

3.2 Weapons Comparison Charts
 3.2.1 Estimated Damage for each Hit against different shields
 The following two charts show estimated damage for each turn for each weapon against each shield level:

Beam Weapons:		Shields												
name	tech	0	1	2	3	4	5	6	7	9	11	13	15	
Laser	1	1-4(x1)	10/25(+0)	1	2.5	1.5	0.7	0.2	--	--	--	--	--	
Hvy Laser	1	1-7(x1)	30/75(+0)	2	4.0	3.0	2.1	1.4	0.9	0.4	0.1	--	--	
Gat Laser	5	1-4(x4)	20/70(+0)	1	10.0	6.0	3.0	1.0	--	--	--	--	--	
^Neut. Pellet	7	2-5(x1)	15/25(+0)	1	3.5	2.5	2.5	1.5	1.5	0.7	0.7	0.2	--	
Ion Cannon	10	3-8(x1)	15/35(+0)	1	5.5	4.5	3.5	2.5	1.7	1.0	0.5	0.2	--	
Hvy Ion	10	3-15(x1)	45/105(+0)	2	8.0	7.0	6.0	5.1	4.2	3.5	2.8	1.6	0.8	
^Mass Driver	13	5-8(x1)	55/50(+0)	1	6.5	5.5	4.5	4.5	3.5	3.5	2.5	1.5	0.7	
Neutron Blst	15	3-12(x1)	20/60(+0)	1	7.5	6.5	5.5	4.5	3.6	2.8	2.1	1.5	0.6	
Hvy Blast	15	3-24(x1)	60/180(+0)	2	12.5	11.5	10.5	9.5	8.6	7.8	7.0	5.5	4.1	
~Graviton	17	1-15(x1)	30/60(+0)	1	8.0	7.0	6.1	5.2	4.4	3.7	3.0	2.4	1.4	
^Hard Beam	19	8-12(x1)	50/100(+0)	1	10.0	9.0	9.0	8.0	8.0	7.0	7.0	6.0	5.0	
Fusion Beam	20	4-16(x1)	20/75(+0)	1	10.0	9.0	8.0	7.0	6.0	5.1	4.2	3.5	2.2	
Hvy Fusion	20	4-30(x1)	60/225(+0)	2	17.0	16.0	15.0	14.0	13.0	12.0	11.1	10.2	8.6	
Megabolt	25	2-20(x1)	30/65(+3)	1	11.0	10.0	9.0	8.1	7.2	6.3	5.5	4.8	3.5	
Phasor	26	5-20(x1)	20/90(+0)	1	12.5	11.5	10.5	9.5	8.5	7.5	6.6	5.7	4.1	
Hvy Phasor	26	5-40(x1)	60/270(+0)	2	22.5	21.5	20.5	19.5	18.5	17.5	16.5	15.6	13.8	
Auto Blstor	28	4-16(x3)	30/90(+0)	1	30.0	27.0	24.0	21.0	18.0	15.2	12.7	10.4	6.5	
~Tachyon Beam	30	1-25(x1)	30/80(+0)	1	13.0	12.0	11.0	10.1	9.2	8.4	7.6	6.8	5.4	
2.2^Gauss Auto	32	7-10(x4)	105/105(+0)	1	34.0	30.0	30.0	26.0	26.0	22.0	22.0	18.0	14.0	
^Particle	33	10-20(x1)	90/75(+0)	2	15.0	14.0	14.0	13.0	13.0	12.0	12.0	11.0	10.0	
Plasma Canon	35	6-30(x1)	30/110(+0)	1	18.0	17.0	16.0	15.0	14.0	13.0	12.0	11.0	9.2	
Death Ray	36	200-1000(x1)	2000/2000(+0)	3	600.	599.	598.	597.	596.	595.	594.	593.	591.	
Disruptor	37	10-40(x1)	70/160(+0)	2	25.0	24.0	23.0	22.0	21.0	20.0	19.0	18.0	16.0	
Pulse Phasor	38	5-20(x3)	40/120(+0)	1	37.5	34.5	31.5	28.5	25.5	22.5	19.7	17.1	12.4	
Tri-focus Pl	45	20-50(x1)	70/180(+0)	1	35.0	34.0	33.0	32.0	31.0	30.0	29.0	28.0	26.0	
Stellar Conv	46	10-35(x4)	200/300(+0)	3	90.0	86.0	82.0	78.0	74.0	70.0	66.0	62.0	54.0	
Mauler Dev	48	20-100(x1)	150/300(+0)	1	60.0	59.0	58.0	57.0	56.0	55.0	54.0	53.0	51.0	

These are streaming weapons, so damage carries over from one target to another
 ^: These are penetrating weapons, that halve the effects of shields.

