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Reference

Report on
STAFF OFFICERS'
COURSES

held at

Combined Training Centre,
Largs.

30th July, 1943 — 18th March, 1944

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BRITISH JOINT STAFF MISSION
OFFICES OF THE COMBINED CHIEFS OF STAFF
WASHINGTON

Ref: B/11/7.

11th April, 1944.

Major-General Karl Truesdell,
Commanding General,
Command & General Staff School,
Fort Leavenworth,
KANSAS.

Dear General Truesdell,

Herewith a Report on the Staff Officers' Course held
at the Combined Training Centre, Largs. This has just been received
from London and I feel it may be of some interest to you and your
Instructors.

With kindest regards to yourself and Mrs. Truesdell,

Yours sincerely,

G. Sysonby

G. SYSONBY, Lt.Colonel, G.S.

*Aut
24 Apr 44*

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M/S
Pashley
27 Apr

REPORT ON STAFF OFFICERS'
COURSES HELD AT COMBINED
TRAINING CENTRE, LARGS
30 JUL 43 - 18 MAR 44

EXCLUDED FROM AUTOMATIC DOWNGRADING
AND DECLASSIFICATION SCHEDULE

Combined Training Centre, Largs.
March, 1944.

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PREFACE

The origin of these courses was a request put forward in the Spring of 1943 to the Chief of Combined Operations by the late Air Vice Marshal A.M. Orlebar, CBE., AFC., Air Officer Combined Operations, for a series of courses on Combined Operations for Royal Air Force officers; these were to be run on similar lines to courses run previously under the direction of the Major-General Combined Training for certain Army Division and Brigade Headquarter Staffs.

The latter courses had been based on the carrying out of planning exercises by the Headquarters concerned, but owing to the high level on which air force operations are planned and directed, a course on these lines was thought to be impracticable.

The alternative of running courses consisting of lectures, demonstrations, discussions and visits to other centres appeared to be the only solution; the matter was discussed at a conference (Operation "Rattle") which was held at Largs by the Chief of Combined Operations in June 1943 for the senior allied commanders of all Services, who were then interested in the planning of operations for the re-entry into North West Europe.

At this conference it was agreed that the present series of courses should be started as early as possible and that vacancies should be made available for officers of all three Services and allied forces.

Attached herewith is a report prepared at the conclusion of this series of courses, giving an indication of the methods employed and the main lessons learnt.

In all, fourteen short courses and five long courses have been held and the officers attending numbered:-

Royal Navy and Royal Marines	153
British Army	379
Canadian Army	122
R.A.F.	351
Allied	153
Total	<u>1158</u>

J. K. King
Colonel,
Commandant.

Combined Training Centre,
Largs, Ayrshire.
March, 1944.

REPORT ON STAFF OFFICERS' COURSES HELD AT
COMBINED TRAINING CENTRE, LARGS, 30 JUL 1943 - 18 MAR 1944.

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- 'Q' Instructions issued to officers arriving.
- 'R' Orders for Batmen.

~~Included in packet at back of report.~~ *Not included. Now included at back.*

NOTE: Appendix 'J' is only included with certain copies of this report.
Full details of distribution are shown overleaf.

DISTRIBUTION:-

	Copy Nos.
Chief of Combined Operations (G(Trg))	1-5
Commandant, Combined Training Centre, Dundonald	6
* RACOB(WA)	7
Major-General Combined Training	8
Chief Instructor, Combined Training Centre, Largs	9
Naval Staff Officer " " " "	10
Air Staff Officer " " " "	11
* GSO 2(1) " " " "	12
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* Less Appendix 'J'

REPORT ON STAFF OFFICERS' COURSES HELD AT

COMBINED TRAINING CENTRE, LARGS, 30 JUL 1943 - 18 MAR 1944.

1. Object of the Course.

The object of the course was to introduce to British Naval, Army and Air Force officers, together with U.S. and other Allied officers, the general problem of combined operations, with particular reference to the technique of a sea-borne assault upon the coast of N.W. Europe. It is considered essential that the object of the course must be kept clearly in mind throughout and the whole of the course must be integrated in order to build up throughout the week the general picture of a combined operation. The Short Course, of six days' duration, at Combined Training Centre, Largs, was designed for officers of the rank of Commander (RN), Lt.Colonel (Army), Wing Commander (RAF) and above. The Long Course, of fourteen days' duration, was designed for officers of the rank of Lt. Commander (RN), Major (Army), and Squadron Leader (RAF) (and equivalent ranks of allied forces). Each course catered for approximately 60 officers.

2. General Organization of the Course.

Instruction was carried out by means of the following :-

- (a) Lectures.
- (b) Model demonstrations.
- (c) Discussions by the students.
- (d) Films.
- (e) Visits to Combined Training Centres or Naval bases to view actual craft or combined training.
- (f) Visits to HM ships, when practicable.
- (g) Demonstrations by Directing Staff.

3. Directing Staff.

The Directing Staff of Combined Training Centre, Largs, consisted of the following officers who carried out the duties tabulated below :-

	Designation of Officer	Rank	Duties
(a)	Chief Instructor	Colonel (Army)	(a) Commands the whole of the Combined Training Centre and is responsible for the co-ordination of the whole course. (b) General Policy. (c) Gives a certain number of lectures of a <u>general</u> nature and will often sum up briefly at the end of a number of lectures involving a particular aspect of the combined operation

..../(b)

	Designation of Officer	Rank	Duties
(b)	Naval Staff Officer	Commander (R.N.)	<p>(a) Gives all lectures on Naval aspects of combined operations, including support.</p> <p>(b) Responsible for "fathering" all naval officers attending the course.</p> <p>(c) Liaison with local naval authorities with a view to arranging outside naval lectures, craft demonstrations, etc.</p> <p>(d) Available for advice to other members of Directing Staff on naval problems.</p> <p>(e) Arranging for instruction of certain local officers, such as SNOT's, masters of LSI's, etc. (Such officers often attended individual lectures on the course as "visitors")</p>
(c)	Air Staff Officer 1.	Wing Commander (R.A.F.)	<p>(a) Gives certain lectures on Air aspect of Combined Operations.</p> <p>(b) Responsible for "fathering" all RAF officers attending the course.</p> <p>(c) Liaison with local RAF authorities with a view to arranging outside RAF lectures, RAF films, etc.</p> <p>(d) Available for advice to other members of Directing Staff on Air problems.</p>
(a)	GSO 2(1)	Major (Army)	<p>(a) Responsible for the detailed organization of the course under the direction of the Chief Instructor. This includes allocation of officers to syndicates (see para 10 below), supervision of the production of précis, preparation of programmes, visits to Combined Training Centres, etc.</p> <p>(b) Gives a certain number of lectures relative to the assault.</p> <p>(c) In view of his responsibilities under (a), GSO 2(1) should be given control, to a large extent, of GSO 3 - GSO 3(Adm) - Clerks.</p> <p>(d) Progress Reports.</p> <p>(e) Combined Training Centre correspondence of 'G' nature.</p>

	Designation of Officer	Rank	Duties
(e)	GSO 2 (2)	Major R.A. (Army)	<ul style="list-style-type: none"> (a) This officer must be a gunner and should give all lectures on the Army gunnery aspect of the combined operation. (b) Acts as adviser to other members of Directing Staff on gunnery problems. (c) Responsible for supervising the layout of all models.
(f)	DAQMG	Major (Army)	<ul style="list-style-type: none"> (a) Gives all lectures regarding maintenance and movement, dealing with all three Services in this respect. (b) Acts as adviser to other members of Directing Staff on 'Q' problems. (c) Setting and correcting of exercises on Long Course.
(g)	Air Staff Officer 2.	Squadron Leader (R.A.F.)	<ul style="list-style-type: none"> (a) Acts as assistant to ASO 1. (b) Gives a certain number of lectures on the Air problem.
(h)	GSO 3	Captain (Army)	<ul style="list-style-type: none"> (a) Supervision of clerks, draughtsman and office routine, (under GSO 2(1)). (b) Security; custody of all Most Secret documents, confidential books, etc. held by Combined Training Centre, Large. (c) Issue of precis, pamphlets, etc. to students. (d) Circulation of correspondence among Staff. (e) Cinema and films; epidiascope and slides. (f) Custody and laying out of models in Lecture Room; wall diagrams. (g) Care and maintenance of craft models in Lecture Room. (h) Preparation of Lecture Room and Syndicate Rooms; ventilation and heating. (i) Acts as model demonstrator during 'G' lectures. (j) Detailed arrangements for visits to Combined Training Centres. (k) War Diary.

	Designation of Officer	Rank	Duties
(i)	GSO 3(Adm) = Staff Capt	Captain (Army)	<ul style="list-style-type: none"> (a) Acts as assistant to DAQMG. (b) Arrival and departure of students. (c) Allotment of accommodation and batmen. (d) M.T. Officer. (e) Part I, II and III Orders. (f) Rail warrants and reservations. (g) Ration cards. (h) General administration. (i) Acts as model demonstrator during 'Q' lectures.
(j)	Conference Secretary	3rd Officer (WRNS) or 2nd Subaltern (ATS) or Section Officer (WAAF)	<ul style="list-style-type: none"> (a) Confidential Secretary. (b) Personal assistant to Chief Instructor. (c) Shorthand record of lectures (as required), questions and general discussion.

