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2.

COURSE OF INSTRUCTION

OF

OFFICERS AND SEAMEN

IN THE

GUNNERY SHIPS.

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BY AUTHORITY OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

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ABSTRACT OF COURSES OF INSTRUCTION.

The Courses of Instruction for all officers and men joining the gunnery ships are laid down in the "Abstract of Courses of Instruction," and are not to be deviated from.

The classes are arranged as follows:—

Reference Number on Table.				Nature of Class.
1	-	"	-	- Gunnery Lieutenants.
2	-	-	-	- Short Course „
3	-	-	-	- Sub-Lieutenants.
4	-	-	-	- Officers R.M.A. and R.M.L.I. qualifying for Instructor.
5	-	-	-	- Subalterns, R.M.A.
6	-	-	-	- Engineer Officers, R.N.
7	-	-	-	- Officers on Half Pay.
8	-	-	-	- Gunners and Gunnery Instructors absent over three years.
9	-	-	-	- Men qualifying for Gunners.
10	-	-	-	- Coastguard Officers.
11	-	-	-	- Gunnery Instructors absent under three years.
12	-	-	-	- Men qualifying for Instructor.
13	-	-	-	- Gunnery Instructors qualifying as Captain of Turret.
14	-	-	-	- S.G.T.'s, 1st class qualifying as Captain of Gun.
15	-	-	-	- S.G.T.'s absent under one year.
16	-	-	-	- S.G.T.'s absent under three years.
17	-	-	-	- S.G.T.'s absent three years and upwards.
18	-	-	-	- Volunteers.
19	-	-	-	- Boys.
20	-	-	-	- Non-Commissioned Officers of Marines qualifying for Instructors.

NOTE.—Instructions Nos. 1, 3, 5, 6 and 7, apply to "Excellent" only.

COURSE OF INSTRUCTION
IN
GUNNERY SHIPS FOR OFFICERS AND
SEAMEN.

ABSTRACT OF COURSES OF INSTRUCTION.

(1.) Instruction in the various subjects should, as a rule, be given in the order in which they stand.

(2.) Officers and men in A and B Instructions, are not to be withdrawn from drills for ship's work, battalion, or manual quarters.

(3.) Officers and men in the other instructions, with the exceptions herein-after mentioned, are, if possible, to join the battalion and manual quarters.

(4.) The number of men in any one class should not exceed 20.

ABSTRACT OF COURSE

Reference Numbers—

Reference Numbers—			1.	2.	3.	4.	5.	6.	7.	8.	
Reference Letter.	Order in which the Instruction will be given when possible.	Instruction. — See Detail of each Day's Work.	Gunnery Lieutenants.	Short Course Lieutenants.	Sub-Lieutenants.	Officers R.M.A. and R.M.L.I. qualifying for Instructors.	Subalterns, R.M.A.	Engineer Officers, R.N.	Officers on Half Pay.	Gunnery and G.I.'s absent over Three Years.	
A	First - -	Field Exercise - -	Days. 18	Days. 15	Days. 15	Days. —	Days. —	Days. —	Twenty Days Special Course.	Days. 5	
B	Second - -	M.L. and B.L. Heavy and Light Guns.	20	15	15	20	20	—		10	
C	Third - -	Ammunition - -	10	8	6	10	10	—		5	
D	Fourth - -	Rifle Practice - -	10	—	—	—	—	—		5	
E	Fifth - -	Cutlass and Pistol - -	3	3	3	—	—	—		2	
F	Sixth - -	Turret, Hand - -	2	2	2	2	2	—		2	
G		Turret, Hydraulic - -	4	4	2	4	4	—		4	
H	Seventh - -	Field and Machine Guns	11	11	7	5*	5*	—		5	
I	Eighth - -	Final - - - -	10	—	5	5	5	—		5	
	Total - - - -	- - - -	88	58	55	46	46	—	20	43	
K	Theoretical - - - -	- - - -	9	2	Satur-days.	2	9	—	—	—	
L	Hydraulics and Gun Mountings - -	- -	10	5	5	5	10	10	—	5	
M	Keeping Accounts - - - -	- - - -	—	—	—	—	—	—	—	—	
N	School - - - -	- - - -	—	—	—	—	—	—	—	17	
O	Examination - - - -	- - - -	8	—	5	3	3	—	—	—	
	Grand Total -	Days	115	65	65	56	68	10	20	65	
			Months	5½	3¼	3¼	2¼	3½	½	1	3½
P	{ Diving Course if medically fit	Gunnery and Torpedo Lieutenants, 14 days.									—
		" " " " not medically fit, 2 days.									—
		Gunnery on promotion and after 3 years absence, 3 days									—
		Men qualifying as Diver, 32 days.									—

* Machine Gun only.

LIST OF CHARGES USED FOR DIFFERENT PRACTICES.
H.M.S. "EXCELLENT."

Reference Number.	Gun.	Charge.	Reference Number.	Gun.	Charge.
1	9-pr. M.L.R. 20-pr. B.L.R.	1 lb. 8 ozs. 2 lb. 8 ozs.	11	4-in. or 5-in. B.L.	12 lbs. or 8 lbs.
2	100-pr. M.L. 64-pr. M.L.R.	12 lbs. 8 lbs.	12	10-in M.L.R.	Reduced 44 lbs., 1 full, 70 lbs. for each class.
3	9-pr. M.L.R.	1 lb. 8 ozs.			
4	M.H. Rifle -	85 grains	13	64-pr. M.L.R.	8 lbs.
5	Pistol -	18 grains.	14	4-in., 5-in. or 6-in. B.L.	12 lbs., 8 lbs., or 17 lbs. (or 21).
6	Gatling- Gardner.	85 grains.			
7	9-pr. M.L.R.	1 lb. 8 ozs.	15	9-pr. M.L.R.	1 lb. 8 oz.
8	1 in. Norden- felt 6-pr. Quick Fir- ing Gun.	626 grains. 2 lbs.	16	9·2-in. B.L.	140 lbs. or 70 lbs.
9	64-pr. M.L.R.	8 lbs.	17	9-pr. M.L.R.	1 lb. 8 oz.
10	6-in. B.L. -	Reduced, 1 full for each class.	18	Turret Gun	Full or re- duced.

H.M.S. "CAMBRIDGE."

1	7-pr. M.L.R.	8 ozs.	11	4-in. or 5-in. B.L.	12 lbs. or 8 lbs.
2	100-pr. M.L.	10 lbs.	12	9-in. M.L.R.	50 lbs. or 30 lbs.
3	9-pr. M.L.R.	1 lb. 8 ozs.	13	64-pr. M.L.R.	8 lbs.
4	M.H. Rifle -	85 grains.	14	4-in., 5-in. or 6-in. B.L.	12 lbs., 8 lbs. or 17 lbs.
5	Pistol -	18 grains.	15	7-pr. M.L.R.	8 ozs.
6	Gatling- Gardner.	85 grains.	16	9·2-in. B.L.	140 lbs. or 70 lbs.
7	9-pr. M.L.R.	1 lb. 8 ozs.	17	7-pr. M.L.R.	8 ozs.
8	1-in. Norden- felt. 6-pr. Quick Firing Gun.	626 grains. 2 lbs.	18	Turret Gun	Full or re- duced.
9	64-pr. M.L.R.	8 lbs.			
10	6-in. B.L. -	Reduced, 1 full for each class.			

PRACTICE.

H.M.S. "EXCELLENT."

