22604-A

CONFIDENTIAL REGISTER Nº 96

THE CONDUCT OF MANEUVERS

(Cancels Edition of May, 1939)

DECLASSIFIED IAW DOD MEMO OF 3 MAY 1972, SUBJ: DECLASSIFICATION OF WWII RECORDS

NAVAL WAR COLLEGE
Newport, R. I.
June, 1940

Not to pass out of the custody of officers of the U. S. Naval or Military Service.

NavTraSta Newport — 4-26-40 — 125.

CONFIDENTIAL REGISTER Nº 96

THE CONDUCT OF MANEUVERS

(Cancels Edition of May, 1939)

NAVAL WAR COLLEGE
Newport, R. I.
June, 1940

Not to pass out of the custody of officers of the U. S. Naval or Military Service.

NavTraSta Newport — 4-26-40 — 125.

3926-3326
3-12-40

INSTRUCTIONS GOVERNING THE CUSTODY OF CONFIDENTIAL AND SERIAL NUMBERED PUBLICATIONS ISSUED IN CONNECTION WITH THE WAR COLLEGE COURSE

This publication is classified as CONFIDENTIAL and is assigned a serial number. It is charged against the officer to whom it is issued, either by a signed receipt or record book entry. It must be safeguarded in accordance with existing security instructions as set forth in the Navy Regulations (Chap. 2, Arts. 75½ and 76), and in the War College pamphlet "INFORMATION FOR STUDENT OFFICERS".

The officer to whom this publication is charged is solely responsible for it until he returns it to the Academic Section and cancels his receipt.

The following procedure governs the return to file of all Confidential and serial numbered publications:

(a) If issued in the Strategy, Tactics, Technical or Intelligence Jacket, it should be returned at the end of the Academic Year in the Jacket in which it was originally issued.

(b) If an OPERATIONS PROBLEM, it should be returned as soon as practicable after it has served its purpose.

(c) If a publication of a general nature, issued during the Academic Year and not included in (a) or (b) above, it should be returned as soon as practicable after it has served its purpose.

E. C. KALBFUS
Rear Admiral, U. S. Navy
President.

Naval War College
Newport, R.I.
June, 1940

3648-1980
5/11/39.

THE CONDUCT OF MANEUVERS

(Introductory)

CONTENTS

CHAPTER I

The Chart Maneuver

	Page
(A) Purpose of the Chart Maneuver	2
(B) Discussion of Rules	3
(C) Material used in the Chart Maneuver	4
(D) Conduct of the Maneuver	5
I. Preparation for the Maneuver	5
II. The Maneuver Staff	5
III. The Maneuver	8
IV. Master Plot	18
V. The Record	19
VI. Discussion and Critique	20

CHAPTER II

The Board Maneuver

(A) Purpose of the Board Maneuver	22
(B) Material of the Board Maneuver	23
(C) Conduct of the Maneuver	36
I. The Maneuver Staff	36
II. The Maneuver	43
III. The Record	45
(D) The Requirements and Methods of Scoring the Effect of Gunfire	46
(E) Torpedo Firing	49
(F) Mines	50
(G) Submarines	50
(H) Aircraft	13,50
(I) Bombs	51
(J) Communications	51

IMPORTANT NOTE

The value of the Maneuvers at the War College depends on their success in simulating the realities of war. These realities are reflected in the rules. When the rules do not fully cover a situation recourse must be had to imagination, judgment, and loyalty to the aims of the War College.

Students should be scrupulous to avoid transmitting information during a maneuver except by the methods available at sea under like circumstances. For example, a Commander in Chief should avoid giving instructions orally to or discussing a situation with the commanders of forces, who, although not in his immediate game presence, may in reality be in the next room. Unauthorized contacts between players tend to destroy the value of a maneuver, and to relieve a subordinate of making decisions properly his own responsibility and privilege.

Only by strict self discipline in these matters can the student gain full value from the War College Maneuvers.

CHAPTER I

THE CHART MANEUVER

(A) - PURPOSE OF THE CHART MANEUVER

The Chart Maneuver is a means of simulating the many and varied strategic situations which arise in war in order that these situations may be studied and the operations of warfare visualized. The Chart Maneuver has the advantage that maneuvers can be simulated, thereby creating a greater number of situations for study than is possible in the Fleet. It has a disadvantage in that results obtained and conclusions drawn are correct only insofar as the Rules and Special Conditions upon which the Maneuver is based are correct. For the purpose of the Maneuver, the intangible factors, such as efficiency of personnel, and indoctrination and morale of the two sides, are usually considered equal, an assumption which may not be correct.

Every effort is made to draw the maneuver rules in accord with existing conditions, so that inaccuracy and artificiality may not violate the soundness of conclusions.

Preliminary to a maneuver, a specific problem is drawn up and issued to all who are to participate. To derive the most benefit, each player is required to study the problem and submit a solution. Solutions are then selected for playing.

With each problem issued, there is included a statement of

(1) The motives of the problem.

(2) What is required of the student.

(3) The Situation. This is a statement of the general causes of the war; the attitude of neutrals or allies; the broad progress of operations to date, with such details as are pertinent; the instructions or orders received from higher authority; the composition and location of own forces; state of defenses of own bases and outposts; latest information of enemy forces including size, general location, bases, etc.; logistic support available; and pertinent meteorological, hydrographic and topographic data.

(4) The Special Conditions, if any, governing the solution of the problem, supplementing or modifying, for the purpose of the particular problem, the maneuver rules, ships data, etc.

(B) - DISCUSSION OF RULES

The rules for the conduct of chart maneuvers serve two purposes:

(1) to prescribe methods and conventions for carrying on the maneuver, and

(2) to express the restrictions imposed upon actual naval operations by material limitations.

In considering the rules which state what may be accomplished with the material of naval warfare, a distinction must be made between the assumption upon which a rule is based, and the terms of the rule itself. In making an assumption regarding the possibilities and restrictions actually existing in the use of naval ships and material, all available data are considered and a decision is reached which is designed to represent a conservative average of data and opinion.

Having decided what the facts in actual practice may be, it is necessary to incorporate these facts into rules in a form simple enough to prevent unnecessary delay in the conduct of the maneuver. MANY OF THE RULES MAY SEEM TO BE ARBITRARY OR ONLY APPROXIMATE TRUTHS. SO LONG, HOWEVER, AS THE RULES FURNISH SUBSTANTIALLY CORRECT PREMISES UPON WHICH TO BASE STRATEGIC DECISION, AND FUNCTION SO AS TO PRODUCE APPROXIMATELY THE SAME EFFECT AS WOULD RESULT IN ACTUAL WAR, THEY FULFILL THEIR PURPOSE.

Suggestions for improvement of the rules are always welcome.