4. Organization of Clerks, Draughtsman, etc.

The establishment of clerks, draughtsman, transport, etc. of the Combined Training Centre was as follows :-

	Service	Rank	Duties
(a)	R.N.	One Writer (WRNS)	<ul style="list-style-type: none"> (a) Shorthand typist to NSO. (b) When not required by NSO, available for typing pool.
(b)	Army.	One Sergeant Clerk (RASC)	<ul style="list-style-type: none"> (a) Co-ordination and supervision of all the work of the clerks and draughtsman of all three Services. (b) Works normally directly under orders of GSO 2(1). (c) Responsible for registration, filing and circulation of all correspondence (other than "Most Secret" and "Confidential"). (d) Administrative clerical work, e.g. Pay, Strength Returns, etc.

	Service	Rank	Duties
(c)	Army	One Corporal or L/Cpl Clerk (RASC)	(a) Acts as Second-in-Command to Sgt. Clerk. (b) Full-time typist.
(d)	Army	Two Privates, Clerks (RASC)	Both typists; one being a shorthand- typist, the other being responsible for despatch.
(e)	Army	One Draughtsman (R.E.)	Responsible for production of all large scale diagrams, notices, etc., together with any duplicated diagrams for inclusion in precia. (It was found that a great deal of work was required of the draughtsman during these courses).
(f)	Army	One batman- driver	(a) Batman to Chief Instructor. (b) Driver of car used for general purposes. <u>NOTE:</u> Other officers of the Combined Training Centre were not provided with batmen because facilities in this respect could be provided by HMS "WARREN". Where such facilities are not available, further batmen would be required.
(g)	Army	One Corporal cinema operator (RACG)	(a) Responsible for operating cinema projector and epidiascope. (b) Layout, under orders of GSO 3, of diagrams, models, etc. in Lecture Room and Syndicate Rooms. <u>NOTE:</u> This corporal was assisted throughout the course by two WRNS cinema operators by arrangement of HMS "WARREN", as during these courses twin projectors were used.
(h)	R.A.F.	Two Corporal Clerks	(a) Shorthand-typists for ASO 1 and ASO 2, and Conference Secretary. (b) When not required by above, available for typing pool.
(i)	R.A.F.	One Driver One Batman	For ASO 1. Batman also looks after other RAF officers attending course.

The following transport was used by Combined Training Centre, Largs :-

One Army car (4 or 6 seater) for general purposes.
One R.A.F. car.
One Motor Cycle.
Four bicycles.

5. Layout of Combined Training Centre, Largs.

This Combined Training Centre was fortunate in being accommodated at HMS "WARREN", Hollywood Hotel, Largs, the Headquarters of Rear Admiral Combined Operations Bases (Western Approaches), where excellent facilities were available for the accommodation of students. In addition to sleeping quarters allotted to D.S. and students, the Combined Training Centre was given the following accommodation at HMS "WARREN" :-

- (a) Lecture Room.
- (b) Two large rooms allotted to four syndicates.
- (c) One medium sized room providing office accommodation for Chief Instructor, NSO and ASO 1. (Conference Secretary was accommodated in the office of the Secretary to Captain, HMS "WARREN").
- (d) One large room providing office accommodation for GSO 2(1), GSO 2(2), DAQMG, ASO 2, GSO 3 and GSO 3(Adm). (This room was also used as a discussion room for the fifth syndicate).
- (e) One large room for clerks, draughtsman, etc.

The ward-room, ante-room, etc. of HMS "WARREN" were used by the D.S. and students of the course. It should be realized that the exceptional facilities available in HMS "WARREN" are not likely to be provided for a Combined Training Centre established elsewhere. A very large number of additional personnel would, of course, be required to provide messing, accommodation, etc. for a similar Combined Training Centre established as a self contained unit.

Detailed descriptions of the various rooms used by Combined Training Centre, Largs, are given below.

6. Lecture Room.

The most careful consideration must be given to the layout of the Lecture Room, as it is here that the greater part of the course is held.

The Lecture Room at Combined Training Centre, Largs was 64 ft long and 45 ft broad. The centre of the floor was left clear for the layout of models, and seats allotted to students were placed on three tiers located on each side of the open floor space. There were thus six lines of chairs stretching from front to rear of the room. Five of these lines were allotted to the syndicates, the sixth being devoted to Syndicate Leaders, Directing Staff and Visitors. Chairs for Chief Instructor, NSO, ASO 1 and Conference Secretary were located at the back of the room, with a clear view of all parts of the room. Lecturers spoke from the dais at the far end of the room. A desk for lecturers was located on the right of the dais.

Students were allotted specific seats which they retained throughout the course. Seats were numbered, students sitting on chairs marked with their particular course number. (Note:- Each student was given the same number for all purposes throughout the course, viz Syndicate Room chairs, napkin in dining room, copy number of precis, etc.). Chairs for D.S., visitors, etc., were marked accordingly. Entrance to the room was through a pair of swing doors. In order to ensure privacy and to assist in preserving security, a permanent screen was erected to cover the entrance and students therefore entered the main body of the Lecture Room from either side of the screen. The chairs allotted to Chief Instructor, NSO, ASO 1 and Conference Secretary were located immediately in front of this screen, into which a small window was inserted in order that CI or representative might ensure that no unauthorized person could enter the room unnoticed during lectures.

A diagrammatic layout of the Lecture Room is shown at Appendix 'A'.

.../In addition

In addition to the above description and the detail given in Appendix 'A', the following points relative to the Lecture room should be noted :-

- (a) Lighting must be good.
- (b) There must be complete arrangements for rapid blackout, in order that no time may be lost in showing a film or using the epidiascope to illustrate a lecture.
- (c) A clock was located at the end of the room. All timings of lectures, etc. were taken from this clock as it was not possible to synchronise clocks in HMS "WARREN".
- (d) A buzzer was installed in the ante-room, operated by a press-button installed in the Lecture Room. Each D.S. lecturer was responsible for pressing the button three minutes before a lecture was due to start in order to warn students in the ante-room. This assisted considerably in maintaining punctuality.
- (e) A number of "pointers" are required for use by lecturers.
- (f) A very large notice was placed above the screen covering the entrance and facing the dais with the inscription "AVOID ABBREVIATIONS". This constituted an exhortation to lecturers, ~~as it was found that~~ in lecturing to such a mixed audience, abbreviations, however common in one Service, were not intelligible to other Services.
- (g) Behind the dais from which the lecturer spoke, the following were displayed permanently (i.e. when not covered by other diagrams superimposed) on a large board (21 ft x 8 ft) running the length of the dais :-
 - (i) List of names and abbreviations of Landing Craft.
 - (ii) Scale of the various models, e.g.
"MODEL 'A': 2 FEET = 1,000 yds".
"CRAFT" = 4 times the scale of the rest of the model".
(Full details of the various models used are given later in this report).
 - (iii) Map of English channel, including South of England and North of France. (Scale 4 miles to an inch).

On the left hand wall of the lecture room was a large diagram showing "Possible Division of Expeditionary Force into Assault, Follow-up and Build-up Roles". The object of the diagram was to keep students in mind of the bigger "picture" of a large scale combined operation.

- (h) The twin cinema projectors were located in a loft above the entrance to the lecture room. The cinema screen was attached to a roller above the dais and arrangements were made for quick lifting and lowering.
- (i) Diagrams were either pinned direct onto the board (referred to in (g) above) for use by the lecturer, or were attached to bars, rolled up and released when required by loosening the string tied in a bow knot.
- (j) A shaded reading lamp was placed on the lecturer's dais, so that he was able to read lecture notes, etc. while a film or epidiascope was being shown. In addition, the following papers were pinned to the desk :-
 - (i) List of students by syndicates.
 - (ii) A card with the words "Have you repeated the last question?" (unless lecturers repeated a question, a large number of the audience was unaware of the point under discussion).
 - (iii)

- (iii) Another card with such statements as:- "There is a glass of water behind you". "Speak up as the acoustics of this room are not particularly good".

This detailed layout of the lecturer's desk proved of value, particularly to visiting officers.

- (k) No smoking was permitted during lectures, and a notice to this effect was therefore prominently displayed at the entrance to the lecture hall, together with a receptacle for cigarette ends. (Note:- Smoking was permitted during question time, discussion and films).
- (l) It is recommended that very careful attention should be given to the heating of the lecture room. If the room is overheated, students will fall asleep; if underheated, students will be too cold to pay real attention to the lecturer. Adjustable heating arrangements and a fan, should, if possible, be provided. During breaks between lectures, students should be requested to vacate the lecture room in order to clear the air, and the ventilation fan should be started to assist.
- (m) It is considered that an NCO should be placed in charge of the lecture room, working normally under the orders of the GSO 3.
- (n) Cupboards should be available in the lecture room in which models, when not in use, should be locked up.
- (o) Notice boards were available in the passage way leading to the lecture room.

7. Syndicate Rooms.

Each Syndicate should, if possible, be allotted a separate room which allows discussion without interference from other Syndicates. Syndicate discussions were held as "round table" conferences, all members of the Syndicate sitting around the table, the Syndicate Leader being in a central position in order to exercise effective control of the discussion. D.S. should sit next to the Syndicate Leader to help as required.

