As it appeared in The Broadside, May-Nov 1982 (a few typos corrected)

ADVANCED DREADNOUGHT

By Jim Eliason

Dreadnought has a good, clean, game system, and is a decent simulation given the larget fleet actions it is able to depict and remain playable. However, there are a few gross oversimplifications made for playability's sake and a few peculiar quirks in the rules that disturb a hard-core naval wargamer. I'd like to present a set of rule changes that make Dreadnought more satisfying as a simulation without detracting from the smooth play of the game.

Dreadnought's provision for repair of damage makes sense and it is surprising that more naval games haven't incorporated repair rules. However, much damage to a ship's fighting power was totally beyond the resources of the crew to repair. This damage could be to two general types: 1) multiple hits that gradually shook apart a key system and also any backups. 2) One devastating hit that totally destroyed a whole turret or engine room.

Both kinds of irreparable damage can be simulated easily as follows. First, an extra G hit on a ship with two G damage (i.e., one whose guns are all inoperable) is not ignored. Such an extra hit is permanent and may not be repaired. The first two G hits may still be repaired, but both must be successfully removed before the ship regains half attack factor (its new maximum). A ship with four G states simultaneously cannot regain any firepower. Second, when rolling to repair a damage state, a die roll of Six means that the damage may never be repaired. A ship with two G damage rolling a Six may roll again next turn to attempt to repair the "other" G state. A ship with three G damage rolling a Six still has only one irreparable state, not two.

These results are denoted as follows: On the piece of paper where repairs are written down, write a "G" when a Six is rolled during a repair attempt. It a G hit is later removed, put a slash through the G. When removing a G hit from a ship with three G damage, put a slash through a "G" in the damage record, or write "Ⓖ". Obviously, a "Ⓖ" counts as a damage state removed while a "G" does not. Ships with two "G"s (with or without slashes) in their damage record may no longer repair any G damage.

Exactly analagous rules apply to S damage. It should be noted that it isn't required to try to repair damage. A battered ship can save damage control effort to repair S states to try to get out of harm's way.

Any ship, especially a light ship, could be sunk by sufficient battering. It's totally unrealistic to require a rare explosion to sink a ship. For those unfamiliar with this game's combat system, the firing ship's Attack Strength is cross referenced with the sum of two dice on the Damage Point Table. The resulting number "attacks" the target's Defense Strength on a Combat Results Table with odds of 1-1 through 5-1. The result is either an "E"or one or two "G"s and/or one or two "S"s. An E is a "sunk" it a third roll comes up Seven or Eleven, a two G, one S otherwise. Ipropose that a ship be considered sunk if 1) it is a wreck and either 2) it has absorbed a number of excess damage states greater than its defense strength or 3) it receives an E in combat. For example, a British battlecruiser with a defense strength of two has removed one S state and is now in a three G state.It receives a G2S combat result. It now has four G and two S hits, which wreck it. It has three excess hits, the two G states above the two needed to wreck it and the S state it removed earlier. Since its defense strength of two is less than three, it is sunk.

It will be rare for a high defense strength ship to be sunk and wrecked all at once. It will usually be wrecked first and sunk (if at all) by prolonged bombardment. Historically, most wrecks were pounded (usually by torpedoes) till they sank. No one left an enemy hulk in the center of the battle area to be recovered by the enemy fleet. An E result represents a potentially lethal hit. A wrecked ship could not be expected to have the damage control capability to save itself from sinking.

Most hits that a ship sustained in battle did not immediately reduce its firepower or speed. This dosen't mean that they didn't cause serious harm. To simulate this, when rolling a miss on the Combat Results Table, the target ship must

. . . mark its damage record as if a damage state had been absorbed and removed. Do this also for G or S hits rolled when the target already has four unremoved states of that kind.