Missiles and Torpedoes:		Shields												
name	tech	0	1	2	3	4	5	6	7	9	11	13		
Nuclear	1	4(x1)	50/20(+0)	2.0	4	3	2	1	-	-	-	-	-	
-Hyper-V	4	6(x1)	70/20(+0)	2.5	6	5	4	3	2	1	-	-	-	
-Hyper-X	7	8(x1)	100/20(+1)	2.5	8	7	6	5	4	3	2	1	-	
-Scatter V	11	6(x5)	115/50(+0)	2.5	30	25	20	15	10	5	-	-	-	
-Merculite	14	10(x1)	105/20(+2)	3.0	10	9	8	7	6	5	4	3	1	
-Stinger	18	15(x1)	155/30(+3)	3.5	15	14	13	12	11	10	9	8	6	
-Anti-Mat Trp	23	30(x1)	75/300(+4)	4.0	30	28	27	26	25	24	23	21	19	
Scatter VII	27	10(x7)	230/50(+2)	3.0	70	63	56	49	42	35	28	21	7	
-Pulson	29	20(x1)	160/40(+4)	4.0	20	19	18	17	16	15	14	13	11	
Hercular	34	25(x1)	220/40(+5)	4.5	25	24	23	22	21	20	19	18	16	
Hellfire Trp	40	25(x4)	150/350(+6)	5.0	100	96	92	88	84	80	76	72	64	
Zeon	41	30(x1)	250/50(+6)	5.0	30	29	28	27	26	25	24	23	21	

26 25 24 23 21 19 17 15 Proton Torp 43 60(x1) 100/400(+6) 8.0 60 59 58 57
 56 55 54 53 51 49 47 45 Scatter X 44 15(x10) 250/ 50(+3) 3.5 150 140 130 120
 110 100 90 80 60 40 20 -Plasma Torp 50 135(x1) 150/450(+7) 6.0 135 134 133
 132 131 130 129 128 126 124 122 120 Note: Plasma Torpedo stats assume that torpedo

fired at adjacent stack.
 3.2.2 Shield Protection Planet shield level where weapons cease to affect:
 2: Laser, Gatling Laser
 4: Heavy Laser, Ion Cannon, Nuclear Missile Planetary Shield
 V:5: Neutron Pellet Gun
 6: Neutron Blaster, Hyper V Rockets, Scatter Pack Vs
 7: Mass Driver, Heavy Laser
 8: Heavy Ion Cannon, Graviton Beam, Fusion Beam, Auto Blaster, Hyper X Missiles
 Planetary Shield X:10: Megabolt Cannon, Phasor, Pulse Phasor, Gauss Autocannon, Mercurite Missiles, Scatter Pack VIIs
 12: Nuclear Bomb, Hard Beam, Heavy Blast Cannon
 13: Tachyon Beam, Hellfire Torps
 15: Heavy Fusion Beam, Plasma Cannon, Stinger Missiles, Scatter Pack Xs, Anti-Matter Torps
 Planetary Shield XV:18: Stellar Converter
 20: Heavy Phasor, Disruptor, Fusion Bomb, Pulson Missile
 Planetary Shield XX:25: Tri-Focus Plasma, Hercular Missiles
 31: Zeon Missiles, Proton Torpedoes
 Weapons beyond max defense: Mauler Device, Death Ray, Anti-Matter Bomb, Omega-V Bomb, Neutronium Bomb, Plasma Torps.(35 is maximum Planet Defense)

Ship shield level where weapons cease to affect:
 4: Laser, Gatling Laser, Nuclear Missile
 6: Hyper V Rockets, Scatter Pack Vs
 7: Heavy Laser
 9: Neutron Pellet Gun, Ion Cannon, Hyper X Missiles
 11: Mercurite Missiles, Scatter Pack VIIs
 13: Neutron Blaster
 15: Heavy Ion Cannon, Fusion Beam, Auto Blaster, Graviton Beam, Mass Driver, Stinger Missiles, Scatter Pack Xs
 Following weapons beyond max defense: Megabolt Cannon, Phasor, Pulse Phasor, Gauss Autocannon, Hard Beam, Heavy Blast Cannon, Tachyon Beam, Hellfire Torps, Heavy Fusion Beam, Plasma Cannon, Anti-Matter Torps, Stellar Converter, Heavy Phasor, Disruptor, Pulson Missile, Tri-Focus Plasma, Hercular Missiles, Zeon Missiles, Proton Torpedoes, Mauler Device, Death Ray, Plasma Torps.

