UP FRONT BY THE NUMBERS
An Analysis of the Odds
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A central focus of any game or game system is its representation of random events. Supposedly, all other factors are known to the players and are ideally used in the most efficient manner possible. It is left, then, for the game to create everything from the lack of command knowledge to the basic chance happenings of a battlefield in some random manner. In *UP FRONT,* this is achieved by the card deck. Through a *tour-de-force* of design and development effort, the deck is used to cover a myriad of uncertainties. It not only takes the place of the familiar dice for combat resolution but confers terrain, movement, the ability to fire, and many other elements of squad level combat.

One of the deck's main features is to both represent and separate the two primary vagaries of the battlefield: the fog-of-war and the uncertainty of actions. The focus of this article is on the statistically predictable functions of the deck, since most of the spectrum of the results of combat can be represented by hit probabilities, blast radii, average casualties, etc. These, then, will be quantified below for the use of the gamer.

We would be somewhat remiss, however, if we did not first make at least passing mention of the other factor—fog-of-war. This is represented by the lack of knowledge of the cards held by your op-

ponent and the order of those left in the deck. The player still is left with the rather generous intelligence of the cards already discarded and the composition of the opposing force. (It might be interesting and more realistic to cover the personnel cards on the table with a sheet of paper until they fire or are within Range 2.) The cards held by your opponent are another matter. These will vary both with needs and availability. A few general expectations are valid, though. An ideal hand will consist of one each of terrain, movement, fire and rally cards. The German has the luxury of adding a Concealment card and the US player can even afford to hold on to special cards such as Mines, Wire, or Sniper without disturbing the mix. Note that this doesn't mean that such cards will not be present in the Soviet hand, just that he will have to give up other flexibilities to retain them over a long span of time. Situations will also play a role in the desired hand. Movement and terrain are more desirable at the start of a game. Fire, concealment and rally are worth more later. You can expect that an opponent on the tactical defensive will be discarding movement and terrain cards (except Marsh and Stream) in favor of fire and special effect cards. Per this, the discard phase is one of the most important facets of a turn. Knowing what to hold and what to dump is crucial to success. In the same light, a count of a few critical cards is necessary. By keeping up with the number of Mine, Sniper, Marsh, and Stream cards discarded, you can make movement at times which promise a greater likelihood of success. If you are like most players and cannot remember every card played, at least look for these. A final hint for those scenarios with definite offensive and defensive sides is in order. Since time is judged by the use of the deck, it is to the advantage of the defensive player to "spend" cards and the offensive player to save them. The defender, therefore, can fire at atrocious odds at large groups and waste ten cards in resolving the fire attack. Soviet players will often ditch whole hands again and again if the cards are only marginally useful. The attacker will be forced to

retaliate with swift movement and optimal fire. There are, of course, many other tricks available to the players. The rest of this article will attempt to put them on a firm statistical footing.

Before beginning our analysis of the full 162 card deck, let us look at the contents of a single card. In the upper right hand corner is the basic Random Number (RN)—similar to a dice roll in that it gives a bell curve of results from minus six to plus six, including both plus and minus zero. This number is used for the resolution of combat situations from Fire (6.5, 14.3, etc.) to Close Combat (20.7) to Overrun (29.2)—as well as ordnance To Hit (25.3), sniper checks (14.4), fording attempts (8.53), weapons repair (19.3) and reacquisition (18.2, 20.91), morale checks (20.21). The center of the card is devoted to the status and actions possible for a squad. These include fire, movement, terrain, and rally with a differentiation of capabilities by nationality for certain actions. At the bottom of the card are the Random Position (RP) numbers. These are in ten groups of one through zero and range within each group from one to the group size. These numbers give random results for panic (6.53), rout (6.531), sniper attacks (14.2), execution (15.5), weapon malfunction (19.43), close combat (20.52), berserk (20.9), mines (24.31), and wounds (33.1).

Number	Percent
1	0.62
2	1.23
3	1.85
4	2.47
5	3.09
6	3.70
7	4.32
8	4.94
9	5.56
10	6.17

TABLE 1 Percentage of cards out of 162

RN	Number	Percent
0	44	27.2
1	36	22.2
2	28	17.3
3	22	13.6
4	16	9.9
5	10	6.2
6	6	3.7

Table 2a Quantity of Each Random Number in the deck. For all numbers, half are black and half are red.

They may also *be* used for set-up of DYOs (43). Use of the numbers is called a Random Position Check (RFC). These numbers are also red or black (for minus or plus), which influence success or failure in infiltration (20.3), bogging (28.53), or ATMM s versus overruns (31.22). They may even be treated similarly to RN s for resolution of close combat versus AFV s (28.8). The cards are graphically as stunning as the rest of the game and, what's better, are of playing card quality so that repeated shuffling will not degrade their performance. [As a hint to the shuffling, divide the deck with your opponent and then split your half. Shuffling each half while cross-cutting them, cross-cut with your opponent to further mix the cards. Five repetitions of this should result in a good mixture when the deck is re-assembled.]

