

## TEMPO MILITARY PLANNING GAME EXPLANATION AND RULES\*

The game is played between two teams. Each team begins the game from the same starting point. The game is made up of simultaneous plays, called years. Each year, the teams are given a budget and must decide how to spend their budget that year. At the end of each year, there is a chance that a war will occur. In the event of a war, a score is calculated and a winner is announced. The game continues for a fixed number of years, no matter how many wars occur.

### FORMAT OF THE GAME

At the beginning of each year, the team receives a budget form with a budget. The budget can be spent in four broad ways: (1) the operation of existing weapon systems, (2) research and development of future weapon systems, (3) the acquisition of additional weapon systems, and (4) intelligence and counterintelligence. The team must fill out the budget form and give a copy to the umpire at the time specified on the game schedule. Additionally, a probability of war is written at the top of the budget form. This probability indicates the likelihood of a war occurring in the year. The outcome, whether or not a war actually occurs, will not be known until **after** the budget form is turned in.

### THE SCORE

There are four **types** of weapon systems: Offensive A, Offensive B, Defensive A, and Defensive B (OA, OB, DA, and DB, respectively). Each Weapon System Type is comprised of individual weapon systems, such as OA1, OA2, and so forth. If a team pays to operate units of a system, each unit produces an output that is measured in "**Utils**". The Util is a measure of effectiveness.

In the event of a war, the team with the greatest net utils wins the war. The losing team's budget will be reduced in the following year by the amount of the difference in net utils produced. Net utils are calculated as the sum of the team's offensive utils minus the defensive utils produced by the opposing team. Specifically, a team's Net Utils is calculated as follows:

$$\begin{aligned} & \text{(Type A Offensive Utils)} - \text{(Opposing Team's Type A Defensive Utils)} \\ & \quad \text{PLUS} \\ & \text{(Type B Offensive Utils)} - \text{(Opposing Team's Type B Defensive Utils)} \end{aligned}$$

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\*This game was developed originally as a strategic planning exercise by H. Hatry, F. Jackson, and P. Lever of the Economic Analysis Section of TEMPO, General Electric Company, Santa Barbara, California. It was subsequently adapted by DRMI for use as a resource allocation exercise.

### **NUMERICAL EXAMPLE:**

**Suppose that a war occurs at the end of year one and :**

*Team X operated 20 units of OA1, 40 units of OB1, 20 units of DA1, and 15 units of DB1.*

*Team Y operated 10 units of OA1, 35 units of OB1, 50 units of DA1, and 12 units of DB1.*

*Each unit of: OA1 produced 120 utils.*

*OB1 produced 20 utils.*

*DA1 produced 15 utils.*

*DB1 produced 50 utils.*

#### **X TEAM**

OA <sub>x</sub>	2,400
DA <sub>y</sub>	<u>-750</u>
Net (OA)	1,650

OB <sub>x</sub>	800
DB <sub>y</sub>	<u>-600</u>
Net (OB)	200

*Total Net Utils, team X*      1,850

#### **Y TEAM**

OA <sub>y</sub>	1,200
DA <sub>x</sub>	<u>-300</u>
*20% over-defense credit	<u>-10</u>
Net (OA)	890

OB <sub>y</sub>	700
DB <sub>x</sub>	<u>-750</u>
Over-defense	<u>-50*</u>
Net (OB)	0

*Total Net Utils, team Y*      890

**Team X won. Team Y's budget will be reduced by 1850-890=960 the following year.**

**In addition, both teams' budgets will be reduced by 400 the following year due to the occurrence of war.**

\*Defensive weapon systems defend against your opponent's offensive weapon systems of the same Weapon System Type -- your DA weapons defend against the enemy's OA weapons, and your DB weapons defend against the enemy's OB weapons. Any DA system counts against any OA system of the enemy, and likewise for B systems. If you over defend against a Weapon System type, 20% of the over-defense amount is applied to your defensive capability in the other category.

### **PLAY OF THE GAME**

At the beginning of the game, your team will be given the following important information:

- A Game Schedule.
- Budget Allocation Forms with your budget for the first year and the probability of war.
- A sheet showing your Initial Weapons Systems including information on the inventory, maximum acquisition rate, costs, and utils.
- A set of Weapon System Information Sheets describing the current status of newly available weapons systems (for example, see enclosure 1).

## INTELLIGENCE

Intelligence is available at a cost of \$100 per category (Offensive Operating Forces; Defensive Operating Forces; Offensive R&D, Acquisition; Defensive R&D, Acquisition). Counterintelligence costs \$300 and covers all four intelligence categories. The information you receive depends on whether your opponent buys counterintelligence:

- **If your opponent does not buy counterintelligence:**
  - For Operating Forces: The type and quantity of operating systems.
  - For R&D, Acquisition: The type and quantity of systems acquired and a list of systems in R&D.
- **If your opponent buys counterintelligence:**
  - For Operating Forces: The type of system and the direction of change in quantity (up, down or constant), i.e., DB1 up, down, or unchanged.
  - For R&D, Acquisition: The systems in R & D and only the type of system acquired.

