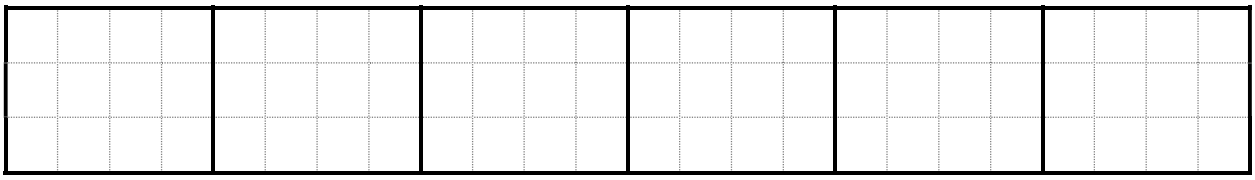
KMS *Admiral Graf Spee*

***Deutschland*-class cruiser**

Speed	Armor	Armament
28.5 knots (diesel). Use Hawkins speed change curve.	Belt: 4 in. Torpedo bulges. Deck: 2 in. (3 in. over magazines)	2 × triple 11-in. turrets 8 × single 5.9-in. turrets 2 × quadruple 21-inch TT (deck)

Damage Chart



Notes: subdivisions inside the large (solid black outline) damage boxes added for convenience. One full 6-inch hit (Ajax / Achilles) crosses one subdivision out. One full 8-inch hit (Exeter) crosses two out. The first time a new large damage box is hit, apply speed and vital hits per rules as needed.

Disable one primary turret when the first three large damage boxes are crossed out entirely. Choose randomly.

Disable one secondary gun for every 9 subdivisions crossed out. Choose randomly, engaged side first.

Percentage of full speed allowed after torpedo hits: 85 (1) / 60 (2) / 30 (3) / 0 (4).

Percentage of firepower lost after torpedo hits: 10 (1) / 25 (2) / 50 (3) / 100 (4).

Armour Penetration

Own Ship		Enemy Ships	
Vertical	**Horizontal**	**Vertical**	**Horizontal**
8 in. (Exeter)	**8 in. (Exeter)**	**11 in. (Primary)**	**11 in. (Primary)**
20° — 17 kyds.	18 / 22 kyds.	At all ranges.	18 kyds.
40° — 14 kyds.	**6 in. (Ajax / Achilles)**	**5.9 in. (Secondary)**	**6 in. (Secondary)**
6 in. (Ajax / Achilles)	20.5 / N/A.	20° — 8.5 kyds.	20.5 kyds.
20° — 4.5 kyds.		40° — 6.5 kyds.	
40° — N/A.			

Notes: vertical armour penetration happens at range listed and **under**; horizontal armour penetration happens at range listed and **over**.

Own ship: for adjudicating deck armour penetration with plunging fire, use the value before the slash to decide whether a **speed hit** has occurred, and the value after the slash to decide whether a **vital hit** has occurred. This reflects the better protection of *Graf Spee*'s magazines compared to her machinery spaces.

Enemy ships: Exeter's magazines were protected by boxes up to 5 inches thick. As an approximation, and only for vital hits, consider using the values: 20° — 16 kyds., 40° — 12.5 kyds. for 11-inch gun fire against vertical armour. Vital hits from plunging fire would not be possible. Vital hits from 5.9-inch secondaries would not be possible.

As for Ajax and Achilles, their deck armour was thinner over their machinery spaces. Speed hits would be possible at 12 kyds. or over for both 11 and 5.9-inch guns.

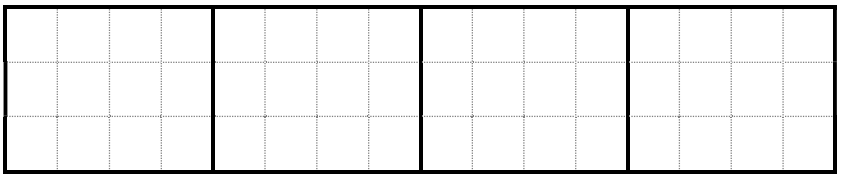
HMS Exeter

York-class cruiser

Speed	Armor	Armament
32 knots (steam turbine). Use County speed change curve.	Belt: 3 in. (5 in. on magazines) Deck: 1.5 in. (5 in. over magazines) **Note:** deck armour rounded to 2 in.	3 × twin 8-in. turrets 2 × triple 21-inch TT (deck)

Aircraft: 2 × Spotter-reconnaissance, two catapults.