Each Syndicate was allotted a steel cupboard in which secret papers, etc., could be locked. (Although this worked very well, it would be preferable for each student to have his own "lock up"). Two keys for the cupboard were given to the Syndicate Staff Officer (see para 10 (e) below), one of which was normally held by the Syndicate Staff Officer himself, and the other by one other officer elected by the Syndicate Leader. In addition to the précis, pamphlets, etc. issued to each individual officer, the following documents were placed in each syndicate cupboard as a "reference library" for members of the Syndicate; it was not considered necessary to make an individual allotment of these documents:-

- (a) Intelligence summary of layout of German defences in N.W. Europe (6 copies). (This took approximately half an hour to read; students were requested to read the summary on the first day of the course in order to obtain a background to which the problem of the re-entry into the Continent could be related. Care should be taken to ensure that this Intelligence summary is kept up-to-date).
- (b) Details of German obstacles (2 copies).
- (c) Intelligence Data regarding Italy. (As example only).
- (d) ISIS Reports. (As example only).
- (e) Book of Illustrated Landing Craft (1 copy).

- (f) Two sets of M.T.P. No. 2 - Offensive.
No. 3 - Defence.
No. 4 - Withdrawal.

- (g) Various Combined Operations Pamphlets in draft or galleyproof.

The above documents were signed for by the Syndicate Staff Officer who was responsible for controlling issue to other members of the syndicate. Receipt form for these documents is attached as Appendix 'B'. Syndicate rooms also contained, on tables round the walls of the room, scale models of landing ships and craft, tanks, model of typical stretch of enemy coast. The latter model was typical of those used for planning purposes. On the walls were placed photographs and statistics of artillery equipments, R.E. devices, etc. GSO 3 was responsible for keeping these photographs and statistics up to date.

A total of six steel boxes were held centrally for issue to Senior Officers such as Major-Generals for the retention of their secret documents, apart from the syndicate cupboard.

8. Office Accommodation.

Office accommodation for D.S. and Clerks was on normal lines. Each D.S. should be provided, if possible, with a separate telephone and a separate steel cupboard. In view of the large amount of secret information dealt with on the course, it was found necessary for the Chief Instructor to be provided with a "scrambler". The following major items of equipment for the office were required by the clerks :-

- (a) Typewriters.

Two with 12" carriage.
Three with 15" carriage.
One with 18" carriage.

- (b) Duplicators.

Large size stencil duplicator fitted for both brief and foolscap stencils.
Foolscap size, Fordigraph type, for reproduction of diagrams, etc.

In view of the large number of precis produced for the course, it was found that sufficient space must be allotted within the office to lay out the precis so that they are easily available for issue. At Combined Training Centre, Largs, three large boxes (approx $4\frac{1}{2}$ ft square) were used for this purpose. An added advantage was that these boxes could be locked up at night without disturbing the lay-out of the precis.

9. Organization of Programme.

Examples of the programmes used at Combined Training Centre, Largs, are attached at Appendices 'C' and 'D'.

Appendix 'C' - No. 5 Long Course (31 Dec 43 - 13 Jan 44).

Appendix 'D' - No. 14 Short Course (13 - 18 Mar 44).

The success of the course depended to a very large extent on the careful co-ordination of the programme. In drafting the programme the following points should be borne in mind :-

- (a) The whole programme must be co-ordinated by one officer (Chief Instructor) in order to ensure that the course presents one integrated "picture". This picture should be built up in logical sequence throughout the course. The Chief Instructor should also ensure that the material dealt with by each lecturer in no way infringes on the scope of other lectures. This will apply particularly to lecturers provided from sources

outside the Combined Training Centre, who must be fully briefed regarding the scope of the remainder of the course. (Note:- The courses at Combined Training Centre, Largs, while designed to give a general picture of combined operations, were particularly related to the assault by one brigade group on the coast of N.W. Europe).

- (b) When possible, the principle of one motif/one day should be followed, e.g. one day should be devoted to all aspects of the assault proper (Army, Navy and R.A.F.); a second day should be devoted to all aspects of the support of the assault (Naval Bombardment, S.P. Arty firing from L.O.T., Air Bombing, etc.).
- (c) The layout of the programme must be strictly related to the receptivity of the audience. Lectures should rarely exceed one hour's duration, including 10 minutes at end for questions. Frequent breaks of 5 - 10 minutes should be made throughout the day, together with one major break of $\frac{1}{2}$ - 1 hr in morning and afternoon.
- (d) If possible, not more than two or three consecutive days should be devoted to work indoors. A day out-of-doors (e.g. visit to Combined Training Centre to view craft) should then be included, whenever possible.
- (e) A meeting of D.S. was held daily for approximately 15 mins, in order that any immediate points requiring solution might be raised.
- (f) Exclusive of the visit to inspect craft, etc., and times allotted to the showing of instructional films, attendance at which was voluntary, the time available for instruction on Short Courses was 28 hrs 25 mins. Separate statistics are given for the Long Course later in this report.
- (g) The time available was allotted to various subjects as shown below :-
 - (i) General - including introduction and explanation of course. 2 hrs 25 mins
 - (ii) Air - General. 2 hrs 20 mins
 - (iii) Assault (Naval and Army). 4 hrs 20 mins
 - (iv) Support (All Services). 5 hrs 40 mins
 - (v) Beach Organization including A.A. 2 hrs 50 mins
 - (vi) Communications (Naval and Army). 1 hr 20 mins
 - (vii) Discussions (Syndicate and General). 6 hrs 30 mins
 - (viii) Planning. 3 hrs
- (h) The figures in para(g) above are not sub-divided between the three Services. This is done below. The time shown under the heading 'General' includes all lectures which are common to two or more Services.
 - (i) R.N. 4 hrs 45 mins
 - (ii) Army. 7 hrs 55 mins
 - (iii) R.A.F. 3 hrs 5 mins
 - (iv) General. 12 hrs 40 mins
- (j) If possible, arrangements should be made for a senior officer equal or superior in rank to any of the students attending the course, to give an address at the opening and closing of the course.

Detailed comments on the various lectures given at Combined Training Centre, Largs, together with suggestions for lecturers, are given later in this report.

10. Organization into Syndicates.

- (a) Students were organized into five syndicates, each of approximately twelve students. It is recommended that syndicates should be as small as possible, and should, if possible, not exceed twelve in number. GSO 2(1) was responsible for allotting students to syndicates. The principle underlying the allotment was that officers should be divided as evenly as possible between syndicates by each Service, nationality, etc. By this means, each syndicate normally had within it officers with a wide variety of interests and experience.

Syndicate lists were published on the day prior to the commencement of the course and showed the name, rank, regt, appointment, etc., of each individual officer. A wide circulation of this list enabled officers to talk, out of lecture hours, to other officers whose appointments would give them specialized knowledge. An amended list was published after students had arrived and D.S. had checked details.

- (b) If possible, each syndicate should be allotted a separate room. The layout of Combined Training Centre, Largs did not permit this and four of the syndicates were given two large rooms. If this should be necessary, every care should be taken to separate the syndicates as far as possible. Each syndicate should be provided with a cupboard for keeping secret papers under lock and key.
- (c) One D.S. was allotted to "father" each of the five syndicates. His responsibilities vis-a-vis the syndicate were as follows :-

- (i) Supervise the issue to his syndicate of the "most secret" précis, pamphlets, etc. at the commencement of the course.
- (ii) At start of each course, D.S. gave their respective syndicates half an hour's talk on domestic details such as :-

Layout of Combined Training Centre.
General Organization of course.
Need for security and punctuality.
Method of running syndicates.
General administrative arrangements.

This introduction to the course was considered of great value by the students.

- (iii) Act as technical adviser to syndicate during discussion periods.
- (d) Syndicate discussions were normally held at 1800 hrs at the conclusion of the day's work. Discussions were conducted by the Syndicate Leader, who was usually the senior officer of the Syndicate. Normally the Syndicate Leaders were the five senior officers of the course but this was not invariably so, as an attempt was made, whenever possible, to include representatives of all Services among the Syndicate Leaders.
- (e) The most junior officer in each syndicate was appointed Syndicate Staff Officer, his duties being to assist in the distribution of pamphlets, précis, etc., and to hold the keys of the syndicate cupboard.
Recommendation regarding the running of syndicate discussions are given in para 21, below.

- (f) Reports on officers attending the course were made only when specially requested by Combined Operations Headquarters.

11. Equipment used in Lectures, Demonstrations, etc.

Before dealing in detail with individual lectures, points to watch in lecturing, etc., certain information must be given regarding the equipment used in lectures, demonstrations, etc. This equipment consisted of the following :-

- (a) Cloth models.
- (b) Craft models.
- (c) Wall diagrams.