Unless otherwise stated in the problem, data regarding displacement, speed, drive, kind of fuel, fuel capacity, fuel expenditure, and normal fleet organization, are as given in War College pamphlets of the latest issue.

(C) - MATERIAL USED IN THE CHART MANEUVER

The following material is used in the Chart Maneuver:

Implements.

Strategic plotting charts, tracing paper ("Flimsies"), drawing instruments, RED and BLUE pencils, and prescribed forms.

The Maneuver Staff keep the Master Plot of the Maneuver. Each player handling a force keeps on a chart or plotting sheet, a plot of the movement of all elements of that force, as well as those of other own or enemy forces with which he is concerned.

The Communication Detail uses a ditto machine to make copies of messages for delivery.

Forms used by players (To be found in rack outside of game-room).

(1) Message blanks (S-5).
(2) Record of Previous Move blanks (S-6).
(3) Aircraft Flight Forms (S-10).
(4) Fuel Account blanks (S-7).
(5) Fuel Work Sheet (S-8).

Forms used by Staff.

(1) Aircraft Casualty Forms (T-16).
(2) Air Damage Record (T-12).
(3) Umpire's Communication Record (S-12) (Blueprint).
(4) Gunfire Penalty Tables (Tabulation for scoring Gunfire) (Large Card).
(5) Umpire's Damage Sheets (T-6(a) etc.). (Blueprint).
(6) Information blank (T-10, Mod. 1).
(7) Ship Damage Table (Maneuver Rules, page f-32).

(D) - CONDUCT OF THE MANEUVER

I. PREPARATION FOR THE MANEUVER.

After the problem for maneuver has been solved by student officers, the Director designates the commanders for the various forces concerned.

Some time is usually allowed in which the various commanders can study their tasks, prepare directives, and indoctrinate their subordinates. Before the game starts separate meetings of each side are held so that the commander can explain his estimate of the situation, decision, directives and doctrine.

II. THE MANEUVER STAFF.

The Maneuver Staff conducts the maneuver as expeditiously and with as little artificiality as possible, and expects full cooperation from all players in these respects.

A typical Maneuver Staff Organization for a chart maneuver is indicated in the following pages. The number of officers assigned to the Maneuver Staff is governed by the extent of the operations, the forces involved, and the number of officers available for this detail. When the staff is insufficient in numbers, one officer may be detailed to perform several of the functions indicated.

The general functions of the various members of the Maneuver Staff are as follows:

1. The Director is in charge of the conduct of the maneuver, and coordinates the work of the Maneuver Staff. He is the arbiter in all cases of doubt. His decisions are final.

2. The Plotting Officer, under the Director, supervises the Master Plot. In general, he:

(a) Announces the length of moves;

(b) Announces when moves are to be handed in;

(c) Announces the game time, when changes are made;

(d) Subject to the Director, makes decisions;

(e) Determines contacts and writes them up;

(f) Transmits appropriate information to liaison officers and players.

(g) Informs the Damage Umpire of all damage assigned except air attack damage.

(h) Supervises the preparation of the History of the Maneuver, and of diagrams of moves for the critique.

(See also Master Plot, p.18, and History, p.20).

3. The Liaison Officers clear up contacts by telephone or personal interviews with players and, subject to approval of the Director, make decisions as to the results. They immediately inform the Plotting Officer, Technical Assistants, and the Recorder as to all decisions. It is the particular duty of the Liaison Officers, while expediting progress, to make the maneuver as realistic as possible to players.

4. The Air and Weather Umpire, with the aid of one or more assistants,

(a) Has general supervision over the operation of aircraft, and keeps records of aircraft available to each side;

(b) Receives and checks Aircraft Flight Forms;

(c) Assists the Plotting Officer in his functions, particularly with respect to aircraft operations and contacts;

(d) Determines the results of aircraft attack, and informs the Director, the Plotting Officer, The Damage Umpire, and the Recorder;

(e) When necessary, or desirable, maintains a separate plot of aircraft operations;

(f) Prepares the Weather Prediction for the Next Move, submits it to the Director for approval, and, when so directed, transmits one copy to each player and to the Plotting Officer. Subject to the approval of the Director, decides as to the existing general and local weather conditions.

5. The Move Umpires (one for each side):

(a) Receive and check the flimsies of ship and aircraft moves and "Record of Previous Moves";

(b) Transmit the flimsies to the Master Plot, and the Records of Previous Moves to the Recorder; and

(c) Assist the Plotting Officer in carrying out his functions, as may be required.

6. The Communication Umpire supervises the application of Section E of the Maneuver Rules in effecting communications for the Maneuver. He assists the students detailed as his assistants in learning their duties before the maneuver begins. He advises, as necessary, the two students selected as Commanders of the sides in regard to their Communication Plans. He makes decisions required by Rule E-23(b) and in other situations which may not be covered by the Maneuver Rules.

The Assistant Communication Umpires, one for each side, are responsible for the communications of their respective sides. They

(a) Receive the message forms from the players and, using the Rules of Section E and the example on page e-6, check them for errors in filling out.

(b) Determine from the Communication Plan which addresses can be reached on the circuit indicated, and which require relays.

(c) Note whether time of preparation (Rule E-3) has been taken into account by the player when it is known that his message is in response to a message or information slip.

(d) From the values in parts II to V of Table E-4, fill in on the message form the charges for coding, etc.

(e) From these compute the game times of delivery, taking into account necessary relays.

(f) Record each message on the Communication Record Form (S-12), using the "call and heading" and "text" times, to

determine the transmission period the circuit would be in use.

(g) Note from Form S-12 whether the circuit is already in use and if so apply the appropriate delay to the transmission period and time of delivery of later messages, having regard for their order of precedence (Rule E-5).

(h) Have the orderlies prepare the requisite number of copies (including one for Master Plot) and deliver them to the addressees via pneumatic tube when the game time reaches the determined time of delivery.

(i) Keep informed from Master Plot of the position of forces so that transmission distances may be checked, and assist the Director and Communication Umpire to apply Rules E-12 and E-13.

(j) Delay the delivery of messages to submerged submarines to conform to their radio listening periods.

(k) In cooperation with the Assistant Communication Umpire of the other side, decide and apply the effect of jamming plans if they are placed in effect.

(l) At the close of the game turn over message files and Communication Record to the Recorder.

7. Other Technical Assistants usually include: Land Operations Umpire; Damage Umpire; and Logistics Umpire. Their general functions are indicated by their titles.

8. The Recorder, under the supervision of the Plotting Officer, prepares the History of the maneuver. (p.19).

III. THE MANEUVER.

The maneuver should be expedited as much as possible. This requires promptness in handing in flimsies, messages, decisions as to action taken, etc.

Reserve all disagreements with decisions of the Director until the final discussion and critique.

Beginning of Move.