Damage Chart



Notes: subdivisions inside the large (solid black outline) damage boxes added for convenience. One full 5.9-inch hit (*Graf Spee* secondary guns) crosses one subdivision out. One full 11-inch hit (primary guns) crosses six out. The first time a new large damage box is hit, apply speed and vital hits per rules as needed.

Disable one primary turret for every 16 subdivisions crossed out. Choose randomly.

Percentage of full speed allowed after torpedo hits: 75 (1) / 45 (2) / 0 (3).

Percentage of firepower lost after torpedo hits: 25 (1) / 100 (2).

Armour Penetration

Own Ship		Enemy Ship	
Vertical	**Horizontal**	**Vertical**	**Horizontal**
11 in. (Primary) At all ranges. **5.9 in. (Secondary)** 20° — 8.5 kyds. 40° — 6.5 kyds.	**11 in. (Primary)** 18 kyds. **5.9 in. (Secondary)** 20.5 kyds.	20° — 17 kyds. 40° — 14 kyds.	18 / 22 kyds.

Notes: vertical armour penetration happens at range listed and **under**; horizontal armour penetration happens at range listed and **over**.

Own ship: Exeter's magazines were protected by boxes up to 5 inches thick. As an approximation, and only for vital hits, consider using the values: 20° — 16 kyds., 40° — 12.5 kyds. for 11-inch gun fire against vertical armour. Vital hits from plunging fire would not be possible. Vital hits from 5.9-inch secondaries would not be possible.

Enemy ship: for adjudicating deck armour penetration with plunging fire, use the value before the slash to decide whether a **speed hit** has occurred, and the value after the slash to decide whether a **vital hit** has occurred. This reflects the better protection of *Graf Spee*'s magazines compared to her machinery spaces.

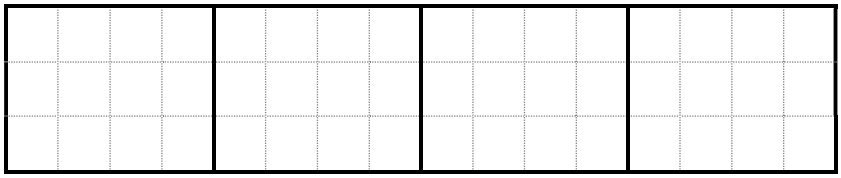
HMS Ajax / HMS Achilles

Leander-class cruiser

Speed	Armor	Armament
32.5 knots (steam turbine). Use County speed change curve.	Belt: 3 in. (3.5 in. on magazines) Deck: 1.25 in. (2 in. over magazines) **Note:** deck armour rounded to 1 in.	4 × twin 6-in. turrets 2 × quadruple 21-inch TT (deck)

Aircraft: 2 × Spotter-reconnaissance, one catapult.

Damage Chart



Notes: subdivisions inside the large (solid black outline) damage boxes added for convenience. One full 5.9-inch hit (*Graf Spee* secondary guns) crosses one subdivision out. One full 11-inch hit (primary guns) crosses six out. The first time a new large damage box is hit, apply speed and vital hits per rules as needed.

Disable one primary turret for every large damage box crossed out entirely. Choose randomly.

Percentage of full speed allowed after torpedo hits: 75 (1) / 45 (2) / 0 (3).

Percentage of firepower lost after torpedo hits: 25 (1) / 100 (2).

Armour Penetration

Own Ship		Enemy Ship	
Vertical	**Horizontal**	**Vertical**	**Horizontal**
11 in. (Primary) At all ranges. **5.9 in. (Secondary)** 20° — 8.5 kyds. 40° — 6.5 kyds.	**11 in. (Primary)** 18 kyds. **5.9 in. (Secondary)** 20.5 kyds.	20° — 17 kyds. 40° — 14 kyds.	18 / 22 kyds.

Notes: vertical armour penetration happens at range listed and **under**; horizontal armour penetration happens at range listed and **over**.

Own ship: deck armour on the Leander class was thinner over machinery spaces. Speed hits would be possible at 12 kyds. or over for both 11 and 5.9-inch guns.

Enemy ship: for adjudicating deck armour penetration with plunging fire, use the value before the slash to decide whether a **speed hit** has occurred, and the value after the slash to decide whether a **vital hit** has occurred. This reflects the better protection of *Graf Spee*'s magazines compared to her machinery spaces.