The torpedo rules are grossly oversimplified and in some cases very unrealistic. First, since torpedoes are launched dnly at the beginning of a Movement Phase, ones with short ranges are unduly limited in what they can hit. Second, all ships are equally susceptible to torpedoes, from the mighty Yamato to the flimsy Courageous. Third, only destroyers are allowed to fire torpedoes. Fourth, torpedoes have their major effect on firepower while they should be more likely to reduce speed. Fifth, light units and early dreadnoughts usually suffer only moderate damage from torpedo hits while in fact a single torpedo hit was often fatal.

****

To remedy these problems (discussed in PART I), I suggest the following changes. To remove problem one, make torpedo launches part of the movement plot for the firing unit and they may occur at any point during the unit's move. I fail to see what is so magic about those instants every fifteen minutes which mark new movement phases. Torpedoes plotted to move "C2" must specify the first hex of movement of the torpedo spread, since it is unclear in the rules.

Problems two and three are alleviated by resolving torpedo combat similar to gunnery combat. Each unit has a torpedo damage point value (see the Ship Factor Table) and when a torpedo spread and s hip enter a hex simultaneously this damage point value is compared with the ship's defense strength to give an odds ratio., instead of an automatic one-to one. Damage is found by rolling two dice and consulting the Combat Results Table.

To make torpedo damage more damaging to speed than gunnery, read each "G" on the CRT as an "S" and vice versa, when rolling for torpedo damage. There are two exceptions: read "S" as "S", not "G"; and read "2S" as "GS", not "2G".

To reflect torpedoes' high lethality, an "E" combat result automatically sinks a unit with a Defense Strength of four or less and sinks units with Defense Strengths of five - to - ten on die rolls of seven through eleven. Ships with Defense Strengths of twenty or more are sunk only on a die roll of eleven. Gamers may want to use this rule for gunnery combat as well.

Since torpedoes were much more effective against ships which were neither moving quickly nor turning, use the following additions to the odds: Zero if the target ship used seven - to - nine Movement points during the movement phase; Plus One if it used four - to - six; Plus Two if it used one - to - three; and Plus Three if it didn't move at all. Also, increase the odds by One if the target made no direction changes between the time the torpedoes were launched and the time it encountered the spread; and by One if the launching unit was not fired on in the previous combat phase. A One - to Two attack (normally ineffective) with a Plus One becomes a One - to - One, a One - to - Three with a Plus Three becomes a Two - to - One, and so on.

Almost all torpedoes carried by cruisers and capital ships were in two sets, port and starboard. These ships can fire their port tubes once and their starboard tubes once. If more than one ship in a hex makes an identical torpedo plot, their strengths add and form one spread. Some old battleships and battlecruisers had submerged tubes that could not be aimed. These are noted in the Ship Factor Table as having a restricted "field of fire".

It should also be noted that most ships didn't carry torpedo reloads. Only Japanese ships can fire any torpedo battery more than once per game. They may fire twice.

Battleship secondary armament is treated very simplistically for playability's sake. The original rule greatly overrates the power of secondary batteries. A typical World War One battlecruiser with an Attack Strength of eighteen has to roll an Eight or better to get a One - to - One on an old German destroyer unit, with its main battery if it's under fire, yet its secondary gets a One - to One automatically. Secondary armaments varied tremend-

ously in effectiveness, but were usually roughly equivalent to light cruisers of the same period. The Ship Factor Table lists the dreadnought classes with a secondary attack factor and range. In each case this factor may be used in the port or starboard or both broadside arcs unless otherwise specified. In many cases the value is an avarage of the many secondary armament configurations that existed during a ship's lifetime. Secondaries fire at any ship.

Some ships' secondaries are noted in the Ship Factor Table as being doubled against unarmored ships. They had relatively small caliber guns that had little armor penetrating ability. They were often very effective against destroyers while of little value against armored ships. All destroyers and L 10 and L 50 class light cruisers are also doubled when firing at each other.