3.2.3 Damage per unit of space: I have noted that if you are using current technology, the space that a weapon takes up is pretty well denoted by the following equation. (current size + power * (1 - current tech level/100)) at least through tech level 60. The following tables then, show the total damage per turn (assuming all shots hit) for each unit of space used. This is a handy means of comparing weapons of different tech levels: Weapon comparison for tech level 10 :

Assumption: Space = size + power * .9 Beam Weapons: Shieldsname

tech	cost/spc	(bon)	rng	0	1	2	3	4	5	6	7	9	11	13	15	Laser	1	2/28(+0)
1	.089	.054	.027	.009	--	--	--	--	--	--	--	--	--	--	--	Hvy Laser	1	5/84(+0)
2	.048	.036	.026	.017	.010	.005	.002	--	--	--	--	--	--	--	--	Gat Laser	5	7/77(+0)
1	.130	.078	.039	.013	--	--	--	--	--	--	--	--	--	--	--	^Neut. Pellet	7	3/35(+0)
1	.100	.071	.071	.043	.043	.021	.021	.007	--	--	--	--	--	--	--	Ion Cannon	10	4/47(+0)
1	.117	.096	.074	.053	.035	.021	.011	.004	--	--	--	--	--	--	--	Hvy Ion	10	11/140(+0)
2	.064	.057	.050	.043	.036	.030	.025	.020	.012	.005	.002	--	--	--	--	Missiles and Torpedoes:		

Shieldsname tech cost/spc(bon) spd 0 1 2 3 4 5 6 7 9 11 13 15 Nuclear

1	27/45(+0)	2.0	.089	.067	.044	.022	--	--	--	--	--	--	--	--	--	Hyper-V	4	46/64(+0)
2.5	.094	.078	.062	.047	.031	.016	--	--	--	--	--	--	--	--	--	Hyper-X	7	81/99(+1)
2.5	.081	.071	.061	.051	.040	.030	.020	.010	--	--	--	--	--	--	--	Weapon comparison for tech level 20 :		

Assumption: Space = size + power * .8 Beam Weapons: Shieldsname

tech	cost/spc	(bon)	rng	0	1	2	3	4	5	6	7	9	11	13	15	Laser	1	1/23(+0)
1	.109	.065	.033	.011	--	--	--	--	--	--	--	--	--	--	--	Hvy Laser	1	3/68(+0)
2	.059	.044	.032	.021	.013	.006	.002	--	--	--	--	--	--	--	--	Gat Laser	5	4/63(+0)
1	.159	.095	.048	.016	--	--	--	--	--	--	--	--	--	--	--	^Neut. Pellet	7	2/26(+0)