Order Chits

Move Chit			
Unit	**Time**	**Course**	**Speed**
General intentions.			

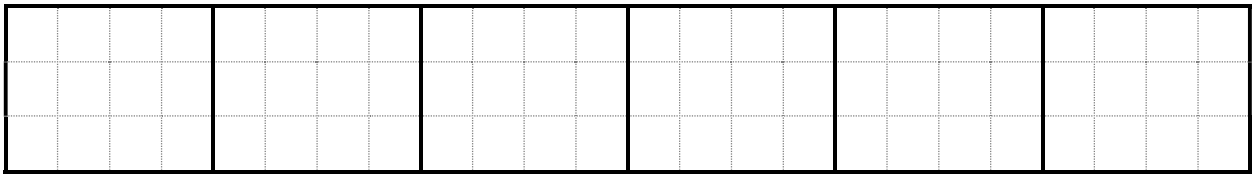
Gunfire Chit			
Unit	**Time**	**Main armament**	**Secondary armament**

Torpedo Chit			
Unit firing	**Time of launch**	**Point of aim**	**“W” torpedoes (Y/N)**
Torpedo speed	**Torpedo range**	**Enemy course / speed OR Torpedo course**	

Damage repot chit for issue to players by umpire			
Ships	**Guns lost**	**Guns firing**	**Maximum speed**
Remarks			

Ship Damage Charts (Umpire)

Admiral Graf Spee



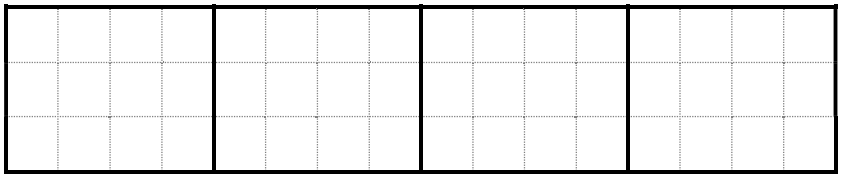
Disable one primary turret when the first three large damage boxes are crossed out entirely. Choose randomly.

Disable one secondary gun for every 9 subdivisions crossed out. Choose randomly, engaged side first.

Percentage of full speed allowed after torpedo hits: 85 (1) / 60 (2) / 30 (3) / 0 (4).

Percentage of firepower lost after torpedo hits: 10 (1) / 25 (2) / 50 (3) / 100 (4).

HMS Exeter

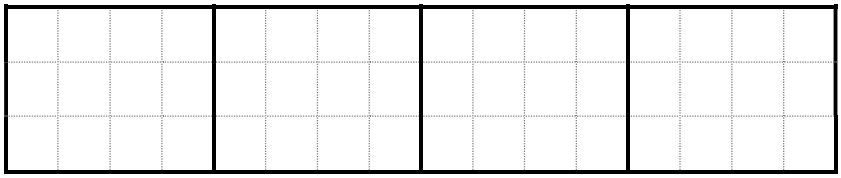


Disable one primary turret for every 16 subdivisions crossed out. Choose randomly.

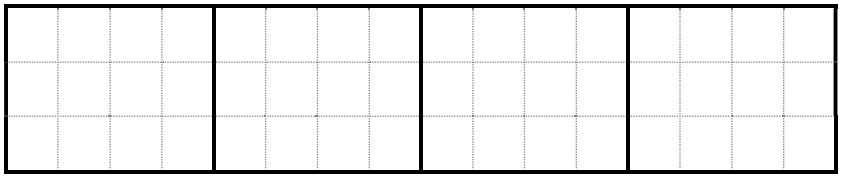
Percentage of full speed allowed after torpedo hits: 75 (1) / 45 (2) / 0 (3).

Percentage of firepower lost after torpedo hits: 25 (1) / 100 (2).

HMS Achilles



HMS Ajax



Disable one primary turret for every large damage box crossed out entirely. Choose randomly.