When the maneuver starts, the Air and Weather Umpire distributes copies of the weather prediction, and the Plotting Officer posts and announces information concerning the first move, and sets the clock dial to indicate the game hour of the beginning of the move.

Length of Move.

The length of the move will be announced by the Director or Plotting Officer.

Weather conditions that actually exist in the theater of operations will be assumed as closely as possible during the maneuver. Predicted weather prevails unless individual players are notified otherwise. Variations will be introduced as desirable. In unsettled conditions, the probability of contacts may be determined by the throw of a die.

Plotting by Players.

Having noted the announced length of the move and the predicted weather conditions, each player plots on his work chart the intended movements of his vessels and aircraft for the period of the entire move. Conventions to be followed in plotting are summarized below:

(a) In all plots, positions of the main body will be indicated by a dot within a small square; of other detachments and single ships, by a dot within a small circle.

(b) In case of a submarine submerged, a wavy line will be drawn over the position circle. (For additional instructions for plotting submarines, see page 15).

(c) Tracks of vessels proceeding on the surface will be drawn in full lines. Those of submarines submerged and aircraft flying will be drawn in dotted lines. (For additional instructions for plotting aircraft, see pages 13, 14, and 16).

(d) All tracks will be labelled to show the ship or force,

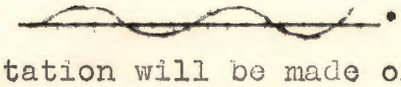
course (except aircraft) and speed made good, and, by an arrowhead (T for aircraft), the direction of movement. Each point of change of speed or course will be indicated, and will be labelled with the time of such change; similarly, each point where a submarine or aircraft leaves or returns to the surface will be shown.

(e) Tracings will then be made on flimsy paper with black lead pencil. All flimsies will indicate proposed tracks complete until the end of the current move. Each tracing will have two reference points, each of which shall be shown as the intersection of a latitude line and a longitude line, and the following legend in the upper right hand corner, in colored pencil, blue for BLUE forces and red for opposing forces:

(1) Serial number of move followed by game time of move,
(2) Composition of force (task name and actual force),
(3) Name of commander (game and actual),
(4) Room number.

(f) Each flimsy should contain all information with respect to the composition and movements of the force which may be required by the Master Plot in determining contacts and the results of contacts. The detailed dispositions of cruising forces should be laid out on mooring board diagrams by the time the forces put to sea; one copy should be retained by players and one submitted to Master Plot.

(g) In order that the plotter may determine quickly the position of a vessel or unit at any given time the ground speed and the times of changes of course and speed, should be entered. Unless this is done, it is possible for information or contacts to be incorrectly transmitted by the plotter.

(h) When vessels or units are zigzagging, the actual zigzag, if the chart scale is large, should be plotted. With a small scale chart (such as the usual plotting charts) a zigzag should be indicated thus  . When this zigzag symbol is employed, a notation will be made of the actual speed,

the speed made good on the base course, and the zigzag plan in use.

(i) When vessels are accompanied by air patrols a note as to the composition, altitude, station, and purpose of the patrol should be made on the flimsy, and the presence of the patrol indicated on the track. This procedure will insure against the presence of such patrols being neglected.

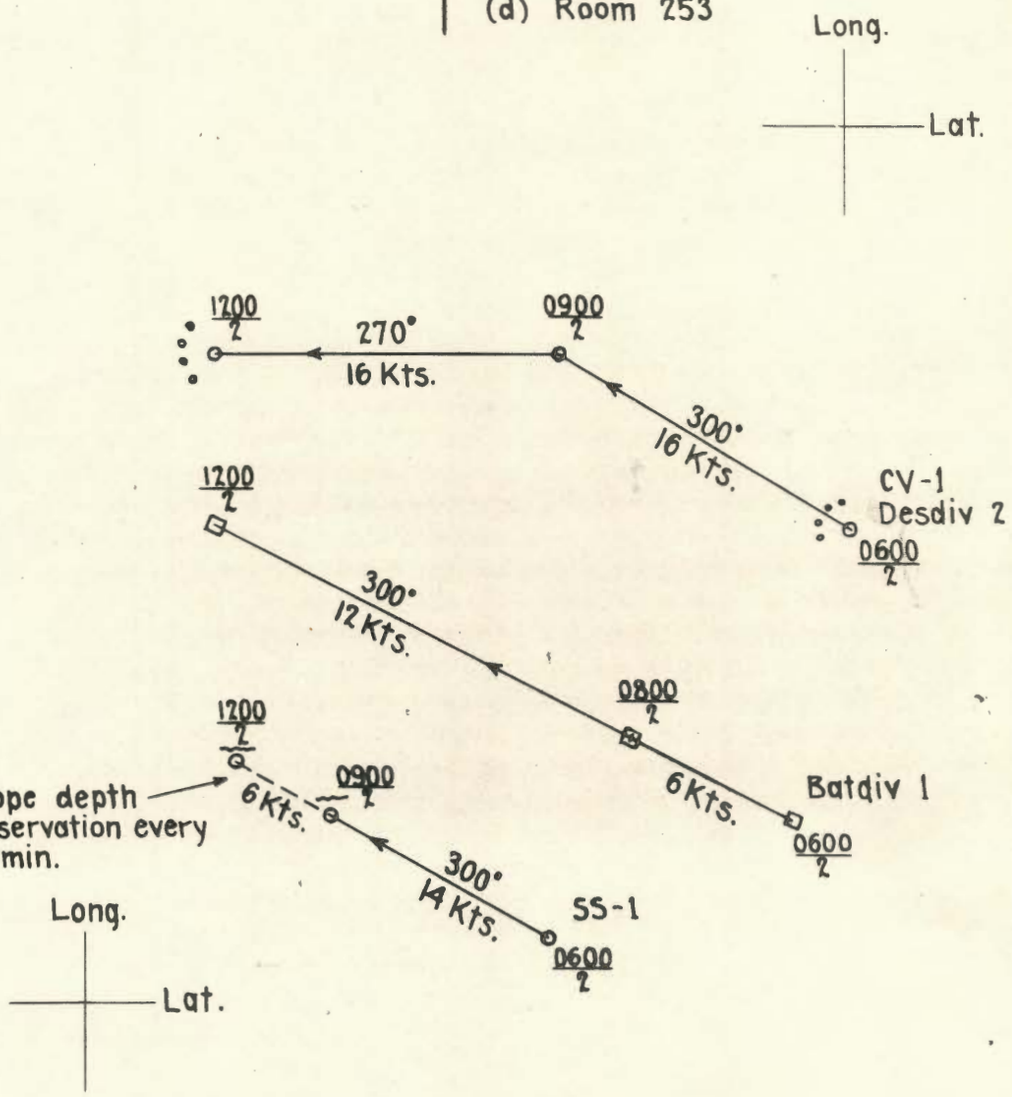
(j) The presence of an anti-submarine screen, particularly for isolated vessels such as, for example, a lone CV, should be indicated on a flimsy by drawing dots (or a broken circle) around the circle marking the initial position. The dots should indicate the number of screening vessels.