The rule for subtracting One from the damage point dice roll when firing in a bow or stern arc is also a gross oversimplification. The Ship Factor Tablelists the bow and stern attack strengths for the capital ships. Wing turrets which could fire directly ahead or directly astern were only counted at half value, since they really covered only half the bow or stern arc. I retain the "subtract One" rule for light ships, because it is actually unclear what ships they represent and the exact facing of a formation is difficult to ascertain.

The original Damage Point Table also distorts many ships' broadside firepower, especially at the lower attack strengths. An Invincible Class battlecruiser had much more firepower than a Deutschland Class battleship, and their respective attack strengths of Ten and Six reflect this. However, the original Damage Point Table almost totally removes the advantage by lumping allAttack Strangths from Six to Ten in one column. I constructed a Revised Damage Point Table, where the results for ships with Attack Strengths of Three, Eight, Thirteen, Eighteen, 23, 28, 36, 46, 56, 66, and 86 remained the same and interpolated other results inbetween. Certain ships are significantly more effective than they were before, such as Invincible, Roma, and Nelson classes. Others suffer a penalty, such as World War One destroyers, and the Hood, Deutschland, and Bismarck classes. In all these cases, I think the change in effectiveness puts them more in line with their actual worth in combat. Theappearance of new numbers in the table also alters the worth of some defense factors, especially those like Seven and Eleven. The advantage of a Defense Strength of Eleven versus one of Ten is now marginal, as it should be, rather than of major importance.

The Combat Results Table has a couple of minor problems. A Two - to One attack does not give many more hits than a One - to - One attack. In situations where I want to slow down an enemy ship, a One - to - One is better than a Two - to - One. This is ridiculous. Add a "1S" result column on die rolls of Seven and Ten, "1S" to the Three - to - One column on a roll of Six, and "1G" to the Four - to - One column on a roll of Five.

While I generally dislike altering counter values, some of the factors are clearly wrong. One should make the broadside factor of Indefatigable Class battlecruisers Eleven instead of Ten, and Neptune and Colossus Class battleships Fourteen instead of Thirteen, since their starboard wing turrets could fire to the port side and vice versa, though their fields of fire were rather limited. The Kaiser Class should have an Attack Strength of only Twenty, since the designer allowed their wing turrets to fire across the ship at full effectiveness and these turrets also had a limited field of fire. If you use the old Damage Point Table, use Ten for Indefatigable and 21 for Kaiser or you will distort their worth even more.

Light cruisers in World War One were much like destroyers in vulnerability, but were slowerand more heavily gunned. If five destroyers have a Defense Strength of Three to Five, then two light cruisers (i.e., L 10 or L 50) should have a Defense Strength of Two, not One. D 10 and D 50 should have a Movement Factor of Eight. World War One heavy cruisers were much better protected, so give C 10 and C 50 a Defense Strength of Three.

The firepower and protection of British Orion, King George V, and Iron Duke class battleships were substa ntially greater than the Lion Class battlecruisers. The extra turret of the battleships gives them an Attack Strength of 22, and the inadequate protection of the British battlecruisers gives the Lion Class a Defense Strength of Four, and the Tiger a Defense Strength of Five.

(To be continued, next issue)

(Funny, in all that activity, nobody mentioned Dreadnought. Perhaps the continuation of Jim Eliason's fine article might spark some interest in. . . .)

ADVANCED DREADNOUGHT
by Jim Eliason

Canada and Erin are inexplicably underrated. These two ships were not in the same class at all. Erin was built for Turkey and Canada was ordered by Chile. Both were confiscated by Britain in 1914 when war broke out. Erin was armored much like the King George V and Iron Duke classes and had anti-torpedo bulges the others lacked. Her Defense Strength should be Six. She also had the same armament, so her Attack Strength should be 22. Canada was bigger than Iron Duke and as well armored. Her Defense Strength should also be Six. She mounted fourteen-inch (not 13.5-inch) guns that were comparable to those of the Kongo class. Her Attack Strength should be 27.