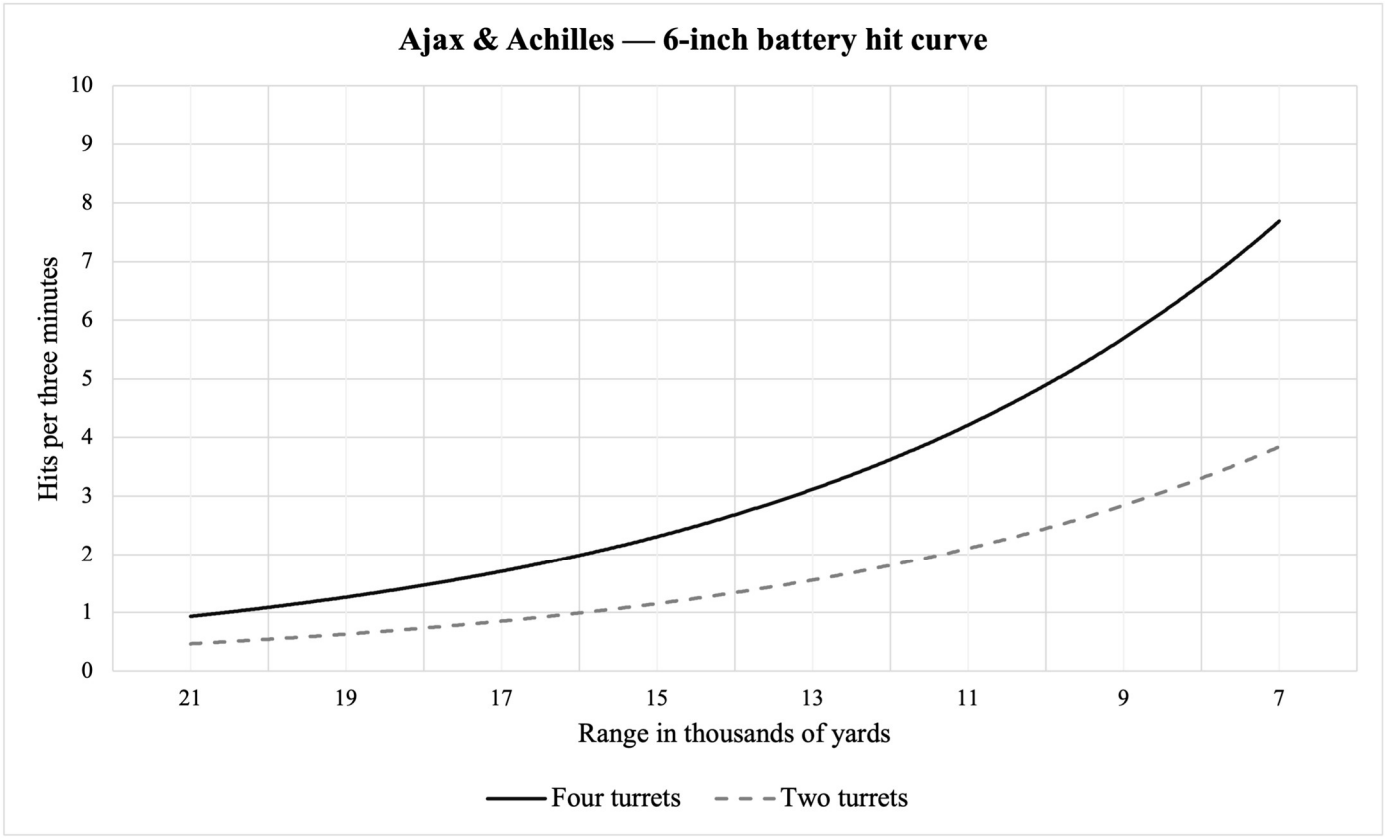
Percentage of full speed allowed after torpedo hits: 75 (1) / 45 (2) / 0 (3).