Instruction.	Reference Number.	Rounds.	Gun.	Where fired from.	Distance in Yards.	Projectile.	Remarks.
Heavy Gun.	1	{ 3 1	9-pr. M.L.R. - 20-pr. B.L.R. -	Mortar Boat or Platform.	1,200	Common shell filled with water or Palliser shell. For 20 p. B.L.R. solid shot.	1 life-saving rocket to each class.
	2	2	100-pr. S.B. -	Ship -	1,000 to 2,000		
Ammunition -	3	3	9-pr. M.L.R. -	Launch -	Various.		
Rifle Practice -	4	90	Rifle -	Range -	"		
Cut and Pistol	5	24	Pistol -	"	"		
F. & M. Gun	6	{ 30 30 30	Gatling - Gardner or Nordenfelt	"	"		See Note.
	7	1	9-pr. M.L.R. -	Field Gun -	"		
	8	{ 40 5	1-in. Nordenfelt 6-pr. Quick Firing.	Gunboat - "	" "		
Final -	9	3	64-pr. M.L.R. -	"	800 to 1,000		
	10	3	6-in. B.L. -	"	1,000 to 2,000		
	11	3	4-in. or 5-in. B.L.	"	"		
	12	1	10-in. M.L.R. -	"	2,000		
Captains Guns.	13	8	64-pr. M.L.R. -	"	1,000 to 2,000		
of	14	8	4-in., 5-in. or 6-in. B.L.	"	"		
	15	2	9-pr. M.L.R. -	Turret -	"		
Captains Turrets.	16	10	9.2-in. B.L. -	"Snake" -	2,000		
of	17	10	9-pr. M.L. -	Turret -	1,000 to 2,000		
	18	4	Turret Gun -	" -	"		

Note.—On the days on which Nos. 9 and 10 firings are carried out, and after the completion of these each man is to fire one filled common shell fitted with time fuze at the target distant not less than 1,500 yards.

PRACTICE.

H.M.S. "CAMBRIDGE."

Instruction.	Reference Number.	Rounds.	Gun.	Where fired from.	Distance in Yards.	Projectile.	Remarks.
Heavy Gun	1	4	7-pr. M.L.R.	Platform	1,400	Common shell filled with water or Palliser projectile.	1 life-saving rocket to each class.
	2	2	100-pr. S.B.	Ship	1,400		
Ammunition	3	3	9-pr. M.L.R.	Launch	Various		
Rifle Practice	4	90	Rifle	Range	"		
Out and Pistol	5	24	Pistol	"	"		
F. and M. Gun.	6	{ 30 30	{ Gatling Gardner	"	"		
	7	1	{ Field Gun 9-pr. M.L.R.	Breakwater	"		
Final	8	{ 40 5	{ 1" Nordenfekt 6-pr. Quick Firing	Gunboat	"		
	9	3	64-pr. M.L.R.	"	800 to 1,000		2 filled shell to be fired for each class; fitting of fuze to be explained.
	10	3	6" B.L.	"	1,000 to 1,200		2 filled shell to be fired for each class; fitting of fuze to be explained.
	11	3	4" or 5" B.L.	"	"		
Captains Guns.	12	1	9" M.L.R.	"	2,000		
	13	8	64-pr. M.L.R.	"	1,000 to 1,200		
	14	8	4", 5" or 6" B.L.	"	"		
	15	2	7-pr. M.L.R.	Turret	1,400		
Captains Turret.	16	1	9" 2" B.L.	"Cuckoo"	2,000		
	17	10	7-pr. M.L.R.	Turret	1,400		
	18	4	Turret Guns	"	1,000 to 2,000		

PRACTICE (REQUALIFYING COURSE)

Instruction.	Reference Number.	Number of Rounds.	Gun.	Where fired from.	Distance in Yards.	Projectile.	Remarks.		
Rifle Practice	4	60	Rifle -	Range -	Various.	Common shell filled with water or Palliser projectile.			
Field and Machine Gun.	6 {	30	Gatling -	} " -	"				
		30	Gardner -						
Final -	{	8 {	10	Nordenfelt -	Gunboat -		"		
			5	6-pr. Quick firing.	" -		"		
		9 {	2	64-pr. M.L.R.	" -		"		
			12 {	1	9-in. M.L.R.		" -	"	
			14 {	4	4", 5" or 6" B.L.		" -	"	
	16 {	1	9·2" B.L. -	" -	"				

PRACTICE (MANUAL CLASSES), QUARTERLY.

Manual.	Reference Number.	Number of Rounds.	Gun.	Where fired from.	Distance in Yards.	Projectile.	Remarks.
Rifle Practice	4	25	Rifle - -	Range -	Various.	Common shell filled with water or Palliser projectile.	5 rounds at 200 yds.
							5 " 300 "
							5 " 500 "
							5 " 600 "
							5 at moving target, if possible.
Pistol -	5	24	Pistol -	" -	"		1 cylinder at moving target, if possible.
Manual -	9	3	64-pr. M.L.R.	Gunboat -	"		Gunboat steaming past targets; time 3 minutes.

Whenever a gunboat goes out for practice, the following rules are to be observed:—

- (1.) All the gear, such as sponges, rammers, &c. are to be placed conveniently for working.
- (2.) With M.L.R. guns, the guns are to be cleared away at the order, "Exercise Action," and then each man is to be put through three rounds of "Aiming Drill" at any object, as the gunboat steams out of the harbour.
- (3.) With B.L. guns the same to be carried out, but after each round the motions of "Sponging and Loading" are to be performed as if actually firing.
- (4.) Tubes are not to be expended for "Aiming Drill."
- (5.) All firings in gunboats are to be carried out "against time."

Each man is to judge distance at three objects at unknown distances, the officer on board the gunboat obtaining the correct distance from the chart or by any other means.

Points are to be awarded as follows:—

From 25 yards short to 50 over	-	-	4 points.
" 50 "	100	" -	- 3 "
" 75 "	150	" -	- 2 "
" 100 "	200	" -	- 1 "

A prize will be given to the best judge of distance in each class of over 15 men, on the day when No. 12 firing is carried out, provided he gets 6 points.

Whenever officers go out in the gunboat, every opportunity is to be taken of firing by director.

In firing Nos. 9, 13 and 14 three targets are to be placed in a line, and moored about 600 yards apart, the gunboat to steam at full speed parallel to them, bringing them on in succession, the distance being communicated as often as possible.

In all firings, points are to be awarded as laid down in the gunnery manual.

CLASSIFICATION FOR FIRING AND PRIZES AWARDED.

The average of the number of points obtained in specified firings from ship or gunboat, with the exception of filled shell, will be recorded against each man, from which the classification will be made as follows:—

Average.			Class for Firing.
8 points and over	-	-	1st class.
6 " to 8 points	-	-	2nd "
4 " to 6 points	-	-	3rd "

No man to be rated S.G.T. first class unless he reaches the standard of a second-class shot. Men not coming up to the standard of third-class shots will be put through additional firing, and if they are incapable of attaining the third class, they cannot be qualified as S.G.T's.

PRIZES FOR GOOD SHOOTING.

Money prizes will be awarded to men passing through the various instructions as follows:—

Aiming Instruction.—Best figure of merit in each class of at least 10 men	1 Prize.
Aiming Drill, Sec. II.—Highest score at moving target	1 Prize.
No. 9 Firing.—Gunboat steaming past targets, three rounds. Time allowed, three minutes, one point being deducted for every 10 seconds over time, and one point being added for every 10 seconds under time. At least 24 points must be obtained to gain a prize. Each class must consist of at least 10 men	4 Prizes.
No. 13 (or 14) Firing (as available). Gunboat steaming past targets, 8 rounds. Time allowed, six minutes, one point to be deducted for every 10 seconds over time and one point being added for every 10 seconds under time. At least 80 points must be obtained to gain a prize. Each class must consist of at least 10 men.	4 Prizes.

PRIZES FOR FINAL AVERAGE.

Men obtaining a final average of nine points and upwards from 4" B.L. and all guns above will be awarded certain money prizes in proportion to their average:—

<i>Rifle Practice.</i>	£	s.	d.
Best shot in ship	2	10	0
" " company	1	0	0
Marksmen (<i>see</i> Field Exercise Book)	0	2	6
Best judge of distance in each company	0	2	6
Judging distance on the day No. 12 firing is carried out provided six points are obtained, and the class consists of at least 15 men. One Prize	0	2	6

EXPLANATION OF TABLE OF ABSTRACT OF COURSES OF INSTRUCTION, p. 4 and 5.

