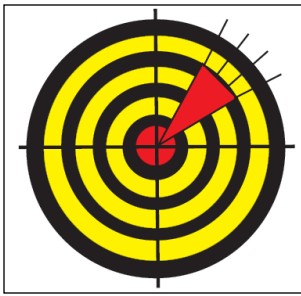

Formation Deconfliction Planner

Computes time, altitude, and horizontal deconfliction for multiple aircraft deliveries.

When using time deconfliction, subsequent aircraft should not enter the horizontal or vertical limits of the fragmentation cylinder until expiration of the time of flight for the preceding aircraft's weapon fragments. Time separation between aircraft (using similar delivery profiles) is equal to the fragmentation time of flight, plus preceding munition time of fall, plus the time to fly the distance between weapon actual range (AR) and maximum fragment travel horizontal range of the preceding fragments.

Compute time deconfliction.

Maximum Fragment Travel, Time of Flight (from chart) (sec)

Maximum Fragment Travel, Horizontal Range (ft.) (from chart)

Weapon Ground Actual Range (i.e. downrange distance from release to weapon impact) (ft.)

Weapon Time of Fall (sec)

Aircraft Ground Speed (Knots)

Time Between Aircraft (sec)

When altitude deconfliction is used, subsequent aircraft must recover above the maximum altitude for the fragment envelope for the preceding attacker's munitions. For example, the maximum fragment travel (altitude) is 3265 ft for a MK-84 delivery at a 5,000-foot target density altitude (See Chart). So the subsequent aircraft must recover above 3265 ft. at a minimum.

When using horizontal deconfliction, subsequent aircraft must remain outside the maximum horizontal range of the fragment envelope for the preceding attacker's munitions. For example, from Chart, a lateral separation of 2,600 feet provides deconfliction from a MK-82 released at Sea Level.

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MAXIMUM BOMB/ROCKET FRAGMENT TRAVEL CHART

MAXIMUM BOMB FRAGMENT TRAVEL						
	ALTITUDE (FEET)		HORIZONTAL RANGE (FEET)		TIME OF FLIGHT (SECONDS)	
	TDA		TDA		TDA	
	SEA LEVEL	5000 FEET	SEA LEVEL	5000 FEET	SEA LEVEL	5000 FEET
UNITARY WARHEADS						
MK 82 ALL TYPES	2225	2535	2600	2965	25.3	27.0
MK 83 ALL TYPES	2424	2769	2807	3205	26.7	29.3
MK 84 ALL TYPES	2855	3265	3295	3760	28.9	30.9
M117 ALL TYPES	2790	3160	3395	3850	27.6	29.2
BLU-109 ALL TYPES	3590	4080	4295	4880	31.5	33.4
BLU-110 ALL TYPES	MK-83 with PBNX-109 Fill - NO DATA AVAILABLE					
BLU-111 ALL TYPES	MK-82 with PBNX-109 Fill - NO DATA AVAILABLE					
BLU-113 ALL TYPES	4630	5235	5700	6450	35.1	37.3
BLU-117 ALL TYPES	MK-84 with PBNX-109 Fill - NO DATA AVAILABLE					
AGM-65G	FRAG TRAVEL - JMEM					
AGM-65H	FRAG TRAVEL - JMEM					
AGM-65K	FRAG TRAVEL - JMEM					
INTACT CANISTERS						
CBU-87/B, A/B, B/B, C/B	1980	2250	2360	2685	23.6	25.1
CUB-89/B, A/B	2400	2735	2805	3195	26.3	28.0
CBU-103	1980	2250	2360	2685	23.6	25.1
CBU-104	2400	2735	2805	3195	26.3	28.0
CBU-105	2760	3150	3225	3675	28.2	30.0
CBU-107	NOT A FRAGMENTATION WARHEAD - NOT APPLICABLE					
CLUSTER SUBMUNITIONS						
BLU-91/B (CBU-89, -104)	NOT A FRAGMENTATION WARHEAD - NOT APPLICABLE					
BLU-92/B (CBU-89)						
BLU-97/B, A/B (CBU-87, -103)	545	620	635	725	12.8	13.7
BLU-108/B, B/B (CBU-105)	NOT A FRAGMENTATION WARHEAD - NOT APPLICABLE					

MAXIMUM ROCKET FRAGMENT TRAVEL							
MUNITION	IMPACT ANGLE (DEGREES)	ALTITUDE (FEET)		HORIZONTAL RANGE (FEET)		TIME OF FLIGHT (SECONDS)	
		TDA		TDA		TDA	
		SEA LEVEL	5000 FEET	SEA LEVEL	5000 FEET	SEA LEVEL	5000 FEET
MK-1	5	1030	1170	1430	1630	17.1	18.1
	10	1015	1150	1425	1630	16.9	17.9
	20	985	1110	1425	1620	16.5	17.5
	30	930	1045	1410	1610	16.0	17.0
Mk5	5	1190	1360	1620	1850	18.5	19.5
	10	1175	1340	1620	1845	18.3	19.4
	20	1140	1300	1615	1840	18.0	19.1
	30	1110	1265	1600	1825	17.7	18.8
MK-151	5	1010	1145	1335	1515	17.1	18.2
	10	1000	1135	1330	1515	17.0	18.1
	20	990	1110	1325	1510	16.9	17.8
	30	965	1085	1300	1500	16.6	17.6
WDU-4A/A	NOT A FRAGMENTATION WARHEAD - NOT APPLICABLE						