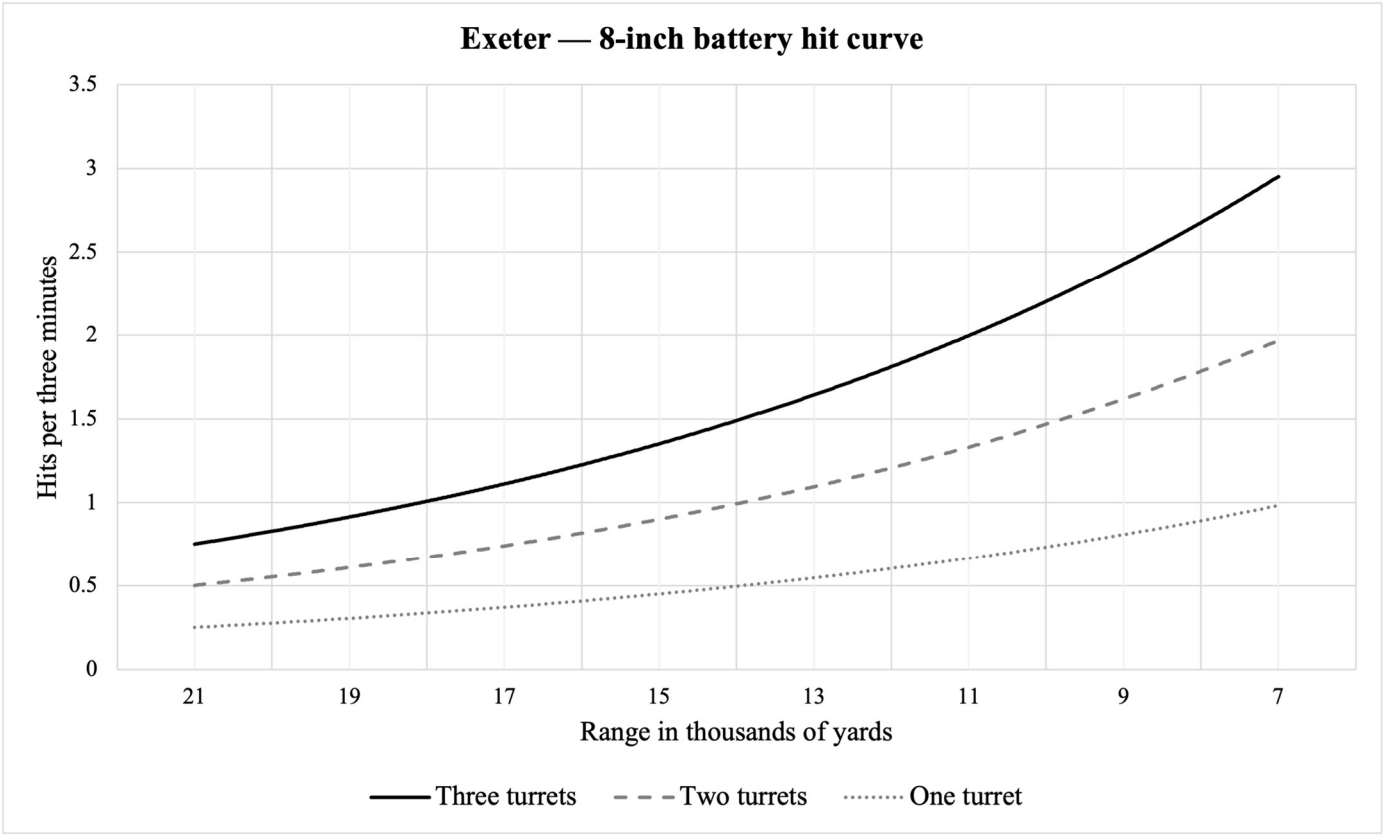
Percentage of firepower lost after torpedo hits: 25 (1) / 100 (2).