I. GUNNERY LIEUTENANTS.

The Course for Gunnery Lieutenants is to be as laid down in the "Abstract of Courses of Instruction," No. 1, with the following modifications and additions:—

1. The number of officers in each class should, if possible, be limited to five, the classes being completed from manual men who have finished their course.
2. Every opportunity is to be given to these officers to fall out and drill.
3. The instruction in ammunition is to embrace the whole of the matter contained in the text book on Ammunition, as well as the Manufacture of Powder.
4. Nine days' instruction is to be given on the principles of gunnery by one of the Staff Lieutenants.
5. Twenty-eight working days are to be spent at Woolwich in studying the actual manufacture of guns and ammunition, &c.; examining and sentencing guns, including also one day at the Powder Factory, and one day at the Royal Small-Arm Factory.
6. The following books will be supplied as text books:—

Gunnery Manual and Drill Book.

Rifle and Field Exercise and Musketry Instruction.

Treatise on Ammunition.

„ on Carriages.

„ on Gun Construction.

„ on Powder.

Diving Manual.

Notes on Naval Guns.

Machine Gun Handbooks,

and

Instructions for Armourers.

7. A number of subjects for lecture will be communicated to the class at the commencement of the gunnery course and officers will be given access to every means of information bearing on these subjects. Notice of one month will be given to each officer of the subject on which he will be called upon to lecture at the examination.

II. SHORT COURSE LIEUTENANTS.

The course for "Short Course Lieutenants" is to be as laid down in the "Abstract of Courses of Instruction," No. 2:—

1. The class is to be completed from manual men who have finished their course.
2. Opportunity is to be offered of falling out to drill.
3. The class will join the battalion or manual quarters after 5 days' instruction in A. or B.
4. Two days to be devoted to lectures on the theory of gunnery, gun construction, the use of the director, and a resumé of recent experiments.
5. Five days to be devoted to lectures on Hydraulics and Gunmounting (L) Instructions, to be given by a Staff Lieutenant.
6. During B. Instruction the Short Course Lieutenants will carry out Nos. 8, 10, and 12 firings, also firing by director.

During the Field Exercise Instruction they will fire 10 rounds at 100 yards, and 10 rounds at 300 yards.

During E. instruction, 12 rounds with pistol at running man.

III. SUB-LIEUTENANTS.

The course for Sub-Lieutenants to be as laid down in the "Abstract of Courses of Instruction," No. 3.

NOTE.—Every opportunity is to be given to these officers to fall out and drill.

A Lieutenant on the staff will be detailed to superintend, as far as possible, their whole instruction, and on Saturday forenoons will conduct their theoretical instruction at the College, which will consist of a course of 12 lectures on convergence, the use of director, and the principles of gunnery.

They will carry out the following firings in their instructions, viz.:—

In A. instruction, 10 rounds at 100 yards, and 10 rounds at 300 yards, with rifle.

In E. instruction, 12 rounds with pistol at running man.

In B. „ Nos. 8 and 10 firings.

They will also, when out in the gunboat, fire two broadsides each by director, if possible.

Whilst in B. instruction they will join the battalion, being warned the previous day.

Whilst in C., E., F., and H. instructions they will go to Heavy Gun Quarters.

IV. OFFICERS R.M.A. AND R.M.L.I. QUALIFYING AS GUNNERY INSTRUCTORS.

The course for Officers R.M.A. and R.M.L.I. is to be as shown in the "Abstract of Courses of Instruction," No. 4.

Two days to be devoted to lectures on the theory of gunnery, gun construction, the use of the director, and a resumé of recent experiments.

V. SUBALTERNs R.M. ARTILLERY.

The course for Subalterns R.M.A. is to be as laid down in the "Abstract of Courses of Instruction," No. 5.

Nine days' instruction is to be given on the principles of gunnery by one of the Staff Lieutenants.

VI. ENGINEER OFFICERS R.N.

The course for Engineers is to be as laid down in the "Abstract of Courses of Instruction" No. 6.

VII. OFFICERS ON HALF PAY.

The course for officers of the rank of Commander and upwards will extend over 20 working days, or 4 weeks.

The officers will not take part in the drills, but will observe them being carried on, and the course will be conducted entirely by one of the Lieutenants on the Senior Staff.

It will consist of the following subjects: the time being divided between them according to their importance, and every information given on the latest alterations and additions to the armament, &c. supplied to sea-going ships.

- (1.) Field Exercise, including Battalion and Musketry.
- (2.) Gun Drills, including exercise at Quarters and a description of the Guns, Carriages, Slides, &c. in use in the Service.
- (3.) Ammunition and warlike stores in use in the Service.
- (4.) Turret Gun Drill, including hydraulic gunnery and new systems of mounting, sighting, &c.
- (5.) The practical use of the Director. Systems of firing.
- (6.) Armour and armament, including Machine Guns.
- (7.) Progress in Gunnery, and Gun Construction. Latest experiments with Ordnance and Armour.
- (8.) Gunnery Training. Returns. Examinations. Ammunition allowed for practice. Prize firing and miscellaneous subjects connected with Gunnery in sea-going ships.
- (9.) Field Gun and Battery Drills.

VIII. GUNNERS AND GUNNERY INSTRUCTORS OVER THREE YEARS ABSENT.

The course for gunners and G.I.'s over three years absent from a gunnery ship is to be as laid down in "Abstract of Courses of Instruction," No. 8, in which they will not fall in, but will act as Drill Instructors under supervision.

IX. MEN QUALIFYING FOR GUNNERS.

The course for men qualifying for gunners is to be as follows:—

- (1.) The School Course. (*Vide* p. 25.)
- (2.) The Theoretical Course. (*Vide* p. 23.)
- (3.) The course of drill as laid down in the "Abstract of Courses of Instruction," No. 9, in which they will act as Drill Instructors under supervision.

If the man qualifying for gunner has just passed through No. 12, then instead of No. 9, he will be put through No. 8.

X. COASTGUARD OFFICERS.

The course for Coastguard Officers will be as laid down in the "Abstract of Courses of Instruction," No. 10.

They will be required to fall in at drill, and to give detail in all instructions.

XI. GUNNERY INSTRUCTORS UNDER THREE YEARS ABSENT.

G.I.'s under three years absent from a gunnery ship will be put through a 10 to 20 days' course of final.

XII. MEN QUALIFYING FOR GUNNERY INSTRUCTORS.

Men are to be selected to qualify for Gunnery Instructors in accordance with Art. 775, page 270, of Admiralty Instructions.

The course is to be as follows:—

- (1.) The School Course. (*Vide* p. 25.)
- (2.) The course of drill as laid down in the "Abstract of Courses of Instruction," No. 12, in which they will act as Drill Instructors under supervision.

If the man qualifying for Gunnery Instructor has just passed through No. 18, then instead of No. 12, he will be put through No. 8.

XIII. GUNNERY INSTRUCTORS QUALIFYING FOR CAPTAIN OF TURRET.

Gunnery Instructors qualifying as Captain of Turret will be put through 5 days Hydraulic (L) Instruction and 8 or 5 days Final (I) Instruction, after which they will be examined. Men who have held the rating of Captain of Gun will be put through Nos. 16, 17, and 18 Firings only, but those who have not held that rating will first be put through Nos. 13, 14, and 15 Firings, in which they must obtain an average of at least 8 points, including time allowance. In Nos. 16, 17, and 18 Firings the men must obtain an average of at least 8 points, including the time allowance in No. 17 Firing.

XIV. S.G.T.'s 1ST CLASS QUALIFYING FOR CAPTAIN OF GUN.

S.G.T.'s 1st class, holding the rating of L.S. or above, qualifying for Captain of Gun will be put through the 5 day's course of heavy and light guns, during which one of the class will be acting as Instructor, the remainder forming the gun's crew. Two additional days will be allowed for instruction in the details of mountings and compressors, which will be given by a Staff Lieutenant. Each man will be put through Nos. 9, 10, 11, 13, 14, and 15 Firings, in which the final average must be 8 points, including the time allowances. An examination in heavy and light gun mountings and drill will be held.

XV., XVI., AND XVII. S.G.T.'s.

The courses for S.G.T.'s are to be as follows:—

Under one year's absence from gunnery ship. Nil.

Over one and less than three years' absence { 10 to 20
days' final.