(k) The flimsy for a modified move should show the part of the original move which is changed, and should continue until the end of the current move. It is unnecessary to show what has taken place previous to the time the modification takes place, or to show on the modified flimsy any forces except those whose tracks have been changed.

EXAMPLE OF TRACING OF MOVE

NOTE: This legend in blue pencil for BLUE forces. RED for opposing forces.

(a) Move - 3
(2 Jan. 0600 to 1200)
(b) Northern Scouts:
Batdiv 1, CV-1, SS-1,
Desdiv 2
(c) Rear Admiral Y
(Jones)
(d) Room 253



In case squared plotting sheets are used the reference marks will be the corners of numbered squares instead of Latitude and Longitude.

(l) Quite frequently students plan a change of operations, or intend to send out messages which will cause forces other than their own to make changes. They may plan to change on their own volition at any time after the announced game time, or at any time after a contact or the TOD of a message containing new information or orders. In any case they should inform the Director IMMEDIATELY in order that the game time may be held up until the message or the modified move has been submitted.

(m) Flimsies should be submitted to Master Plot via the pneumatic tube as promptly as possible, and be accompanied by a Record of Previous Move, Form S-6 (see page 15), and an Aircraft Flight Form, S-10, if aircraft flights are planned. Records of Previous Moves are submitted only at the end of a full move, and not for a partial move.

Aircraft Plotting. (See also page 9, subparagraphs (c) and (d)).

Following are hints for expediting the preparation of aircraft flimsies:

Officers assigned to the "Player Detail" whose task forces include airplane units should carefully read the "Instructions" at the bottom of the Aircraft Flight Form, (Form S-10).

It is well for players to understand all of Section J of the Maneuver Rules and particularly Rules J-2, 4, 5, 7, 8, and 9. Rule J-9 describes the method used at the War College to apply the effect of wind in plotting aircraft flights. Rule A-7 (a) describes the War College convention for expressing wind force.

At the beginning of each move, submit flight forms and flimsies for all aircraft flights that are planned for that move. If no flights were planned, but at some time during the move they become necessary, notify the Air Umpire and then prepare and submit the flight form and flimsy as soon as possible. Use the same procedure if it is desired to modify a flight previously planned.

If flimsy and flight form are not sent to Master Plot, no flights will be considered to have been made.

In order to expedite the computation of the times required for planes to complete the various legs of their flights, the length of legs may always be taken as correct to the nearest ten miles, and the times of flight to the nearest five minutes. Example: A TBD-1 airplane proceeds at cruising speed, 110 knots, against a wind component of 15 knots, along a flight leg 124 miles long. Assume ground speed as 100 knots, (nearest even 10 to 110 minus 15), and the length of leg as 120. From the Airplane Speed-Time-Distance table of page 16, the time of flight to the nearest five minutes will be seen to be 70 minutes.

Where flights are repeated exactly one or more times during the same weather interval, a single drawing of the airplane tracks for the first flight may be made to serve for all flights. When this procedure is used, draw the airplane tracks on a piece of flimsy paper separate from the ship flimsy, and indicate on the latter the points and times of the beginnings of each repeated flight. Mark the airplane flimsy "Repeated Flight" and insert on it a Table showing, for the individual planes of each flight, the times of start, course changes, and finish. Mark the ship flimsy: "Plane flights on separate sheet". An example is shown on the diagram on page 17.

If the legs of the flight are very short, as in the case of an Anti-submarine Patrol, draw the position of the first launching, a figure around the ship or formation showing the outline of the patrol, and indicate the number of planes in the patrol and the hours during which it is flown.

Example of tracing is given on page 17.

Aircraft tracks are dotted, and are indicated on the flimsy by a horizontal T, with the cross of the T in the direction of flight. The course need not be indicated, but the ground speed

must be.

Submarine Plotting. (See also page 9, subparagraphs (b) and (c)).

In addition to showing whether submerged or on the surface, submarine commanders will state the depth of submergence, if submerged; the exact times of periscoping, if using periscope; and the periods during which listening for radio with the vertical antenna exposed. (Rules D-10, E-14).

Records of Previous Moves.

A record of the actual movements of each move is filled out by each player on Form S-6 at the end of the full move for surface craft and submarines, and forwarded to Master Plot at the same time as the flimsy for the next subsequent move. Records of Previous Moves are not required for aircraft.

Messages.

See Section E of the Maneuver Rules. Players will expedite the maneuver if they pay particular attention to the directions for the use of the Message Form, including those concerning proper and fresh carbon, hard pencil, and the celluloid sheet to provide a hard backing. Also note particularly that the originator of a message should include himself as an information addressee in order to obtain a copy for his file.

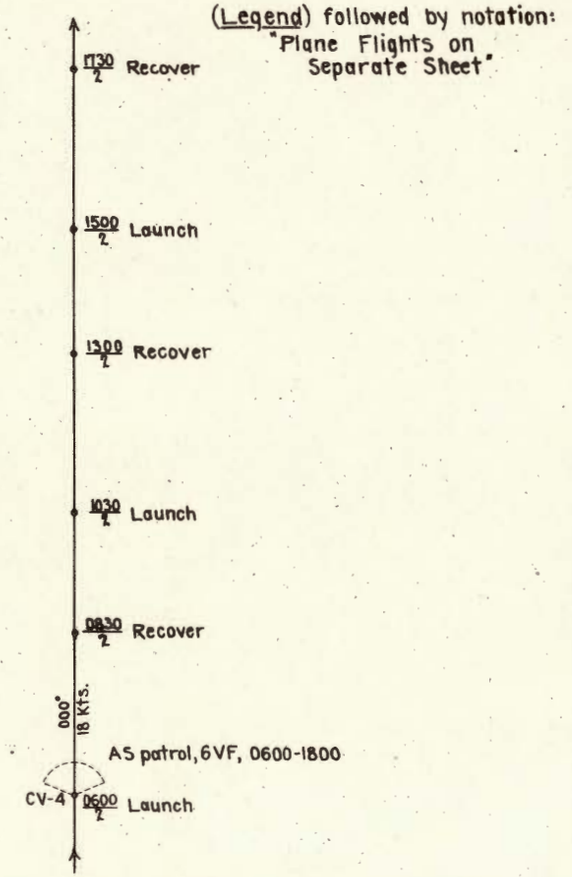
A player may file with the Assistant Communication Umpire messages to be sent at any game time subsequent to that which the maneuver has reached. He may also ask Master Plot to hold the game time as necessary to permit him to get off a message.

