

Investigation into Airborne Resupply
By Steve Hunwick

Pay attention because I shall be asking questions later.

These are the results gained from running different versions of Stefan's test scenario. 20km and Full Week turns.

In all cases the units just sat still. There was no movement, no combat.

The first is a run of the unmodified scenario and it shows Airborne Resupply in action quite clearly.

In all cases unit proficiencies are 75%.

Anomalies are caused by desertion effects.

The end of this scenario (from turn 5 onwards) shows why it is a nightmare to calculate in advance how much supply will be received due to desertion effects lessening the supply demand.

Colour coding: Red is supply loss, blue is no gain no loss, and green is supply increase.

The formulas for HQ, Paratroops, Glider Troops, and Special Forces are as follows:

Supply Received = r, Supply Stockpile = s, and Supply Demand = d

Clear	$r = s - d$	}	(Oh, I wish it were that simple...or perhaps not...)
Cloudy	$r = \frac{2s}{3} - d$		
Rainy	$r = \frac{s}{2} - d$		

Trace 1

Turns		Unit Supply				Change				Stockpile	Air Lift	
		HQ	Para 1	Para 2	Para 3	HQ	Para 1	Para 2	Para 3			
Editor		100	100	100	100	n/a	n/a	n/a	n/a			
1		72	72	72	72	-28	-28	-28	-28	20	500	You will always take an initial hit that varies.
2		64	64	57	64	-8	-8	-15	-8	20	500	
3		56	56	49	49	-8	-8	-8	-15	20	2500	
4		41	41	41	41	-15	-15	-8	-8	20	250	
5		33	33	23	26	-8	-8	-18	-15	20	250	<-- Desertion Effects kick in here on Para 2
6		18	25	20	20	-15	-8	-3	-6	20	250	<-- Everyone is deserting...
7		10	13	20	10	-8	-12	0	-10	20	250	<-- Note the supply drop hit on Para 2
8		10	20	10	10	0	7	-10	0	20	250	
9		13	13	20	20	3	-7	10	10	20	250	
10		20	20	13	13	7	7	-7	-7	20	250	
11		10	20	20	10	-10	0	7	-3	20	250	
12		20	13	20	20	10	-7	0	10	20	250	
13		20	10	13	10	0	-3	-7	-10	20	250	
14		13	20	20	20	-7	10	7	10	20	250	
15		20	20	20	20	7	0	0	0	20	250	
End of Scenario												HQ and all Units suffered from desertion effects

For the second run I have modified the test scenario to make the supply stockpile 30.

Trace 2

Turns		Unit Supply				Change				Stockpile	Air Lift	
		HQ	Para 1	Para 2	Para 3	HQ	Para 1	Para 2	Para 3			
Editor		100	100	100	100	n/a	n/a	n/a	na			
1		72	72	72	72	-28	-28	-28	-28	30	500	You will always take an initial hit that varies.
2		64	59	74	64	-8	-13	2	-8	30	500	
3		66	51	61	56	2	-8	-13	-8	30	2500	
4		68	53	63	58	2	2	2	2	30	250	
5		70	55	50	60	2	2	-13	2	30	250	
6		72	47	52	62	2	-8	2	2	30	250	
7		74	49	39	49	2	2	-13	-13	30	250	
8		66	51	41	51	-8	2	2	2	30	250	
9		58	38	43	43	-8	-13	2	-8	30	250	
10		50	25	45	35	-8	-13	2	-8	30	250	
11		37	15	47	37	-13	-10	2	2	30	250	<-- Desertion Effects kick in here on Para 1
12		39	30	49	39	2	15	2	2	30	250	<-- Note the supply drop hit on Para 1
13		41	32	41	41	2	2	-8	2	30	250	
End of Scenario												Only Para 1 suffered desertion effects

Trace 2 shows a regular pattern until slightly upset by desertion effects on Para 1.

In Trace 3 I have modified the airlift to a uniform level but lower than originally programmed.

Trace 3

Turns		Unit Supply				Change				Stockpile	Air Lift	
		HQ	Para 1	Para 2	Para 3	HQ	Para 1	Para 2	Para 3			
Editor		100	100	100	100	n/a	n/a	n/a	na			
1		72	72	72	72	-28	-28	-28	-28	30	150	You will always take an initial hit that varies.
2		74	74	74	74	2	2	2	2	30	150	
3		66	66	76	76	-8	-8	2	2	30	150	
4		58	68	63	68	-8	2	-13	-8	30	150	
5		50	70	65	70	-8	2	2	2	30	150	
6		42	62	67	72	-8	-8	2	2	30	150	
7		44	49	69	74	2	-13	2	2	30	150	
8		36	41	56	61	-8	-8	-13	-13	30	150	
9		28	33	48	63	-8	-8	-8	2	30	150	
10		30	25	50	65	2	-8	2	2	30	150	
11		22	30	52	52	-8	5	2	-13	30	150	<-- Note the supply drop hit on Para 1
12		30	32	44	44	8	2	-8	-8	30	150	<-- Note the supply drop hit on HQ
End of Scenario												Only HQ and Para 1 suffered desertion effects.