1 .135 .096 .096 .058 .058 .029 .029 .010 -- -- -- -- Ion Cannon 10 3/36(+0)
1 .153 .125 .097 .069 .046 .028 .014 .005 -- -- -- -- Hvy Ion 10 6/107(+0)
2 .084 .075 .065 .056 .047 .040 .032 .026 .015 .007 .002 -- ^Mass Driver 13 6/74(+0)
1 .088 .074 .074 .061 .061 .047 .047 .034 .020 .010 .003 -- Neutron Blst 15 5/62(+0) 1 .121
.105 .089 .073 .058 .045 .034 .024 .010 .002 -- -- Hvy Blast 15 13/186(+0)
2 .073 .067 .062 .056 .051 .046 .042 .037 .029 .022 .016 .011~Graviton 17 5/72(+0)
1 .111 .097 .084 .072 .061 .051 .042 .033 .019 .009 .003 -- ^Hard Beam 19 12/127(+0)
1 .079 .071 .071 .063 .063 .055 .055 .047 .039 .031 .024 .016Fusion Beam 20 7/80(+0)
1 .125 .113 .100 .087 .075 .063 .053 .043 .027 .014 .006 .001Hvy Fusion 20 21/240(+0)
2 .071 .067 .062 .058 .054 .050 .046 .043 .036 .029 .024 .019 Missiles and Torpedoes:
Shieldsname tech cost/spc(bon) spd 0 1 2 3 4 5 6 7 9 11 13 15Nuclear
1 13/29(+0) 2.0 .138 .103 .069 .034 -- -- -- -- -- -- -- -- Hyper-V 4 23/39(+0)
2.5 .154 .128 .103 .077 .051 .026 -- -- -- -- -- -- -- -- Hyper-X 7 41/57(+1)
2.5 .140 .123 .105 .088 .070 .053 .035 .018 -- -- -- -- -- -- -- -- Scatter V 11 62/102(+0)
2.5 .294 .245 .196 .147 .098 .049 -- -- -- -- -- -- -- -- Mercurite 14 69/85(+2)
3.0 .118 .106 .094 .082 .071 .059 .047 .035 .012 -- -- -- -- -- -- -- -- Stinger 18 135/159(+3)
3.5 .094 .088 .082 .075 .069 .063 .057 .050 .038 .025 .013 -- Weapon comparison for tech level
30 : Assumption: Space = size + power * .7 Beam Weapons: Shieldsname
tech cost/spc(bon) rng 0 1 2 3 4 5 6 7 9 11 13 15Laser 1 1/19(+0)
1 .132 .079 .039 .013 -- -- -- -- -- -- -- -- -- -- Hvy Laser 1 2/57(+0)
2 .070 .053 .038 .025 .015 .008 .003 -- -- -- -- -- -- -- -- Gat Laser 5 2/53(+0)
1 .189 .113 .057 .019 -- -- -- -- -- -- -- -- -- ^Neut. Pellet 7 1/21(+0)
1 .167 .119 .119 .071 .071 .036 .036 .012 -- -- -- -- -- -- -- -- Ion Cannon 10 2/29(+0)
1 .190 .155 .121 .086 .057 .034 .017 .006 -- -- -- -- -- -- -- -- Hvy Ion 10 3/85(+0) 2 .106 .094
.082 .071 .060 .050 .041 .033 .019 .009 .003 -- ^Mass Driver 13 3/52(+0)
1 .125 .106 .106 .087 .087 .067 .067 .048 .029 .014 .005 -- Neutron Blst 15 3/49(+0) 1 .153
.133 .112 .092 .073 .057 .043 .031 .012 .002 -- -- -- -- -- -- -- -- Hvy Blast 15 7/147(+0)
2 .092 .085 .078 .071 .065 .059 .053 .047 .037 .028 .020 .014~Graviton 17 3/54(+0)
1 .148 .130 .112 .096 .081 .068 .056 .044 .026 .012 .004 -- ^Hard Beam 19 6/93(+0)
1 .108 .097 .097 .086 .086 .075 .075 .065 .054 .043 .032 .022Fusion Beam 20 4/63(+0)
1 .159 .143 .127 .111 .095 .081 .067 .055 .034 .018 .007 .001Hvy Fusion 20 11/188(+0)
2 .090 .085 .080 .074 .069 .064 .059 .054 .046 .037 .030 .024Megabolt 25 6/67(+3)
1 .164 .149 .134 .120 .107 .094 .082 .071 .052 .035 .022 .012Phasor 26 7/78(+0)
1 .160 .147 .135 .122 .109 .096 .084 .073 .053 .036 .022 .012Hvy Phasor 26 20/234(+0)
2 .096 .092 .088 .083 .079 .075 .071 .067 .059 .052 .045 .039Auto Blastor 28 13/89(+0)
1 .337 .303 .270 .236 .202 .171 .143 .117 .073 .039 .016 .003~Tachyon Beam 30 9/86(+0)
1 .151 .140 .128 .118 .107 .098 .088 .080 .063 .049 .036 .026 Missiles and Torpedoes:
Shieldsname tech cost/spc(bon) spd 0 1 2 3 4 5 6 7 9 11 13 15Nuclear
1 7/21(+0) 2.0 .190 .143 .095 .048 -- -- -- -- -- -- -- -- -- Hyper-V 4 12/26(+0)
2.5 .231 .192 .154 .115 .077 .038 -- -- -- -- -- -- -- -- -- Hyper-X 7 20/34(+1)
2.5 .235 .206 .176 .147 .118 .088 .059 .029 -- -- -- -- -- -- -- -- Scatter V 11 31/66(+0)
2.5 .455 .379 .303 .227 .152 .076 -- -- -- -- -- -- -- -- -- Mercurite 14 35/49(+2)
3.0 .204 .184 .163 .143 .122 .102 .082 .061 .020 -- -- -- -- -- -- -- -- Stinger 18 67/88(+3)
3.5 .170 .159 .148 .136 .125 .114 .102 .091 .068 .045 .023 -- Anti-Mat Trp 23 46/256(+4)
4.0 .117 .113 .109 .105 .102 .098 .094 .090 .082 .074 .066 .059Scatter VII 27 187/222(+2)
3.0 .315 .284 .252 .221 .189 .158 .126 .095 .032 -- -- -- -- -- -- -- -- Pulson 29 149/177(+4)

