Brief Outline of Volume I Part I

Part I – The Concepts and General Structure of the Integrated Land and Air Resource Model

Chapter I-1, Studying Military History Using Operational-Strategic Simulations

The first chapter in Volume I is concerned with describing what military simulations are, how they have evolved (in the military community), why military simulations are such a powerful tool for studying military history, and the key differences in methodology between a qualitative and quantitative analysis. The last section of this chapter introduces the concepts of tactical, tactical-operational, operational and strategic level simulations.

Chapter I-2, The Integrated Land and Air Resource Model

Chapter I-2 describes the concept of the Integrated Land and Air Resource Model, its key objectives, and defines the difference between a 'fully' and 'partially' integrated model. In the Fully Integrated Land and Air Resource Model (FILARM), all personnel and equipment (termed resources) present at the start of the campaign, and all resources received from all sources during the campaign period, are within the model. 'Fully' refers to the fact that all resources, in all physical locations are included, not just those on the 'East Front'. 'Partially' refers to the fact that only resources committed to the 'East front' are included. 'Integrated' refers to the fact that the model is a system by which a change in any part of the model has a cascade effect on other model components. The primary focus of this chapter is an explanation of how and why the integrated resource model enables a realistic and historically accurate analysis of a country's war effort to be produced.

Chapter I-3, The Structure of the Fully Integrated Land and Air Resource Model (FILARM)

Chapter I-3 represents the core of Part I. Chapter I-3 is devoted to defining and describing the FILARM model methodology, concepts, structure and processes, with illustrations using real examples from Operation Barbarossa. The underlying principle involved here is conservation of 'physical mass', with the 'mass' being personnel and equipment of all types. Essentially, personnel and equipment (or resources) cannot be created from nothing and cannot disappear, unless destroyed (by combat or attrition) or scrapped. Two of the main aims of the FILARM model, are to ensure that the actual strength of all combat units is not simply based on their TOE strength, and that the resources mobilised (in any simulation) do not exceed the number that were historically available to that country's entire armed force. It means all resources mobilised for the armed forces have to be tracked from manufacture and deployment, to the end of their military life, or the end of the period in question. The generic structure of the FILARM model described in this chapter enables this to be achieved.

Chapter I-4, The Structure of the Partially Integrated Land and Air Resource Model (PILARM)

Chapter four is essentially a repeat of the previous chapter, but only focuses on the differences between the fully and partially integrated models.

Chapters I-5 to I-9, titled:

The Order of Battle (OOB): the Force Deployment Matrices

Tables of Organisation and Equipment (TOE)

The Heterogeneous Model vs. the Homogeneous Model

Supply Distribution Efficiency (SDE)

A 'Divisional Sized' or 'Division Equivalent' Combat Unit in WWII

The remaining five chapters in Part I are concerned with introducing, discussing and in some cases defining important concepts needed to analyse a historical military event. These include:

- The historical Order of Battle (OOB) and the resultant Force Deployment Matrices in the integrated resource models.
- Tables of Organisation and Equipment (TOE). This includes an introduction to TOEs and how to read them. Most importantly, this chapter focuses on how to 'translate' a traditional TOE into a structure usable by the FILARM-PILARM models, and how to read and understand the many TOEs that appear later in Parts IV to VI of this book.
- The difference between a heterogeneous and a homogeneous model. In this chapter, we focus on the use of historical data to determine the actual historical resources available to any armed force. It is explained how conflicting (or simply missing) figures for personnel and equipment, usually from different historical sources, are reconciled in the integrated model. In fact, this is one of the key benefits of the FILARM model. Without an integrated resource model or suitable historical records, the military historian is usually reduced to making a guess in regards to a force's actual historical strength. Alternatively, they may choose to ignore the issue completely, as is often the case.
- The relative Supply Distribution Efficiency (SDE). SDE is a measure of the ability of support infrastructures (in an armed force) to supply and support a specific number and type of combat unit over a fixed distance and terrain during combat operations. In this chapter, the SDE in the FILARM-PILARM model is defined, and the procedure for calculating the SDE is laid out. The chapter includes a discussion of the vital concepts of 'supply lift', 'supply demand' and 'supply radius'. The ability to accurately determine a side's historical SDE is another one of the key benefits (and objectives) of the FILARM model.
- A divisional sized or division equivalent combat unit in WWII. In the final chapter in Part I, we examine the concept of a division as it related to armed forces in World War Two. The different divisions utilised by various WWII belligerents in 1941 are examined, highlighting the problems with using divisions when attempting to compare historical strengths of various sides. The military concept of 'divisional slice' is introduced, and a formal methodology is defined for determining whether a (historical) combat unit can reasonably be called a divisional sized combat unit. This analysis does not directly affect the structure of FILARM-PILARM models, because even very small combat units (down to platoon and company level) are considered in these models. However, the divisional analysis above does have a bearing on discussions relating to the perceived strengths of the belligerents in WWII, and these are referred to at various points throughout this work.

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