The Kaiser, Rivadavia, and Nelson classes had little or no speed advantage over other older battleships. They all should have speeds of Five, not Six.

I have disagreements with some of the factors assigned whichare of a more subjective nature. First, the French Dunkerque class seems substantially overrated. Her main battery was only thirteen-inch and firing toward the stern caused structural damage and covered the bridge with smoke. I use an Attack Strength of 35. Her protection left much to be desired, giving her a Defense Strength of Nine.

The German eleven-inch gun used in World War Two was a fine weapon, but not as good as the game makes it look. A Lutzov class pocket battleship could probably hold her own against two heavy cruisers of the day, but these are given an Attack Strength of only ten-to-sixteen against the pocket battleship's 21. Give the Lutzow class an Attack Strength of Sixteen and the Gneisenau class an Attack Strength of 24. The latter was certainly well protected, but they were no match for a modern battleship. I use a Defense Strength of fourteen.

Under the rules a ship's fire is severly disrupted if it is under fire herself. This seems fine for accurate high calibre fire which jars the ship because of impact or induces evasive maneuver to avoid it. However, scattered or low calibre fire is going to be much less disruptive to fire control. Therefore, incoming fire which has no chance of causing damage points equal to or greater than a ship's Defense Strength reduces the die roll of outgoing fire by only one instead of two. This rule reduces the effectiveness of the unrealistic tactic of disrupting the fire of the enemy's strongest ships with destroyers and light cruisers, while using your own best ships to beat up on your opponents weak units.

Throughout the dreadnought era, accurate gunfire was always partly dependent on observing where your shots fell and correcting ranging errors accordingly. These corrections were more difficult when other friendly shells were falling around your target. Hence the rule that only one of a group of ships firing at the same target. can fire at full factor. Since a light cruiser unit is really two targets, two ships may fire at full factor at one of those (or at a heavy cruiser unit). Five ships may fire full factors at a destroyer unit. A ship's main and secondary batteries count as separate ships for this purpose, because their fire control systems were independent and it was often not possible to tell the difference between twelve-inch and six-inch shell splashes.

Once a ship started firing on one target, it usually paid to keepfiring on it, since changing targets required retraining the guns, firing ranging shots, and so forth, before beginning to hit again. Admirals, especially in the First World War, didn't have communications systems rapid or reliable enough to tell their captains what ships to fire on, so they often used prearranged tactics to assure that each enemy ship would be under fire. To discourage the gamer from trying to perform superhuman feats of gunfire direction by continuously shifting targets and to simulate the difficulty in acquiring a new target, a ship's Attack Strength is halved if the firing battery did not fire on the same target the turn before. This rule speeds play since many firing orders will simply be repeated.

All ships should fire at half factor at their maximum range (even when less than thirteen hexes) since shell trajectories were much harder to control at extreme range, shells had lost most of their penetrating power, and shells fell more nearly straight down, making

the target effectively smaller. Units with a range of Four fire at doubled Attack Strength at range Three and normal at range Four.

In the game the tactic of "crossing the T" is advantageous, but it should be even more so. To increase its effectiveness, allow only the top ship in a stack to fire along the single line of hexes that her bow points to. Allow only the bottom ship to fire directly astern. This simulates the inability to fire through a friendly ship which is only three hundred meters away. If the firing ship is directly ahead or directly astern of the target she increases her Damage Point dice roll by two. If she is elsewhere in the target's bow or stern arc, she increases the dice roll by one. A ship moving directly toward you is easier to hit, because her bearing dosen't change much as she moves, ranging errors are less serious because you are firing at the ship's length, not width, and a shell will usually hit the deck armor, not the thicker belt armor.

Battleships were notoriously ponderous and unable to make quick changes of direction. I forbid capital ships to make 180-degree radical turns. I also find the maneuver restrictions too rigid for destroyers, which were much more maneuverable. A destroyer unit should be able to make three direction changes per turn as long as it moves at least one hex straight ahead after each change and ay least two hexes straight ahead after the last change.

