smoke munition for marking purpose.
Frequently update of meteorological data due to abrupt differences (or variations) in temperature.
(d) Redundancy and winterization of sensors (e.g. FO, UAV).
(e) Providing extra and improved battery sets for dismountable equipment.
(f) Frequently controls of outside part of CIS equipment.
(g) Equipping material and human resources with winter camouflage piece of equipment.

e. **Desert and hot regions.**

(1) **General description.**

Desert regions are usually located in warm or tropical climate zones, which mean that there is a combined effect of climate and terrain. Deserts consist of large stretches of terrain with a passable surface, fairly

flat and relatively uninterrupted by obstacles. There are also areas with great differences in altitude and with steep rock formations, sometimes even in the nature of a low mountain range, and vast sand dunes. The lack of water makes the desert an inhospitable region. It is sparsely populated and has an extremely limited infrastructure. Inhabited areas are few and far between and are only to be found where there is water. The surface conditions away from the few roads require equipment with some degree of off-road capability, such as tracked vehicles. Vegetation is scarce in the desert, which means that artificial aids have to be used for camouflage.

(2) **Environmental Consequences for Joint Fire Support.**
In desert and hot regions, JFS employment could be hampered/ challenged by:
(a) Rapid, highly mobile warfare conducted over great distances.
(b) Ballistics problems (abrupt weather changes, enormous differences for night/day temperatures).
(c) An increased difficulty to locate target and/or to conduct fire due to the absence of prominent landmarks, reliable maps, heat waves, mirages and sandstorms.
(d) CIS performance due to long distances, high temperature.
(e) Difficult resupply operation due to e.g. battle tempo, long distances, extreme wear of some pieces of equipment due to extreme high temperature, sand and dust , lack of water and reduced battery life for dismountable assets at night.
(f) Force protection because of the lack of concealment, isolated engagement, and mutual support.

(3) **Fire Support Considerations.**
In order to resolve those challenges, recommendations are:
(a) The employment of heavy or medium JFS assets (preferably self-propelled). Due to highly mobile warfare and likelihood of airmobile operations, it is also recommend considering deployment of air transportable JFS assets.
(b) Increasing number of meteorological survey, special care for ammunition storage, increase number of extended range munition and number of PGM.
(c) The deployment of GPS based sensors coupled with extended use of aerial sensors such as UAV and other ground sensors.
(d) Deploying retransmission assets, adding complementary cooling systems for temperature sensible equipment.
(e) Pre-positioning supply dump, encourage aerial re-supply (e.g. airdrop), increase maintenance frequency, provide extra and improved battery sets for dismountable equipment, increased catering allocation (especially water).
(f) All round surveillance around isolated bases with available sensors, extra personnel to conduct base protection duties in and around the base and adapted camouflage sets.

f. **Operations in mountains.**

(1) **General Description.**
Mountainous operations include many of the same problems found in cold weather regions. Mountainous areas typically have rugged, compartmented terrain with steep slopes and treacherous mobility. Weather may span the entire spectrum from extreme cold with ice and snow in winter to extreme heat during the summer. In mountain operations, the advantages favor the defender, and the focal point is the

battle to control the high ground. Infantry units are the most suitable force for this type of combat, particularly when properly supported. Also, the terrain promotes isolated battles that make C² difficult. Small-unit commanders often operate semi-independently.

(2) **Environmental Consequences for Joint Fire Support.**
In mountainous terrain, JFS employment could be hampered by:
(a) Reduced tactical mobility.
(b) Difficult positioning of JFS assets and force protection.
(c) Need for support to very small scale and dispersed manoeuvre units.
(d) Ballistics problems (e.g. high angle, crest clearance, changing meteorology).
(e) An increased difficulty to locate target and/or to conduct fire due terrain features, poor visibility, echoes.
(f) Difficult resupply operation.
(g) Increased risk of CIS problems and GPS affiliation problems.

(3) **Fire Support Considerations.**
In order to resolve those challenges, recommendations are:
(a) The employment of highly mobile JFS assets and increased employment of airmobile movement.
(b) Planning of firing and observation positions integrating limitations of material resources as well as danger induced by terrain characteristics such as avalanches.
(c) Considering deployment of JFS assets from individually to multiple assets positions.
(d) Highlighting employment limitations (e.g. airburst munitions, subzero munitions limitations, sensors limitations).
(e) The redundancy of sensors (e.g. FO, UAV).
(f) Pre-positioning supply and to increase aerial resupply operations.
(g) Deploying relay, directional antennas.

g. **Operations in jungle and tropical terrain.**

(1) **General Description.**
Jungles are vast tropical forest areas which are often combined with mountainous terrain or swamps. They have extremely dense vegetation with relatively few open spaces. There are virtually no roads in jungles; paths must be cleared and kept open by hacking through vegetation. Because of the dense vegetation, the fields of observation and fire are extremely limited; areas which would normally be designated as key terrain no longer have this value. The larger rivers form good approach routes. The living conditions are tough, not least because of the exhausting climate. Reliable maps are often unavailable or have limited value because of the lack of orientation possibilities. The unfavorable terrain can restrict communications and limit the possibilities for movement. Helicopters are essential for movements and support tasks. High temperatures and humidity take their toll on equipment and soldiers.

(2) **Environmental Consequences for Joint Fire Support.**
In jungle/tropical terrain, JFS employment could be hampered by:
(a) Reduced tactical mobility.
(b) Difficult positioning of JFS assets and force protection.
(c) Need for support very small scale and dispersed manoeuvre units.
(d) Ballistics problems (e.g. high angle, crest clearance, premature detonation).
(e) An increased difficulty to locate target and/or to conduct fire due to terrain features, poor visibility, echoes.
(f) Difficult resupply operation.

(g) Increased risk of CIS problems and GPS affiliation problems.

(3) **Fire Support Considerations.**

In order to resolve those challenges, recommendations are:

(a) The employment of highly mobile JFS assets.

(b) Planning of firing and observation positions integrating limitations of material resources as well as difficulties induced by terrain characteristics such as non-reliable cartography, presence of important river or swamp area.

(c) Considering deployment of JFS assets from individually to multiple assets positions.

(d) Highlighting employment limitations (e.g. reduced capability for airburst munitions, premature detonation due to thickness canopy, sensors limitations).

(e) Considering increasing the number of observers, improving general visibility, general situation awareness and observation of fall of shot. This will enable redundancy and a possible reduction of fratricide.

(f) Pre-positioning supply using all available routes aviation, air drop, boat.

(g) Deploying relay, directional antennas.

h. **Littoral regions.**

(1) **General Description.**

Littoral regions know many forms of appearance, e.g. big river deltas, swamp areas, fjords, and dunes. Some areas, like coral reefs and fishing areas are environmental protected areas. The importance of littoral regions may increase since the influence that maritime forces can execute is widening due to increased efficiency of naval fire support. The function of a littoral region can also differ in various operations. It can be an assembly/staging area, from where land forces start their operation. Maximum protection against attacks from the sea and land borne attacks is the main priority.

(2) **Environmental Consequences for Joint Fire Support.**

In littoral regions, JFS employment could be challenged by:

(a) Increased need for liaison with maritime components at all levels of JFSE in order to share COP, synchronize fire support activity.

(b) CIS interoperability issues.

(3) **Fire Support Considerations.**

In order to resolve those challenges, recommendations are:

(a) Increased exchange of liaison teams on- and off-shore,

(b) Interoperability of C4I systems.

i. **Operations in adversary controlled territory.**

(1) **General description.**

These operations may be conducted in conjunction with those of other forces, or independently, deep in adversary occupied territory without a direct link with another force. They will be conducted with emphasis on mobility, evasion and surprise, where offensive action is required, or, on concealment and stealth, where the role is intelligence collection or target acquisition. The forces involved should not allow themselves to be contained by the adversary. In spite of careful planning and preparation, the pattern of operations is normally less predictable than that of any other combat action and so commanders will need extensive freedom of action.