12. Cloth Models.

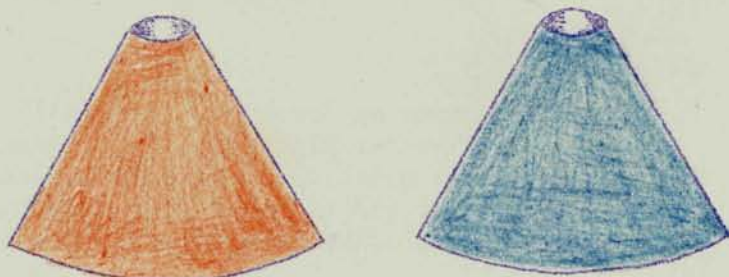
The following cloth models were used on the course:-

- (a) MODEL 'A' - A canvas model (45 ft x 15 ft) showing a typical stretch of coastline and hinterland in N.W. Europe (occupying approximately one third of the model), together with the sea-space off the coastline (occupying approximately two thirds of the model). The model was made (at a cost of approx £30) by Defence Research Studios, Netheravon, Salisbury, Wilts, and the geographical features such as woods, towns, villages, etc., consisted of rubber material sewn on to the canvas. Lecturers and students could therefore walk on the model without harming it. Photographs of typical layout of model 'A' are shown at Appendices 'E' and 'F'. The following points should be noted :-
- (i) A notice with the words "MODEL 'A'" and "KEEP OFF the MODEL" are displayed on the dais.
 - (ii) Scale of model (2 ft = 1,000 yds) is given at the foot of the dais and also on cards placed along the sides of the model.
 - (iii) Scale models of craft referred to were, as far as possible, made available. Details are given in para 17.
When a quick reorganization of craft was required, such craft were mounted previously in position on a board and the board placed direct on to the model.
 - (iv) Model aircraft were suspended from the roof by string, in order to keep students in mind of the air problem.
 - (v) Defended localities, gun positions, etc., were indicated by coloured cards placed on the model, an explanatory legend being displayed on a blackboard on the dais. In addition to the colour, the actual type of locality was inscribed on the card. The following example is shown :-



The use of the colour enabled students at the back of the room to follow work on the model without difficulty.

- (vi) Certain lectures involved demonstrations on the model, during which the rapid movement of units, headquarters, ^{wireless links} etc., had to be indicated. It was found that the most convenient method of doing this was by the use of coloured cones, e.g. red cones as below indicated Bn Headquarters, blue cones indicated Company Headquarters:-



- (vii) These cones could be very quickly placed in a new position by the lecturer or an officer assisting.
- (viii) Wireless communications, system of control, etc., were indicated by the use of coloured tapes pinned to the model with coloured pins. It should be noted that, even with long practice, the laying out of a complicated wireless diagram will take a considerable time to complete; in some cases as much as one hour. Allowance must be made for this in arranging programmes. It will be of help to have connecting tapes sewn together, as far as possible. Miniature beach signs were also used on the model. It is recommended that officers or other ranks should be given specific tasks in laying out the model.

Model 'A' was used to represent a stretch of enemy coastline suitable for the landing of one assault brigade group, which was assumed to be assaulting on two beaches. Model 'A' was used very extensively throughout the course and was employed for illustrating points in lectures, answers to questions, general discussions, etc.

That part of the model which depicted sea-space was sufficient to show the diagrammatic deployment of the one Naval assault group (viz. ships and craft to lift one assault brigade group).

The way in which model 'A' was employed in specific lectures is dealt with in later paragraphs.

- (b) MODEL 'B' - A canvas model (18 ft x 14 ft) showing a similar area of sea, coastline and hinterland to that shown in Model 'A'. Geographical features were, however, not sewn onto the model, but painted on; and hill-slopes, etc. were indicated by inserting packing underneath the model. Model 'B' was used only to a limited extent, and this principally to illustrate the maintenance aspect of the Assault. Details of the way in which the model was used are given later in the comments on the Beach Organization lectures. This model was also made by the Defence Research Studio, Netheravon, Salisbury, Wilts, at a cost of approximately £10.

The following points should be noted :-

- (i) Plain white cards were used for designating Headquarters, units, etc. on the model, e.g.



Cones as described in para 12 (a) (vi) were also used, together with model 25 pr guns (to indicate gun posns) and model balloons constructed of wire. These model guns and balloons were made by the Defence Research Studio, Netheravon, Salisbury, Wilts.

- (ii) As the main use of the model was to show the layout of the maintenance organization on land, the landward portion of the model was located more centrally than in the case of Model 'A' when the emphasis was on the deployment of craft and ships approaching the beaches.
- (iii) Similar arrangements to those detailed in para 12 (a) (i) and (ii) were made in respect of model 'B', the scale of which was 6 ft = 1 mile. The way in which Model 'B' was employed is dealt with in later paragraphs.

13. Wall Diagrams.

Wall diagrams were used extensively during lectures throughout the course and a great deal of the draughtsman's time was devoted to making such diagrams and keeping them up to date. The following points in the production of diagrams should be noted :-

- (a) All diagrams were made on cartridge paper, which was sufficiently strong to avoid the necessity of renewal during the period of the course. Any amendments required were normally dealt with as follows. The part to be amended was cut out of the diagram and the insertion pasted on the back of the diagram so that the insertion was seen as through a "window". This method avoided double thickness and consequent buckling when the diagram was rolled.
- (b) Very careful attention must be paid to the layout of diagrams; diagrams must not be over-crowded and the eye should be able "to take in" the whole diagram without difficulty.
- (c) The size of the lettering is a most important point. All words on the diagram must be easily read by the students at the back of the room. It was found that in a lecture room of the size used in Combined Training Centre, Largs, letters are required to be between $1\frac{1}{2}$ " and 2" high.
- (d) Differentiation by colours must be done judiciously. Since many of the diagrams dealt with organization involving all three Services, the following three colours were used consistently throughout all diagrams:-

DARK BLUE = Navy.
RED = Army.
LIGHT BLUE = RAF.

(e) The following materials were used :-

- (i) Indelible ink (various colours) - For lettering and edgings.
- (ii) Watercolours (with good brushes) - For background.
- (iii) Gum arabic. - For joining paper.

(f) The draughtsman first plotted the diagram on a foolscap sheet, spacing the layout to conform to a 2" lettering. This layout would then determine the size of the actual diagram to be made and, as a result, some diagrams were as large as 16 ft x 12 ft. In view of the very great size of some of the diagrams made, the draughtsman had to prepare them on the floor, and sufficient floor space for this purpose must be provided.

(g) Approximately two or three days were required to complete each diagram. Allowance must be made for this by D.S. when requesting diagrams.

(h) When not in use wall diagrams were rolled up and held centrally in racks specially fitted into the wall of the D.S. room. Each diagram was given a reference number marked on a ticket attached to the tape, which was tied round the diagram when rolled. Each diagram or set of diagrams was given a separate rack and the rack was marked accordingly. Appendix 'G' shows a list of the diagrams used together with other items of equipment used by lecturers.

14. Blackboard Diagrams.

Blackboard diagrams were used when permanent diagrams as described in para 13 were not required. Diagrams on the blackboard were laid out on the same lines as for wall diagrams, and it was found that approximately 4 large blackboards (8 ft x 4 ft) and 3 small blackboards (4 ft x 4 ft) were required to meet all eventualities. Blackboard diagrams were normally completed in approximately 6 hrs. Coloured chalks were used.

15. Film and Epidiascope.

Instructional and recreational films were included in the programme, and considerable use was made of instruction by means of slides and epidiascope. The following equipment was employed :-

- (a) One ROSS type epidiascope (1,000 watt; 240 volt lamp).
- (b) One 16 mm "GEESCOPE" (L.516) type sound projector unit.
- (c) Twin 35 mm G.B. "N" type sound projector unit.
- (d) One roller type rubberised screen.

A list of the Instructional films shown throughout the courses at Combined Training Centre, Largs is given at Appendix 'H'. Certain films (e.g. "Beach Organization") were shown during the day to illustrate lectures. The majority of the films included at Appendix 'H' were, however, shown at night after dinner, attendance being voluntary.

16. Posters.

A limited use was made of official posters in the lecture room and Syndicate rooms, when such posters had a particular application to certain aspects of the course. Care must be taken, however, not to employ such means over-extensively as there must obviously be a limit to the amount of instruction which students can absorb during one week.

17. Model Craft.

The following types, size and number of model craft were used :-

Craft	Size	Number Held
LCA	1.25" x 0.4"	82
LCA(HR)	1.25" x 0.4"	12
LCS	1.5" x 0.5"	20
Navigational Leader	1.5" x 0.4"	6
LCT(A)	4.0" x 0.8"	12
LCT.	5.8" x 1.2"	54
LCG(L) (LCT with white 'G')	5.8" x 1.2"	54
LCT(R) (LCT with white 'R')	5.8" x 1.2"	6
LCT carrying SP Arty (White bar across craft)	5.8" x 1.2"	12
LCI(L)	5.0" x 0.75"	14
LCH(LCI painted red)	5.0" x 0.75"	4
LST(2)	10.0" x 1.5"	8
LSI(S)	12.0" x 1.5"	2
LSI(L) (Used also to represent LSH)	14.5" x 1.7"	2
Destroyer(Used to represent Assault Group H.Q. Ship)	11" x 1"	1
Cruiser	15" x 1.7"	1
Monitor	11" x 2.5"	1
Hospital Ship (LSI(S)) (Painted white with cross)	12" x 1.5"	1

18. Storage of Models, Equipment, etc.

Four cupboards were used for the storage of models, equipment, etc., as follows :-

- No. 1 Cupboard - Model 'A' complete with all signs and markings for Assault lectures, etc. Notices for all lectures except "Beach Organization" lectures.
- No. 2 Cupboard - Model 'B' complete with all signs and markings for "Beach Organization" lectures.
- No. 3 Cupboard - 16 mm projector complete.
- No. 4 Cupboard - All model craft for use on models. Tapes, painted signs and pins for "Communications" lecture. Model Aircraft.

At the back of the lecture room a room was erected in which all films could be re-wound. A re-winding apparatus was available here.