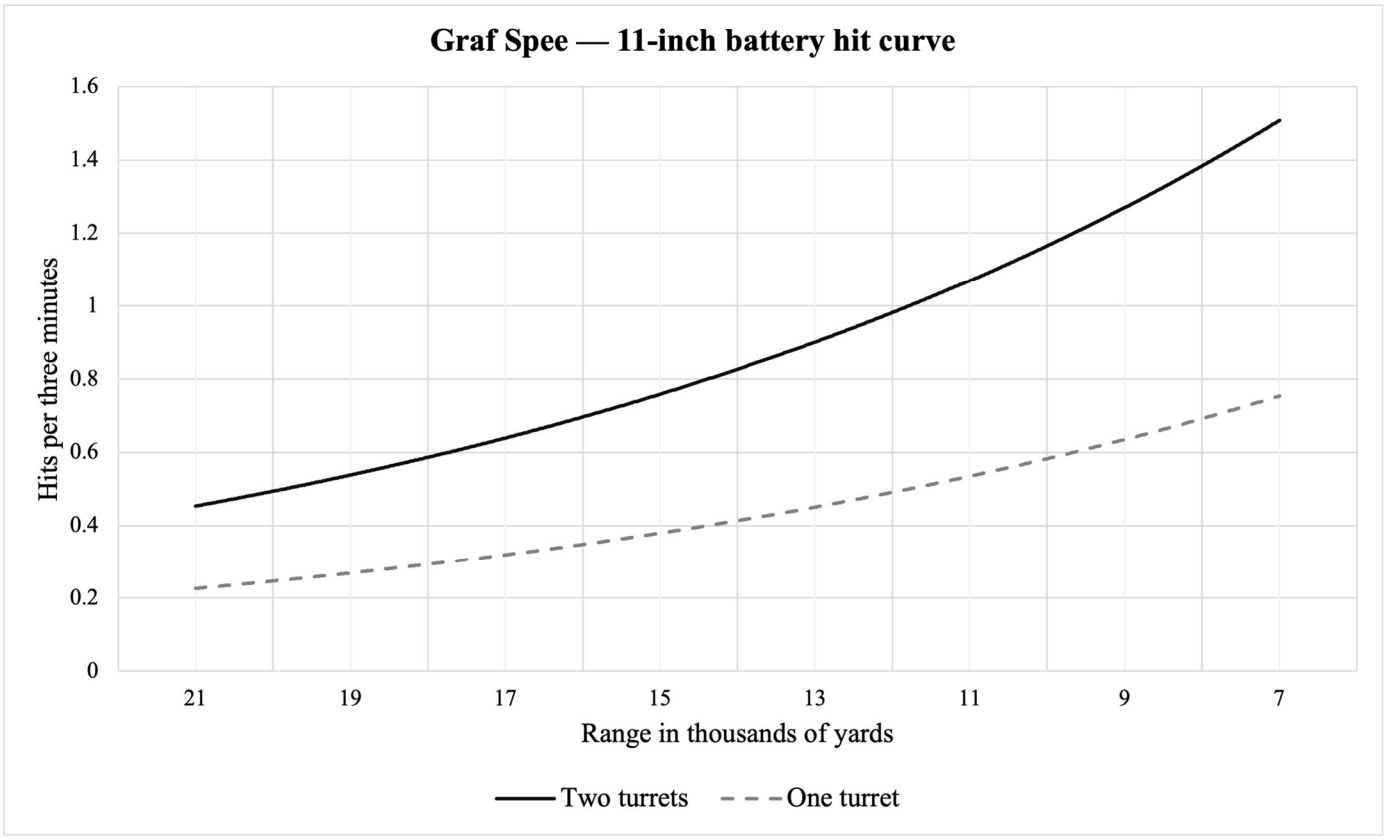
5.9 and 6-in. guns: cross out one (dotted) subdivision per full hit.

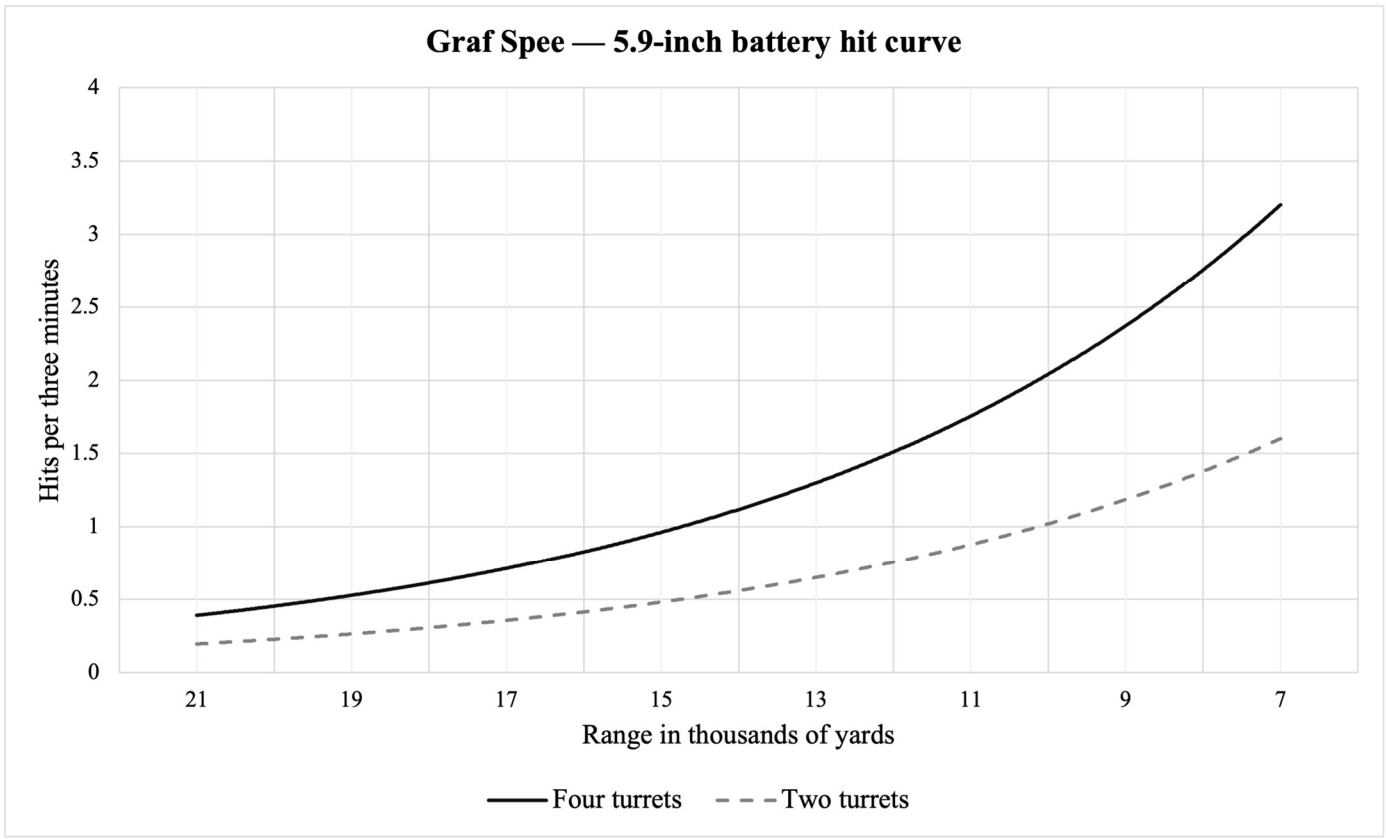
8-in. guns: cross out two (dotted) subdivisions per full hit.