(2) **Tactical Consequences for Joint Fire Support.**
During operations in an adversary controlled area, JFS employment could be challenged by:
(a) Reduced tactical mobility if the deployed land forces have its own land JFS assets as well as the need for support very small scale and far positioned manoeuvre units.
(b) Ballistics problems (e.g. long range delivery).
(c) Difficulty to locate target and/or to conduct fire in function of engagement zone and possibility to deploy sensors.
(d) Difficult resupply operation for embedded JFS assets.
(e) CIS problems due to long ranges and eventually GPS affiliation problems in function of operational environment.
(f) Force protection due to high vulnerability of isolated friendly elements beyond adversary lines.

(3) **Fire Support Considerations.**
In order to resolve those challenges, recommendations are:
(a) The employment of highly (air) mobile JFS assets for beyond adversary lines deployment and heavy/medium JFS assets to provide deep strike capabilities for the rest of the remaining forces.
(b) Dissemination of accurate meteorological forecast to enable precision delivery of deep fires.
(c) Redundancy of sensors e.g. aerial and ground sensors as well as the deployment of human sensors inside of the assigned unit in order to increase target location capability and situational awareness of the isolated AOR.
(d) Increasing the combat load in order to enhance autonomy and aerial re-supply for the assigned unit.
(e) Considering providing assigned unit with satellite communication as well as HF CIS assets.
(f) Allocation of extra personnel assigned for protection of own troops as well as man packed surveillance system.

j. **Airmobile operations.**

(1) **General description.**
An airmobile operation is an operation in which combat forces and their equipment manoeuvre across the battlefield by aircraft to engage in ground combat. The formation is designed for a specific mission and normally includes Joint Fire Support Assets. Airmobile forces are particularly well suited to exploit opportunities when speed is essential, distances are great and terrain is restrictive. These forces are used to seize deep objectives and to conduct penetration, covering force, denial, or surveillance operations. The JFS assets are positioned to attack deep targets, to suppress bypassed adversary concentrations or not trafficable terrain, and to help facilitate future operations.

(2) **Tactical Consequences for Joint Fire Support.**
In airmobile operations, JFS employment could be more complex because of:
(a) Complicated deployment due to air assets availability/capability.
(b) A need for a high degree of collaborative joint planning.
(c) Difficult C^2 issues (e.g. maximum decentralization).
(d) Ballistic issues (e.g. long range delivery, unavailable meteorological data).
(e) The requirement of additional target acquisition assets (e.g. to face adversary indirect fires immediately after landing).

(f) The difficult resupply operation for JFS assets (e.g. restricted ammunition supply capability).
(g) CIS problems due to long ranges.
(h) Force protection.

(3) **Fire Support Considerations.**

In order to resolve those challenges, recommendations are:

(a) Detailed coordination at all levels for the employment of JFS assets.
(b) The JFSE must consider during the operational planning process the issues associated with staging, loading, air movement, landing and ground tactical plans which requires aggressive execution, and speed of emplacement.
(c) Detailed allocation of C² cells at the lowest tactical level in order to enable continuous C² capability (e.g. increased number of deployed JFSE).
(d) The dissemination of accurate meteorological forecast to enable precision delivery of deep fires.
(e) The planning of the coverage by STA assets (e.g. UAV, and weapons locating radars) e.g. to help the counter battery fire effort.
(f) Planning, prioritizing, and synchronizing initial deployment stocks as well as subsequent resupply with the manoeuvre plan in order to support the applicable COA.
(g) Considering the provision of assigned units with satellite communication as well as HF CIS assets in order to ensure communication throughout the area of operations.
(h) A 6,400-mil (360-degree) capability is required of all indirect fire assets.

k. **Airborne[36] operations.**

(1) **General description.**

An airborne operation is a joint operation involving the air movement and deployment of ground forces into an objective area by fixed wing aircraft. Airborne forces are particularly well suited for envelopment or turning movements, attacks to exploit fires on distant objectives, seizure of critical terrain and facilities, mobile reserves, raids, and diversions.

(2) **Tactical Consequences for Joint Fire Support.**

In airborne operations, JFS employment could be more complex because of:

(a) The inherent limitation.
(b) A need for high degree of collaborative joint planning.
(c) Difficult C² issues (e.g. transfer of control).
(d) Limited tactical mobility once landed.
(e) Ballistic issues (e.g. long range delivery, unavailable meteorological data).
(f) Difficult target location and/or the conduct of the fire.
(g) Complexity of planning and executing the fire.
(h) The difficult resupply operation for JFS assets (e.g. restricted ammunition supply capability).
(i) CIS problems due to long ranges.
(j) Force protection.

(3) **Fire Support Considerations.**

In order to resolve those challenges, recommendations are:

(a) The employment of specialized airdrop suitable JFS assets.

[36] Airmobile operations (AAP 6): An operation in which combat forces and their equipment manoeuvre about the battlefield by aircraft to engage in ground combat.

(b) That the JFSE must consider during the operational planning process the issues associated with staging, loading, air movement, landing, marshalling and ground tactical plans which requires aggressive execution, and speed of emplacement.
(c) That during the assault phase of the operation, C² must be conducted from an airborne platform. C² functions are transferred from the airborne platform to the assaulting force when the assaulting force commander and his JFSE are on the ground and operational.
(d) Considerations of advantages/disadvantages (risk) of deploying airborne assets. Once landed the lighter JFS assets will be almost immovable, therefore rapid deployment of towing capabilities is essential.
(e) The dissemination of accurate meteorological forecast to enable precision delivery of deep fires.
(f) That initial targeting intelligence must be through strategic assets. Reconnaissance forces may be inserted early in the operation.
(g) Aerial photography and long range UAVs may be used to provide targeting information during the early phases of the operation.
(h) During initial stages of airborne operations, aerial observers may be critical target acquisition assets.
(i) Radars and/or short range UAVs may not be deployed during the initial stages of an airborne operation; however, they should be deployed during follow-on air-land operations,
(j) That during the initial stages of airborne operations, manoeuvre commanders may require positive clearance of fires.
(k) Cratering munitions should not be planned on airfields.
(l) Air Force or Navy weather assets should be requested to provide early MET support.
(m) Planning early airdropped or air-landed delivery of ammunition.
(n) Considering the provision of assigned units with satellite communication as well as HF CIS assets in order to ensure communication throughout the area of operations.
(o) That a 6,400-mil (360-degree) capability is required of all indirect fire assets. Consider the reinforcement of the JFS assets by a strong local defence team.

l. **Amphibious operations.**

(1) **General description.**

An amphibious operation is an attack launched from the sea by naval, air and landing forces embarked in ships or other craft for the purpose of landing on an enemy shore. A successful amphibious assault achieves surprise and concentrates an overwhelming force at a point of adversary weakness. An amphibious operation is conducted in five phases: planning, embarkation, rehearsal, movement, and assault.

It requires collaborative joint planning in order to integrate seamlessly air and naval strike during the first phase of the assault. The Commander Amphibious Task Force (CATF) ensures that coordinated and integrated naval and air fire support plans are prepared for all phases of the operation and it occurs within the Supporting Arms Coordination Center (SACC) which is located on the command ship. While afloat, the fire support cell is located with or adjacent to the SACC. Common communications facilities are used until the fire support cell moves ashore.

Responsibility for conduct of operations ashore lies with the landing force commander.