For Use Only in War College Problems

AIRPLANE SPEED - TIME - DISTANCE TABLE

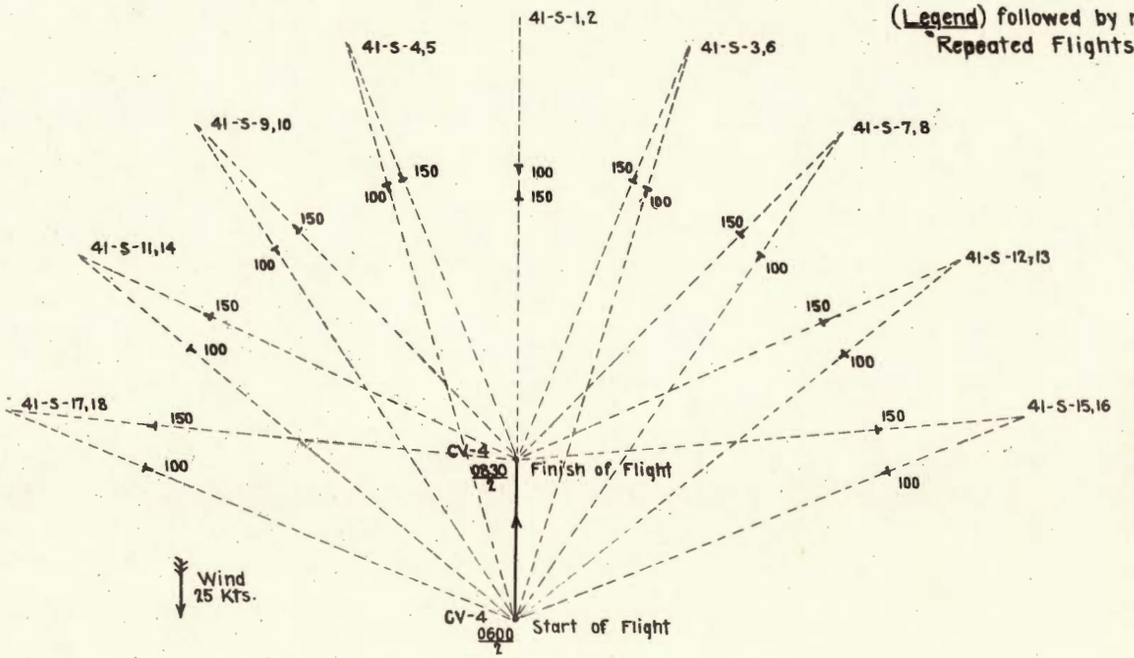
Time (Min.)	Ground Speed in Knots Distance to Nearest Ten Miles										Time (Min.)
	60	70	80	90	100	110	120	130	140	150	
5	5	10	10	10	10	10	10	10	10	10	5
10	10	10	10	20	20	20	20	20	20	30	10
15	15	20	20	20	30	30	30	30	40	40	15
20	20	20	30	30	30	40	40	40	50	50	20
25	25	30	30	40	40	50	50	50	60	60	25
30	30	40	40	50	50	60	60	70	70	80	30
35	35	40	50	50	60	60	70	80	80	90	35
40	40	50	50	60	70	70	80	90	90	100	40
45	45	50	60	70	80	80	90	100	110	110	45
50	50	60	70	80	80	90	100	110	120	130	50
55	55	60	70	80	90	100	110	120	130	140	55
60	60	70	80	90	100	110	120	130	140	150	60
65	65	80	90	100	110	120	130	140	150	160	65
70	70	80	90	110	120	130	140	150	160	180	70
75	75	90	100	110	130	140	150	160	180	190	75
80	80	90	110	120	130	150	160	170	190	200	80
85	85	100	110	130	140	160	170	180	200	210	85
90	90	100	120	140	150	170	180	200	210	230	90
95	95	110	130	140	160	170	190	210	220	240	95
100	100	120	130	150	170	180	200	220	230	250	100
200	200	230	270	300	330	370	400	430	470	500	200
300	300	350	400	450	500	550	600	650	700	750	300
400	400	470	530	600	670	730	800	870	930	1000	400
500	500	580	670	750	830	920	1000	1080	1160	1250	500

(Legend) followed by notation:
"Plane Flights on Separate Sheet"



EXAMPLE of that part of a Flimsy for CV-4 between 0600/2 and 1730/2

(Legend) followed by notation:
"Repeated Flights"



REPEATED FLIGHTS

1ST. FLIGHT				2ND. FLIGHT				3RD. FLIGHT			
Plane Nos.	Start	Times of End 1st Leg	Finish	Plane Nos.	Start	Times of End 1st Leg	Finish	Plane Nos.	Start	Times of End 1st Leg	Finish
41-S-1,2	0600	0740	0830	42-S-1,2	1030	1210	1300	41-S-1,2	1500	1640	1730
3,6	"	"	"	3,6	"	"	"	3,6	"	"	"
4,5	"	"	"	4,5	"	"	"	4,5	"	"	"
7,8	"	"	"	7,8	"	"	"	7,8	"	"	"
9,10	"	"	"	9,10	"	"	"	9,10	"	"	"
12,13	"	0735	"	12,13	"	1205	"	12,13	"	1635	"
11,14	"	"	"	11,14	"	"	"	11,14	"	"	"
15,16	"	"	"	15,16	"	"	"	15,16	"	"	"
17,18	"	"	"	17,18	"	"	"	17,18	"	"	"

EXAMPLE OF FLIMSY

of Repeated Airplane Flights where CV launches 3 succesive Scouting Groups.
(Note: Times are derived from Table on Page 14.)

IV. MASTER PLOT.

One end of the Game Room is screened off to form "Master Plot", headquarters for the Maneuver Staff. Players are requested not to enter this enclosure during progress of a Maneuver.

During chart maneuvers all flimsies, Records of Previous Moves, messages, etc., are sent to Master Plot by pneumatic tube. A maneuver telephone connecting players' rooms with Master Plot is available for communication.

Plotting.

The Plotter, a draftsman or technical assistant, transfers to the Master Plot the movements shown on all players' flimsies, and enters data as to course, speed, and times of positions. Flimsies are then filed.

After the movements of all vessels and aircraft have been plotted, the Plotting Officer notes carefully whether any contacts have occurred.

If none has occurred, he advances the clock dial to indicate the time of the end of the move, and calls for the following move. In advancing the game time, regard should be had for messages which probably will be sent and those which are awaiting delivery.

If contact has taken place, the Plotting Officer advances the clock to or beyond the time of the contact, announces the new game time over the loud speaker, and clears up the contact. He then advances the clock to clear up the next happening or group of happenings during the move, and so on until the game time of the end of the move is reached.