Intelligence reports are prepared after the budget submissions.

## PROBABILITY AND RESULTS OF WAR

The probability of war will be announced at the beginning of each year and is for that year only. If war occurs, it will happen after your budget decisions for that year have been completed but before the next year begins. Neither team can declare a war. If war occurs, the outcome (score) will be announced by your umpire near the beginning of the next year. If war occurs, each team will lose \$400 from its next year's budget. In addition, the losing team's budget will be further reduced by a \$ amount equal to the difference in net utils produced that year (\$960 in the scoring example on page 2).

## WEAPON SYSTEM INFORMATION SHEETS

During the game, Weapon System Information Sheets will be provided for new systems, which you may choose to fund through the following stages:

### ***Research and Development (R&D)***

R&D on new systems takes 1 to 2 years to complete. Weapon System Information Sheets show **historical and current values in BOLD. These values are final and exact.** Information about future costs and util values are estimated, *will appear in ITALICS and are subject to change (see Enclosure 1).* If you budget the R&D for "This Year", you will be given an updated Weapon System Information Sheet at the start of the next year. In the final year of R&D, you will be given a **FINAL** Weapon System Information Sheet (with final and exact cost and util data). None of the R&D opportunities is mandatory. R&D on a weapon system may be discontinued at any time. However, if it is resumed in a later year, a penalty of \$300 or one-half of the current R&D, whichever is smaller, will be charged and must be included by the team in its budget.

## ***Acquisition***

A team may acquire additional units of any system already in the inventory at any time. Units of any new system may be acquired during the final year of R&D and thereafter. The maximum annual acquisition rate for any particular system is stated on the Weapon System Information Sheet.

## ***Operating***

A team may operate any unit of a weapon system in inventory at the start of a year. Operation is not mandatory, but if existing units are not operated, they are permanently lost from the inventory. Units acquired in one year cannot be operated until the following year.

## **BUDGET ALLOCATION FORM**

In each year of the game, your team will be given two copies of a Budget Allocation Form to record all decisions to: perform R&D, acquire units, operate units and buy intelligence and/or counterintelligence. A completed Budget Allocation Form must be handed in to your umpire at the end of each game year. The other copy is for your team's records.

An example of a completed Budget Allocation Form (see Enclosure 2) is provided only to illustrate the proper entries and arithmetic required to complete the form and may not reflect the actual numbers used in the game. **Do not interpret this example as indicating "good" or "bad" play.**

The budget will change from year to year. You will have no information on future budgets except during the final three years.

## **PENALTIES**

There are three special penalties that can affect your budget:

- a. If the Budget Allocation Form is submitted late, the team will be penalized \$50 per minute for the first five minutes and \$100 for each additional minute. The penalty will be subtracted from the next year's budget.
- b. A team that exceeds its budget in one year will have its next year's budget cut by twice the amount of the over-expenditure.
- c. Funds not used in any one year are lost.

## WEAPON SYSTEM INFORMATION SHEET

OAX

Note: All numbers in **BOLD** are **FINAL & EXACT**

All other numbers are estimated and appear in *italics*

Weapon System	R&D		Acquisition		Operations	
	1st Year	2nd Year	Maximum units/year	Unit Cost	Unit Cost	Utils/ Unit
<b>OAX</b>	<b>\$ 400</b>	<i>\$ 500</i>	<i>15</i>	<i>\$ 200</i>	<i>\$ 250</i>	<i>400</i>

Year 1

## BUDGET ALLOCATION FORM

YEAR 1 BUDGET \$14,400 WAR PROBABILITY .05 TEAM 7Y

R&amp;D

ACQUISITION

OPERATING

FORCE TYPE	WEAPON SYSTEM	R&D COST	# OF UNITS	UNIT COST	TOTAL COST	# OF UNITS	UNIT COST	TOTAL COST
OFF A	OA1					20	150	3000
	OA2	600	24	75	1800			
OFF B	OB1		6	50	300	40	30	1200
	OB2	900						
DEF A	DA1					100	20	2000
	DA2	400	20	90	1800			
DEF B	DB1					15	60	900
	DB2	800						
SUBTOTALS:		2700			3900			7100

INTELLIGENCE: \$100 per category

SUBTOTALS:

Offensive: Operating Forces 100R&D 2700R&D / Acquisition 100ACQUISITION 3900Defensive: Operating Forces 100R&D / Acquisition 100OPERATING 7100COUNTERINTELLIGENCE (CI): \$300 300SUBTOTAL: 700INTELL/CI 700GRAND TOTAL (R&D + ACQUISITION + OPERATING + INTELL/CI) 14,400

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