(2) **Tactical Consequences for Joint Fire Support.**
In amphibious operations, JFS employment could be more complex because of:
(a) Task organization of the assigned land forces.
(b) Deployment possibility (e.g. protected staging area).
(c) Difficult C^2 activities (e.g. transfer of authority and reorganization).
(d) Ballistics issues (e.g. long range delivery, missing availability of Met).
(e) Possible limited target location capabilities and/or limited availability of observation location.
(f) Difficult positioning of JFS assets.
(g) The critical resupply of ammunition during the early stages of battle and the undesired effects of saltwater on equipment.
(h) CIS problems due to long ranges or to different standards.
(i) Force protection during the movement ashore.

(3) **Fire Support Considerations.**
In order to resolve those challenges, recommendations are:
(a) Based on accurate adversary intelligence, real time situational awareness, and maximum employment of boat transport capability, to design the forces with the best possible combat/combat support ratio in order to support overall campaign objective.
(b) Proper rehearsal for the landing troops in similar environments and choice of forces (light, medium or heavy) that are the more suitable for the disembarkment site.
(c) That the transfer of Control and Coordination of JFS is transferred from afloat to land when the landing force commander's JFSE is established. The transfer should take place as soon as possible.
(d) The dissemination of accurate meteorological forecast to enable precision delivery of deep fires. During the early phase of the battle meteorological support may be obtained from navy shipboard meteorological stations.
(e) That initial targeting intelligence must come from naval, air and strategic sources. Once troops have landed and gained a foothold, ground observers and target acquisition assets can be used as normal.
(f) That ground indirect fire systems could be positioned on offshore islands to provide fire support for the assault element, when coastal topography and weapon capability permits. Engineer assets may be required to stabilize gun or launcher positions.
(g) Interservice coordination is necessary to ensure adequate supply and/or logistic activities.
(h) Equipment and ammunition should be protected from salt water.
(i) Considering providing assigned unit with satellite communication as well as HF CIS assets and make sure, that they are interoperable with e.g. the systems of the navy.
(j) That JFSE should be dispersed throughout the assault elements. Coherent allocation of human and personal resources in order to keep battle readiness at the smallest level (e.g. a gun crew and his gun on the same boat).

m. **Non-contiguous, non-linear areas.**

(1) **General description.**
In a non-contiguous, non-linear area of operations, subordinate units may operate in isolated pockets, connected only through integrating effects of

an effective concept of operations. A non-contiguous, non-linear area of operations places a premium on initiative, effective information operations, decentralized security operations, and innovative logistics measures.

JFS assets must be prepared to conduct full spectrum operations in both contiguous and non-contiguous area of operations.

(2) **Tactical Consequences for Joint Fire Support.**

In non-contiguous, non-linear area of operations, JFS employment could be more complex because of:

(a) C^2 activities.
(b) The need for support isolated manoeuvre units.
(c) The possible absence of mutual support and important size of the LOC.
(d) CIS problem due to non-contiguous environment.
(e) Force protection.

(3) **Fire Support Considerations.**

In order to resolve those challenges, recommendations are:

(a) Detailed allocation of C^2 cells at the lowest tactical level in order to enable continuous C^2 capability (e.g. increased number of deployed JFSE).
(b) Considering deployment of JFS assets from individually to multiple assets positions.
(c) Increasing self-sufficiency and firepower capabilities of isolated units as well as the redundancy employment of JFS assets in the AOR. Finally to provide the units with a much larger number of extended range ammunition and PGM than usual.
(d) To position relay stations as well as the provision of satellite communication and HF assets to the far located units.
(e) Allocation of extra personnel assigned for protection of own troops (it includes base protection issues).

n. **Asymmetrical threats.**

(1) **General considerations.**

Asymmetric threats occur when an adversary initiates operations which friendly forces cannot respond effectively against due to dissimilar values, organization, training, or equipment. The adversary may use the civilian population and infrastructure to shield their capabilities from fires and manoeuvre. The enemy may also attack coalition forces and civilian population with weapons of mass destruction (WMD). An adversary employing asymmetrical threats is most likely to be based in and target urban areas to take advantage of the density of civilian population and infrastructure. Other examples of enemy employing asymmetrical threats include terrorist attacks; EW, to include computer-based systems; criminal activity; guerilla warfare; and environmental attacks.

(2) **Fire Support Considerations.**

Referring to applicable tactical environment, the only complementary recommendations are to increase our real time situational awareness with a large number of sensors (ground and aerial) as well as the use of blue force tracking system in order to deliver precise and timely counterstrike supportive fires.

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CHAPTER 7

Combat Service Support (CSS)

SECTION I - INTRODUCTION

701. **Aim.** The aim of this chapter is to describe the principles, responsibilities and operation of the Combat Service Support (CSS) system for ground FS. CSS provides the physical means with which forces operate and contributes to moral cohesiveness. It is the means by which combat power is maintained so that maximum firepower can be concentrated and an operational tempo and intensity be sustained. It encompasses the storage, handling and transportation of supplies, maintenance, recovery and repair of materiel, medical care and treatment of casualties, personnel replacement, equipment replacement and the provision of necessary welfare services. Combat supplies must be provided at the right time, in the right quantities, at the right place and in a serviceable condition.

702. **Scope.** The scope of this chapter is the timely provisioning of supplies of all kinds to joint fire support assets. However, the chapter focuses on ground FS ammunition resupply, coordination and mutual support (see ATP-3.2). Generic CSS information can be found in AJP-4.

SECTION II – PRINCIPLES

703. **General.** CSS provides the foundation of combat power which all arms and services must contribute to as a precondition for a successful employment of their forces. Particularly for ground FS, as a consumer of bulk supplies, it is essential to cooperate closely with CSS elements. The combat power of a military force which can be applied against an adversary, is constrained by its capability to deliver forces and materiel to the required positions across the range of military operations.

704. **Ground Indirect Fire Systems and CSS.** The JFSE, must anticipate the potential CSS implications of the Commander's guidance and plans. The staff must forecast requirements for additional support. The main issue is likely to be planning the amounts and nature of ammunition and fuel required, the means by which it is to be transported, and where it is to be located or prepositioned. Much of the CSS is similar to that for other arms and services. However, some significant differences should be noted:

a. In major combat, land-based FS provides the majority of the firepower. The bulk and weight of ammunition that must be regularly provided are usually far greater than for any other commodity on the battlefield. Therefore, the artillery commander is particularly reliant on CSS. The resupply of ammunition is likely to be one a key planning factor.
b. Land-based FS ammunition will normally account for a large proportion of a force's transport system capacity. The quantities of ammunition to be moved and handled places great demands on the logistic staff, the transport system and weapon detachments.
c. Land-based FS units are usually dispersed over wide areas of the battlefield. This creates a considerable challenge for the CSS staff and assets.
d. The unique flexibility of indirect fire encourages the use of all available assets. The fact that land-based FS are not normally held in reserve means it requires continuous CSS. Interoperability, particularly of land-based FS CSS, is therefore a major importance.

SECTION III - CHAIN OF COMMAND AND LOGISTICS

705. General. The components of a joint and combined force normally operate simultaneously within the theatre and the lines of communication (LOC) approaching the theatre. Coordination of functions among all affected commands, nations, and agencies is essential to avoid confusion and unnecessary duplication. The commanders should provide general guidance, by function and area, wherever needed to ensure unity of effort.