Any ship capable of movement may accelerate from Zero to One if she desires. This should be obvious, but it isn't allowed as the rules are written.

Collisions at sea are an ever-present danger. Admirals did not order fancy criss-crosses in the heat of battle; it was too risky. Any ships entering the same hex at the same time on nonparallel courses must roll for collision. A single die rollof Six means that both ships stop dead in the collision hex and suffer G 2 S damage. If two stacks can collide, roll once for each ship in the smaller stack. A destroyer or cruiser counter counts as one ship for this purpose. If a collision occurs, determine the colliding ships randomly. One ship can't collide more than once per turn.

While all these rules add complexity to the game, only the secondary battery rules increase the amount of die rolling and the slowdown of play caused by looking up new ship factors should be more than made up for by the simplified fire plotting encouraged by the target acquisition rule. I think you will find these new rules will enhance the enjoyment of Dreadnought without gumming up the smooth flow of the game.

(Jim's article will continue next issue, withsome extensive Revised Tables he has worked out. That should give you plenty of time to remember which closet you stashed <u>your</u> Dreadnought in)

SHIP FACTOR TABLE

#	Class	Bow AS	Stern AS	2° AS	2° Range	Torpedo
011	Dreadnought	6	6	½*	4	½**
020	Bellerophon	6	6	1*	5	¼**
030	St. Vincent	6	6	1*	5	¼**
040	Neptune	6	10	1½*	5	¼**
050	Colossus	6	10	1½*	5	¼**
060	Orion	9	9	1½*	5	¼**
070	King George V	9	9	1½*	5	¼**
080	Iron Duke	9	9	3	8	½**
091	Agincourt	6	6	4	8	¼**
101	Erin	9	9	4	8	½**
102	Canada	11	11	4	8	½**
110	Queen Elizabeth	18	18	3	8	½**
120	Q. Eliz. refit	18	18	3	8	¼**
130	Q. Eliz. refit	18	18	2	8	¼**
140	Royal Sovereign	18	18	4	8	¼**
150	Roy. Sov. refit	18	18	3	8	0
160	Nelson	27	0	6	12	¼**
170	King George V	25	17	4*	13	0
180	Vanguard	22	22	4*	13	0
190	Invincible	6	6	1½*	5	½**
200	Indefatigable	6	6	1*	5	¼**
210	Lion	9	4	1½*	5	¼**
221	Tiger	9	9	3	8	½**
230	Renown	18	9	1½*	5	¼**
240	Renown refit	18	9	1*	5	1
250	Renown refit	18	9	3*	10	1
260	Courageous	9	9	1½*	5	½,1#
271	Hood	20	20	3*	9	1
281	Hood refit	20	20	1½*	9	1
300	South Carolina	8	8	1½*	9	¼**
310	Delaware	8	8	1½*	7	¼**
320	Utah	8	8	2*	7	¼**
330	Arkansas	8	8	2*	7	¼**
340	New York	10	10	1½*	7	¼**
350	Oklahoma	12	12	1½*	7	¼**
360	Oklahoma refit	12	12	3*	8	0
370	Pennsylvania	14	14	2*	7	¼**
380	Penn. refit	14	14	3*	8	0
390	New Mexico	14	14	2*	7	¼**
400	New Mex. refit	14	14	2*	8	0
410	Tennessee	14	14	1½*	7	¼**
420	Tenn. refit	14	14	2*	8	0
430	Colorado	14	14	1½*	7	¼**
440	Colorado refit	14	14	3*	8	0
450	Washington	44	22	4*	8	0
460	South Dakota	44	22	4*	8	0
470	Iowa	44	22	4*	8	0
480	Alaska	20	10	2½*	8	0

SHIP FACTOR TABLE (cont'd)

