Bywater's War Errata

28 March 2013

When we published *Bywater's War*, we had to include a ship's Gunnery Standard in the specifications in Annex A. This was because of the wide age range of the ships described, from pre-*Dreadnought* armored cruisers up to ships built in the late 1930s that served throughout WW II. Many of the classes also went through reconstructions in the 1920s and 1930s that upgraded their gunfire control.

Also, for the first time, we considered the gunnery capabilities of minor vessels, like subs and small craft, that were not fitted with a director, or even a wide-base rangefinder. Their chances of hitting would be less than a larger warship, even if they had the same weapons.

While the *Command at Sea* rules book includes the information for Gunnery Standards III and IV, Standards I and II are not included, and we don't expect players to buy *FG&DN* just to get the information.

The base hit chances for Gunnery Standards I through IV are shown on this page, and their gunnery modifiers are listed on pages 2 and 3. The next pages has Annex I, listing optical rangefinders for the interwar period. The last page has the rules for searchlights extracted from *FG&DN* and data for the searchlights used on the ships in *Bywater's War*.

We apologize for leaving this information out of the booklet, and encourage players to post this information on appropriate bulletin boards and share it with their friends. Also if players have any questions about Bywater's War or any other Admiralty Trilogy product, please contact us and we'll do our best to answer.

Larry Bond

GUNFIRE HIT CHANCES & MODIFIERS

Gunnery Standard 1 Base Hit Chances:
Short Range = 40%
Medium Range = 20%
Long Range = 10%
Extreme Range = 5%

Gunnery Standard 2 Base Hit Chances:
Short Range = 50%
Medium Range = 30%
Long Range = 10%
Extreme Range = 5%

Gunnery Standard 3 Base Hit Chances:
Short Range = 55%
Medium Range = 35%
Long Range = 10%
Extreme Range = 5%

Gunnery Standard 4 Base Hit Chances:
Short Range = 60%
Medium Range = 40%
Long Range = 15%
Extreme Range = 5%

GUNFIRE HIT CHANCE MODIFIERS TABLE
(GUNNERY STANDARD 1 & 2) - Pre-Dreadnought Era/World War I

VISIBILITY/ENVIRONMENTAL MODIFIERS	Modifier		
• Visibility ≤20% (Ignore when target illuminated or silhouetted)	-4		
• Visibility ≤40% (Ignore when target illuminated or silhouetted)	-2		
• Target in line with sun - Target obscured. Must be ±10° of line from ship to sun.	-2		
• Target in line with twilight sun - Target silhouetted. Must be ±30° of line from ship to sun.	+1		
• Target silhouetted by a starshell or fire.	-1		
• Target illuminated by a starshell or fire or if ship is using a searchlight.	+0		
• Target illuminated by a searchlight.	+1		
• Dead Reckoning Fire - First turn of fire after a loss of visual contact on a target.	-4		
• Blind Fire - Firing at muzzle flashes. (Ignore visibility modifiers.)	-6		
• Sea State (Heavy seas make it very difficult to aim the guns properly.)	**A&B**	**C&D**	**E-G**
SS 3	NA	NA	-1
SS 4	NA	-2	-3
SS 5	-2	-4	-6
SS 6	-4	-6	NFP
SS 7 (No Fire Possible (NFP) at Sea States ≥ 7.)	NFP	NFP	NFP

FIRE CONTROL/GUN MODIFIERS		Modifier
• First turn of fire on target. (Long and Extreme range bands) First salvo if new target is >15° in azimuth and 1 nm off of old target.		-2
• Third or later turn of fire on target - (All range bands.)		+1
• Firing ship is not being fired on.		+1
• Overconcentration (Extreme range band only). Too many ships firing at same target.		-1 per ship above limit
• Firing beyond range finder capability.	Up to +3,000 yds	-1
	+3,001 to 6,000 yds	-2
	>6,000 yds	-3
• Coincidence range finders in poor visibility (≤40%) – Extreme range band only.		-1
• Automatic fire control system (Argo, Dreyer Mk IV or better, Ford Mk I)		+1
• Local Control (GS 2 only)		-2
• Firing ship changes course by ≥45°.		-3
• Firing ship steering evasively. Takes precedence over course change modifier.		-4
• Number of barrels firing.		
1 - 2		+0
3 - 4		+1
5 - 6		+2
7 - 8		+3
9 - 10		+4
11+		+5