706. Responsibilities. The commander is always responsible for CSS. He normally delegates the detailed planning and execution of CSS plans to his staff, but he must be made aware of critical areas that may affect operations and require his personal decisions. In land-based FS formations, all logistic aspects have to be clearly defined regarding responsibilities, no matter if national or multinational. For CSS tasks the units are typically reinforced with supply and maintenance support elements. Their mission is to ensure the operational readiness of the units in the mobile battle. The tasks may include:

a. Resupply of land-based FS ammunition predominates due to its sheer quantity.
b. Resupply of combat supplies, particularly fuel.
c. Materiel support.
d. Equipment support.
e. Manpower and reinforcements.
f. Medical support, particularly casualty treatment and evacuation.
g. Effective utilization of returning transport assets.

SECTION IV - FIRE SUPPORT SYSTEMS AMMUNITION

707. General. The purpose of the ammunition distribution system is to provide ammunition at the right time, place and quantity to ensure the success of the operation. Munitions planning and operations must be flexible and continuous. They must complement combat plans and operations and improve the ability of the supported force to accomplish its mission.

708. Controlling Ammunition Requirements. Major operations and deployments create a tremendous demand for the supply and transport of ammunition. Commanders control the flow and usage of ammunition within their areas of responsibility by using ammunition supply rates such as the Required Supply Rate (RSR) and the Available Supply Rate (ASR). For most weapons, these are expressed in rounds per weapon per day for each nature of ammunition fired by weapon systems. For those weapons that use multiple-round ammunition packages, supply rates are expressed as complete packages per weapon per day, for example Rocket Pod Containers per day for rocket launcher. Commanders may further control expenditure by imposing a modified supply rate, which may be sub-allocated by subordinates.

709. Multinational Employment of Ground Fire Support Systems Ammunition. It is possible for some NATO members to interchange land-based FS ammunition. The details of national ammunition interchangeability is outlined in STANAG 4425 (AOP-29 ‘NATO Indirect Fire Ammunition Interchangeability’).

710. Means of Ammunition Transport. Various transportation systems are available for the strategic, intra-theatre and tactical movement of land-based FS ammunition. The use of a specific means of transportation depends on the mission, the time available, equipment availability, the nature of ammunition to be moved, the regional infrastructure, the security of routes, and the distances involved.

SECTION V - LOGISTIC PLANNING PROCESS

711. General. The planning process conforms to the logistic principles defined earlier in the chapter. The exchange of logistic support among allies or coalition members should produce significant economies of effort. In the absence of international agreements, the commander must ensure that a consensus is reached on the degree of implementation of multinational logistics (see AJP 4 & ALP 4.2 for further details).

712. Land-based Fire Support Systems Logistic Staff Tasks. The basis for CSS planning is the mission and commander's guidance. The logistic staff element coordinates amongst others on ammunition resupply. Ammunition planning consists of determining and establishing required and controlled supply rates, basic loads, assembling stocks, and resupply procedures needed to sustain the force. Successful ammunition resupply depends on the following:

a. Careful estimates based on usage, experience, and the intensity of combat anticipated.
b. The ability of the command to prioritize demands for critical ammunition on the basis of the tactical situation.
c. A smooth flow of ammunition from rear logistic bases direct to ammunition transfer and supply points and/or firing positions.
d. Establishment of ammunition resupply routes, which may be prioritized for FS ammunition.
e. A clear definition of how non-organic FS units are resupplied.

713. Land-based Fire Support Systems CSS Staff Coordination. The CSS staff should identify and co-ordinate how the land-based FS receives its CSS. The CSS for land-based FS is based on the task organization, the tactical task of each element, locations on the battlefield and the availability of CSS assets. The CSS effort for the land-based FS is further complicated by the dynamic nature of FS Systems support. Land-based FS may frequently be supplied from different or multiple support areas because of their tactical task and/or location on the battlefield. Therefore, the CSS staffs at all levels should facilitate future operations by anticipating future requirements and coordinating the transfer of CSS responsibilities between support areas.

714. The Logistic Estimate. The evaluation of the logistic situation is principally the same as the planning process of the commander's staff outlined above. Logistic doctrine details the specific process for the logistic estimate which may be applied to the land-based FS.

715. General Planning Considerations for the Primary Operations of War. When considering the influences on operations of land-based FS CSS, the commander must consider the principles and responsibilities described as follows:

a. **Offensive activities.**
The key aspiration is to increase the logistical self-sufficiency of the attacking force in order to ensure the timely provision of fuel and ammunition. This implies larger integral echelons. Additional ammunition for major fire plans may need to be pre-dumped on gun positions, with all other ammunition stocks held on transport and kept forward. Consequently, priority on supply routes may need to be allocated for the movement of land-based FS ammunition. Maintenance must concentrate on repairing battle critical equipment as far forward as possible and recovery of any equipment not repairable in the short term. Casualty evacuation resources may require reinforcing and all transport on the return leg of their loop must be prepared to carry casualties. Exploitation and pursuit operations may involve accepting logistic risk as distances open between the logistic bases and the supported units.

b. **Defensive activities.**
FS ammunition expenditure against an attacking adversary can be expected to be high. Stocks, particularly of land-based FS ammunition, have to be built up and compete with defence construction materiel for transport. Decisions regarding the prepositioning of ammunition and its security are likely to be critical. Preliminary, main defence battle and

subsequent positions should be considered and balanced against the competing requirements for the same logistic assets.

For delay operations complementary considerations are as follows:

(1) Enhance and extend the logistic self-sufficiency of the land-based FS supporting the delay operation,

(2) Stocks may be prepositioned along the direction of movement,

(3) Within the restrictions of Operation Security (OPSEC), all non-essential vehicles, stocks and supplies from the delaying force should be withdrawn at the earliest opportunity.

c. **Enabling activities.**

Considering the purpose of such operations (as advance to contact, meeting engagement, link up), the main concern for land-based FS should be to focus on a detailed planning in order to synchronize overall CSS plan with the combat manoeuvre, to pre-position ammunition and to envisage more frequent ammunition re-supply, to increase aerial resupply operations (especially for light forces), to increase re-supply assets movement rate.

d. **Stability activities.**

It is essential that a flexible and robust land-based FS system is maintained. Ammunition stock levels should be planned upon the worst-case requirement and the friendly COA. This often leads to a requirement for relatively large stocks at an early stage of stability activities, which may be modified as the operation proceeds. The provision of ammunition for training should be included in planning.

ANNEX A
EFFECTS (DEFINITION)

Physical and functional effects:

Harassment
Repeated, deliberate and intimidating activities intended to discourage, impede and disrupt. Those fires are delivered on an irregular timeframe and location with a reduced amount of delivery platforms.

Suppression
Suppression fires are fires on/or about a weapon system to degrade its performance below the level needed to fulfill its mission objectives. The effect of suppressive fires usually lasts only as long as the fires are continued. Suppression is used to prevent effective fire on friendly forces. It is typically used to support a specified movement of forces.

Neutralization Fire
Fire delivered to render the target temporarily ineffective or unusable. Neutralization fire results in adversary personnel or materiel incapable of interfering with a particular operation or the accomplishment of a particular course of action.

Destruction
Destruction fire physically renders an adversary force combat-ineffective unless it is reconstituted, or so damaged that it cannot function as intended nor be restored to a usable condition without being entirely rebuilt.

Terrain effects
FS units are able to deliver area and precision effects by employing a wide variety of munitions.

Psychological effects
All delivered fires and even the presence of FS assets has a positive effect on own troops besides the classical effects generated on the adversary power. Even if FS assets just fire non-lethal ammunition, friendly forces show their resolve and the readiness to use lethal ammunition if necessary. Psychological effects encompass deter, demoralize, discourage, etc.

Operational effects
Those effects are known as e.g. delay, disrupt, defeat, divert, deter, degrade, dislocate, deny, deceive, dissuade, limit, interdict, canalize, isolate, block, area control, separate, fix, contain, compel, obscure, illuminate, coerce, hinder, hamper, contain, turn, neutralize, demonstrate, eliminate, prevent, retaliate, etc.

