A SET OF TEMPLATES FOR EVALUATING WARGAMES

(BENCHMARKS)

Prepared by

ROBERT McQUIE

U.S. Army Concepts Analysis Agency

October 1988
A set of templates are presented that can be used in quickly comparing wargame results with history. These templates are based on data about 260 historical battles between 1937 and 1982. 31 ratios and rates were extracted from this data describing key aspects of each battle. The data and results have been published in a report published by the U.S. Army Concepts Analysis Agency. The 31 measures summarize the following aspects of the battles: (1) relative advantage; (2) target density; (3) weapon density; (4) casualties & losses; (5) movement & duration; (6) artillery fire. The templates provide a summary description of combined arms combat as it has existed in our lifetime.
A set of templates are presented here that can be used in comparing wargame results with history. These templates are based on data about 260 historical battles between 1937 and 1982. This data has been assembled over a quarter of a century by Colonel Trevor N. Dupuy, USA, Ret and his military historian colleagues at Data Memory Systems, Inc. This historical data, like wargame data itself is not easy to interpret.

To facilitate interpretation and enable the data to be compared with wargame results, 31 ratios and rates were extracted from it describing key aspects of each battle. The data and results may be found in a report published by the US Army Concepts Analysis Agency. The 31 measures summarize the following aspects of the 260 battles:

- relative advantage
- target density
- weapon density
- casualties & losses
- movement & duration
- artillery fire

From the array of values for each of the 31 ratios or rates, three values were extracted:

a. The median value.

b. The range in which the middle 50% of the values are found.

c. The range in which 90% of the values are found.

These three values were used to construct the templates on the following pages. In each template, the "box" shows the range in which the middle 50% of the values were found; the "whiskers" at each end of the box show the range of values extended to 90% of the battles. The median value of the measure is shown as a horizontal line across the middle of the box.

When the range of a characteristic is so wide that it cannot be diagrammed on the template, the whisker has been truncated, with the actual value shown by a small figure at its end. Otherwise, the scale at the left edge shows the values and units of measure. Questions about these templates may be referred to the author (AV: 295-5227).

The templates provide, it may be noted, a summary description of combined arms combat as it has existed in our lifetime.
INITIAL CONDITIONS

2. TARGETS

- **Troops**
  - Attacker: 9300, 6000, 6000
  - Defender: 280, 5600, 4000

- **Weapon systems per 3000 pe kilometer of front**
  - Attacker: 160
  - Defender: 300
INITIAL CONDITIONS

3. ATTACKER WEAPONS

- Rifle Sqds
- Mortars
- AT wpns
- Tanks
- Arty
- AD wpns
- Sorties / day

Number per kilometer of front

0 10 20 30 40 50 60 70 80 90 100
INITIAL CONDITIONS

4. DEFENDER WEAPONS

Number per kilometer of front

Rifle Sqds  Mortars  AT wpns  Tanks  Arty  AD wpns  Sorties / day
OUTCOMES
5. CASUALTIES

Per day of battle

Over time

Per kilometer advanced

Over distance
OUTCOMES
6. TANK LOSSES

Per day of battle
30%
20%
10%
0%
Attacker Defender
Over time

Per kilometer advanced
11%
13%
4%
3%
2%
1%
0%
Attacker Defender
Over distance
OUTCOMES

7a. LOSS RATIO

7b. TIME-DISTANCE

Ratio of attacker to defender losses:
- 7:1
- 7:1:1
- 4:1
- 3:1
- 2:1
- 1:1
- 0:1

Men: Cbt hours, Km advance
Tanks: Per day
OUTCOMES

8. ROUNDS FIRED

Rounds per artillery tube per day

<table>
<thead>
<tr>
<th>Attack</th>
<th>Defense</th>
<th>Pursuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>20-40</td>
<td>50-100</td>
</tr>
<tr>
<td>10-30</td>
<td>40-80</td>
<td>60-100</td>
</tr>
<tr>
<td>30-50</td>
<td>80-120</td>
<td>70-110</td>
</tr>
<tr>
<td>50-70</td>
<td>120-160</td>
<td>90-130</td>
</tr>
<tr>
<td>70-90</td>
<td>160-200</td>
<td>110-150</td>
</tr>
<tr>
<td>90-100</td>
<td>200-240</td>
<td>130-170</td>
</tr>
</tbody>
</table>

Graph showing the distribution of rounds fired per artillery tube per day across Attack, Defense, and Pursuit categories.