TARGET MODIFIERS	Modifier		
• Target speed.			
Speed 20 - 24 knots	-2		
Speed ≥ 25 knots	-3		
Speed ≤ 10 knots	+1		
Stationary (“Dead in the Water”)	+2		
• Target steering evasively. (Requires min target ship speed of 20 knots.)			
Size Class B (Pre-Dreadnoughts can not steer evasively.)	-2		
Size Classes C & D	-3		
Size Classes E - G	-4		
• Target Aspect (Broad/Quarter/Narrow)			
Size Class A	+2	+1	0
Size Class B	+1	+0	-1
Size Class C & D	+0	-1	-2
Size Class E - G	-2	-3	-4

GS 1 & 2 Modifier multipliers (Short & Medium/Long & Extreme) = 3/2

GUNFIRE HIT CHANCE MODIFIERS TABLE
(GUNNERY STANDARD 3 & 4) – Interwar Period/World War II

VISIBILITY/ENVIRONMENTAL MODIFIERS	Modifier		
• Visibility ≤20% (Ignore when target illuminated or silhouetted)	-4		
• Visibility ≤40% (Ignore when target illuminated or silhouetted)	-2		
• Target in line with sun - Target obscured. Must be ±10° of line from ship to sun.	-2		
• Target in line with twilight sun - Target silhouetted. Must be ±30° of line from ship to sun.	+1		
• Target silhouetted by a starshell or fire.	-1		
• Target illuminated by a starshell or fire or if ship is using a searchlight.	+0		
• Target illuminated by a searchlight.	+1		
• Dead Reckoning Fire - First turn of fire after a loss of visual contact on a target.	-4		
• Blind Fire - Firing at muzzle flashes. (Ignore visibility modifiers.)	-6		
• Sea State (Heavy seas make it very difficult to aim the guns properly.)	**A&B**	**C&D**	**E-G**
SS 3	NA	NA	-1
SS 4	NA	-2	-3
SS 5	-2	-4	-6
SS 6	-4	-6	NFP
SS 7 (No Fire Possible (NFP) at Sea States ≥ 7.)	NFP	NFP	NFP

FIRE CONTROL/GUN MODIFIERS		Modifier
• First turn of fire on target. (Long and Extreme range bands)		-2
First salvo if new target is >15° in azimuth and 1 nm off of old target.		
• Third or later turn of fire on target - (All range bands)		+1
• Firing ship is not being fired upon.		+1
• Overconcentration: too many ships firing at same target. (Long and Extreme range bands)		-1 per ship over limit
• Radar + Visual Fire Control	(1st Gen)	+2
Best combination to use. Annex X lists RFC generation.	(2nd Gen)	+3
• Radar Fire Control only (Except blindfire capable radars.)		-3 off RFC Mod
• Land within ±45° of target and within unmodified fire control radar range		-2 off RFC Mod
• Local Control		-2
• Spotter aircraft ≤5 NM of the target and at Low or Medium altitude band.		+2
• Ships without stable elements that change course by ≥45°		-3
• Firing ship steering evasively. Takes precedence over course change modifier.		-3
Japanese ships or small combatants firing with steering evasively.		-4
• Number of barrels firing.		
1 - 2		+0
3 - 4		+1
5 - 6		+2
7 - 8		+3
9 - 10		+4
11+		+5