Contacts.

The information concerning contacts and action subsequently taken is conveyed to and from the players by means of Informa-

tion Blanks. Blanks are delivered to players in duplicate, with the information which the conditions of the contact require. Players decide upon proposed action, write synopses of action on the Information Blanks, and return one copy to Master Plot. If desired, players then change their own plotting sheets, and submit flimsies for a modified move.

In case contacts are important or complex, Liaison Officers consult the players of both sides in person or by telephone, in order to obtain clear pictures of the probable sequence of events.

Results of contacts are then decided, and the maneuver continues.

Termination of the Maneuver.

When contact becomes general, or when, in the opinion of the Director, all lessons to be derived from the maneuver are clearly demonstrated, the strategic chart maneuver terminates. It is not designed to demonstrate tactical situations.

V. THE RECORD.

Records kept by players.

The following records are kept by players:

(1) Orders, Plans, Doctrine, and special instructions, if issued;

(2) Track chart;

(3) File of messages sent;

(4) File of messages received;

(5) File of Records of Previous Moves;

(6) Fuel Account;

(7) File of Aircraft Flight Forms;

(8) Location of airplanes on board carriers;

(9) Copy of diagrams showing cruising and other dispositions, (page 10, subparagraph (f)).

Director's History:

The Recorder, under the Plotting Officer, prepares the History which includes:

(1) Length of each move and conditions during move;

(2) BLUE dispositions and movements;

(3) Opposing force's dispositions and movements;

(4) Contacts and their results;

(5) Damage;

(6) Comments by members of the Maneuver Staff.

In these notes, reference should be made to all salient features as they develop.

The History is divided into sections which should correspond to the periods covered by the plates (usually one 24-hour move). All contacts indicated on the plates should be identified in the History.

VI. DISCUSSION AND CRITIQUE.

As soon as practicable after the completion of the maneuver, a final meeting is held for discussion and critique. This should take place while the events are still fresh in the minds of the players, and before they have lost interest and have become occupied with other problems.

The discussion begins with comments on student solutions, followed by the history of the maneuver, in which the master plotting sheets are shown by means of slides.

During the showing of the slides, the Director points out the interesting features and situations, the merits and defects of decisions and movements of the opposing sides, and interesting strategic points which may have been demonstrated. After this comment, players and Maneuver Staff are given opportunity to make such comment as they may desire.

The Director should impress upon the players that the exercise is a maneuver conducted for the purpose of training in strat-

egy, order writing, and the exercise of command; and that it is not a game conducted for the purpose of seeing who wins or loses.

Naturally many questions will arise, on which there is a justifiable difference of opinion. The Director and Maneuver Staff should give their personal views upon such questions and call for the views of the players. The discussion, however, should not be allowed to stray from the point at issue.

CHAPTER II

THE BOARD MANEUVER

(A) - PURPOSE OF THE BOARD MANEUVER

Tactical problems for solution on the board are prepared with a definite motive. For each problem a different Commander-in-Chief is selected for each side from members of the class.

When the detail of players has been made, the Commander-in-Chief of each side assembles his subordinate commanders and indoctrinates them in the purpose of his plan and in the methods he has decided to use in its execution.

Observe the distinction between the problem and the maneuver. The stated problem sets forth the conditions of a situation requiring action. A study of the situation, and the incentive to change or maintain it, results in a decision and the directives for placing the latter in effect. As the maneuver proceeds, the static nature of the problem disappears, new situations develop, presenting their own problems and in turn requiring new estimates and decisions, although in all cases subsidiary to the decision of the problem.

The maneuver is continued until a point is reached where no further value is to be obtained. The game is then called. Commanders-in-Chief may then be required to submit a brief estimate of the situation existing at the end of the problem. At an early date, the Director presents a history and critique of the maneuver to the class, and calls upon the Commanders-in-Chief and Subordinate Commanders for such comment and explanation as they may wish to make. The one exception to the above procedure is in the case of so-called "quick decision" maneuvers which are limited and brief in scope, and hence the methods employed in the critique are expedited.

How Tactical Problems are Framed:

Tactical problems are framed to cover the tactical phases of naval warfare and are made up in a form similar to that used in framing strategic problems; that is, under the following subheads:

(a) Motives of Problem.

(b) Requirements.

(c) Special Conditions.

(d) The Situation.

Solution.

Tactical problems are also solved by means of an Estimate of the Situation leading to a Decision. The details of the directive are formulated and the directives are issued as plans and orders.

Motive.

The motive of the tactical maneuver is two-fold:-

1. To deduce, develop, and illustrate tactical principles.
2. To afford opportunity for the practical application of such principles.

For the detailed development of the Estimate - see "Sound Military Decision including the Estimate of the Situation and the Formulation of Directives".

(B) - MATERIAL OF THE BOARD MANEUVER

The following material is used in carrying on tactical exercises.

Implements.

1. Maneuver Board.
2. Chalk or crayon for plotting.
3. Model ships.
4. Strips for forming groups of ships.
5. Turning cards.
6. Torpedo Fire cards.

7. Protractors.
8. Range Wands.
9. Plotting table, drawing instruments.
10. Screens.
11. Ditto Machine.

Tables and Forms.

Forms used by players. (To be found in rack outside the game room).

1. Message blanks (S-5).
2. Aircraft flight forms (S-10).
3. Move and Gunfire Sheet (T-1).
4. Torpedo fire blanks (T-7).
5. Minelaying blanks (T-8).
6. Tactical plotting sheets.

Forms used by Staff.

1. Aircraft casualty form (T-16).
2. Air damage record (T-12).
3. Umpire's communication record (S-12)(blueprint).
4. Gunfire Penalty Tables (Tabulation for scoring gunfire).
5. Umpire's Damage Sheets (Forms T-6(a) etc.).
6. Umpire's Torpedo Fire Record (T-13).
7. Fire Distribution Sheet (T-2).
8. Ship Damage Table. (Card).
9. Information Blanks (Form T-10, Mods 1 and 2).
10. Damage Reports (Form T-11).
11. Ammunition Expenditure Tally Sheet. (Form T-15).

1. THE MANEUVER BOARDS

The boards represent the earth's surface, sea or land, depending upon the natural features of the area under consideration.

How divided.

The Maneuver Board is divided into large squares sixty inches on a side, and each large square is sub-divided into small squares six inches on a side.

The Junior Maneuver Board is divided by white lines into large squares forty inches on a side and into small squares four inches on a side.

The smaller squares on both boards are usually considered 1000 yards on a side.

How marked.

The boards will be lettered in the same manner as the Tactical Plotting Sheets. (Description of Plotting Sheet, page 35).

At times it is necessary to work with latitude and longitude on the board. When this is done it is customary to consider that 2000 yards in the north and south direction of the board are equal to 1 minute of latitude; the longitude parallels are then marked off in chalk, to represent a Mercator's projection.