4.0 .113 .107 .102 .096 .090 .085 .079 .073 .062 .051 .040 .028Weapon comparison for tech level 40 : Assumption: Space = size + power * .6 Beam Weapons:

Shieldsname	tech	cost/spc(bon)	rng	0	1	2	3	4	5	6	7	9	11	13	15	Laser
1	1/16(+0)	1	.156	.094	.047	.016	--	--	--	--	--	--	--	--	--	Hvy Laser 1 1/47(+0)
2	.085	.064	.046	.030	.018	.009	.003	--	--	--	--	--	--	--	--	Gat Laser 5 1/44(+0)
1	.227	.136	.068	.023	--	--	--	--	--	--	--	--	--	--	--	^Neut. Pellet 7 1/17(+0)
1	.206	.147	.147	.088	.088	.044	.044	.015	--	--	--	--	--	--	--	Ion Cannon 10 1/23(+0)
1	.239	.196	.152	.109	.072	.043	.022	.007	--	--	--	--	--	--	--	Hvy Ion 10 2/69(+0) 2 .130 .116
	.101	.087	.074	.061	.050	.040	.023	.011	.003	--	--	--	--	--	--	^Mass Driver 13 2/38(+0)
1	.171	.145	.145	.118	.118	.092	.092	.066	.039	.020	.007	--	--	--	--	Neutron Blst 15 2/40(+0) 1 .187
	.163	.138	.113	.090	.070	.052	.037	.015	.003	--	--	--	--	--	--	Hvy Blast 15 4/119(+0)
2	.113	.105	.097	.088	.080	.073	.065	.058	.046	.035	.025	.017	--	--	--	~Graviton 17 2/42(+0)
1	.190	.167	.144	.124	.105	.087	.071	.057	.033	.016	.005	--	--	--	--	^Hard Beam 19 3/72(+0)
1	.139	.125	.125	.111	.111	.097	.097	.083	.069	.056	.042	.028	--	--	--	Fusion Beam 20 2/50(+0)
1	.200	.180	.160	.140	.120	.102	.085	.069	.043	.023	.009	.002	--	--	--	Hvy Fusion 20 6/150(+0)
2	.113	.107	.100	.093	.087	.080	.074	.068	.057	.047	.038	.030	--	--	--	Megabolt 25 3/50(+3)
1	.220	.200	.180	.161	.143	.126	.111	.096	.069	.047	.029	.016	--	--	--	Phasor 26 4/62(+0)
1	.202	.185	.169	.153	.137	.121	.106	.092	.067	.045	.028	.015	--	--	--	Hvy Phasor 26 10/185(+0)
2	.122	.116	.111	.105	.100	.095	.089	.084	.074	.065	.057	.049	--	--	--	Auto Blstor 28 7/67(+0)
1	.448	.403	.358	.313	.269	.227	.189	.155	.096	.052	.021	.003	--	--	--	~Tachyon Beam 30 5/63(+0)
1	.206	.190	.175	.161	.147	.133	.121	.109	.086	.067	.050	.035	--	--	--	^Gauss Auto 32 17/123(+0)
1	.276	.244	.244	.211	.211	.179	.179	.146	.114	.081	.049	.024	--	--	--	^Particle 33 10/100(+0)
2	.150	.140	.140	.130	.130	.120	.120	.110	.100	.090	.080	.070	--	--	--	Plasma Canon 35 9/87(+0)
1	.207	.195	.184	.172	.161	.149	.138	.127	.106	.087	.070	.055	--	--	--	Death Ray 36 228/2716(+0)
3	.221	.221	.220	.220	.219	.219	.219	.218	.218	.217	.216	.215	--	--	--	Disruptor 37 18/153(+0)
2	.163	.157	.150	.144	.137	.131	.124	.118	.105	.092	.080	.069	--	--	--	Pulse Phasor 38 22/107(+0)
1	.350	.322	.294	.266	.238	.210	.184	.159	.116	.079	.049	.026	--	--	--	Missiles and Torpedoes:

Shieldsname	tech	cost/spc(bon)	spd	0	1	2	3	4	5	6	7	9	11	13	15	Nuclear
1	3/15(+0)	2.0	.267	.200	.133	.067	--	--	--	--	--	--	--	--	--	Hyper-V 4 6/18(+0) 2.5
	.333	.278	.222	.167	.111	.056	--	--	--	--	--	--	--	--	--	Hyper-X 7 10/22(+1)
2.5	.364	.318	.273	.227	.182	.136	.091	.045	--	--	--	--	--	--	--	Scatter V 11 15/45(+0)
2.5	.667	.556	.444	.333	.222	.111	--	--	--	--	--	--	--	--	--	Mercurite 14 17/29(+2)
3.0	.345	.310	.276	.241	.207	.172	.138	.103	.034	--	--	--	--	--	--	Stinger 18 34/52(+3)
3.5	.288	.269	.250	.231	.212	.192	.173	.154	.115	.077	.038	--	--	--	--	Anti-Mat Trp 23 23/203(+4)
4.0	.148	.143	.138	.133	.128	.123	.118	.113	.103	.094	.084	.074	--	--	--	Scatter VII 27 93/123(+2)
3.0	.569	.512	.455	.398	.341	.285	.228	.171	.057	--	--	--	--	--	--	Pulson 29 75/99(+4)
4.0	.202	.192	.182	.172	.162	.152	.141	.131	.111	.091	.071	.051	--	--	--	Hercular 34 145/169(+5)
4.5	.148	.142	.136	.130	.124	.118	.112	.107	.095	.083	.071	.059	--	--	--	Hellfire Trp 40 150/360(+6)
5.0	.278	.267	.256	.244	.233	.222	.211	.200	.178	.156	.133	.111	--	--	--	Weapon comparison for tech level 50 : Assumption: Space = size + power * .5 Beam Weapons:

Shieldsname	tech	cost/spc(bon)	rng	0	1	2	3	4	5	6	7	9	11	13	15	Ion
Cannon	10	1/19(+0)	1	.289	.237	.184	.132	.088	.053	.026	.009	--	--	--	--	Hvy Ion
10	1/56(+0)	2	.161	.143	.125	.107	.091	.076	.062	.049	.029	.014	.004	--	--	^Mass Driver 13
1/29(+0)	1	.224	.190	.190	.155	.155	.121	.121	.086	.052	.026	.009	--	--	--	Neutron Blst 15 1/32(+0)
1	.234	.203	.172	.141	.113	.087	.066	.047	.019	.003	--	--	--	--	--	Hvy Blast 15 2/95(+0)
2	.142	.132	.121	.111	.100	.091	.082	.073	.057	.044	.032	.022	--	--	--	~Graviton 17 1/33(+0)