Ok. Now we are cooking with gas.

Trace 1 is an overall supply deficiency that is balanced out by desertion effects.
What can we infer though from traces 2 and 3?

Consider this:

Trace 4

Turns		Unit Supply				Change				Stockpile	Air Lift	
	Editor	HQ	Para 1	Para 2	Para 3	HQ	Para 1	Para 2	Para 3			
		100	100	100	100	n/a	n/a	n/a	na			
	1	72	72	72	72	-28	-28	-28	-28	30	40	You will always take an initial hit that varies.
	2	74	74	64	74	2	2	-8	2	30	40	
	3	76	76	66	76	2	2	2	2	30	40	
	4	78	68	68	78	2	-8	2	2	30	40	
	5	80	70	60	80	2	2	-8	2	30	40	
	6	67	72	62	82	-13	2	2	2	30	40	
	7	59	59	54	84	-8	-13	-8	2	30	40	
	8	61	46	56	86	2	-13	2	2	30	40	
	9	63	48	48	78	2	2	-8	-8	30	40	
	10	65	50	50	80	2	2	2	2	30	40	
	11	57	37	52	82	-8	-13	2	2	30	40	
	12	59	24	54	84	2	-13	2	2	30	40	
End of Scenario												Neither HQ nor any of the units suffered from

OK. Traces 2, 3, and 4 are essentially the same. Trace 4 had better weather that's all.
But what do we make of the air lift?

Trace 5

Turns		Unit Supply			Change				Stockpile	Air Lift		
Editor	HQ	Para 1	Para 2	Para 3	HQ	Para 1	Para 2	Para 3				
	100	100	100	100	n/a	n/a	n/a	na				
1	72	72	72	72	-28	-28	-28	-28	30	30	You will always take an initial hit that varies.	
2	72	62	58	72	0	-10	-14	0	30	30		
3	72	62	48	58	0	0	-10	-14	30	30		
4	72	62	48	58	0	0	0	0	30	30		
5	62	62	34	48	-10	0	-14	-10	30	30		
6	52	62	34	47	-10	0	0	-1	30	30		
7	52	62	34	48	0	0	0	1	30	30		
8	38	62	34	48	-14	0	0	0	30	30		
9	38	62	34	38	0	0	0	-10	30	30		
10	38	62	20	38	0	0	-14	0	30	30		<-- Desertion effects Para 2
11	39	63	14	29	1	1	-6	-9	30	30		<-- Note the supply hit Para 2
12	31	65	20	31	-8	2	6	2	30	30		<-- Note the supply hit Para 2
13	33	57	20	23	2	-8	0	-8	30	30		<-- Desertion effects Para 3
14	35	49	30	20	2	-8	10	-3	30	30		<<-- Supply hits on Para 2 and Para 3
End of Scenario											Desertion effects only on Para 2 and Para 3	

Now isn't that interesting?

Trace 6 is pretty much what you should expect by now.

Trace 6

Turns		Unit Supply				Change				Stockpile	Air Lift	
	HQ	Para 1	Para 2	Para 3	HQ	Para 1	Para 2	Para 3				
Editor	100	100	100	100	n/a	n/a	n/a	na				
1	72	72	72	72	-28	-28	-28	-28	30	100000	You will always take an initial hit that varies.	
2	74	74	74	74	2	2	2	2	30	100000		
3	76	76	66	61	2	2	-8	-13	30	100000		
4	63	63	53	63	-13	-13	-13	2	30	100000		
5	55	65	55	65	-8	2	2	2	30	100000	<-- Desertion effects HQ	
6	42	67	47	57	-13	2	-8	-8	30	100000		
7	29	69	49	59	-13	2	2	2	30	100000		
8	16	56	51	51	-13	-13	2	-8	30	100000		
9	20	48	53	53	4	-8	2	2	30	100000	<-- Desertion effects Para 1 Desertion effects only on HQ and Para 1	
10	30	50	45	55	10	2	-8	2	30	100000		
11	22	37	47	57	-8	-13	2	2	30	100000		
12	20	24	39	49	-2	-13	-8	-8	30	100000		
End of Scenario												

That looks suspiciously like traces 2, 3, and 4 to me.
The next one is sort of what you might expect but not quite...