Orientation.

Letters are placed on the balcony or margins of the board to indicate the true directions: North, South, East and West; these may be changed as necessary to suit particular problems.

Tracking.

The tracks of the forces moved on the board are indicated by chalk lines made by the players.

2. CHALK OR CRAYON

Colors.

The tracks of all surface forces are drawn in white chalk, of aircraft, when put on the board, in yellow chalk.

Character of lines.

Tracks of single ships are drawn in dotted lines; tracks of two or more ships in column are drawn in full lines.

3. THE MODEL SHIPS

How identified.

The hulls of the ships are painted red or blue to indicate the opposing forces.

In games between actual ships the numbers are the same as those given to the ships in the "BLUE, ORANGE, or RED Fleets".

Submarines (when placed on the board) will be indicated in such manner as the Director may prescribe.

The positions of aircraft are frequently shown on the board in accordance with the method designated by the Director.

How distinguish types.

The model ships, besides being painted in the two colors, blue and red, are for the game board, made in three sizes, large, intermediate and small.

The following table gives class designation of vessels and a short description of the models used on the Maneuver Board.

Class Designation	Size	Distinctive Features
BB	Large	1 Mast, 1 Stack
CC	do	1 Mast, 1 Stack White Stripe
CV	do	Flat Flight Deck
CA	Intermediate	1 Mast, 2 Stacks
CL	do	1 Mast, 4 Stacks
DL	Small	1 Mast, 2 Stacks
DD	do	1 Mast, 2 Stacks
DM	do	1 Mast, 2 Stacks
SS)) SM)		As indicated by the Director
Train	Intermediate	1 Stack

Other types as designated by the Director.

Each vessel on the maneuver board will be given a serial number corresponding to the number in the "Fleets". Destroyer divisions will be numbered according to fleet organization or as indicated in the statement of the problem.

The following table gives a short description of the models used on the Junior Maneuver Board.

Class Designation	Color of Sail
BB	Green
BM	As designated by Director
CC	Green and White
CA	White
CL	Yellow
CV	Brown
CM	As designated by Director
DL	No sail
DD	No sail
DM	No sail
SS)	
SM)	
PE)	
PC)	
PG)	
PS)	
PY)	
AD)	
AS)	
ASR)	
AV)	
AZ)	
AR)	As designated by Director
AF)	
AC)	
AO)	
AE)	
AK)	
AP)	
AH)	
AT)	
AM)	
AG)	
Y)	

Each vessel used on the maneuver board will be given a serial number corresponding to the number in the Fleets. Destroyer divisions will be numbered according to fleet organization or as indicated in the statement of the problem.

4. STRIPS FOR FORMING GROUPS

For convenience of handling in formation the model ships are so constructed that they may be attached to metal strips. These strips are so fitted as to permit the formation of a division, squadron, or fleet of any size at 300 or 600 yards distance.

The freedom of movement of these strips when joimed permits a close approximation to the tracks of the ships even when making large changes of course in column formation.

5. The TURNING CARD

Turning cards are used to determine the track of a ship during a move. They are constructed to the scale of the boards.

Speeds.

The straight edge of the card represents the distance that a ship would move on a straight course during three minutes at a speed of thirty knots. At speeds less than thirty knots the distance the ship would move is indicated by the figures along the edge.

Tactical diameter.

The circle drawn on the turning card represents the turning circle of the ship, assuming a tactical diameter of 1,000 yards.

The reduction of speed during the turn is allowed for on the card.

Tangent Lines.

The straight lines tangent to the turning circle represents the paths of a ship for changes of course of 15° - 30° - 45° - 60° - 75° - 90° - 105° - 120° - 135° - 150° - 165° - 180°.

Numbers.

The numbers along the tangent lines represent the position the ship would reach in three minutes at a speed in knots indicated by the figure.

Use of Card.

In using this card the straight edge is laid in the direction of the course at the beginning of the move with the point or origin coincident with the position of the ship at that time.

If a turn has been begun in the previous move and not completed the card is laid as if for beginning a turn from the original point and the position of the ship is determined by carrying it along from its last position in the turn.

6. TORPEDO FIRE CARDS

Torpedo fire cards are small blueprints bound in book form, each type of torpedo being plotted on a separate card with the exception of the variable speed torpedo which is plotted on three cards to cover its variations in speed and range. These cards include target speeds from six to thirty three knots and give effective range and sight angle at once.

7. PROTRACTORS

These are ordinary protractors of transparent celluloid.

There are special types to facilitate determination of target angle, roll, spray, pitch and yaw, in accordance with the Maneuver Rules.

8. RANGE WANDS

The Range Wands are flexible strips of wood. They are painted black and white in alternate sections.

At the middle of each section is painted, in the opposite color, a figure indicated the number of thousands of yards from the origin to the middle of the section.

How used.

These wands are used to determine the range by placing the zero end on the center of one ship and noting the section in which lies the ship whose range is being measured.

9. PLOTTING TABLE, DRAWING INSTRUMENTS, ETC.

Plotting table, drawing instruments, etc., are used for maintaining relative plot, solving mooring board problems, etc.

10. SCREENS.

(a) When the limit of vision of a vessel under the existing conditions (reduced day visibility, night, submarines submerged, smoke screen, distance from main action, etc) does not permit the vessel to see all other vessels in the maneuver, the player handling that vessel will be permitted to see only such portions of the board as is actually within the limits of vision of his ship.

(b) This will be accomplished by placing screens on the board to shut off his vision, or by placing him out of sight of the board and of any other player handling forces not in sight from his force, and having him make his moves on tactical plotting sheets.

(c) When a player thus separated from the board is moving his force on a plotting sheet, his moves are handled in the same way as in the chart maneuver, except that the Director may cause them to be transferred by the maneuver staff either to the maneuver board or to the Master Plot, or to both.

(d) Players thus separated from the board are given information in the same way as in the chart maneuver.

(e) The commander of a submarine will be permitted to see the board only when permitted by the Director.

(f) The commander of a group of aircraft will be permitted to see the board only when permitted by the Director. The Director will limit the length of observations by aircraft commanders.

11. DITTO MACHINE

A reproducing machine capable of clearly and rapidly reproducing dispatches in any required number.

12. FIRE EFFECT TABLES AND DIAGRAMS

"Fire Effect Tables" give the average, expected fire effect at various ranges for one gun of each type used afloat, and their rate of fire.

The "Fire Effect Diagrams" give the average, expected fire effect for full broadside of the main battery of specific types of ships against opposing, specific types, and the rate of fire of the guns.

Contents and use of "Tables and Diagrams" are described in a Foreword of each publication.

These publications are issued from the Archives.