11-in. guns: cross out six (dotted) subdivisions per full hit.


Ajax & Achilles — 6-inch battery hit curve
Hits per three minutes
10
9
8
7
6
5
4
3
2
1
0
21
19
17
15
13
11
9
7
Range in thousands of yards
Four turrets
Two turrets


Exeter — 8-inch battery hit curve
Hits per three minutes
3.5
3
2.5
2
1.5
1
0.5
0
21
19
17
15
13
11
9
7
Range in thousands of yards
Three turrets
Two turrets
One turret


Graf Spee — 11-inch battery hit curve
Hits per three minutes
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
21
19
17
15
13
11
9
7
Range in thousands of yards
Two turrets
One turret


Graf Spee — 5.9-inch battery hit curve
Hits per three minutes
4
3.5
3
2.5
2
1.5
1
0.5
0
21
19
17
15
13
11
9
7
Range in thousands of yards
Four turrets
Two turrets

Armour Penetration Tables (Umpire)

***Admiral Graf Spee* as target**

Gun	Vertical armour	Horizontal armour
8 in.	20° — 17 kyds. 40° — 14 kyds.	18 / 22 kyds.
6 in.	20° — 4.5 kyds. 40° — N/A.	20.5 / N/A.

Note: for plunging fire against horizontal armour, use the value before the slash for speed hits, and the value after the slash for vital hits.

HMS Exeter as target

Gun	Vertical armour	Horizontal armour
11 in.	At all ranges.	18 kyds.
5.9 in.	20° — 8.5 kyds. 40° — 6.5 kyds.	20.5 kyds.

Note: only for vital hits, use the values: 20° — 16 kyds., 40° — 12.5 kyds. for 11-inch gun fire against vertical armour. Vital hits from plunging fire are not possible. Vital hits from 5.9-inch secondaries are not possible against either vertical or horizontal armour.

HMS Ajax / Achilles as targets

Gun	Vertical armour	Horizontal armour
11 in.	At all ranges.	18 kyds.
5.9 in.	20° — 8.5 kyds. 40° — 6.5 kyds.	20.5 kyds.

Note: only for speed hits, allow penetration of horizontal armour at 12 kyds or over for both 11 and 5.9-inch guns.

A Note on Propulsion

Although not covered in the game rules, the Umpire may want to explore the differences between *Graf Spee*'s diesel engines and the British cruisers' steam turbines in the operational or tactical situation. For an outline of the contemporary debate on the subject, we recommend the articles in USNI *Proceedings* written by M. F. Gunning in 1926 (vol. 52/5/279), Lt Cdr. John O. Huse in 1934 (vol. 60/11/381), and Lt. (j.g.) Allan McLane Chambliss in 1938 (vol. 64/11/429).