1 .242 .212 .184 .158 .133 .111 .091 .073 .042 .020 .006 -- ^Hard Beam 19 2/ 56(+0)
1 .179 .161 .161 .143 .143 .125 .125 .107 .089 .071 .054 .036Fusion Beam 20 1/ 41(+0)
1 .244 .220 .195 .171 .146 .124 .103 .084 .053 .028 .011 .002Hvy Fusion 20 3/121(+0)
2 .140 .132 .124 .116 .107 .099 .092 .084 .071 .058 .047 .037Megabolt 25 2/ 38(+3)
1 .289 .263 .237 .212 .188 .166 .145 .126 .091 .062 .039 .021Phasor 26 2/ 49(+0)
1 .255 .235 .214 .194 .173 .153 .134 .116 .084 .057 .036 .019Hvy Phasor 26 5/146(+0)
2 .154 .147 .140 .134 .127 .120 .113 .107 .094 .083 .072 .062Auto Blastor 28 4/ 52(+0)
1 .577 .519 .462 .404 .346 .293 .244 .200 .124 .067 .027 .004~Tachyon Beam 30 3/ 48(+0)
1 .271 .250 .230 .211 .193 .175 .158 .142 .113 .087 .065 .046^Gauss Auto 32 9/ 83(+0)
1 .410 .361 .361 .313 .313 .265 .265 .217 .169 .120 .072 .036^Particle 33 5/ 66(+0)
2 .227 .212 .212 .197 .197 .182 .182 .167 .152 .136 .121 .106Plasma Canon 35 5/ 66(+0)
1 .273 .258 .242 .227 .212 .197 .182 .167 .140 .115 .093 .073Death Ray 36 114/1758(+0)
3 .341 .341 .340 .340 .339 .338 .338 .337 .336 .335 .334 .333Disruptor 37 9/108(+0)
2 .231 .222 .213 .204 .194 .185 .176 .167 .148 .130 .113 .097Pulse Phasor 38 11/ 77(+0)
1 .487 .448 .409 .370 .331 .292 .256 .222 .161 .110 .068 .037Tri-focus Pl 45 18/139(+0)
1 .252 .245 .237 .230 .223 .216 .209 .201 .187 .173 .158 .144Stellar Conv 46 38/302(+0)
3 .298 .285 .272 .258 .245 .232 .219 .205 .179 .153 .129 .107Mauler Dev 48 48/281(+0)
1 .214 .210 .206 .203 .199 .196 .192 .189 .181 .174 .167 .160 Missiles and Torpedoes:
Shieldsname tech cost/spc(bon) spd 0 1 2 3 4 5 6 7 9 11 13 15Scatter V
11 8/ 33(+0) 2.5 .909 .758 .606 .455 .303 .152 -- -- -- -- -- -- -- Mercurite 14 9/ 19(+2)
3.0 .526 .474 .421 .368 .316 .263 .211 .158 .053 -- -- -- -- -- -- -- Stinger 18 17/ 32(+3)
3.5 .469 .437 .406 .375 .344 .312 .281 .250 .187 .125 .062 -- -- -- -- -- -- -- Anti-Mat Trp 23 12/162(+4)
4.0 .185 .179 .173 .167 .160 .154 .148 .142 .130 .117 .105 .093Scatter VII 27 47/ 72(+2)
3.0 .972 .875 .778 .681 .583 .486 .389 .292 .097 -- -- -- -- -- -- -- Pulson 29 37/ 57(+4)
4.0 .351 .333 .316 .298 .281 .263 .246 .228 .193 .158 .123 .088Hercular 34 73/ 93(+5)
4.5 .269 .258 .247 .237 .226 .215 .204 .194 .172 .151 .129 .108Hellfire Trp 40 75/250(+6)
5.0 .400 .384 .368 .352 .336 .320 .304 .288 .256 .224 .192 .160Zeon 41 134/159(+6)
5.0 .189 .182 .176 .170 .164 .157 .151 .145 .132 .119 .107 .094Proton Torp 43 62/262(+6)
8.0 .229 .225 .221 .218 .214 .210 .206 .202 .195 .187 .179 .172Scatter X 44 165/190(+3)
3.5 .789 .737 .684 .632 .579 .526 .474 .421 .316 .211 .105 -- -- -- -- -- -- -- Plasma Torp 50 150/375(+7)
6.0 .360 .357 .355 .352 .349 .347 .344 .341 .336 .331 .325 .320Weapon comparison for tech
level 60 : Assumption: Space = size + power * .4 Beam Weapons:
Shieldsname tech cost/spc(bon) rng 0 1 2 3 4 5 6 7 9 11 13 15Fusion
Beam 20 1/ 31(+0) 1 .323 .290 .258 .226 .194 .164 .136 .112 .069 .037 .015 .002Hvy Fusion
20 2/ 94(+0) 2 .181 .170 .160 .149 .138 .128 .118 .109 .091 .075 .060 .047Megabolt 25
1/ 29(+3) 1 .379 .345 .310 .278 .247 .218 .191 .165 .120 .082 .051 .027Phasor 26 1/
38(+0) 1 .329 .303 .276 .250 .224 .197 .173 .150 .109 .074 .046 .025Hvy Phasor 26
3/114(+0) 2 .197 .189 .180 .171 .162 .154 .145 .137 .121 .106 .092 .079Auto Blastor 28 2/
39(+0) 1 .769 .692 .615 .538 .462 .391 .325 .266 .166 .089 .036 .006~Tachyon Beam 30 2/
36(+0) 1 .361 .333 .307 .281 .257 .233 .211 .190 .151 .117 .087 .061^Gauss Auto 32 5/
57(+0) 1 .596 .526 .526 .456 .456 .386 .386 .316 .246 .175 .105 .053^Particle 33 3/ 44(+0)
2 .341 .318 .318 .295 .295 .273 .273 .250 .227 .205 .182 .159Plasma Canon 35 3/ 49(+0)
1 .367 .347 .327 .306 .286 .265 .245 .225 .189 .155 .125 .098Death Ray 36 57/1179(+0)
3 .509 .508 .507 .506 .506 .505 .504 .503 .501 .500 .498 .496Disruptor 37 5/ 78(+0) 2 .321
.308 .295 .282 .269 .256 .244 .231 .205 .180 .156 .134Pulse Phasor 38 6/ 57(+0)
1 .658 .605 .553 .500 .447 .395 .345 .299 .217 .148 .092 .049Tri-focus Pl 45 9/ 97(+0)