Trace 7

Turns		Unit Supply				Change				Stockpile	Air Lift	
	Editor	HQ	Para 1	Para 2	Para 3	HQ	Para 1	Para 2	Para 3			
		100	100	100	100	n/a	n/a	n/a	na			
	1	72	72	72	72	-28	-28	-28	-28	35	80	You will always take an initial hit that varies.
	2	60	60	66	77	-12	-12	-6	5	35	80	
	3	65	54	60	82	5	-6	-6	5	35	80	
	4	70	48	65	87	5	-6	5	5	35	80	
	5	58	53	70	92	-12	5	5	5	35	80	
	6	63	47	75	86	5	-6	5	-6	35	80	
	7	68	52	80	80	5	5	5	-6	35	80	
	8	73	46	74	85	5	-6	-6	5	35	80	
	9	78	40	79	90	5	-6	5	5	35	80	
	10	83	45	84	84	5	5	5	-6	35	80	
	11	88	50	89	89	5	5	5	5	35	80	
	12	82	38	94	77	-6	-12	5	-12	35	80	
End of Scenario												
Neither HQ nor any of the units suffered from desertion effects.												

If 40 airlift shifts 30 supply then surely 80 airlift should be able to cope with 35 supply?
But it appears the airlift is only shifting 33 supply. The natural urge is to turn up the air lift a tad but try it and see what you get.

All this begs the question: what does the trace look like when there is no air lift and the units are genuinely unsupplied?

TRACE 8

Turns	Unit Supply				Change				Stockpile	Air Lift	
	HQ	Para 1	Para 2	Para 3	HQ	Para 1	Para 2	Para 3			
Editor	100	100	100	100	n/a	n/a	n/a	na			
1	72	72	72	72	-28	-28	-28	-28	35	0	You will always take an initial hit that varies.
2	45	45	45	45	-27	-27	-27	-27	35	0	<-- Desertion Effects kick in here on Para 1,2, and 3
3	18	18	18	18	-27	-27	-27	-27	35	0	<-- Desertion Effects kick in on the HQ
4	1	1	1	1	-17	-17	-17	-17	35	0	

No point going any further

It was not an accident that I set the supply stockpile to 30 in trace 2. I already knew from trace 1 that the supply demand was going to be 28.

The "-8" you get in trace 1 is not the same as the "-8" you get in trace 2. The "-8" in trace 1 is an air drop in clear weather.

It is the basic deficiency between demand "28" and the supply "20". So you are still getting "20" supply. It is just not enough to offset the supply demand.

The "-8" you get in trace 2 is an air drop in cloudy conditions since 30*2/3 = 20. This is supply you will get so 20 - 28 = -8.

In stormy conditions in trace 2 you are penalised 50% so 30*50% = 15 and 15 - 28 = -13.

This is all fairly standard but please remember that HQ, Para, Glider, and Special Forces get better supply than everyone else.

Now if you imagine that all this is beginning to make sense then I am going to leave you with something to think about....

Trace 9 is from an unmodified Korsun 44 in the Classics folder. SS Wallonien is a Mech Inf and the others are Inf and HQ.

I turned off the air staff assistant and set all air forces to rest as I clicked through the turns.

All units begin 1/3 under strength.

All units are 85% proficiency. And these are not all the units in the pocket just a random selection of four of them.

5km, Half-Day turns.

Trace 9

Turns	Unit Supply				Change				Stockpile	Air Lift	
	HQ 57	SS Wall	546/389	179/57	HQ 57	SS Wall	546/389	179/57			
Editor	75	50	50	50	n/a	n/a	n/a	na			
1	73	48	48	48	-2	-2	-2	-2	15	150	You will always take an initial hit that varies.
2	72	47	47	47	-1	-1	-1	-1	15	150	
3	71	46	46	46	-1	-1	-1	-1	15	150	
4	70	45	45	45	-1	-1	-1	-1	15	150	
5	69	44	44	44	-1	-1	-1	-1	15	150	
6	68	43	43	43	-1	-1	-1	-1	15	150	

And this is far enough to make the point.

Curiouser and curiouser...

And now I have questions:

(You thought I was joking didn't you?)

a) Why is the supply demand only 2?

b) What happened to the weather?

c) If the supply demand is 2 and there is a supply stockpile of 15, why am I only getting 1 supply?

d) So if the HQ gets better supply than the other units, why isn't it getting better supply?

And I do not accept such excuses as "Please Sir, the dog ate my homework."

Disclaimer: Please do not use any of these figures for planning a scenario. They refer specifically to the scenarios mentioned..