19. Lectures.

The greater portion of the course consisted of instruction by means of lectures. Detailed recommendations in respect of individual lectures are given later. The following general points should be noted :-

- (a) A precis relative to each lecture was published and a copy issued to each student on the day prior to the lecture, in order that he might make a preliminary study of it, if he wished to do so. A complete set of precis issued on No. 14 Short Course (13 - 18 Mar 44) and No. 5 Long Course (31 Dec 43 - 13 Jan 44) is attached as Appendix 'J'. Students were allowed to retain lecture precis at the conclusion of the course. Detailed points regarding the production and layout of precis are given later in the report (see para 20).

- (b) It is not recommended that lecturers should follow their precis strictly in their lecture, but the degree to which this should be done will depend on the personality of the lecturer. Generally speaking, the precis should cover more detail than the lecture, and should be regarded as a "memory freshener" for the student after he has left the course. The object of the lecturer should be to "put over" to the student the main principles of his subject. If these are made clear any student who may have a particular interest in the subject can fill in the required detail himself from the precis, pamphlets, etc.
- (c) Considerable use should be made by lecturers of the model and diagrams. When referring to the model, the lecturer should always come down onto the model and point out the areas, ships, etc. being referred to.
- (d) In a highly concentrated and organized course such as those given at Combined Training Centre, Largs, lecturers must adhere strictly to the timings laid down for their lectures.
- (e) The lecturer must always bear in mind the audience to which he is lecturing, and be careful to avoid taking anything for granted, particularly in dealing with an audience of all three Services and Allied officers.
- (f) 10 minutes should be allowed at the end of each lecture for questions. Questions should be repeated by the lecturer in order that all students may be aware of the point under discussion.

Questions which cannot be answered by the lecturing D.S. should, if necessary, be repeated to the other D.S. listening to the lecture. Only on rare occasions, in the case of very specialized questions, should an answer be requested from individual students with particularly relevant experience or knowledge. The Conference Secretary or a shorthand typist should be available in the lecture room to take down all questions asked, and answers given.

- (g) It was found that when lecturers had been giving the same lecture for weeks on end, the lecture became rather stereotyped, and the lecturer tended to indulge in cliches. Lists of cliches used were therefore circulated and the D.S. thus avoided pitfalls of which they might otherwise have been unaware.

As a "fresh mind" will always see more than a mind which has been continually engaged on the same task, every encouragement should be given to casual visitors to make suggestions regarding ways of improving the course. Suggestions were not, however, invited from students, after the completion of the first two courses. Any voluntary suggestions made by students were, of course, carefully considered.

- (h) It was found that lectures immediately after lunch provided a separate problem, owing to the natural tendency of students to fall asleep. If lunch is at 1300 hrs, it is not advisable to start lectures before 1430 hrs. On many days, however, it was essential to restart at 1400 hrs. Under such circumstances every effort must be made to avoid giving an ordinary "straight" lecture which will almost certainly be a soporific. Extensive use should be made of models, demonstrations, etc. A detailed example will be found in the bombardment "play" which was given during the bombardment lecture, immediately after lunch. Details are given in para 25 (e).

- (i) Normally the Chief Instructor attended all lectures. It was found desirable that in addition to the Chief Instructor, one of the D.S. should be present, in order to assist the lecturer in the event of any unexpected eventuality. GSO 2(1) was responsible for arranging which D.S. should be in attendance.
- (j) Outside lecturers must be carefully briefed and rehearsed in order that their lecture may be in line with the rest of the course.
- (k) The Chief Instructor and attendant D.S. made notes throughout the lecture regarding points to be corrected and improved, etc.
- (l) Some lecturers made use of small cards with notes especially when speaking on the models. Every effort must, however, be made to avoid giving the impression that a lecture is being read out.
- (m) When referring to wall diagrams or models, the lecturer should position himself so that he does not mask the diagram or model from his audience.

Other obvious points to be watched by lecturers are not tabulated here, but the Chief Instructor must always be on the look out for them and correcting them. Detailed suggestions regarding individual lectures are given later in para 25.

20. Production of Precis.

A great deal of the time of the clerical staff was occupied in the production of precis. This was supervised by the GSO 2(1). Precis were written by the D.S. or the outside lecturer concerned, details of production, staff duties, etc. being the responsibility of the GSO 2(1). A standard method of laying out precis was thus obtained. The following points should be noted :-

- (a) At the head of the first page of the precis, reference was made to the Programme Serial No. (see Appendices 'C' and 'D'), in order that students might know which precis they would require for any particular lecture.
- (b) The precis relative to a particular aspect of combined operations, e.g. the Assault, were stapled together, and detailed timings of the various lectures shown on a covering sheet. A list of the abbreviations used was also shown on the covering sheet, together with a reference to the appropriate Combined Operations Pamphlet or Pamphlets.
- (c) The date of typing of precis should always be shown on covering sheet.
- (d) GSO 2(1) should lay down a date by which D.S. are to hand in any amendments to precis. As it was normal at Combined Training Centre, Largs, for two or three short courses to be held consecutively, followed by a week's break, all precis for two or three consecutive courses were run off together, any amendments being made during the week's break in time for the following set of courses.
- (e) A large portion of the draughtsman's time was occupied in producing diagrams and appendices to precis. Normal methods of production were used. A number of these appendices were re-productions of the wall diagrams used in lectures. When this is so, similar colours should be used in both instances. Appendices to precis which were used as wall diagrams are indicated in Appendix 'J' by a red circle with the words "wall diagram" inserted.
- (f) Precis were issued to Syndicate Staff Officers for sub-allotment to individual students on the day prior to the lecture.

21. Method of running Syndicate Discussions.

The general outline of the way in which syndicates were organized has already been given in para 10. The object of holding syndicate discussions was to give individual officers an opportunity of giving vent to their ideas regarding certain major aspects of combined operations, and to encourage officers who were diffident about talking in the conference room to express their views. Such discussions were productive of a good deal of interesting material, especially from officers with operational experience of this war. They also provided an excellent method for officers of different Services to become acquainted, leading to further valuable conversation in the ante-room. Appendix 'K' gives a list of questions discussed by syndicates on No. 14 Short Course. Questions should be of as general a nature as possible, in order that all members of the syndicate may be able to take part in the discussion. The following points regarding the running of syndicates should be noted :-

- (a) Syndicate Leaders had to be chosen off paper lists before the arrival of students. It was not therefore necessarily certain that a suitable officer had been chosen for the job. As a good deal of the success of syndicate discussions depended on the syndicate leader, D.S. should be prepared to "brief" syndicate leaders very fully on their duties, the way in which discussion should be conducted, etc.
- (b) Once the procedure has been explained to the Syndicate and the Syndicate Leader, D.S. should interfere as little as possible, provided the discussion is lively and on the right lines. If, on the other hand, discussion flags, D.S. must be prepared to stimulate it by provocative suggestions, etc.
- (c) Each syndicate was required to provide an official syndicate spokesman to express the syndicate's views at the general discussion. It was often advisable that the Syndicate Leader should appoint the spokesman on a particular question before the subject was discussed, in order that the spokesman might be able to make adequate notes as the discussion proceeded. It was also advisable that the spokesman should start off the syndicate discussion.
- (d) The Syndicate Leader should be encouraged to give all members of the syndicate the opportunity to express their views. It was often especially necessary to invite allied officers by name to express their views, as, in certain cases, they were rather diffident in putting forward their ideas.
- (e) A slip of paper giving the names of all students in the syndicate was pinned to the table in front of the Syndicate Leader, in order to make it easier for him to call on officers by name.
- (f) Discussion should not last longer than one hour, but, in case a discussion ends very quickly, spare questions should be available to fill in the extra time. (See Appendix 'K').

22. Method of running General Discussion.

A general discussion lasting approximately two-and-a-half hours was held in the lecture room at the conclusion of the course. The general discussion was attended by all students and all the D.S. At this discussion, spokesmen nominated by each syndicate expressed their official syndicate views on the various questions discussed at syndicate discussions. After each official spokesman had spoken, the question was thrown open to the whole course, in order that individual officers might express minority views or make additional comments.

The following points of detail should be noted regarding the general discussion :-

.../(a)

- (a) Students' chairs were turned inwards in a wide semi-circle.
- (b) Model 'A' was laid out to show diagrammatically the ships and craft to lift one brigade, and the following notices were pinned up on the board behind the dais :-
 - (i) "High water is at Z + 3 hrs. Lowering position is 7 miles offshore".
 - (ii) Diagram showing the various phases of support.
- (c) D.S. sat next to the screen at the far end of the room from the dais. A special table was provided for the Chief Instructor, who sat there throughout discussion with NSO and ASO 1 on either side. Conference Secretary or representative was present to take down the whole of the discussion.
- (d) The whole of the discussion was controlled by the Chief Instructor. If individual discussion was sticky, appeal was made to, for example, R.A.F. officers, if no R.A.F. officer had previously spoken.
- (e) Speakers should be invited to use the model or blackboard to illustrate points, and should be invited to address the "house" and not the Chief Instructor. It is not recommended that speakers should be allowed to use the lecturer's desk as this tends to turn the discussion into a lecture.
- (f) At the close of discussing each question, D.S. particularly interested in the question may be asked to sum up by the Chief Instructor.
- (g) 5-10 minutes' break should be allowed between each question. During one break, the ships and craft were re-arranged on the model in order to show students how the ships and craft might look in an actual operation, e.g. certain of the craft were shown upside-down to indicate sinkings by enemy action, LCT's were shown keeping anything but perfect station, etc. NSO then gave a brief description of what had happened, explaining the difficulties of navigation, station keeping, etc., and emphasizing that the diagrammatic layout had been used for ease of instruction only, and could not be expected to be obtained in the actual operation.
- (h) It is considered that two-and-a-half hours' discussion was adequate. Normal duration of each question was $\frac{1}{2}$ - $\frac{3}{4}$ hr.
- (i) Smoking was permitted throughout the discussion.