#	Class	Bow AS	Stern AS	2 AS	2 Range	Torpedo
500	Courbet	10	10	4	8	½**
510	Provence	9	9	4	8	½**
520	Provence refit	9	9	3	8	0
530	Dunkerque	35	0	3½*++	11	0
540	Richelieu	43	0	7++	15	0
550	Viribus Unitis	13	13	3	7	¼**
560	Minas Gerias	12	12	1½*	6	0
570	Rio de Janeiro	6	6	4	8	¼**
580	Gangut	4	4	2*	8	½**
590	Imperator Alex. III	4	4	2*	8	½**
600	Westfalen	7	7	3	7	½**
610	Helgoland	9	9	4	7	½**
620	Kaiser	9	13	4	7	½**
630	König	9	9	4	7	½**
640	Baden	21	21	4	7	½**
651	Blucher	2	2	2	7	¼**
661	von der Tann	6	6	3	7	¼**
670	Moltke	7	11	3	7	¼**
680	Seydlitz	7	11	3	7	¼**
690	Deutschland	3	3	4	11	½**
700	Hessen	3	3	4	11	½**
710	Derfflinger	9	9	3	7	¼**
720	Lützow	8	8	4	12	1½
730	Gneisenau	16	8	7	12	1
740	Bismarck	30	30	7	12	0,1#
750	Settsu	6	6	3	7	¼**
760	Satsuma	5	5	2	7	½**
770	Kawachi	3	3	3	7	¼**
780	Fuso	9	9	4	12	¼**
790	Fuso refit	9	9	4	12	0
800	Ise	9	9	4	12	½**
810	Ise refit	9	9	4	12	0
820	Nagato	16	16	4	12	1
830	Nagato refit	16	16	4	12	0
840	Yamato	44	22	7+	16	0
850	Kongo	13	13	4	10	1**
860	Kongo refit	13	13	4	10	0
870	Kirishima	13	13	4	10	1**
880	Kirishima refit	13	13	4	10	0
900	Dante Alighieri	3	3	2½*	6	¼**
910	Conte di Cavour	6	6	2*,4#	6	¼**,0
920	C. di Cav. refit	13	13	2*,2½*#	10	0
930	Roma	20	10	4	13	0
950	España	7	7	2*	5	0
960	Rivadavia	15	15	3	6	¼**

SHIP FACTOR TABLE (cont'd)

Screen Unit	Torpedo Factor
C10	½**
C20	2-Brit. ; 0-US
C30	2½-Brit. ; 0-US
C50	½**
C60	4-Ital. ; 10-Jap. ; 2½-Ger. (in 10.2)
C70	4-Ger. ; 0-Ital. ; 16-Jap.
L10	2
L20	2½-Brit. ; 2-US
L30	2½-Brit. ; 0-US
L50	2
L60	1½-Ger. ; 6-Jap. ; 1½-Ital.
L70	4-Ger. ; 2-Ital.
D10	7
D20	10
D30	13
D40	16
D50	10
D60	14
D70	17-Ger., Ital. ; 30-Jap.
D80	30

Notes to SFT:

* Doubled against DD's, L10, and L50

** May only be given C2 torpedo plots

\+ port or starboard but not both in the same turn

++ any one of port, starboard or stern arcs in one turn

\# When two values appear separated by commas, the first number refers to the first ship(s) in the class. In classes 910 and 920 the numbers after the commas refer to Caio Duilio and Andrea Doria which actually formed a separate (though very similar) class.