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ANNEX B
DETAILS ON FIRE SUPPORT COORDINATION MEASURES (FSCM)

a. Fire Support Coordination Line (FSCL).

The FSCL facilitates the expeditious attack of surface targets of opportunity beyond the coordinating measure. An FSCL does not divide an area of operations by defining a boundary between close and deep operations or a zone for close air support. The FSCL applies to all fires of air, land, and sea-based weapons systems using any type of ammunition. Forces attacking targets beyond an FSCL must inform all affected commanders in sufficient time to avoid fratricide. Supporting elements attacking targets beyond the FSCL must ensure that the attack will not produce adverse effects on, or to the rear of, the line. Short of an FSCL, all air-to-ground and surface-to-surface attack operations are controlled by the appropriate land or amphibious force commander. Coordination of attacks beyond the FSCL is especially critical to commanders of air, land, and special operations forces. In exceptional circumstances, the inability to conduct this coordination will not preclude the attack of targets beyond the FSCL. However, failure to do so may increase the risk of fratricide and could waste limited resources.

(1) **Purpose.** The primary purpose of the FSCL is to provide a measure for coordination between ground elements and supporting forces without endangering friendly forces in the air or on the ground or requiring additional coordination with the establishing headquarters. The FSCL serves several specific purposes:
   a. It facilitates the expeditious attack of targets beyond it, mainly by aircraft.
   b. It provides ground commanders with sufficient control of aircraft short of the FSCL to ensure troop safety.
   c. It maximizes employment of weapons where they are most efficient.

(2) **Establishment.** The FSCL is established by the appropriate land commanders within their boundaries in consultation with superior, subordinate, supporting and affected commanders. In joint or combined operations, the FSCL is usually established by the highest headquarters.

(3) **Location.** To facilitate recognition from the air, the FSCL should be located on identifiable terrain. It should be located beyond the area in which the establishing commander intends to send patrols or penetration forces or in which he intends to maintain security forces. When detached forces are deployed beyond the FSCL in the zone of action of the establishing commander, that commander must establish other coordination measures to encircle and provide a degree of safety to the detached forces. A key factor in the placement of the FSCL is the range of organic Indirect Fire weapon systems.

(4) **Dissemination.** The location of the FSCL is disseminated by the establishing commanders JFSE to the JFSE of subordinate, adjacent and higher headquarters, as required.

(5) **Graphic Portrayal.** A solid black line with the letters FSCL followed by the establishing headquarters and nation above the line. Below the line the name and the effective date-time group is added. See figure B-1.

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Figure B-1. FSCL

b. Coordinated Fire Line (CFL).

The CFL is a line beyond which conventional surface fire support means (mortars, field artillery and naval surface fire support ships) may fire at any time within the zone of the establishing headquarters without additional coordination.

(1) **Purpose.** The purpose of the CFL is to expedite the attack (using surface fires) of targets beyond the CFL without the coordination with the manouvre commander in whose zone of action targets are located and to provide the manouvre commander with an area within his zone of action where the forces can operate in safety from friendly indirect fires.

(2) **Establishment.** Normally, manouvre commanders are responsible for selecting or recommending the CFL location within their zone of action or sector of defence. Supporting indirect Fire commanders and indirect fire liaison officers from the JFSE at every echelon should make appropriate recommendations concerning its location. The lowest level at which a CFL is established is the battalion. A consolidated CFL may be published for the force as a whole.

(3) **Location.** The major factor for location should be the range of land-based indirect fire systems. It does no good to have a measure in place for uncoordinated indirect fires when there is limited range beyond the measure. The location of the CFL is also based on such factors as the scheme of manouvre, patrol plans, locations of security forces and the troop safety desires of the manouvre commander. There is no requirement for the CFL to be placed on identifiable terrain, but it can be helpful for Forward Observers (Coy-JFSE) calling in indirect fires. Additional factors such as the limits of ground observation, the location of the initial objectives in the offense, and the requirement for maximum flexibility in both manouvre and the delivery of supporting fires should be considered.

(4) **Dissemination.** Initial and subsequent locations of the CFL are disseminated through the various JFSE and fire direction centers to manouvre and supporting arms units concerned.

(5) **Graphic Portrayal.** A dashed black line with the letters CFL followed by the establishing headquarters and nation above the line. Below the line the effective date-time group is added. See Figure B-2.

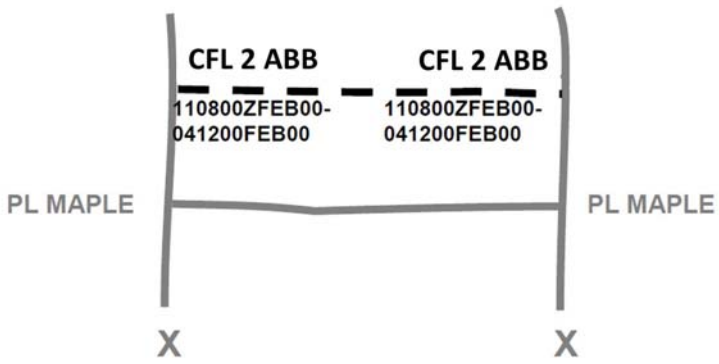

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Figure B-2. CFL

c. Free Fire Area (FFA).

The FFA is a specific designated area into which any weapon system may fire without additional co-ordination with the establishing headquarters.

(1) **Purpose.** The purpose of the FFA is to expedite the attack of targets and facilitate the jettison of CAS munitions. Units are authorized to fire into the area without further coordination with the establishing force headquarters.

(2) **Establishment.** The force staff determines the need for FFA, based on the enemy dispositions and the current tactical situation. It then recommends the area to be designated a FFA to the commander. He then requests approval of the recommended FFA from the force commander or civilian official exercising jurisdiction in the area. Upon approval of the request, the designated area is declared clear for firing without further coordination.

(3) **Location.** The area should be easily identifiable from the air; however, it may be designated by the use of grid coordinates or LAT/LONG. If the intent is to jettison ordnance, typically the FFA will be located behind the friendly forces in an area they will not have to manouvre through. If the intent is to expeditiously attack targets, typically it will be located short of the FSCL in an area where friendly forces will not have to manouvre through.

(4) **Dissemination.** The commencement and termination of the FFA are specified by date-time group. The force commander then directs that the geographical limits and effective date-time group(s) or the area be disseminated to his subordinate units.

(5) **Graphic Portrayal.** An area outlined with a solid black line. The letters FFA followed by the establishing headquarters and nation are written within the area followed by the name and effective date-time group for commencement and termination. See figure B-3.

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Figure B-3. FFA

d. No-Fire Area (NFA).

The NFA is an area into which no fires or the effects of fires are allowed except if temporarily authorized by establishing authority or if an adversary force within this area engages friendly forces.

(1) **Purpose.** The purpose of the NFA is to prohibit fires or their effects in the area, normally to protect civilians, populated areas or areas of historical/cultural significance.

(2) **Establishment.** Typically, the manouvre commander establishes an NFA, but it may be established by any ground commander within his own zone. On arrival of military forces, the force commander coordinates the location of an NFA with local authorities

(3) **Location.** The established area should be readily identifiable from the air but may be designated by the use of grid lines or by a radius about a center point on the ground.

(4) **Dissemination.** The locations, designations and effective date-time groups of the areas are transmitted to all units of the force. All NFAs should be entered in the fire direction systems and placed on maps and charts as appropriate to ensure safety in the delivery of fires. The force commander is informed of any changes through constant liaison.