Over three years' absence - { As laid down in the
"Abstract of Courses
of Instruction," No. 17.

NOTE.—Any new drill which may have been introduced in the absence of men from the gunnery ships is, however, to be taught before they are again drafted.

XVIII. VOLUNTEERS.

The course for Volunteers to be as laid down in the "Abstract of the Course of Instruction," No. 18.

XIX. BOYS.

COURSE OF INSTRUCTION FOR BOYS IN H.M.S.
"EXCELLENT."

This course of seven weeks is to be regulated by the Captain of the "Excellent."

COURSE OF INSTRUCTION FOR BOYS IN H.M.S.
"FOUDROYANT."

This course of seven weeks is to be regulated by the Captain of "Cambridge."

XX. N.C.O. OF MARINES QUALIFYING FOR GUNNERY
INSTRUCTORS.

The course for Non-commissioned Officers of Marines qualifying for Gunnery Instructors is to be as laid down in the "Abstract of Courses of Instruction," No. 20.

MANUAL COURSE.

- Monday - Heavy gun, ammunition, cutlass.
 Tuesday - Field Exercise.
 Wednesday - Light gun, turret, or musketry.
 Thursday - Battalion, ammunition, cutlass.
 Friday - Field and machine gun, manual quarters.

Each man after being in the manual for three months is to fire every quarter :—

Five rounds of empty shell from a gunboat, and

With a rifle 5 rounds at 200 yards.

5 " " 300 "

5 " " 400 "

5 " " 600 "

5 " " Skirmishing Targets.

With a pistol 24 " (12 from each hand).

They will also carry out No. 9 Firing.

DETAIL OF COURSES OF INSTRUCTION.

A. FIELD EXERCISE.

18 DAYS' COURSE.

1st and 2nd	-	{ a.m. Manual and Firing Exercise by numbers.
		{ p.m. Squad Drill.
3rd	-	{ a.m. Manual and Firing Exercise by numbers and in quick time.
		{ p.m. Squad Drill.
4th	-	{ a.m. Manual and Firing Exercise, in quick time.
		{ p.m. Squad Drill.
5th	-	{ a.m. Squad Drill.
		{ p.m. Squad Skirmishing.
6th to 16th	-	{ a.m. To 10. Drill each other. 10 to 10.30. Rifle exercise. 10.40 to 11.45. Company Drill.
		{ p.m. Company Skirmishing. Shelter Trench Exercise.
17th	-	- Recapitulation.
18th	-	- Examination.

Note. In 15 days' course, same as above, with the following exceptions:—

14th	-	- Recapitulation.
15th	-	- Examination.

After the third days' instruction, when the weather is favourable, the arms are to be piled on all occasions of dismissing.

A. 5 DAYS' COURSE.

Days.		
1st	-	{ a.m. Manual and Firing Exercise by numbers and in quick time.
		{ p.m. Squad Drill.
2nd	-	{ a.m. Squad Drill.
		{ p.m. Squad Skirmishing.
3rd and 4th	-	{ Company Drill and Company Skirmishing.
		{ Shelter Trench Exercise.
5th	-	{ a.m. Recapitulation.
		{ p.m. Examination.

When the weather is favourable the arms are to be piled on all occasions of dismissing,

B. HEAVY AND LIGHT GUNS.

20 DAYS' COURSE.

M.L.

Day's Work.

- | | | |
|--------------------|---|--|
| 1st, 2nd, and 3rd. | } | Preliminary Drill and Aiming Instruction. |
| 4th, 5th, and 6th. | | |
| 7th, 8th, and 9th. | } | a.m. Practice. p.m. Practice drilling with detail. |
| 10th - - | | |
| | | Nos. 1 and 2 Firings. Practice, Shifting breechings and Dismounting. |
| | | Recapitulation. |

B.L.

The same as for M.L. omitting the firings.

On the 20th day Examination in M.L. and B.L.

B. 10 DAYS' COURSE.

M.L.

Day's Work.

- | | | |
|-------------|---|---|
| 1st and 2nd | - | Preliminary Drill and Aiming Instruction. |
| 3rd and 4th | - | Practice. |
| 5th | - | Recapitulation and Drill with detail. |

B.L.

- | | | |
|-------------|---|---|
| 1st and 2nd | - | Preliminary Drill and Aiming Instruction. |
| 3rd and 4th | - | Practice. |
| 5th | - | Recapitulation and Examination in M.L. and B.L. |

Note.—Each day's instruction is to begin with a lesson lasting a quarter of an hour. Where the length of course in Abstract of Instruction differs, alterations must be made accordingly.

Note to A. and B. Instructions.

The above detail of course is for officers, and men qualify as instructors.

For volunteers, omit, "Drilling each other," giving the time gained, to perfecting the drill.

In cases where volunteers or old S.G.T's show special aptitude for drill, and are likely to make good captains of guns, or instructors, they should be encouraged to learn the detail, and fall out and drill, with a view of passing for these ratings.

C. AMMUNITION.

8 DAYS' COURSE.

Days.

- | | |
|---|---|
| 1 | General description of projectiles used, proportion allowed, how supplied, marked, and method of filling. |
|---|---|

Days.

- 1 General description of all fuzes used, method of fitting, and mode of supply.
- $\frac{1}{2}$ Description of powder, cartridge cases, ammunition boxes, night signal box.
- $\frac{1}{2}$ Description of cartridges, material used, making up and proportion allowed.
- $\frac{1}{2}$ General description of magazines and shell rooms, their stowage, working, ventilation, and precautions used.
- 1 Equipment of boats, manned and armed, and No. 3 firing.
- $\frac{1}{2}$ General description of war, life saving, and signal rockets, tubes and fireworks, their use, supply, and stowage.
- $\frac{1}{2}$ Fitting fuzes and gas-checks.
- 1 Life saving, and signal rocket firing, and stowing away apparatus.
- 1 Recapitulation and Examination.

8 Total.

C. 5 DAYS' COURSE.

Days.

- $\frac{1}{2}$ General description of projectiles used, proportion allowed, how supplied, marked, and method of filling, and gas checks.
- 1 General description of all fuzes used, method of fitting and mode of supply.
- $\frac{1}{2}$ Description of powder, cartridge cases, ammunition, and night signal boxes, and also cartridges.
- 1 Equipment of boats manned and armed, and No. 3 firing.
- $\frac{1}{2}$ Description of war, life-saving, and signal rockets, tubes and fireworks, their use, supply, and stowage.
- $\frac{1}{2}$ Description of magazines and shell rooms, their stowage, working, and ventilation, &c.
- 1 Recapitulation and Examination.

5 Total.

Note.—In ten days' course, the two extra days are to be devoted to fitting fuzes and recapitulation.

D. RIFLE PRACTICE.

11 DAYS' COURSE.

As laid down in the Rifle Practice Instruction.

D. 5 DAYS' COURSE.

As laid down in the Rifle Practice Instruction.

E. CUTLASS AND PISTOL.

4 DAYS' COURSE.

Day's Work.

- 1st - { Cutting and Guarding practice.
Pointing and General practice.
2nd - Cutlass exercise and Attack and Defence practice.
3rd { Cutlass exercise and Attack and Defence practice.
Loose play, and Pistol drill.
4th { a.m. Drilling each other. Pistol firing. No. 5.
p.m. Examination.

E. 3 DAYS' COURSE.

Day's Work.

- 1st - { a.m. Cutlass drill.
p.m. Attack and Defence practice.
2nd - Ditto, and drilling each other.
3rd { a.m. Pistol drill.
p.m. Examination.

F. and G. TURRET.

TOTAL 6 DAYS' COURSE { 2 days hand.
4 days hydraulic.

F. 2 DAYS' COURSE.—HAND LOADING.

Day's Work.

- 1st - - Preliminary drill.
2nd - - Practice (steam up).

Steam to be raised on the second day for each class to move the turret.

G. 4. DAYS' COURSE—HYDRAULIC LOADING.

Day's Work.

- 1st and 2nd - Preliminary drill.
3rd „ 4th - Practice and Examination

Steam or air will be available, if possible on three days for working the hydraulic apparatus for the instruction of each class.