Now for the expectations of what you will receive when drawing your cards. Table 1 is a summary of percentages out of 162 for a number of cards. The table is limited to ten to save space. If you feel the need for higher number probabilities, a small amount of decimal point shifting and addition should suffice.

Table 2a, 2b, and 2c cover the Random Numbers. Table 2a is a simple listing of the number of cards for each RN and the percentage. These cards are evenly divided between black and red (plus and minus). Table 2b expands the listing by giving the quantity for all numbers and the accumulated total and percentage. This can be read as a declining percentage by merely reversing black and red. For example, if you wish to know your chances on a morale check for a "4" morale soldier against a resolved "2" strength fire attack, looking at the black "2" row gives 25.3%. Table 2c gives the percentages necessary for the To Hit (25.3) chances of ordnance. If a black result is required for hull down (25.31) or moving (25.32, 33), the percentage should be halved. Note the large difference between "0" and "0-1".

Tables 3a, 3b, and 3c cover the expectations of card draws to fill your hand for actions and terrain. Table 3a gives the cards which are non-nationality dependent. The notes section for Minefields shows the fire strength for each card. For snipers, the PIN,

K1A values are given. The 48 Fire cards are broken down by their strengths and then the number of firepower factors required to use each card is noted. Table 3b lists the nationality dependent cards by type and nationality. Note that the total number of cards here and in 3a do not necessarily sum to 162. This is because of the split-action cards which may have both halves applicable to a given nation. A study of this table will give an understanding of the characteristics of each nationality, as will Table 3c which gives the conditional abilities for radio usage broken down by nationality. Table 3c includes all of the conditions listed vertically on the right hand side of the card, as well as noting that each card is open ground when reversed. A careful study of these three tables should give you an idea of what should be possible in a game. Again, the reader should at least be able to keep up with certain critical occurrences such as knowing when there are no more Streams or Minefields in the deck.

Another warning is applicable here. The percentages on all occurrences are based on the full deck. In practice, this is never so, since there is a marked tendency for certain cards to be either discarded per scenario rules, in a player's hand as noted above, or on the table as terrain. This is especially true when a deck has ended and there are likely to be as many as 20 cards which are not available for re-shuffle. These in particular tend to be terrain cards. A short examination of the deck will show that these are quite often zero or low number RN s. This will make a difference in expected distribution and at the same time makes up for the skewing present because there are plus and minus zeroes in the deck.

Table 4a is a rather complicated way of giving hints on fire group make-up. The 48 Fire cards are listed by number of cards for each strength and the sum for all cards equal or less. The average column is the average attack strength generated by the cards for given firepower. The average and the sum are then multiplied to give an effectiveness rating. This rating is a result of the choices between fire group size, weapons, and range which should indicate how to get the most frequent and effective fire from the minimum number of men given the distribution of cards which will allow the group to fire. The player should also study the table with regards to his tactical situation. A defensive group will wish to maintain effective fire over all ranges while an assault section may only be interested in a high volume of fire at close range. A quick glance will tell you that a fire group with 2, 4, 8, or 14 fac-

Card Type	US	German	USSR
Smoke	5	2	0
Concealed 1	8	8	12
Concealed 2	3	4	5
Concealed 3	2	2	2
Cower	7	4	4
Rally 1	5	7	7
Rally 2	5	5	4
Rally 3	4	4	3
Rally 4	3	3	2
Rally 5	2	2	2
Rally 6	1	1	1
Rally All	1	1	1
Movement	24	27	30

Table 3b Quantity of cards available by card type for types which have differing amounts for different nationalities.

Card Type	All	US	German	USSR
Open Ground	162			
Breeze	9			
Ford	6			
Flank	4			
Radio		8	7	9

TABLE 3c Quantity of provisional card types. Radio cards are broken down by nationality.

tors is inefficient when compared with a group with one less factor. They gain nothing in attack strength to make up for the lesser number of Fire cards they have available. Using this line of reasoning, a group of ten factors has the greatest total output per card available. (Note that because five is also an acceptable result—although not optimal—a group of five bolt-action rifles will make a very good fire group but the same weapons used by four men exhibits each point of inefficiency. Three rifles and a machine pistol is also a viable group. Table 4b summarizes the fire power of these three groups versus relative range. The reader is encouraged to make up the same table for each of his own groups at set-up time. They may provide hints for minor changes which will give major benefits.)