(5) **Graphic Portrayal.** An area outlined with a solid black line with diagonal lines inside. The letters NFA are written within the area along with the effective date-time group for commencement and termination. The area should also be identified by the designation of the headquarters that established the area. See figure B-4.

Figure B-4. NFA

e. Restricted Fire Area (RFA).

The RFA is an area in which specific restrictions are imposed and in which fires that exceed those restrictions are not delivered without co-ordination with the establishing headquarters.

(1) **Purpose.** The purpose of an RFA is to regulate fires into an area according to stated restrictions. These restrictions may vary with locality and time. The RFA is applicable to conventional and special munitions and their effects delivered by any means. No fire delivery means may fire into this area without meeting the criteria of the establishing authority.

(2) **Establishment.** An RFA may be established by any ground unit commander within his own zone; however, it is normally established below battalion level. Companies operating independently, however, could establish RFAs.

(3) **Location.** The RFA should be located on recognizable terrain and readily identifiable from the air, but its location can be given by grid coordinates or as a radius from a point. When RFAs are used to protect a forward unit from friendly fires; e.g., reconnaissance teams, the RFA size should be large enough to allow the manouvre of the unit but not so large as to needlessly restrict fire support in other areas.

(4) **Dissemination.** The identification of the RFA is disseminated to each level of command, including the establishing command and all concerned JFSE.

(5) **Graphic Portrayal.** An RFA is portrayed by a solid black line defining the area with the letters RFA, the designation of the unit establishing the area, the name, any special instructions, and the effective date-time group written inside the area. See figures B-5 and B-6.

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Figure B-5. RFA

Figure B-6. RFA (Restriction examples)

f. Restrictive Fire Line (RFL).

The RFL is a line established between converging friendly forces (one or both may be moving) that prohibit all fire or effects from fires across the line without coordination with the affected force.

(1) **Purpose.** The purpose of an RFL is to prevent fratricide between converging friendly forces. It is applicable to conventional and special munitions delivered by any means and the effects of those munitions.

(2) **Establishment.** An RFL is established by the common commander of converging forces. In certain instances, he may delegate establishing authority to the senior commander of the two converging forces or to the commander of the manouvring force in a linkup operation between a moving and a stationary force.

(3) **Location.** To provide for recognition by all JFSE, the RFL should be located on identifiable terrain. This is not only because CAS can influence this operation, but also because the inherent, complex nature of this operation requires simplicity in execution and coordination of direct weapon system, as well as indirect fire systems. In linkup operations, the RFL is positioned as close as possible to the stationary force to allow maximum freedom of manouvre and fire support to the linkup (moving) force.

(4) **Dissemination.** The location of the RFL is disseminated by the staff of the establishing commander to the staff of the subordinate, adjacent and higher headquarters as required. It is further disseminated within each level of command, including the establishing command and all concerned JFSE.

(5) **Graphic Portrayal.** A solid black line with the letters RFL followed by the name of the establishing headquarters and nation above the line. The effective date-time group is written below the line. See figure B-7.

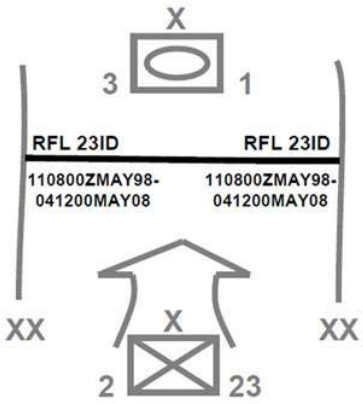

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Figure B-7. RFL

g. Airspace Coordination Area (ACA).

A restricted area or route of travel specified for use by friendly aircraft and established for the purpose of preventing friendly aircraft from being fired on by friendly forces.

(1) **Purpose.** The ACA acts as a safety measure for friendly aircraft while allowing other supporting arms to continue fires in support of the manouvre force. It ensures aircrew safety and effective use of indirect supporting surface fires by deconfliction of time and space. It facilitates simultaneous attack of targets near each other with aircraft and one or more of the supporting arms. This is the primary way to deconflict airspace for CAS and assault support.

(2) **Establishment.** The commander of the unit requesting air support requests ACAs based on the recommendations of his JFSE. Formal ACAs are established by the airspace control authority. The ACA should only be used when risk to friendly aircraft is great enough to justify the attendant loss of surface delivered fires. The extent of the ACA employed is dependent on the time available.

(3) **Location.** The ACA should be located on identifiable terrain. The ACA should be kept as simple as the situation permits. Factors that should be considered in determining the actual size and shape of the ACA are the type of aircraft, type of ordnance and air defence threat.

(4) **Dissemination.** The ACA should be disseminated as early and quickly as possible. The manouvre unit employing the ACA will disseminate the details to higher and adjacent units and to JFSEs, which will notify their subordinate elements, as required. A scheduled ACA will be disseminated with its effective date-time group(s), usually on an overlay. An on-call ACA is promulgated without its effective date-time group. The information that describes the ACA includes its designation, minimum and maximum altitudes (above mean sea level (MSL) or above ground level (AGL)), length (grid coordinates), width (either side of the center line defined by the grid coordinates), and the effective date-time group(s).

(5) **Graphic Portrayal.** A formal ACA is shown as an area enclosed by a slid back line. Data includes the letters ACA, the name, the originating headquarters, minimum and maximum altitude and effective times. See figure B-8.

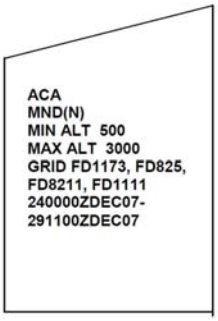

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Figure B-8. ACA

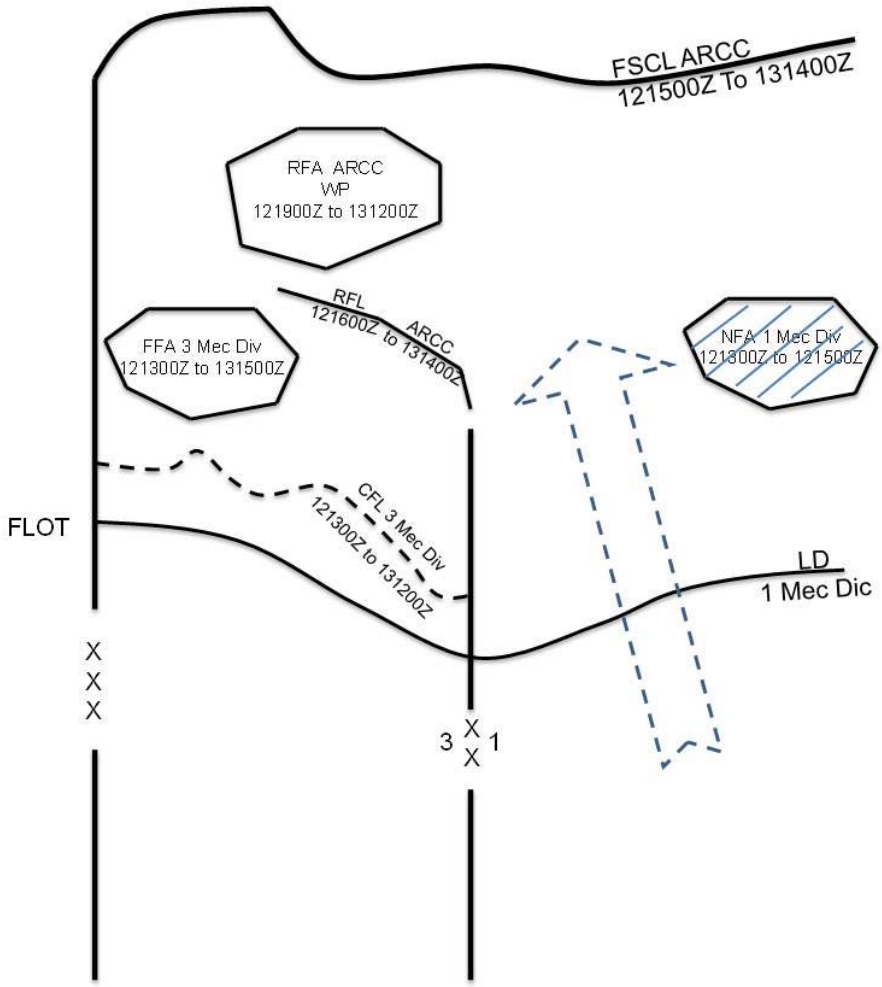

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Figure B-9. Fire Support Coordination Measures on an overlay.