Gunnery Lieutenants, Subalterns R.M.A., and Engineer Officers R.N. will go through a ten days' course of instruction in Hydraulic Gunnery and Gun Mountings, as detailed in L. Instruction, page 24. All other officers and men who are to receive hydraulic instruction, as in table at pages 4 and 5, will go through a five days' course of L. Instruction, as detailed at page 25.

H. FIELD AND MACHINE GUN EXERCISE.

11 DAYS' COURSE.

Day's Work.

- 1st - Preliminary drill. Field gun.
- 2nd - Practice. Field gun.
- 3rd - Practice and firing field gun (1 round each man).
No. 7.
- 4th - Field gun and field machine gun drill.
- 5th - Field machine gun drill and firing field machine gun.
No. 6.
- 6th - a.m. Gardner and Nordenfelt mechanism and drill
 $\frac{1}{2}$ class to each gun at same time.
p.m. 6-pr. Quick Firing gun.
- 7th - Ditto.
- 8th - Ditto.
- 9th - Gardner and Nordenfelt drill and Gardner firing.
No. 6.
- 10th - Resumé.
- 11th - Examination.

H. 5 DAYS' COURSE.

Day's Work.

- 1st - { a.m. Field gun drill.
p.m. Field machine gun drill, including No. 6 firing.
- 2nd - Gardner and Nordenfelt mechanism and drill (class divided).
- 3rd - a.m. Ditto. p.m. 6-pr. Quick Firing gun.
- 4th - Ditto, and Gardner firing. No. 6.
- 5th - { a.m. Machine gun drill.
p.m. Examination (machine guns only).

H. SUB-LIEUTENANTS.

Day's Work.

- 1st - Field gun drill.
- 2nd - Field gun drill.
- 3rd - { a.m. Field machine gun drill.
p.m. Field machine gun firing (No. 6).

- 4th - a.m. Gardner and Nordenfelt mechanism and drill
(class divided). p.m. 6-pr. Quick Firing gun.
5th - Ditto.
6th - Ditto, and Gardner firing. No. 6.
7th - Machine gun drill and resumé.

NOTE.—Battery drill will take place, if possible, on Friday forenoon, and will also in addition be taught for two days during the course for half an hour in the forenoons.

I. FINAL.

10 DAYS' COURSE.

Recapitulation in any of the foregoing instructions as necessary. Nos. 8, 9, 10, 11, and 12 firings are to be carried out in this instruction. Gunnery Lieutenants are to fire by director in this instruction.

5 DAYS' COURSE.

Recapitulation in any of the foregoing instructions as necessary. No. 8, 9, and 11 firings are to be carried out in this instruction. Short Course Lieutenants, Officers R. M. A. and R. M. L. I. qualifying for Instructors, and Subalterns R. M. A. are to fire by director in this instruction.

K. THEORETICAL COURSE.

MEN QUALIFYING FOR GUNNER.

Geometrical problems	-	-	-	2 days.
Converging guns, laying and marking racers	}	6	"	
and plates				
Elevating scales and arcs, graduating sights	-	-	-	2 "
Director, corrections for, how to work out	}	6	"	
and form tables				
Practical use of director. Prepare a broad-				
side, and pass down the orders every day	-	-	-	2 "
after the theory is known.				
Gunnery stores, accounts, and gunnery returns.	-	-	-	5 "
M. Instruction.				
Taking impressions of guns	-	-	-	1 day.
Miscellaneous subjects	-	-	-	1 "
Hydraulic lectures. L. Instruction.	-	-	-	5 days.

During this course Gunnery qualifying are to learn the care and use of diving dress.

L. HYDRAULICS AND GUN MOUNTINGS

10 TEN DAYS' COURSE.

Day's Work. *To be given by a Staff Lieutenant.*

- 1st - a.m. On the first introduction of hydraulic machinery applied to guns in the Navy. Ships which are fitted with hydraulic machinery, classifying them into their different types and mountings. "Head" of water, Accumulators. General principles on which the machinery is constructed. Steam pumping engine in all its details. Centre pivot pipe.
 p.m. Visit ships on board which the objects of the forenoon's lecture may be seen.
- 2nd - a.m. Recoil presses of turret ships in all their details. Gun working valve. Hydraulic and hand-locking bolts.
 p.m. As in afternoon of previous day.
- 3rd - a.m. Ammunition lifts. Shot hoists (cylinder and chain). Rammers. Elevating presses of "Inflexible" type and "Colossus" type.
 p.m. As on previous day, with pressure on for working the machinery.
- 4th - a.m. All the machinery and apparatus involved in turning turrets and barbette platforms.
 p.m. As in afternoon of previous day.
- 5th - a.m. Intensifiers and theoretical considerations with regard to the dimensions of the various working parts of the machines.
 p.m. As in afternoon of previous day.
- 6th - a.m. Different principles of the mountings in turrets, such as "Dreadnought," "Inflexible," "Colossus," "Rodney," &c. Different points in the working of hydraulic machinery on which experience has been gained, such as Recoil press relief valves, Packings, &c.
 p.m. Examine interior of recoil press valve box on board, and other available portions of machinery.
- 7th - a.m. Types of iron gun carriages from their first introduction and the various defects in principle of the earlier patterns. Different points of weakness, &c.
 p.m. Visit ships and examine types of carriages and slides.

Day's Work.

- 8th - a.m. Compressors, frictional and hydraulic; consider subject of recoil. Describe the compressors and hydraulic buffers, except Vavasseur's.
 p.m. Examine compressors and buffers in different ships in Dockyard or on board gunnery ship.
- 9th - a.m. Description of Vavasseur's compressor in all its details.
 p.m. Examine ditto in different ships in Dockyard, or on board gunnery ship.
- 10th - { a.m. } In gunboat to observe Vavasseur's compressor when actually firing.
 { p.m. }
- Note.—This may not perhaps take place on the last day of the course, but must be arranged for according to circumstances.

L. 5 DAYS' COURSE.

To be given by a Staff Lieutenant.

- 1st, 2nd, 3rd, } As in above Course.
 and 4th. }
- 5th - Recapitulation.

N. SCHOOL COURSE.

MEN QUALIFYING FOR GUNNER.

Simple and Compound Proportion	-	-	10 days.
Vulgar Fractions	-	-	15 "
Decimal	„	-	15 "
Square Root	-	-	5 "
Logarithmic Arithmetic	-	-	15 "
Plane Trigonometry. Use of Sextant and Barometer. Taking angles and ascertaining distances	-	-	20 "
Total			80 "

N. MEN QUALIFYING FOR INSTRUCTORS.

Simple Proportion	-	-	10 days.
Vulgar Fractions	-	-	15 "
Decimal	„	-	10 "
Preparing for examination	-	-	5 "
Total			40 "

P. DIVING INSTRUCTION.

32 DAYS' COURSE.

Days.	
2	Dressing and undressing, and inflating the dress.
2	Going under water to the bottom of the ladder and repeating signals.
5	Going to the bottom and repeating signals and communicating with the surface by means of a slate.
2	Move about on the bottom by means of a distance line.
2	Move about by direction signals.
2	Search for articles lost.
3	Bending on gear, examining moorings, shackling and unshackling cables.
3	Cleaning a ship's bottom, taking out and putting in Kingston valves, clearing propellers.
4½	Nailing on copper and stopping leaks.
4½	General work in deep water up to 20 fathoms.
1	Describing the nature and action of the air pump.
1	Repairing diving dress, air pipes, and the management of them.

 32

Any time gained to be devoted to work in deep water.

P. 14 DAYS' COURSE.

No. of Days.	
1	Dressing and undressing, and inflating the dress.
1	Going under water to the bottom of the ladder and repeating signals.
1	Going to the bottom and repeating signals and communicating with the surface by means of a slate.
1	Move about on the bottom by means of a distance line.
1	Move about by direction signals.
1	Search for articles lost.
2	Bending on gear, examining moorings, shackling and unshackling cables.
2	Cleaning a ship's bottom, taking out and putting in Kingston valves, clearing propellers.
2	Nailing on copper and stopping leaks.
2	General work in 10 fathoms.