Table 5 is a compilation of the available results under the Random Position numbers. The number of red and black numbers are listed and then a breakdown by occurrence for each. There does seem to be one small error in the "9" row (destined for correction in the next edition). All of the other rows are evenly divided where possible, but this row

RN	Number	Sum	Percent
6	3	3	1.9
5	5	8	4.9
4	8	16	9.9
3	11	27	16.7
2	14	41	25.3
1	18	59	36.4
0	22	81	50.0
0	22	103	63.6
1	18	121	74.7
2	14	135	83.3
3	11	146	90.1
4	8	154	95.1
5	5	159	98.1
6	3	162	100.0

TABLE 2b Quantity, sum and percentage for Random Numbers are broken down by red and black, respectively.

TO HIT Number	Percent
3	13.6
2	17.3
1	22.2
0	27.2
0-1	49.4
0-2	66.7
0-3	80.3
0-4	90.2
0-5	96.4

TABLE 2c Percentage of success for TO HIT Numbers. For situations where only black numbers apply, these percentages must be halved.

Card Type		Number	Notes
Brush		6	
Minefield		2	(Attack: 4,5)
Hill		3	
Stream		2	
Buildings2		4	
Buildings3		4	
Marsh		2	
Gully		3	
Woods		5	
Wall		3	
Pillbox		1	
Sniper		4	(Pin.KIA: 2,4; 3,5; 3,6;
Wire		3	
Hero		2	
Fire		48	(factors required)
	Fire 1	9	(1,1,2,2,3,3,4,4,5)
	Fire 2	8	(1,2,3,4,5,6,7,8)
	Fire 3	7	(3,4,5,6,7,8,9)
	Fire 4	6	(7,8,9,10,11,12)
	Fire 5	6	(10,11,12,13,14,15)
	Fire 6	6	(13,14,15,16,17,18)
	Fire 7	4	(15,16,17,18)
	Fire 8	2	(17,18)

Table 3a Quantity of cards available by card type. The Fire cards are broken down by firepower.

Firepower Factors	Number	Sum	Average Fire	Product
18	3	3	7.00	21.00
17	3	6	7.00	42.00
16	2	8	6.50	52.00
15	3	11	6.00	66.00
14	2	13	5.50	71.50
13	2	15	5.50	82.50
12	2	17	4.50	76.50
11	2	19	4.50	85.50
10	2	21	4.50	94.50
9	2	23	3.50	80.50
8	2	26	3.00	84.00
7	3	29	3.00	87.00
6	2	31	2.50	77.50
5	3	34	2.00	68.00
4	4	38	1.75	66.50
3	4	42	1.75	73.50
2	3	45	1.33	60.00
1	3	48	1.33	64.00

TABLE 4a Value per Firepower factor. The table gives the number of cards available for use by each size fire group as a sum and the average value of each applicable fire card. The product gives a weighted value for each group size.

Range	5 Rifles	4 Rifles	3 Rifles, MP
0	0	0	0
1	5	4	3
2	5	4	3
3	10	8	7
4	10	8	9
5	15	12	14

TABLE 4b Firepower generated by differing sizes of groups at different ranges. For comparison, utilize Table 4a.

RPN	Red	Black	1	2	3	4	5	6	7	8	9	0
0	12	150	17	17	16	16	16	16	16	16	16	16
9	15	147	18	18	18	18	18	18	18	18		
8	19	143	21	21	20	20	20	20	20	20		
7	26	136	24	23	23	23	23	23	23			
6	36	126	27	27	27	27	27	27				
5	49	113	33	33	32	32	32					
4	65	97	41	41	40	40						
3	84	78	54	54	54							
2	107	55	81	81								
1	129	33	162									

TABLE 5 Distribution of the Random Position Numbers, both by color and number.

has 17 under "l" and 19 under "7" which leads one to suspect that one of the black "7's" should have been a "1". The occurrence of red results within each RP group is as smooth as possible. An illustration for the use of this table is that Infiltration versus a ten man group without modifiers is successful only 7.4% of the time but rises to 79.6% against a single man. Close Combat versus AFVs (28.8) is resolved with rows "2", "4", or "5". The preponderance of red results for the lower numbers reflects the greater difficulty of attacking open versus closed vehicles. Also evident is the slight advantage to the positioning of leaders and critical crew and weapons at least third in a group. One chance in 162 may be small but it does exist.

The standard caveat will once again be repeated. Odds are no more than that. Just because the above tables show that a Sniper card is a 2.47% chance and sixes happen 3.7% of the time, you should not be totally amazed when the 0.1% chance hits and your squad leader is dead. The wise player realizes that occasionally, despite his best efforts, results will be unfavorable. It is the use of available information to minimize these occurrences which gives such players a long term winning edge. Also, despite the plethora of data given above, *UP FRONT* is a heavily psychological game. Just as in poker, the best hand will not survive a successful bluff. Fear of your opponent's hand and the next card in the deck can have the same effect as fear on the battlefield. Perhaps this is what gives the game its character and niche in an over-crowded field and this feature is due to the uniqueness of the card deck.

May you always draw the ones you need.

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