23. Visits to Combined Training Centres, Craft Demonstrations, etc.

Normally one full day in each short course was allotted to a visit to Combined Training Centres, craft demonstrations, etc., in order that students might have some practical idea of the types of craft and weapons used in combined operations. It also provided an invaluable break from the lecture room. The majority of students had reached saturation point after two-and-a-half days' of lectures. Arrangements for these visits depended on the availability of craft, etc. at the various combined operations bases and training centres within range of Largs. Visits were made to the following places :-

Combined Training Centre, Inveraray.
Combined Training Centre, Castle Toward.
Combined Training Centre, Dundonald.
Troon Harbour.
Irvine Harbour.

.../The visits

The visits were normally made in two civilian buses, but, in the case of visits to Combined Training Centre, Castle Toward, an Admiralty tender s.s. "MAGICIAN" (approx 1,000 tons) was loaned from Naval Authorities for the day, and conveyed the course from Largs to Castle Toward. The firing of LCA(HR) and SP guns from LCT was also watched from s.s. "MAGICIAN" at various points in the vicinity of Castle Toward.

GSO 2(1) was responsible for the detailed organization of the outside visits, being assisted by the NSO in matters involving naval liaison. A typical programme for a visit to Combined Training Centre, Castle Toward, is attached at Appendix 'L'. The following points should be noted in arranging outside visits :-

- (a) As any craft-handling demonstration is liable to interruption by bad weather, a complete alternative programme should always be prepared.
- (b) Students should always be kept under organized control either as a course or by syndicates.
- (c) Officers describing craft, etc. should be given such aids as loud hailer or megaphones in order that their voices may reach their audiences without difficulty.

24. Security.

Careful security arrangements were necessary in view of the high degree of secrecy attaching to a great deal of the instruction given on the course. GSO 3 was made responsible for all security arrangements. In addition to the normal security arrangements which were detailed in security orders published by the Chief Instructor, the following additional points relative to the problem of security might be noted :-

- (a) All identity cards must be checked on arrival. This was done by D.S. in the preliminary syndicate meeting before commencement of course.
- (b) All students must be made to sign individually for any accountable documents (see para 7 above for details).
- (c) The Chief Instructor stressed the necessity for absolute security in the opening and closing addresses to the course.
- (d) It was found advisable to make certain that all accountable documents had been returned some hours before the course was scheduled to disperse, in order that a check-up on all students could be made, if a document were missing.
- (e) After issue of documents to officers, each officer was made individually responsible for his documents; cupboards, etc., were available as described in para 7.
- (f) At the conclusion of the course, the Chief Instructor explained to students the extent to which the information given on the course could be disseminated by students on their return to their units.

25. Points relative to Individual Lectures.

General points regarding lectures on the course have already been given in para 19. The following points relative to individual lecturers should also be noted :-

.../Lectures by

Lectures by Chief Instructor.

(a) COMBINED OPERATIONS (See Appendix 'J'5).

The object of this lecture was to give a large scale background to the more detailed considerations dealt with subsequently in the course.

With this in view, such matters as the comparison of the main differences between the long and short sea-voyage operations were included - a general outline of how the assault, follow-up and build-up formations fit into the main picture - considerations of the size of the covering position - general intention behind the enemy defensive system on the coast - the choice of Zero hour - use of airborne troops, etc.

During this lecture a large scale diagram (see Appendix 'M') was shown and discussed. This was left up in the lecture room throughout the rest of the course in order to give a reminder that whereas the model on the floor covered only one Brigade Assaulting Area, the operation itself would be on a far larger scale.

During this lecture a wall map of the English Channel was also used; the outline of the German defences was shown by means of coloured discs 4" in diameter, which were pinned on the map, and showed where the coastal divisions (blue) might be located, and where the enemy armoured reserve divisions (red) might be.

(b) PLANNING (See Appendix 'J'9).

This lecture was really divided up into two parts:-

- (i) An outline of how any particular project was conceived on the Chiefs of Staff level.
- (ii) Certain of the problems that arise when planning a combined operation at Divisional level.

It may be thought that the first part was really unnecessary, but it was found that very few officers appreciated what the procedure was, and it was therefore thought that it would give an idea of the reason why certain difficulties arose subsequently, such as the preparation of a firm order of battle.

Two diagrams were used on the epidiascope during this part of the lecture. One showed the composition of the Joint Planning Staff and its relation to the Chiefs of Staff Committee, the Chief of Combined Operations, the Joint Intelligence Staff and the other Service Ministries. The other showed the relation between the Supreme Allied Commander, Allied Commanders-in-Chief of the various Services, and the Service Ministries.

As regards the second part, this was chiefly concerned with consideration of the Planning Programme or drill, which must be properly worked out and practised if all the factors that require attention during planning are given adequate time for consideration.

(c) SUMMARY FOR SUPPORT LECTURE. (See Appendix 'J'7).

During the earlier courses held at Largs, no summary was included during the Support day. It was found, however, that so much detail was included in that day that some of the main points were inclined to be overlooked.

A summary was therefore included which lasted about 25 minutes;

.../this was

this was based on a typical fire support programme shown pictorially on a wall diagram.

During the summary this fire support programme was worked through on the model by the Chief Instructor, the GSO 2(2) pointing to the position reached on the wall diagram.

It was shown how all the various means of providing support could be fitted into one programme, and the main problems that required solution were emphasized. Such problems were :-

- (i) Each operation requires its own support programme.
- (ii) There must be one support programme including all three Services and embodying arrangements for Smoke.
- (iii) Programme must be worked on a time basis.
- (iv) The use of smoke will reduce the efficiency and will be at the expense of the lethal effort.
- (v) No contribution from the Air Forces can be expected until air superiority has substantially been achieved.

Lectures by NSO.

(a) LANDING SHIPS AND CRAFT.

This lecture was designed to introduce to students the ships and craft used by the Navy in combined operations. The lecture was illustrated by the showing of slides on the epidiascope, starting off with minor landing craft and followed by major landing craft and ships. Before the slides were shown, a very brief explanation was given of :-

- (i) The way in which abbreviations of craft are made up, e.g. LCT, LCA, etc. Reference was made to the List of Abbreviations displayed on the board behind the dais (see para 6(g)(i)).
- (ii) Classification of Landing Ships, Craft, Barges and Vehicles.
- (iii) Normal organization of Landing Ships and Craft into flotillas and squadrons.

No slides of support or control craft were shown during this lecture, but these were kept until the support lecture, in order to avoid over-weighting the material for one lecture.

NOTE: An opportunity was taken at the end of this lecture to point out three principal alterations that would have to be made in the Combined Operations Film shown later during the day. These alterations were :-

- (a) The term "lowering position" being used in home waters instead of "release position".
- (b) Beaches being designated green, white and red, and not green, amber and red.
- (c) The attention of the audience was invited to the VLR shown in the film about which there was no commentary in the film itself.

(e) NAVAL ASPECTS OF THE ASSAULT.

This lecture was divided into two parts :-

The Assault Phase.
Follow-up and Build-up Phases.

- (f) The Assault Phase. (See Appendix 'J'6).

.../This lecture

This lecture described the formation of Naval forces, together with their Naval Staffs, and compared them with the Military opposite numbers. The various Naval aspects in this phase were then considered, such as :-

- (i) Navigational difficulties and aids.
- (ii) Beach gradients and how found.
- (iii) Organization for the passage to the assault area.
- (iv) Limitations of ships and craft in this phase.

This part of the lecture was concluded by the lecturer going down to the model and explaining the suggested layout, stressing that it was diagrammatic only and represented the approximate shipping and craft required for lifting one Assault Brigade Group at assault scales.

(g) The Assault - Naval Aspects of Follow-up and Build-up (see Appx 'J'6).

Between this part of the lecture and the first part, the Military lecturer had given the lectures referred to in para 25(q) & (r) below. This lecture therefore described the naval aspect of the situation after the assaulting brigade had landed and outlined the ships and craft used in this phase. The following points were also dealt with :-

- (i) Difficulty of working on flat beaches.
- (ii) Problems attached to drying-out.
- (iii) Bridging the water gap.
- (iv) Emphasis on necessity for fine weather and the early provision of a port.
- (v) The danger attaching to runnels.
- (vi) The off shore control of the shuttle and ferry service was only briefly touched on, as more details were given in the lectures on Beach Organization.

The following equipment was used during the lecture:-

- (i) Slides showing the drying out of LCT's of various marks.
- (ii) Cross section of beach gradient with a separate scale diagram of LCT, showing draught fore and aft. Diagram of LCT was manoeuvred by lecturer and pinned on to the beach diagram to show the point at which LCT would touch down at various states of the tide.

(h) Support - Naval Aspect. (See Appendix 'J'7).

The capabilities of different classes of ships in the bombardment role were described, and the limitations of Naval guns for this purpose were emphasized.