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ANNEX C INHERENT RESPONSIBILITIES OF STANDARD FS TACTICAL MISSIONS

AN FS UNIT WITH A MISSION OF	DIRECT SUPPORT	REINFORCING	GENERAL SUPPORT REINFORCING	GENERAL SUPPORT
Answers calls for fire in priority from	1. Supported unit 2. Own sensors[1] 3. Force FS HQ	1. Reinforced FS 2. Own sensors[1] 3. Force FS HQ	1. Force FS HQ 2. Reinforced unit[1] 3. Own sensors[1]	1. Force FS HQ 2. Own sensors[1]
Has as its zone of fire	Zone of action of supported unit	Zone of fire of reinforced FS unit	Zone of action of supported unit to include zone of fire of reinforced FA unit	Zone of action of supported unit
Furnishes FS personnel	Provides temporary replacements for casualty losses as required	No requirement	No requirement	No requirement
Establishes communication With	Directly supported manoeuvre unit	Reinforced FS unit HQ	Reinforced FS unit	No requirement
Establishes liaison with	Directly supported formation/unit	Reinforced FS Unit	Reinforced FS Unit	No requirement
Allocates sensors[2]	Observers to manoeuvre element and sensors assets to the directly supported unit	No inherent requirement	No inherent requirement	No inherent requirement
Is positioned by	DS FS unit commander or as ordered by force FS HQ	Reinforced FS unit or as ordered by force FS HQ	Force FS HQ or reinforced FS unit if approved by force FS HQ	Force FS HQ
Has its fires planned by	Develops own fire plan in close cooperation with supported unit	Reinforced FS unit HQ	Force FS HQ or as otherwise specified	Force FS HQ

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GLOSSARY

A

Airspace Coordination Area (ACA)
A restricted area or route of travel specified for use by friendly aircraft and established for the purpose of preventing friendly aircraft from being fired on by friendly forces.

Air Route (AR)
The navigable airspace between two points, identified to the extent necessary for the application of flight rules.

B

Base Defence Zone (BDZ)
In airspace management, airspace established around a base to enhance the effectiveness of air defence systems.

Battle Damage Assessment (BDA)
The assessment of effects resulting from the application of military action, either lethal or non-lethal, against a military objective.

Battlefield Management (BM)
BM is the use of means and measures that enable the dynamic synchronization, prioritization and deconfliction of activity across all dimensions of an assigned area of operations within the battlespace. It comprises dimensions of land, sea, air and space, EM spectrum, information and time.

C

Coordinated Fire Line (CFL)
The CFL is a line beyond which conventional, indirect, surface fire support means may fire at any time within the boundaries of the establishing headquarters without additional co-ordination.

Coordination Level (CL)
An altitude or height used to establish airspace control responsibilities primarily to deconflict airspace users.

D

Deconfliction of JFS
Coordination of the battlespace (air, naval and land environment) conducted by the JFSE to optimize the use of JFS assets in order to allow safe freedom of movement and delivery of fires and effects. Measures taken for the safeguarding of all fire support elements by mitigating the risk of fratricide by a seamless integration of fires delivered concurrently or simultaneously by air, naval and land fire support elements on a unique or on multiple targets.

Direct Support (DS)
DS is the support provided by a unit not attached to or under the command of the supported unit or formation, but required to give priority to the support required by that unit or formation.

E

F

Fire Support Coordination (FSC)
The planning and executing of fires must ensure that targets are adequately covered by a suitable weapon or group of weapons.
(This term is a reviewed definition of Fire Support Coordination and it will be recommended to modify it in AAP-6)

Fire Support Coordination Measures (FSCM)
Measures employed by land or amphibious commanders to facilitate the rapid engagement of targets and to provide safeguards for friendly forces.

Fire Support Coordination Line (FSCL)
Within an assigned area of operations, a line established by a land or amphibious force commander to denote coordination requirements for fires by other force elements which may affect the commander's current and planned operations. The FSCL applies to fires of air, ground or sea weapons using any type of ammunition against surface or ground targets. The establishment of the fire support coordination line must be coordinated with the appropriate commanders and supporting elements. Attacks against surface or ground targets short of the fire support coordination line must be conducted under the positive control or procedural clearance of the associated land or amphibious force commander. Unless in exceptional circumstances, commanders of forces attacking targets beyond the FSCL must coordinate with all affected commanders in order to avoid fratricide and to harmonize joint objectives. Note: in the context of this definition the term "surface targets" applies to those in littoral or inland waters within the designated area of operations.

Fire Support Officer (FSO)
The Fire Support Officer (FSO) is the advisor to the manoeuvre commander at all levels in all JFS matters, consisting of FS planning, -synchronization, coordination and integration.
(This term is a new term and definition and it will be recommended for inclusion in AAP-6)

Fire Support Task (FST)
A fully developed Fire Support Task includes a task, purpose, method, and effects. The task describes what targeting objectives (e.g. delay, disrupt, limit, harass or destroy), fires must achieve on an adversary capability. The purpose describes why the task contributes to manoeuvre. The method describes how the task will be accomplished by assigning responsibility to observers or units and delivery assets and providing amplifying information or restrictions. Typically the method is described by covering three categories: priority, allocation, and restrictions. Effects quantify successful accomplishment of the task.

Free-Fire Area (FFA)
A designated area into which any weapon system may fire without additional co-ordination with the establishing headquarters.

G

General Support (GS)
GS is a support which is given to the supported force as a whole and not to any particular subdivision thereof.
(This term is a reviewed definition and it will be recommended to modify it in AAP-6)

General Support Reinforcing (GSR)
GSR is a tactical task in which an indirect fire system fires in support of the force as a whole and, on a secondary basis, provides reinforcing fire for another indirect fire system.
(This term is a reviewed definition and it will be recommended to modify it in AAP-6)

H
-

I

Indirect Fire System (IFS)
A system of systems, the main characteristics of which are its 24/7, all weather capability to acquire targets and achieve effects over a wide area and in depth. It should be able to deliver area and precision munitions.

(This term is a new term and definition and will be recommended for inclusion in AAP-6)

J

Joint Fires (JF)
Fires applied during the employment of forces from two or more components in coordinated action toward a common objective.

Joint Fire Support (JFS)
Joint Fire support is the coordinated and integrated employment of all weapon platforms delivering fires (It includes land, air, naval delivered indirect fires) to achieve the required effects on ground targets to support land operations in the full spectrum of conflict. It encompasses the integration of indirect fires and effects in order to influence the adversary forces, installations or functions.
(This term is a new term and definition and will be recommended for inclusion in AAP-6)

Joint Fire Support Element (JFSE)
The Joint Fire Support Element (JFSE) is responsible for the overall planning, coordination and employment of all allocated JFS assets at all levels. It is the single point of contact for Joint Fire Support coordination.
(It should always be tailored to the mission and to the level of force and reinforced by all necessary liaison cells as required)
(This term is a new term and definition and will be recommended for inclusion in AAP-6)

K – L – M
-

N

No-Fire Area (NFA)
The NFA is an area into which no fires or the effects of fires are allowed except if temporarily authorized by establishing authority or if an adversary force within this area engages friendly forces.