 14 Total.

P. 3 DAYS' COURSE.

No. of
Days.

- 1 The care and management of the entire apparatus.
Dressing, undressing, and inflating the dress.
- 2 Attending divers under water.
- 3 Total.

* COURSE OF INSTRUCTION AND EXAMINATION OF OFFICERS STUDYING FOR GUNNERY LIEUTENANTS.

1. Lieutenants desirous of qualifying as Gunnery Lieutenants, are, when employed, to be recommended to the Admiralty by their Captains through their Commander-in-Chief.

2. Appointments will be made to the "Excellent" dating from 1st October; Officers so appointed will remain on the books of that ship during the whole course. Candidates who have not previously served one year at sea as Lieutenants will, if selected, be appointed to a sea-going ship to complete that period as Officer of the Watch.

3. The total period of instruction, including a vacation of about a month in October and November, will be nearly 21 months, and will be distributed in the following order, viz.:—

	Months.	Weeks.
Theoretical Course at Greenwich	- 9	0
Torpedo instruction, including examination in "Vernon"	- 3	0
Practical gunnery, including examination in "Excellent"	- 5	3
Attendance at Royal Gun Factories, Carriage Department, and Laboratory at Woolwich, about	- 0	5
Leave	- 1	0
Total	- 20	0

* See Queen's Regulations and Admiralty Instructions, amended Art. 757, p. 264.

4. Should it be found, during any part of the course of instruction, that a Lieutenant is not likely to prove efficient as a gunnery officer, his name is to be submitted to the Admiralty, with a view to his removal from the books of the "Excellent."

5. GUNNERY LIEUTENANTS' EXAMINATION.

Theoretical Course.

		Numbers.
A. Pure Mathematics—		
I. Arithmetic and Mensuration	-	100
II. Geometry, including the subjects of the First Six Books of Euclid	-	200
III. Algebra, including the Binomial and Exponential Theorems, and Logarithms	-	300
IV. Trigonometry	-	300
V. Co-ordinate Geometry, including Conic Sections	-	400
VI. Differential and Integral Calculus	-	500
		—1,800
B. Applied Mathematics—		
I. Statics	-	350
II. Hydrostatics	-	350
III. Kinematics and Kinetics	-	400
		—1,100
C. Physics, including Heat, Light, Electricity, and Magnetism		400
Chemistry	-	400
Practical Electricity	-	200
		—1,000
D. Fortification, including Military Surveying	-	500
		4,400
		<u>4,400</u>

For a 1st-class certificate in the Theoretical Course, a good knowledge of all the subjects is required, and a minimum of 2,700 numbers must be obtained.

For a 2nd-class certificate, a fair knowledge of all the subjects, with the exception of A. VI., is required, and a minimum of 1,500 numbers must be obtained.

PRACTICAL COURSE.

	Full Nos.
1. Field Exercise - - -	- 230
2. M.L. and B.L. Heavy and Light Guns -	- 280
3. Ammunition, including Laboratory Course -	- 200
4. Rifle Practice - - -	- 90
5. Cutlass and Pistol - - -	- 50
6. Turret Hand and Hydraulic - - -	- 120
7. Field gun, and Battery - - -	- 90
8. Machine Gun - - -	- 100
9. Drilling - - -	- 100
10. Use of Director - - -	- 40
11. Theoretical Gunnery Paper - - -	- 100
12. Hydraulic Gunnery Paper - - -	- 100
13. Lecture - - -	- 150
14. Torpedo - - -	- 400
	2,050

For a 1st class certificate in the Practical Course 1,650 numbers must be obtained.

For a 2nd class certificate in the Practical Course 1,250 numbers must be obtained.

A certificate of competency to examine guns, to authorise minor repairs, and to pass provisional sentence on naval ordnance at sea, is required before an officer is qualified for a Gunnery Lieutenant.

6. Gunnery Lieutenants will be divided into three classes, according to their certificates, as follows:—

I.

1st class certificates in Theoretical and Practical.

II.

2nd class certificate in Theoretical and 1st class in the Practical Course, or *vice versa*.

III.

2nd class certificates in Theoretical and Practical Courses.

7. The scale of additional pay to be granted to Gunnery Lieutenants who have qualified under these regulations whilst performing gunnery duties will be as follows:—

	s.	d.
Gunnery Lieutenants, 1st class -	3	6 a day.
„ „ 2nd class -	2	6 „
„ „ 3rd class -	1	6 „

After officers have duly qualified, they are, if medically fit, to go through a 14 days' course of diving, if not medically fit, a two days' course in the use of dress and pump.

A Lieutenant, *appointed to a ship for gunnery duties*, on attaining the position of Senior Lieutenant of the same ship, provided he combines both duties, and until another Lieutenant is appointed for and commences gunnery duties, will be entitled to gunnery allowance according to his class in gunnery, in addition to his allowance as Senior Lieutenant.

A Gunnery Lieutenant, *not specially appointed for gunnery duties to ship in which he is serving*, will, on attaining the position of Senior Lieutenant of the same ship, provided, 1st, that he performs gunnery duties in addition to his other duties; 2ndly, that the ship is allowed a Gunnery Lieutenant; and 3rdly, that no other Lieutenant is borne for gunnery duties, be entitled to the gunnery allowance according to his class in gunnery, in addition to his allowance as Senior Lieutenant.

The time occupied by Gunnery Lieutenants in re-qualifying is not to exceed five months in both Gunnery and Torpedo.

1. PROGRAMME OF EXAMINATION OF GUNNERY LIEUTENANTS, &c.

TIME :—TEN DAYS.

Subject.	Time occupied.	Qualifications required.
FIELD EXERCISE. FULL Nos. F. Ex. 150 Batt. 80 } 230 Minimum for 1st Class 185 „ „ 2nd Class 150	1 day $\frac{1}{2}$ day	To perform accurately the Manual and Firing Exercises, Squad and Company drills, and to drill with full detail. BATTALION.—To drill a battalion with full detail, and to be able to answer questions on Landing Parties, Advanced and Rear Guards, Outposts and Piquet duties, Shelter Trenches, and Route Marching.

Subject.	Time occupied.	Qualifications required.
HEAVY AND LIGHT GUN DRILL. — FULL Nos. - 280 Minimum for 1st Class 225 „ „ 2nd Class 170	1 day To be divided between the various guns.	To perform accurately the duties of any number at the gun, and to be able to instruct and drill with full detail. Preliminary drill and Practice. To answer questions on any subject connected with the instruction, parts of the guns, carriage, and slide; dismounting the gear; adjusting and working compressors; fittings and workings of all guns on the broadside or in gun vessels turn-tables, &c. Weight of guns, projectiles, and charges, as given in Gunnery Drill Book.
AMMUNITION. — FULL Nos. - 200 Minimum for 1st Class 160 „ „ 2nd Class 120	1 day	Description and use of the different fuzes. Supply and stowage of projectiles, filling and marking, and the proportion allowed. Names and use of the different powders in the Service cartridges; material, marking, filling, and hooping, and proportion allowed; construction, stowage, and working of magazines and shell-rooms; supply of stores to boats. Working boat's guns and description of compressor. War rockets and rocket cutter. Tables and fuze implements. Questions on gunpowder and other explosives; and to be able to give a good general description of the manufacture and classification of gunpowder. Questions on small-arm ammunition, life-saving apparatus, &c., and a general knowledge of the compositions used.
RIFLE PRACTICE. — FULL Nos. - 90 Minimum for 1st Class 75 „ „ 2nd Class 60	$\frac{1}{2}$ day	PRELIMINARY DRILL.—Lessons in Cleaning arms and Position drill, to be learned by heart. To be able to instruct a class of men in the Theoretical Principles, with a thorough knowledge of the Aiming and Judging Distance Drills, and Blank Firing. PRACTICE.—How conducted at different distances. Size of targets and butts. Precautions, orders, ranges, &c. Annual course on board sea-going ships. To be able to dismount and re-mount a service rifle and name all the parts, and answer any questions thereon.