Slides of typical warships, including escort carriers, corvette, frigate and sloop were shown. Photographs of corvettes and frigates were included to show the types of ships which might be used as Assault Group HQ Ships; these were followed by slides of all the support craft. A short film on the LCT(R) was also shown. Considerations affecting counter-battery and beach bombardment were then touched upon, and finally the lecturer came on to the model and explained in detail how all these support craft are actually used in an operation. The model was laid out to scale and depicted an assault with the infantry leading. After this, the various control ships and craft were explained, emphasizing that an organization must always exist to compete with casualties to any of these ships or craft, so that control can be retained.

Finally, a suggested layout of support craft when the Assault Armoured Elements lead the assault, was laid down and explained by

....the lecturer

the lecturer. Craft previously mounted on a board as described in para 12(a)(iii) were used for this purpose to speed up the layout.

(i) SMOKE. (See Appendix 'J' 7).

With the assistance of a large diagram (Appendix 'N') showing the various smoke weapons used by the three Services, the lecturer explained the value and limitations of the weapons available, and described the latest developments being investigated by each Service. A description was then given of the way in which smoke might be employed in the following phases :-

- (i) Assembly at home ports.
- (ii) The voyage.
- (iii) The assault.
- (iv) Advance inland.
- (v) Development.

The lecture was concluded by two short films showing the use of smoke in combined operations exercises.

(j) Control of the Craft off the Beaches in the Follow-up and Build-up Phases. (See Appendix 'J' 10).

This consisted of a "Cox and Box" turn between DAQMG and NSO. For details see sub-para (w)(vi) below. The object of the NSO was to explain the organization of the control of the shuttle and ferry services in a cross-channel operation.

Lectures by ASO.

(k) Aircraft and Armament. (See Appendix 'J' 3).

This lecture followed the precis and was designed to refresh officers' knowledge of the various types of aircraft which might be encountered in a combined operation. Slides of the various aircraft described were shown on the epidiascope.

(l) The Air Problem. (See Appendix 'J' 3).

This was a general introduction to the problem of Air support on combined operations. A diagram was used showing the Chain of Command from Chiefs of Staff level to T.A.F. Reference was also made to the two films shown during the evening at the conclusion of the lecture, viz.

- (i) RAF in Combined Operations.
- (ii) Target - Germany. 8 U.S.A.A.F. Combat Film.

(m) Air Support. (See Appendix 'J' 7).

A wall diagram was used to illustrate the types of aircraft and the chain of RAF command most directly related to the provision of support to the Navy and Army. Model 'A' was used to illustrate the problem of counter-battery and the pulverisation of the beach areas.

(n) Tactical Air Force, Part I. (See Appendix 'J' 2).

The lecture consisted largely of an explanation of a wall diagram showing T.A.F. and Army organization, including a brief description of the way in which the organization was evolved. The lecturer outlined the system of control from Combined HQ down to airfields. The second part of the lecture consisted of explaining a diagrammatic layout of T.A.F. in the field, the diagram used being the same as that shown in Appendix 'B' to precis on 2nd T.A.F. (Appendix 'J' 2 of this report).

(o) Tactical Air Force, Part II. (See Appendix 'J' 2).

This lecture consisted of a general description of the build-up of the Tactical Air Force overseas, using a series of diagrams for the purpose.

Lectures by GSO 2(1).

(p) Army Organization for the Assault. (See Appendix 'J' 6).

This was a "straight" lecture, following the precis, and using Model 'A' with model craft and ships required to lift one assault brigade group. The list of units shown in para 3(b) of the precis relative to this lecture was not dealt with in detail but the unusual features given in para 4 of the precis were stressed.

In addition to Model 'A', use was made of a blackboard diagram showing a typical stretch of enemy coast, and an explanation was given as to how the coastline might be divided up into sectors and beaches.

(q) Allocation of Units to Craft and Ships for the Assault. (See Appx 'J' 6).

Model 'A' with model craft and ships required to lift one assault brigade group was again used, but it should be emphasized that the layout of the model is diagrammatic only. The model was laid out as shown in Appendix 'B' to the precis on Assault. (Appendix 'J' 6 attached).

The lecturer indicated on the model the number of craft in each flight or wave, the expected time of arrival of each flight or wave, the troops and vehicles which might be expected in the various flights and waves.

After the demonstration of the craft allotment, the landward side of the model was explained in detail in accordance with para 4 of the precis. Geographical features, enemy localities, etc., were pointed out.

(r) The Assault of the Beaches and Formation of the Covering Position. (See Appendix 'J' 6).

This was a "straight" lecture following the precis, illustrated, whenever possible, by reference to Model 'A'. As the lecturer described the various stages of the assault and the penetration inland, cards showing enemy localities, gun positions, etc., were removed by GSO 3, who also set up model beach limit signs, when the lecturer described the mopping up of enemy localities in the vicinity of the beaches.

Lectures by GSO 2(2).

(s) Naval Bombardment. (See Appendix 'J' 7).

This lecture did not follow the precis but was sub-divided under the following three main headings :-

- (i) Description of types of target and methods of engagement.
- (ii) Explanation on the model of the various communications available.
- (iii) Short demonstration on the model on the method of calling for and providing naval bombardment.

The demonstration referred to under (iii) above required the assistance of the following officers :-

.../ D.S.

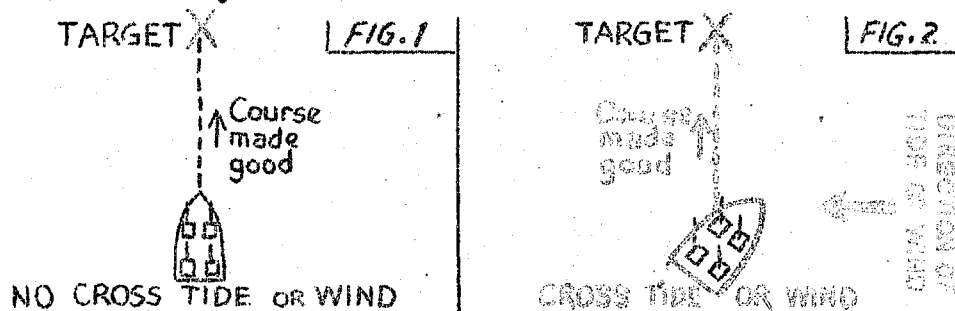
<u>D.S.</u>	<u>Acting as</u>
Chief Instructor	Compere
NSO.	Chief Gunnery Officer on LSH.
GSO 2(1)	BLO aboard cruiser.
GSO 3	BLO aboard monitor.

The method of calling for supporting fire was illustrated by the various officers speaking typical messages. Two "shoots" were carried out. The firing of the ships' guns and the fall of shot ashore were simulated by the firing of $\frac{1}{2}$ oz charges of gun cotton, made up in small canvas bags, concealed under cones and detonated electrically. The officers representing BLO's were provided with a bell push which was pressed at the required moment to simulate ships' fire. A similar arrangement was made for the Chief Instructor to detonate the charges representing the "fall of shot" on land.

(t) R.A. in the Assault. (See Appendix 'J' 7).

This lecture followed the precis, communications and positions of senior R.A. officers and FOO's being explained on the model. Two blackboard diagrams were used :-

- (i) To show how LCT(Mk IV) was the most suitable craft for firing SP artillery, in view of the higher crest clearance available.
- (ii) To show the effect of wind and tide on the firing of SP artillery from LCT as shown below.



(u) AA Defence of Beach Group Area. (See Appendix 'J' 10).

This lecture followed the precis, a diagrammatic layout of the AA defence of the Beach Group Area being built up on the model, until the final picture was that given in Appendix 'J' to the precis on Beach Organization. Cones of various colours (see para 12(a) (v)) were used to represent AA guns, searchlights, etc. Model barrage balloons, constructed of wire, were also used.

One assistant was required to layout the AA defence on the model in accordance with the directions of the lecturer.

Lectures by DAOMG.

(v) Organization of British Division. (See Appendix 'J' 4).

- (i) This lecture lasted approximately $\frac{3}{4}$ hr and was designed to give RN, RAF and allied officers the basic organization of the British Army, with particular reference to the divisional organization.
- (ii) Attendance at the lecture was voluntary as such a lecture was bound to be of rather too elementary a character for a number of the Army students. It is, however, considered essential, that all non Army personnel should receive a lecture of this type at the start of the course.

.../(iii)

- (iii) Explanation of the layout of a division should be compared briefly with the changes in the organization of a division for an assault in a Combined Operation.
- (iv) It is considered essential that the lecture be given at the beginning of the course in order that RN, RAF and allied officers may be able to follow the lecturers during the rest of the week, as such lecturers are bound to place a great deal of emphasis on Army Organization.

(w) Beach Organization. (See Appendix 'J' 10).

One whole morning or afternoon (4 hours), was normally devoted to Beach Organization, sub-divided as follows :-

(i) Layout of Beach Group (approx one hour).

The following diagrams were used :-

System of Control. (See Appendix O)
Organization of Beach Group. (Shown in Appendix 'A1'
to precis on Beach Organization).

During this period the lecturer concentrated on the organization of one beach group in support of one assault brigade.

(ii) Layout of Beach Group Area (approx $\frac{1}{2}$ hr).