TARGET MODIFIERS	Modifier		
• Target speed.			
Speed 25 - 34 knots	-2		
Speed ≥ 35 knots	-3		
Speed ≤ 10 knots	+1		
Stationary (“Dead in the Water”)	+2		
• Target steering evasively. (Requires min target ship speed of 20 knots.)			
Size Class B	-2		
Size Classes C & D	-4		
Size Classes E - G	-6		
• Target Aspect (Broad/Quarter/Narrow)			
Size Class A	+2	+1	+0
Size Class B	+1	+0	-1
Size Class C & D	+0	-1	-2
Size Class E - G	-2	-3	-4

GS 3 & 4 Modifier multipliers (Short & Medium/Long & Extreme) = 4/2

Annex I - Interwar Optical Rangefinders

Country	Name	Length (m)	Effective Range (kyds)	Type	Year	Ships
Japan	BU Type 2.0m	2.0	9.0	Cnc	WWI	DD
Japan	BU Type 2.5m	2.5	11.0	Cnc	WWI	CL
Japan	BU Type 3.5m	3.5	16.0	Cnc	WWI	BB and BC, main deck-mounted RF
Japan	BU Type 4.5m	4.5	20.0	Cnc	WWI	Turret RF on Kongo, Ise, Fuso classes
Japan	Type 5	4.5	21.0	Cnc	1914	BB, Yamashiro main director in 1917, Mutsu
Japan	Type 7	10.0	46.0	Cnc	1918	BB, Nagato main director in 1924
Japan	Type 13	8.0	39.0	Cnc	1924	Turret RF on Haruna & Kirishima (‘27), Kongo & Hiei (‘29), Ise & Fuso classes (‘28), Nagato class (‘30)
Japan	Type 14 2.0 m	2.0	10.0	Cnc	1925	DD
Japan	Type 14 2.5 m	2.5	12.5	Cnc	1925	Main director CLs, including Yubari
Japan	Type 14 3.5 m	3.5	17.0	Cnc	1925	CA Main director
Japan	Type 14 4.5 m	4.5	22.0	Cnc	1925	BB, BC & CA main director: Kongo (‘25), Haruna (‘26), Kirishima (‘27), CAs beginning with Takao
Japan	Type 14 6.0 m	6.0	29.0	Cnc	1925	CA turret RF, main director after 1935, Oyodo class
Japan	Type 14 8.0 m	8.0	39.0	Cnc	1929-33	CA turret RF after 1935
Japan	Types 89 - 93 2.5m	2.5	12.5	Cnc	1929-33	Small escort ships
Japan	Types 89 - 93 3.0m	3.0	14.5	Cnc	1929-33	DD
Japan	Types 89 - 93 3.5m	3.5	17.0	Cnc	1929-33	CLs Abukuma, Kuma, Tama, Kiso, Yura, Ning Hai, Ping Hai after modernization
Japan	Types 89 - 93 4.0m	4.0	19.5	Cnc	1929-33	CLs Natori, Sendai, Jinstu, Naka, Ooi after modernization
Japan	Types 89 - 93 4.5m	4.5	22.0	Cnc	1929-33	CLs Tenryu, Nagara, Isuzu, Kitakami, after modernization. Katori class
Japan	Types 89 - 93 6.0m	6.0	29.0	Cnc	1929-33	CA and CLs, Takao class, Abukuma (‘38), Kitakami and Ooi (‘41) after modernization
Japan	Type 94 4.5m	4.5	22.0	Stereo	1934	Numerous ships, high angle (HA), Main director: Kitakami (‘45), Isuzu (‘44)
Japan	Type 94 8.0m	8.0	39.0	Dual	1934	CA, Oyodo class turret RF, Super A cruisers Main director
Japan	Type 94 10.0m	10.0	49.0	Dual	1934	Battleships after mid-1930s reconstruction. Main director and turret RF

Notes:
(1) BU is the Japanese designation for indigenously produced Barr & Stroud rangefinders