REVISED DAMAGE POINT TABLE

Dice Attack Strength

REVISED DAMAGE POINT TABLE

Dice Attack Strength

Dice	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	4	6	6
5	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	3	3	4	4	4	5	6	7	8	8	8
6	0	0	0	0	1	1	2	2	2	2	2	2	2	3	3	3	3	4	4	4	5	5	6	6	7	7	8	8	8
7	0	0	2	2	3	3	3	4	4	4	4	4	4	4	5	5	6	6	7	7	7	8	8	9	9	9	9	10	10
8	0	2	4	5	5	5	6	6	6	6	6	6	6	7	7	8	8	8	8	9	9	10	10	10	10	10	10	10	11
9	2	4	6	6	6	7	7	8	8	8	8	8	8	8	8	9	9	10	10	11	11	11	12	12	13	14	15	16	1[illegible]
10	3	7	8	9	9	10	10	10	11	11	11	12	12	12	13	14	15	16	16	17	17	17	18	19	19	20	20	20	21
11	6	9	10	11	11	12	12	12	13	13	14	15	16	16	17	17	18	18	19	19	20	20	20	21	22	23	24	25	25
12	8	10	12	13	13	14	15	16	16	17	18	18	18	19	19	19	20	20	21	22	23	24	25	26	27	28	29	30	30

REVISED DAMAGE POINT TABLE (cont'd)

Dice	Attack Strength																													
	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7	8	8	8	8	8	8	9	9	9	9	9	10	10
5	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9	10	11	11	12	12	12	13	14	14	15	16	16
6	8	8	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	11	12	13	14	15	16	17	18	19	20	20
7	10	10	10	10	10	10	10	11	12	13	14	15	16	16	16	16	16	16	17	17	18	18	19	19	20	20	20	21
8	12	13	13	14	15	15	16	16	16	17	17	17	18	19	20	20	20	21	21	22	22	23	23	24	24	25	25	25
9	16	17	17	17	17	17	18	19	20	20	21	22	22	22	23	24	25	25	25	25	25	25	25	25	25	25	25	25
10	22	22	22	23	24	25	25	25	25	25	25	25	25	25	25	25	25	25	26	26	27	28	28	28	29	29	30	31
11	25	25	25	25	25	25	25	26	26	26	26	27	27	28	29	29	30	30	30	30	30	30	30	30	30	3o	30	31
12	30	30	30	30	30	30	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51

REVISED DAMAGE POINT TABLE (cont'd)

Dice \ Attack Strength

Dice	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	2	3	4	5	6	7	8	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
4	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
5	17	17	18	18	18	18	19	19	20	20	20	20	30	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
6	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
7	21	22	22	23	23	24	24	25	25	25	25	26	26	26	26	27	27	27	27	28	28	28	28	29	29	29	29	30
8	25	25	25	25	25	25	25	25	25	26	26	26	26	27	27	27	27	28	28	28	28	29	29	29	29	30	30	30
9	26	26	27	27	28	28	29	29	30	30	31	31	32	32	33	33	34	34	35	35	36	36	37	37	38	38	39	39
10	31	32	32	32	33	34	34	35	35	35	36	36	37	37	38	38	39	39	40	40	41	41	42	42	43	43	44	44
11	32	33	34	35	36	37	38	39	40	41	41	42	42	43	43	44	44	45	45	46	46	47	47	48	48	49	49	50
12	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79

REVISED DAMAGE POINT TABLE (cont'd)

Dice	Attack Strength																				
	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106+
2	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5
3	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15
4	10	10	11	11	12	13	13	14	14	15	15	16	16	17	17	18	18	19	19	20	20
5	20	20	20	20	21	21	21	21	22	22	22	22	23	23	23	23	24	24	24	24	25
6	20	21	21	22	22	23	23	24	24	25	25	26	26	27	27	28	28	29	29	30	30
7	30	30	31	31	31	31	32	32	32	32	33	33	33	33	34	34	34	34	35	35	35
8	30	31	31	32	32	33	33	34	34	35	35	36	36	37	37	38	38	39	39	40	40
9	40	40	40	40	41	41	41	41	42	42	42	42	43	43	43	43	44	44	44	44	45
10	45	45	46	46	46	46	47	47	47	47	48	48	48	48	49	49	49	49	50	50	50
11	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
12	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100