O
-

P

Permissive Measures
Measures which have the purpose of facilitating the attack of targets. With the establishment of a permissive measure, no further coordination is required for the engagement of targets affected by the measure.

Q
-

R

Reinforcing (R)
R is a tactical mission in which one indirect fire system unit augments the fire of another indirect fire system unit.
(This term is a reviewed definition and will be recommended to modify it in AAP-6)

Restricted Fire Area (RFA)
The RFA is an area in which specific restrictions are imposed and in which fires that exceed those restrictions are not delivered without co-ordination with the establishing headquarters.

Restricted Operating Zone (ROZ)
Airspace of defined dimensions, designated by the ACA in response to specific situations and/or requirements within which the operation of one or more airspace users is restricted.

Restrictive Fire Line (RFL)
The RFL is a line established between converging friendly forces (one or both may be moving) that prohibit all fire or effects from fires across the line without coordination with the affected force.

Restrictive Measures
Measures which have the purpose of providing safeguards to friendly forces or objects. The establishment of a restrictive measure imposes certain requirements for specific coordination prior to the engagement of those targets affected by the measure.

S – T – U – V

W

Weapon Engagement Zone (WEZ)
In air defence, airspace of defined dimensions within which the responsibility for engagement normally rests with a particular weapon system.

Weapons Free
In air defence, a weapon control order imposing a status whereby weapons systems may be fired at any target not positively recognized as friendly.

Weapons Tight
In air defence, a weapon control order imposing a status whereby weapons systems may be fired only at targets recognized as hostile.

Weapons Hold
In air defence, a weapon control order imposing a status whereby weapons systems may only be fired in self-defence or in response to a formal order.

X – Y

Z

Zone of Fire
An area into which a designated ground unit or fire support asset delivers, or is prepared to deliver fires.

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LIST OF ACRONYMS AND ABBREVIATIONS

A

AArtyP	Allied Artillery Publication
ACA	Airspace Coordination Area
ACA	Airspace Control Authority
ACM	Airspace Control Means / Airspace Control Measures
ACC	Air Component Command(er)
AD	Air Defence
ADCON	Administrative Control
ADP	Automated Data Processing
AI	Air Interdiction
AOCC	Air Operations Coordination Center
AOO	Area of Operations
AOR	Area of Responsibility
APCLO	Air Power Contribution to Land Operations
AR	Air Route
ASCA	Artillery Systems Cooperation Activities
ASR	Ammunition Supply Rate
ASR	Air Support Request
ATO	Air Tasking Order

B

BDA	Battle Damage Assessment
Bde-JFSE	Brigade Joint Fire Support Element
BDZ	Base Defence Zone
BG	Battle Group
BG-JFSE	Battle Group Joint Fire Support Element
BM	Battlefield Management

C

C UAV	Combat Unmanned Aerial Vehicle
C^2	Command & Control
C^3	Command, Control and Communication
CAS	Close Air Support
(C)AOC	(Combined) Air Operations Center

CAS	Close Air Support
CATF	Commander Amphibious Task Force
CCA	Close Combat Attack
CCF	Course Correcting Fuze
CDE	Collateral Damage Estimation
CFL	Coordinated Fire Line
CIMIC	Civil-Military Cooperation
CIS	Communication and Information System
CL	Coordination Level
CNO	Computer Network Operation
COA	Course of Action
COIN	Counter-Insurgency
CONOP	Concept of Operations
COP	Common Operational Picture
Coy-JFSE	Company Joint Fire Support Element
Corps-JFSE	Corps Joint Fire Support Element
CSS	Combat Service Support

D

D3A	Decide, Detect, Deliver & Assess
DIRLAUTH	Direct Liaison Authority
Div-JFSE	Division Joint Fire Support Element
DS	Direct Support

E

EGM	Effects Guidance Matrix
ESM	Electronic Warfare Support Measures
EW	Electronic Warfare

F

FAC	Forward Air Controller
FDC	Fire Direction Center
FFA	Free-Fire Area
FO	Forward Observer
FSC	Fire Support Coordination
FSCL	Fire Support Coordination Line
FSCM	Fire Support Coordination Measures
FSO	Fire Support Officer

G

GMLRS	Guided Multiple Launch Rocket System
GLE	Gun Location Error
GPS	Global Positioning System
GS	General Support
GSR	General Support Reinforcing

H

HIDACZ	High Density Airspace Control Zone
HPT	High Pay-off Target

I

IA	Interdiction Attack
IFS	(Land-based) Indirect Fire System(s)
IFS	Indirect Fire Support
INFOSEC	Information Security
Info Ops	Information Operation(s)
IPB	Intelligence Preparation of the Battlefield
ISR	Intelligence, Surveillance, Reconnaissance
ISTAR	Intelligence, Surveillance, Target Acquisition, Reconnaissance

J

JACC	Joint Airspace Coordination Center
JAAT	Joint Air-Attack Team
JF	Joint Fires
JFC	Joint Force Command(er)
JFS	Joint Fire Support
JFSE	Joint Fire Support Element
JOA	Joint Operations Area
JOC	Joint Operations Center
JPTL	Joint Prioritized Target List
JTAC	Joint Terminal Attack Controller
JTC	Joint Targeting Cycle

K

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L

LCC	Land Component Command(er)
LEGAD	Legal Advisor
LGP	Laser-Guided Projectile
LM	Loitering Munitions
LOAC	Laws Of Armed Conflicts
LOC	Line Of Communication

M

MCC	Maritime Component Command(er)
MDA	Main Defence Area
MET	Meteorological
METCM	Meteorological Computer Message
METGM	Meteorological Gridded Message
METTA	Meteorological Target Acquisition Message

N

NFA	No-Fire Area
NFS	Naval Fire Support
NGO	Non-Governmental Organization

O

OPCOM	Operational Command
OPCON	Operational Control
OPLAN	Operations Plan
OPORD	Operations Order
OPP	Operations Planning Process
OPSEC	Operation Security

P

PAO	Public Affair Officer
PGM	Precision Guided Munitions
PL	Phase Line
PME	Peace Military Engagement
POL	Petroleum, Oil and Lubricants
POLAD	Political Advisor
PSO	Peace Support Operations
PSYOPS	Psychological Operations

Q

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R

R	Reinforcing
RFA	Restricted Fire Area
RFL	Restricted Fire Line
RoE	Rules of Engagement
ROZ	Restricted Operating Zone
R/R	Re-Attack Recommendation
RSR	Required Supply Rate

S

SACC	Supporting Arms Coordination Center
SCATMIN	Scatterable Mine
SEAD	Suppression of Enemy Air Defences
STA	Surveillance, Target Acquisition

T

TACOM	Tactical Command
TACON	Tactical Control
TACP (ALO)	Tactical Air Control Party Air Liaison Officer
TACP (FAC)	Tactical Air Control Party Forward Air Controller
TACP	Tactical Air Control Party
TEA	Target Engagement Authority
THP	Terminally Homing Projectile
TIC	Troops In Contact
TLE	Target Location Error
TOC	Tactical Operations Center
TTP	Tactics, Techniques & Procedures

U

UAS	Unmanned Aerial System
UAV	Unmanned Aerial Vehicle

V

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W

WAC	Weather Analysis Center
WCO	Weapon Control Order
WEZ	Weapon Engagement Zone
WMD	Weapon of Mass Destruction

X-Y-Z

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