Subject.	Time occupied.	Qualifications required.
CUTLASS AND PISTOL.	$\frac{1}{2}$ day	To put a squad through with full detail, and to perform the exercises correctly.
FULL Nos. - 50		
Minimum for 1st Class 40		
,, ,, 2nd Class 30		
TURRET.	1 day	To take any number and to drill with full detail. A thorough knowledge of the most modern fittings in turret ships and mode of working turrets and guns. Method of sighting, &c.
FULL Nos. - 120		
Minimum for 1st Class 95		
,, ,, 2nd Class 70		
FIELD GUNS AND FIELD BATTERY.	$\frac{1}{2}$ day	To take any number at the gun, and be able to drill one gun, and a Battery with full detail. Questions on weights and stowage of limbers, fittings of gun, &c. Arms carried and space occupied by Battery. Usual position in action.
FULL Nos. - 90		
Minimum for 1st Class 72		
,, ,, 2nd Class 54		
MACHINE GUNS.	$\frac{1}{2}$ day	The fittings, mechanism, and working of Machine Guns. Full detail for Machine Gun Drill.
FULL Nos. - 100		
Minimum for 1st Class 80		
,, ,, 2nd Class 60		
DRILLING.	2 hrs.	To drill a Battery of Guns, and to give any detail required.
FULL Nos. - 100		
Minimum for 1st Class 85		
,, ,, 2nd Class 70		
USE OF DIRECTOR.	$1\frac{1}{2}$ hrs.	Manipulation of Director correctly and quickly.
FULL Nos. - 40		
Minimum for 1st Class 36		
,, ,, 2nd Class 32		
THEORETICAL.	2 days	Two papers on the Principles of Gunnery; 1st Theoretical Gunnery - 100 2nd Hydraulic Gunnery - 100 Combined - 200
FULL Nos. - 200		
Minimum for 1st Class 160		
,, ,, 2nd Class 120		
LECTURE.	1 hr. each	To lecture on a subject of which one month's previous notice has been given.
FULL Nos. - 150		
Minimum for 1st Class 120		
,, ,, 2nd Class 90		

2. SHORT COURSE LIEUTENANTS.

TIME :—FOUR DAYS.

The Examination is to be conducted at the end of each Instruction by a Staff-Officer.

FULL Nos.	-	600
1st Class	-	540
2nd Class	-	480
3rd Class	-	420

Subject.	Time occupied.	Qualifications required.
HEAVY AND LIGHT GUN DRILL. FULL Nos. - 100 Minimum for 1st Class 90 „ „ 2nd Class 80 „ „ 3rd Class 70	1 day	To take any number at a gun and drill with detail (excepting those sections that refer to fittings not on board the ship). To have a good knowledge of the principal parts of guns, carriages, and slides, working of compressors, dismounting the gear, &c. A thorough knowledge of the marking and use of sights and scales. Weights of guns, projectiles, charges, as given in Gunnery Drill Book.
FIELD EXERCISE. FULL Nos. - 130 Battalion. Rifle, Squad and Company. 30 FULL Nos. - 100 27 1st Class 90 24 2nd Class 80 21 3rd Class 70	1 day	Manual and Firing Exercise thoroughly, but without detail; to be able to drill in them, and correct mistakes. Squad and Company Drill with detail; a good knowledge of the principal Battalion manœuvres.
AMMUNITION. FULL Nos. - 100 Minimum for 1st Class 90 „ „ 2nd Class 80 „ „ 3rd Class 70	$\frac{1}{2}$ day	Same as the Gunnery Lieutenants, omitting details of manufacture. A general knowledge of the construction, with a full description of the uses of the different stores, &c.
CUTLASS AND PISTOL. FULL Nos. - 30 Minimum for 1st Class 27 „ „ 2nd Class 24 „ „ 3rd Class 21	$\frac{1}{2}$ day	To put a squad through, correcting all errors.

Subject.	Time occupied.	Qualifications required.
TURRET. FULL Nos. - 70 Hydraulics - - 50 Drill - - - 20 Minimum for 1st Class 63 „ „ 2nd Class 56 „ „ 3rd Class 49	$\frac{1}{2}$ day	To give full detail in hydraulic loading, with a good general knowledge of the fittings and working of turrets.
MACHINE GUN. FULL Nos. 50 1st Class - - - 45 2nd Class - - - 40 3rd Class - - - 35	$\frac{1}{2}$ day	Field Gun and Battery.—To drill in practice with detail, and correct errors.
FIELD GUNS AND FIELD BATTERY. FULL Nos. - 30 Minimum for 1st Class 27 „ „ 2nd Class 24 „ „ 3rd Class 21	$\frac{1}{2}$ day	Machine Guns.—To understand mechanism, to drill with full detail.
DRILLING QUARTERS. FULL Nos. . 50 Minimum for 1st Class 45 „ „ 2nd Class 40 „ „ 3rd Class 35	1 hour	To drill a Battery of Guns and give any detail required.
DIRECTOR. FULL Nos. - 40 1st Class - - - 36 2nd Class - - - 32 3rd Class - - - 28	1 hour	Manipulation of Director correctly and quickly.

3. SUB-LIEUTENANTS.

TIME:—FIVE DAYS.

Subject.	Time occupied.	Qualifications required.
HEAVY AND LIGHT GUN DRILL.	1 day	To take any number at a gun, and to drill in Practice with detail.
FULL Nos. - 130		All questions connected with the Instructions, parts of the gun, carriage, and slide, dismounting the gear, adjusting and mounting compressor, &c.
Minimum for 1st Class 115		Weights of guns, projectiles and charges, as given in Gunnery Drill Book.
" 2nd Class 100		
" 3rd Class 85		
FIELD EXERCISE.	1 day	Same as Short Course without Battalion.
FULL Nos. - 100		
Minimum for 1st Class 90		
" 2nd Class 80		
" 3rd Class 70		
AMMUNITION.	½ day	Description and use of the different fuzes, supply and stowage of projectiles; filling, working, and proportion allowed.
FULL Nos. - 100		Names, general manufacture, and use of the different powders in the Service; description and stowage of cartridges, boats stores, and working boats guns, &c. &c.
Minimum for 1st Class 90		
" 2nd Class 80		
" 3rd Class 70		
THEORETICAL PAPER.	1 day	A paper on the subject matter of the instruction.
FULL Nos. - 70		
FIELD AND MACHINE GUN AND BATTERY.	½ day	Same as for Short Course Lieutenant.
Field Gun - 30		
Machine Gun - 40		
FULL Nos. - 70		
Minimum for 1st Class 60		
" 2nd Class 50		
" 3rd Class 45		
TURRET.	½ day	As for Short Course Lieutenants.
Turret - 20		
Paper on hydraulics 50		
FULL Nos. - 70		
Minimum for 1st Class 60		
" 2nd Class 50		
" 3rd Class 45		

Subject.	Time occupied.	Qualifications required.
CUTLASS AND PISTOL.	$\frac{1}{2}$ day	To perform the exercise, and put a squad through without detail, but correcting all errors.
FULL Nos. - 30		
Minimum for 1st Class 25		
" 2nd Class 20		
" 3rd Class 15		
DIRECTOR.		Manipulation of Director correctly and quickly.
FULL Nos. - 30		

NOTE.—Full Nos.	-	-	-	-	600
Aggregate Nos. required to gain a 1st Class	-	-	-	-	530
" " " 2nd Class	-	-	-	-	460
" " " 3rd Class	-	-	-	-	400

4. OFFICERS R.M.A. AND R.M.L.I. QUALIFYING FOR INSTRUCTORS.

As for Gunnery Lieutenants in the subjects in which they are instructed.

5. SUBALTERNS, R.M.A.

As for Short Course Lieutenants in the subjects in which they are instructed with addition of theoretical paper as for Gunnery Lieutenants.

TIME :—THREE DAYS.

6. ENGINEER OFFICERS, R.N.

No Examination.

7. OFFICERS ON HALF PAY.

No examination.

8. GUNNERS AND G.I.'s ABSENT OVER THREE YEARS.

No examination for Gunners.

Gunnery Instructors to be examined as when qualifying.