1 .361 .351 .340 .330 .320 .309 .299 .289 .268 .247 .227 .206 Stellar Conv 46 19/196(+0)
 3 .459 .439 .418 .398 .378 .357 .337 .316 .276 .235 .199 .165 Mauler Dev 48 24/185(+0)
 1 .324 .319 .314 .308 .303 .297 .292 .286 .276 .265 .254 .243 Missiles and Torpedoes:
 Shieldsname tech cost/spc(bon) spd 0 1 2 3 4 5 6 7 9 11 13 15 Anti-Mat
 Trp 23 6/126(+4) 4.0 .238 .230 .222 .214 .206 .198 .190 .183 .167 .151 .135 .119 Scatter VII
 27 23/ 43(+2) 3.0 1.628 1.465 1.302 1.140 .977 .814 .651 .488 .163 -- -- -- Pulson 29
 19/ 35(+4) 4.0 .571 .543 .514 .486 .457 .429 .400 .371 .314 .257 .200 .143 Hercular 34 36/
 52(+5) 4.5 .481 .462 .442 .423 .404 .385 .365 .346 .308 .269 .231 .192 Hellfire Trp 40
 38/178(+6) 5.0 .562 .539 .517 .494 .472 .449 .427 .404 .360 .315 .270 .225 Zeon 41 67/
 87(+6) 5.0 .345 .333 .322 .310 .299 .287 .276 .264 .241 .218 .195 .172 Proton Torp 43
 31/191(+6) 8.0 .314 .309 .304 .298 .293 .288 .283 .277 .267 .257 .246 .236 Scatter X 44
 82/102(+3) 3.5 1.471 1.373 1.275 1.176 1.078 .980 .882 .784 .588 .392 .196 -- Plasma Torp
 50 75/255(+7) 6.0 .529 .525 .522 .518 .514 .510 .506 .502 .494 .486 .478 .471 3.3. Ground

Combat Odds Following is a guide for how ground combat is determined: GROUND ROLL =
 d100 + Personal Shield + MAX(Personal Armor, Ship Armor) + Personal Weapon +
 Race Bonus (d100 stands for a die roll uniformly distributed between 1 and 100). Both sides do a
 ground role, highest wins and lives, the other is eliminated. Personal Shields (from force field
 technology): None(1) - 0 Personal Deflector Shield(8) - +10 Personal Absorption
 Shield(21) - +20 Personal Barrier Shield(38) - +30 Personal Armor (from Construction
 technology): None(1) - 0 Battle Suits(11) - +10 Armored
 Exoskeleton(24) - +20 Powered Armor(40) - +30 Ship Armor (from Construction
 technology): Titanium Armor(1) - 0 Duralloy Armor(10) - +5 Zortrium
 Armor(17) - +10 Andrium Armor(26) - +15 Tritanium Armor(34) -
 +20 Adamantium Armor(42) - +25 Neutronium Armor(50) - +30 Weapons: (from
 Weapons technology) None(1) - 0 Hand Lasers(2) - +5 Ion Rifle(12)
 - +10 Fusion Rifle(24) - +20 Hand Phasor(31) - +25 Plasma Rifle(42)
 - +30 Racial Bonus is +20 if Bulrathi, otherwise 0 To figure out ratio that is needed, add your
 highest bonuses in each category together, subtract the highest bonuses for your opponent,
 and consult the following formula or table for expected losses: $P(\text{Losing}) = .5 * (100 - \text{Diff}) * (99 - \text{Diff})$
 $(100)^2$ $P(\text{Tie}) = (100 - \text{Diff})$

----- $(100)^2$ So Expected lost = Chance you lose
 ----- * Opponents # of troops (1 - Chance you lose - Chance you
 tie) This leads to the following table: Differential Expected Loss as Percentage of Opponent's
 forces -----

Differential	Expected Loss as Percentage of Opponent's forces
0	100%
+5	82%
+10	68%
+15	56%
+20	47%
+25	39%
+30	32%
+40	22%
+50	14%
+60	8%
+70	5%
+80	2%
+90	< 1%

(maximum differential if not Bulrathis) For example, you are the Bulrathis. You have
 discovered: hand lasers, ion rifle, Armored Exoskeleton, Adamantium Armor. Your opponents
 have made no ship armor advances, but have Personal Deflector Shields, also Armored
 Exoskeleton, and Hand Lasers. Their bonus would be 10 (for shield) + 20 (Armored
 Exoskeleton) + 5 (Hand Lasers). Yours would be 0 (for shield) + 25 (Adamantium Armor) + 10
 (ion rifle) + 20 (racial bonus). Your differential would be +20. You want to send colonists from
 two colonies to take a world of the opponents with 100 pop. If you send a total of 100 pop, you
 should expect approximately 53 to survive the battle.