USA	Mk4 Mod 0 - 5	3.0	15.5	Cnc	1908	OBB, OCR main deck mounted RF
USA	Mk6	1.5	6.5	Stereo		Turret mounted for BB secondary battery
USA	Mk8	4.6	24.0	Cnc	1912	BB, Single Barr & Stround 15 ft RF on Utah
USA	Mk10 Mod 0 - 5	6.1	32.0	Cnc	1913	Turret RF for BBs Utah, Florida, Wyoming, Arkansas, New York, Texas, Oklahoma, Nevada, on turret roof
USA	Mk12 Mod 0 - 4	3.7	19.5	Cnc	1913	BBs, main deck mounted RF
USA	Mk13 Mod 0 - 1	7.7	40.5	Cnc	1914	BBs, turret RF on Pennsylvania class
USA	Mk16 Mod 0 - 1	8.1	42.5	Cnc	1917	BBs, turret RF for New Mexico class
USA	Mk17 Mod 0 - 1	3.7	19.5	Cnc	1917	CL, DD Main deck mounted RF
USA	Mk18 Mod 0 - 2	4.6	24.0	Cnc	1917	BBs, main deck RF on New Mexico and Maryland classes
USA	Mk 22 Mod 0 - 2	9.1	48.0	Stereo	1918	BBs, turret RF for California and Maryland classes
USA	Mk30 Mod 0 - 1	6.1	26.5	Cnc	1924	CVs
USA	Mk35 Mod 0 - 4	3.7	16.0	Cnc	1928	Main deck RF on Arkansas, New York, Texas BBs, Pensacola, Northampton, New Orleans, Omaha classes
USA	Mk36	6.1	26.5	Cnc	1928	BBs, main deck RF on Nevada, Pennsylvania, Colorado classes
USA	Mk37 Mod 0 - 6	8.1	38.0	Stereo	1930	BB, CA, CLs, turret RF for CAs New Orleans, Wichita, Cleveland, and Baltimore classes
USA	Mk38 Mod 0 - 1	4.6		Stereo		Anti-aircraft RF
USA	Mk42	4.6	21.0	Stereo	1939	BB, CA. CL, DD, Mk37 gun director
USA	Mk45 Mod 1 - 4	5.5	25.0	Stereo	1939	BB, CA, CLs, Mk34 Main gun director. BBs and cruisers with modernization. Initial version on Vincennes, Brooklyn class in 1936 didn’t have the RF until 1939.

5.2.4.1 Ship-Based Searchlights. Using a searchlight for illumination is ordered during the Plotting Phase, and is available for targeting purposes in the Planned Fire Phase of that turn. A searchlight can only illuminate a target once it has been detected visually. Any new targets found in the Detection Phase cannot be illuminated until the following Planned Fire Phase. It takes a little time to coach the searchlight operator onto the target.

Any ship in the beam of a searchlight is treated as being illuminated. However, any ship using searchlights is also considered to be illuminated for gunfire purposes.

Country	*Diameter (cm)*	*Year*	*Range (yds)*	*Platforms*
Japan	90	1918	4,000	BB, BC, CA, CL, DD, TB
Japan	110	1922	5,000	BB, BC, CA
Japan	150	Early 1920s	8,000	Coastal Defense
Japan	90	1933	5,000	DD, TB, Patrol Craft
Japan	110	1933	7,000	BB, BC, CA, CL
Japan	90	1938	7,000	DD, DE, TB, Patrol Craft
Japan	110	1938	8,000	BB, BC, CA, CL
Japan	150	1938	9,000	Coastal Defense
USA	60	1920s	4,000	DD
USA	90	1920s	6,000	BB, BC, CA
USA	150	1920s	8,000	Coastal Defense
USA	60	1930s	6,000	DE
USA	90	1930s	8,000	BB, BC, CA, CL, DD
USA	150	1930s	10,000	Coastal Defense