Model 'B' was used. This demonstration was designed to show the various stages in the development of the Beach Group Area. DAQMG described general layout of area and, as units coming ashore were referred to, GSO 3(Adm) placed in position the various cards already described in para 12(b)(i). The eventual layout was as given in Appendix 'L' to the precis on Beach Organization.

(iii) Medical Organization (approx 20 mins).

Normally given by DADMS, Combined Training Centre, Gullane. Consisted of a brief description of the medical organization of the Beach Group Area and method of evacuating casualties to U.K.

(iv) Film on Beach Organization (30 mins).

(v) AA Layout of Beach Group Area (approx 20 mins).

See sub-para 25 (u) above.

(vi) Development of the Maintenance Project (approx 35 mins).

This consisted of approx 20 mins' explanation by DAQMG of the development of Beach Sub-Areas, Rear Maintenance Area, Base Sub-Area, etc. This was followed by a 15 minute demonstration by NSO and DAQMG of the control of two beach groups by a Beach Sub-Area and the control of the waters off shore. This demonstration was carried out on Model 'B' which was re-described by DAQMG as representing a larger area into which two beach groups could be landed across four beaches. A notice was shown indicating the new scale of the model viz, "12 ft to 4 miles"; cards were used with blue lettering to indicate Naval officers, and red to indicate Army officers. HQ Ship and control craft models were also used. NSO explained briefly naval control in the initial approach to the beaches. DAQMG then explained the establishment ashore of Divisional HQ.,

.../Brigade HQ's

Brigade HQ's., Beach Sub-Area HQ and Beach Group HQ's. "Army" cards were then moved from the "sea" to positions inland. NSO then explained how Naval officers such as D/SOAG took over new jobs ashore and changed nomenclature to e.g. PEMr. This was shown by picking up the card indicating D/SOAG, turning it inside out and putting the card down to indicate PEMr on the reverse side, and so on with the other officers. The model layout finally resembled the picture given in Appendix 'M' to précis on Beach Organization. DAQMG then gave a brief concluding description of the way in which Army and Navy will co-operate at the various headquarters.

(x) Mounting a Combined Operation. (See Appendix 'J' 12).

This was a "straight" lecture, the only adjuncts being a map of England and the English Channel, and a large diagram showing layout of Concentration, Marshalling and Embarkation Areas. (See Appendix 'P'). A poster showing 24 hr ration was also exhibited as an item of interest.

26. Administrative Arrangements.

(a) General.

Every effort was made at Combined Training Centre, Largs, to make students attending the course as comfortable as possible, since the less officers needed to worry about their bodily comfort, the greater the mental concentration they could achieve. This was especially necessary in so concentrated a course as the Short Course at Combined Training Centre, Largs. Certain domestic arrangements are included in the list of instructions (Appendix 'Q') which was given to students immediately on arrival at Combined Training Centre, Largs.

(b) Batmen.

Each British and Dominion Army officer was supposed to bring a batman, and an average of 20 was worked upon as a reasonable number both for servicing officers and for billeting. As few as 8 and as many as 32 joined for certain courses, with a consequent disruption of administrative arrangements. The ideal solution would be the provision of batmen in the War Establishment. GSO 3 (Adm) was responsible for the allotment of batmen and a list was published on the notice board, indicating the officers to whom batmen were allocated.

Copy of orders issued to batmen is enclosed at Appendix 'R'.

(c) Finance.

Students were requested to pay their mess bills on the last day of the course.

Cash for the payment of troops, billeting fees and other miscellaneous services was obtained from the Camp Commandant, Combined Training Centre, Rothesay.

(d) Transport.

Repairs to vehicles and monthly inspections were carried out at Combined Training Centre, Dundonald. POL was obtained from Naval sources

(e) Interior Economy.

Exchanges of kit, repairs to boots, washing, were carried out in conjunction with Combined Training Centre, Rothersey.

(f) N.A.A.F.I.

Supplies of cigarettes, tobacco, chocolate, razor blades, matches, etc., were obtained once a month from N.A.A.F.I., Gourcock.

Special Points Relative to the Long Course.

27. Scope of the Long Course.

The Long Course, of fourteen days' duration, was designed for officers of the rank of Lt. Commander (RN), Major (Army) and Squadron Leader (RAF) and equivalent ranks of allied forces. Owing to the greater length of time available, it was possible to introduce greater detail into the course, and to give officers some idea of the actual difficulties involved in the planning and preparation of a combined operation.

28. Programme of the Long Course.

(a) The programme of the Long Course was co-ordinated on the same lines outlined for the short course in para 9. Typical programme of the Long Course is given at Appendix 'C'.

(b) Exclusive of visits to inspect craft, etc., and time allotted to the showing of instructional films, attendance at which was voluntary, the time available for instruction on Long Courses was 67 hrs. 25 mins.

(c) The time available was allotted to various subjects as shown below:-

(i)	General - including introduction and explanation of the course.	5 hrs 10 mins
(ii)	Air - General.	2 hrs 45 mins
(iii)	Assault (Naval and Army).	4 hrs 15 mins
(iv)	Support (All Services).	5 hrs 35 mins
(v)	Beach Organization, including A.A.	5 hrs 40 mins
(vi)	Communications (Naval and Army).	1 hr 45 mins
(vii)	Discussions (Syndicate and General).	10 hrs 15 mins
(viii)	Planning and Training.	6 hrs 15 mins
(ix)	Staff Duties - Landing Tables.	2 hrs 15 mins
(x)	Exercise "PEACOCK".	23 hrs 15 mins

(d) The figures given above were sub-divided between the Services as shown below. The time under the heading 'General' includes all lectures common to two or more Services, discussions and Exercise "PEACOCK".

R.N.	5 hrs 45 mins
Army	13 hrs
RAF.	4 hrs 5 mins
General	44 hrs 35 mins

29. Exercise "PEACOCK".

(a) Approximately three-and-a-half days of the long course were devoted to Exercise "PEACOCK". The object of the exercise was to enable all three Services to study some of the main problems arising during Divisional and Brigade planning for a combined operation, and to enable RAF officers to study certain aspects of air planning for a Corps assault.

(b) The exercise was divided up as follows :-

PROBLEM I - (i) Preparation of the FMLO's appreciation.
(ii) Preparation of the First Key Plan for one Beach Group Area.

PROBLEM II Production of a Brigade Landing Table.

PROBLEM III Preparation of the outline Air plan for a Corps assault.

PROBLEM IV Reconnaissance of First Key Plan made in Problem I (ii), on the ground, and production of the Second Key Plan.

(c) For the exercise, each syndicate was divided up into two sub-syndicates. Problems II and III were studied concurrently, RAF officers being withdrawn from normal sub-syndicates and formed into syndicates of their own for this purpose. Ten sets of papers, equipment, etc., were required. The following equipment was used during exercise "PEACOCK" :-

- (i) $\frac{1}{4}$ ", 1" and 1/25,000 maps.
- (ii) Map cases and chinagraph pencils.
- (iii) Deck plans of LOT, Mk's III, IV and V.
- (iv) Pieces of cardboard showing dimensions (to scale of (iii) above), of the various tanks, vehicles, etc. used in the exercise.
- (v) Landing Table proforma.
- (vi) Air photographs.

It is considered essential that all the above should be provided by the Combined Training Centre, as in a course designed for officers of all three Services, it will be found that RN and RAF officers will be unable to come to the course equipped with, e.g. map cases or chinagraph pencils.

(d) All written work done on the exercise was corrected by the DAQMG; typewritten comments were given to each sub-syndicate leader when papers were handed back. At the conclusion of the exercise, DAQMG gave approximately one hour's "summing-up" of the exercise.

(e) Three complete sets of instructions and papers relative to Exercise "PEACOCK" are forwarded with this report to Combined Operations Headquarters, together with eight complete sets of the equipment detailed under sub para (c) above.

(f) It is recommended that in future courses similar to the Long Course, such an exercise as Exercise "PEACOCK" should come at the very end of the course. To revert to indoor lectures on the last day, as shown in Appendix 'C', tends to be rather an anti-climax.

30. Landing Table Play.

This play was given by the D.S. during one evening of the Long Course, prior to Exercise "PEACOCK". The object of the play was to give students some idea of the procedure to be adopted by the Brigade Staff in the preparation of a Landing Table. The play was given after dinner and was intended to provide amusement as well as instruction.

Copies of the play have been forwarded to Combined Operations Headquarters.

31. Conclusion.

In conclusion, it cannot but be admitted that for the most part the instruction was extremely concentrated.

This was probably inevitable in view of the widely varying appointments held by officers attending and the need to include in the instruction some material which would be of interest to each student.

As a result, it was rather like trying "to pour a quart into a pint pot" and it had to be accepted that no one officer could ever remember all the details referred to.

However, it is thought that the courses enabled all officers to acquire a general picture of the problem and also gave individuals an opportunity for acquiring a certain amount of specialist information of particular interest to themselves. Where further details were called for, these were usually available in the lecture précis, which could be studied later. Questions to which the solutions were not available at Largs were included in the reports which were forwarded regularly to Combined Operations Headquarters at the end of each course.

As far as possible the instruction was designed to provide a basis for further thought and discussion and to avoid being in any way dogmatic; the need for an "open mind" and the danger of having too stereotyped an outlook was continually being stressed.

As a further important object of these courses there is no doubt that they afforded what was to many officers the new and valuable experience of living with officers of the other Services and allied forces with whom they could discuss mutual problems.

In some respects this may be thought to be the most important object to be attained.