9. MEN QUALIFYING FOR GUNNERS.

As for men qualifying for Instructors, fuller knowledge being required in all subjects on those points which especially refer to Gunner's duties. They will also be examined in:—

Subject.	Time occupied.	Qualifications required.
THEORETICAL. —	1 day	To have a fair knowledge of the construction and manufacture of Ordnance, and of the various subjects dealt with in Chapters I., XX., XXII. of the Gunnery Manual. To be thoroughly acquainted with the practical details connected with converging, marking racers, and the use of the Director. To have a good knowledge of Hydraulic Machinery in Turret Ships.
USE OF SEXTANT. —		To be able to take angles and ascertain distances.

10. COASTGUARD OFFICERS.

- A. As for Sub-Lieutenants.
- B. } As for Short Course Lieutenants.
- E. }
- H. { As for Subaltern, R.M.A.
- { General questions.

11. G.I.'s ABSENT UNDER THREE YEARS.

One day's examination by a Staff-Lieutenant.

12. MEN QUALIFYING FOR INSTRUCTORS.

TIME:—FIVE DAYS.

Qualifications will be awarded as V.G.I., V.G., G., F., or Ind. with Nos. as for Volunteers.

Subject.	Time occupied.	Qualifications required.
HEAVY AND LIGHT GUN DRILL. —	1 day	A thorough knowledge of the drill book and to be a smart gun number. To be able to give a full detail for the whole of the preliminary drill and practice as taught on board the ship. To have a thorough knowledge of the parts of guns, carriages, and slides, sights, scales, &c., and able to explain them clearly to a gun's crew. Manner of instructing, and power of keeping a class together, to be considered in awarding the qualifications.
FIELD EXERCISE. —	1 day	Manual and firing exercises, squad and company drill with full detail. Thorough knowledge of the battalion manœuvres in the Field Exercise Book.
AMMUNITION. —	$\frac{1}{2}$ day	As for Gunnery Lieutenants omitting the manufacture of powder, and the ingredients of compositions, other than powder, fuze, rocket, and light.
RIFLE PRACTICE. —	$\frac{1}{2}$ day	As for Gunnery Lieutenant omitting the lectures on the theoretical principles.
CUTLASS AND PISTOL. —	1½ hrs.	As for Gunnery Lieutenants.
TURRET. —	$\frac{1}{2}$ day	As for Gunnery Lieutenants.
FIELD AND MACHINE GUN AND FIELD BATTERY. —	$\frac{3}{4}$ day	As for Gunnery Lieutenants.
DIRECTOR.	1 hour	Manipulation correctly.

13. GUNNERY INSTRUCTORS QUALIFYING FOR CAPTAIN OF TURRET.

Subject.	Time occupied.	Qualifications required.
TURRET FITTINGS —	2 hrs.	To have a thorough knowledge of the use and method of action of all the hydraulic machinery and other fittings connected with the guns and turrets, and to understand how to look after the gear and keep it in order.

14. S.G.T's 1st. CLASS QUALIFYING FOR CAPTAIN OF GUN.

Subject.	Time occupied.	Qualifications required.
HEAVY AND LIGHT M.L. AND B.L. GUN DRILL. —	2 days	A thorough knowledge of the drill book and to be a smart gun number. To be able to give a full detail for the whole of the preliminary drill and practice as taught on board the ship. To have a thorough knowledge of the parts of guns, carriages and slides, sights, scales, &c., and to be able to explain them clearly to a gun's crew. Manner of instructing and power of keeping a class together to be considered in awarding the qualifications.

15. S.G.T's. ABSENT UNDER ONE YEAR.

No examination.

16. S.G.T's ABSENT ONE AND UNDER THREE YEARS.

No examination.

NOTE.—All Seaman Gunners old system absent one year must be examined in order that they may qualify as S.G.T.

17. S.G.T's ABSENT THREE YEARS AND UPWARDS.

To be examined as Volunteers in passing through the instructions and at the final examination by a Staff Lieutenant.

18. VOLUNTEERS.

Subject.	Time occupied.	Qualifications required
FIELD EXERCISE. —	1½ hrs.	1. To know and be able to teach the names of the different parts of the rifle. 2. To be able to give practical instruction in Rifle Exercise I. by numbers or in quick time, without minute detail, and to be able to perform the same in a highly efficient manner. 3. To be able to perform his duties in the ranks of a squad in a highly efficient manner, and to be able to impart practical instruction in all squad drill, especially Section 7-9-15-24-26-29-30-31-32-33-35, and all squad skirmishing. 4. To be able to perform his duties in the ranks of a company in a highly efficient manner, and to know, and be able to perform accurately the duties of a marker.
HEAVY AND LIGHT GUN. —	1¾ hrs.	1. To know and be able to teach the names of the principal parts of gun, carriages, and slides, and the information contained in Table in Gunnery Drill Book. 2. To be able to give practical instruction in preliminary drill and the firings in practice for M.L. and B.L. broadside guns, but without full detail, and to be able to perform the duties of any number efficiently.
AMMUNITION. —	¾ hr.	To know by sight and be able to fit readily any fuze in use, and give a general description of their action. Fit and prepare any projectile for firing at a named object. Know how to distinguish and fire war and signal rockets, signal lights, port-fires, &c., and where to find them in sea-going ships; working a boat's gun; and a good knowledge of the stores supplied for arming boats. Able to open cases.
CUTLASS AND PISTOL. —	¾ hr.	To be able to put a party of men through the drill without detail, but correcting errors, and to be able to take his place in the ranks. To prove himself a decent shot with a pistol.
TURRET. —	1 hr.	To be able to answer questions as to the duties of any number in turret gun drill, and perform the same efficiently.
FIELD AND MACHINE GUNS. —	1 hr.	To understand the mechanism and to take any number at the gun and perform the duties smartly.

FINAL CLASSIFICATION OF VOLUNTEERS.

The subjects in which Volunteers are examined and receive qualifications are as follows:—

Field Exercise; Gun Drill; Ammunition; Field and Machine Gun; Cutlass and Pistol; Turret.

These are divided into two classes:—

Class A., comprising the first four subjects.

Class B., comprising the remaining two.

Men are to be examined twice in Class A., viz.:

First, by the Gunners of the Instruction to ascertain their fitness for continuing their course on passing through the instruction; when qualifications will be awarded with numbers.

Second, at the final examination by Staff Lieutenant, when the qualifications in each subject are to be awarded by numbers as follows:—

<i>Numbers lost.</i>			<i>Qualification.</i>
0 to 5	-	-	V.G.I.
6 „ 10	-	-	V.G.
11 „ 15	-	-	G.
16 „ 25	-	-	F.
Over 25	-	-	Ind.

Men are to be examined only once in the subjects comprised in Class B., viz., when passing out of instructions, and their qualifications are to be awarded as above.

To obtain a first-class certificate in gunnery not more than 60 numbers must be lost in all the subjects of examination, and the proper standard of firing must be obtained. (*See p. 10.*)

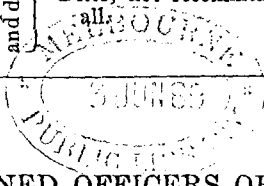
Men who lose over 75 numbers or who get indifferent in any one subject will be considered unfit for S.G.T. and will be discharged to general service.

Gunners of Instruction are to be careful to discover and bring to the notice of the Senior Lieutenant men who are unlikely to pass for S.G.T. at their final examination. In a case of this description the qualification Indiff. should be awarded.

DRILLING.

Subject.	Qualifications required.
To OBTAIN V.G.I. — To OBTAIN V.G. — To OBTAIN G. — To OBTAIN F. —	Smart drills likely to make Gunnery Instructors. Good knowledge of detail laid down and quick at correcting mistakes. Ditto, in a lesser degree. Ditto, not recommended for Gunnery Instructor. Ditto, not recommended for drilling at all.

Captains of guns, and men desirous of qualifying as G.I.'s are to fall out and drill in their final Examination.



20. NON-COMMISSIONED OFFICERS OF MARINES QUALIFYING FOR INSTRUCTOR.

As for Gunnery Instructors in the subjects of instruction omitting Director.