13. GUNFIRE PENALTY TABLES

For use by gun scorers.

14. FLEETS

Copies of "Fleets"(Two publications) are issued to each student. They describe the material characteristics of BLUE combatant ships, and those for opponent's combatant ships from best information available or from estimates.

15. MESSAGE BLANKS (Form S-5)

The use of these is described in Section E of the Maneuver Rules.

16. AIRCRAFT FLIGHT FORMS (Form S-10)

The same aircraft Flight Form will be used as is employed in the Chart Maneuver.

17. UMPIRE'S COMMUNICATION RECORD (Form S-12)

Prepared by Communication Umpire and submitted to the Director at the close of the game.

18. MOVE AND GUNFIRE SHEETS (Form T-1)

This is a form on which a player indicates his intended

Fire Distribution and Move; from which the Move Umpire obtains data for the Fire Distribution Sheet (Form T-2); on which the Gunfire Recorder records the gunfire data determined on the board; and, finally, on which the Chief Scorer computes the fire effect.

19. FIRE DISTRIBUTION SHEET (Form T-2)

One sheet is used by each Move Umpire to record the fire distribution of the ships of the force for which he is umpiring, and to record changes in course and speed and the final speed of all ships. When all gunfire for the move is indicated on the sheet it is delivered to the Chief Scorer.

20. UMPIRE'S DAMAGE SHEETS (Form T-6a, etc.)

A specimen of these forms can be found in each game room Form Rack, or can be obtained from the Drafting Room.

21. TORPEDO FIRE BLANKS (Form T-7)

A specimen of these blanks can be found in each game room Form Rack. Their use is self-explanatory after reading Section "G", Maneuver Rules.

22. MINE LAYING BLANKS (Form T-8)

A specimen of these blanks can be found in each game room Form Rack. Their use is self-explanatory after reading Section "H", Maneuver Rules.

23. INFORMATION BLANKS (Form T-10, Mods. 1 and 2)

These forms on which the Director gives to the Commanders of submerged submarines the information they may obtain by exposure of periscopes; to aircraft commanders, and to the commanders of surface forces not in plain sight of each other by reason of distance, reduced visibility conditions, or night conditions, the information of what smoke or vessels they may see, of what they may hear.

24. DAMAGE REPORTS (Form T-11)

These reports indicate damage per move and are printed on

red or blue paper. Original and one copy are prepared by the assistants to the Chief Scorer. Original is delivered to the Director or Assistant Director for further delivery to the player concerned. Only the unit commander concerned is entitled to receive these reports. Duplicate is filed for record.

25. AIR DAMAGE RECORD (Form T-12)

An explanation of scoring damage inflicted by bombs is given in Section "J", Maneuver Rules.

26. AIRCRAFT CASUALTY FORM (T-16)

Used by assistant for Air to inform players of casualties suffered by Aircraft.

27. TACTICAL PLOTTING SHEETS

The Sheet is a square print and is divided into 100 blocks each block marked with a number at the center. (No. 00 in N.W. corner, No. 99 in S.E. corner).

Each Block is divided into 100 stations numbered in order above, but not marked.

The Stations usually represent the same area as is represented by the small squares on the maneuver-board; that is, 1000 yards square.

Where more than one sheet is required to cover the plot, individual sheets are identified by letter in accordance with the plan shown below.

The letter "M" is used to designate the sheet covering the primary or maneuver board area. Sheets covering adjacent areas are oriented and marked as indicated.

A	B	C	D	E
F	G	H	M	J
K	L	M	N	O
P	Q	R	S	T
U	V	W	X	Y

(C) - CONDUCT OF THE MANEUVER

I. THE MANEUVER STAFF

The assignment of Officers of the Staff and of Student Officers will be made under the direction of the Head of the Department of Operations.

The duty of the Maneuver Staff is to conduct the maneuver as expeditiously and with as little artificiality as possible.

The number of officers detailed to the Maneuver Staff will be governed by the forces involved in the problem and the number of officers available.

There is given below a list of officers of the Maneuver Staff normally required for the Board Maneuver.

1. The Director.
2. Assistant Director, BLUE.
3. Assistant Director, Opponents.
4. COMMUNICATION UMPIRE.
5. GUNNERY UMPIRE.
6. TORPEDO and MINE UMPIRE.
7. SUBMARINE UMPIRE.
8. AIR UMPIRE.
9. Plotting Officer.
10. Recorder.
11. MOVE Umpire, BLUE.
12. MOVE Umpire, Opponents.
13. Assistant COMMUNICATION Umpire, BLUE.
14. Assistant COMMUNICATION Umpire, Opponents.
15. Chief Scorer.
16. Five or more Gunfire and Damage Scorers, Aides to Chief Scorer.
17. Gunfire Recorders, BLUE and Opponents.
18. Such Aides to any of the Umpires as the requirements of the problem may demand.

Duties.

1. The Director is charged with the conduct of the maneuver, its history, critique, and record. He decides as to the length of the moves, weather and visibility conditions, etc. He, when necessary, makes decisions as to the application of the Maneuver Rules and clears up situations not covered by the Rules.

2. 3. The senior of the Assistant Directors is the Executive Officer of the Maneuver and coordinates its progress. In addition, each Assistant Director is in charge of the operations on the Maneuver Board for his respective side. They announce the length of moves, and weather and visibility conditions, keeping the Move and Weather Blackboards up-to-date. They call for the move blanks on their respective sides and, when all the blanks on both sides have been received and checked by the Move Umpires, direct that the moves be made on the Board. They require players to correct any discrepancies noted in their moves and gun-firing in regard to the capabilities of the ships concerned. They check the correctness of the laying and moving of smoke screens. If they permit players to modify a move already made, they notify the Plotting Officer.

They will supply the Recorder with notes and comments concerning the operation of their respective sides, for the History.

4. The COMMUNICATION Umpire is responsible for all communication between players being in accordance with Section E of the Maneuver Rules and will exercise supervision over the communication systems. The Assistant COMMUNICATION Umpires, BLUE and Opponents, are his Aides. (Their duties are described on page 40.) He will familiarize himself with the communication plans in use and will insure that despatches are transmitted in accordance therewith. He will keep informed of damage to ships and other circumstances affecting communications, will see that the Rules

covering these are properly applied, and will charge appropriate delays in Communication for special conditions not covered by the Rules.

5. The GUNNERY Umpire is responsible for the measurement and recording of gunfire. After a move has been made on the board he will announce the gunfire, measure ranges and target angles, decide whether end-on or broadside fire, determine penalties due to smoke, gas, sun glare, roll, pitch, yaw, masked fire, battery interference,etc. The Gunfire Recorder for each side will record the data on the gunfire sheet for the information of the Gunfire Scorers and will deliver them to the Chief Scorer.

6. The TORPEDO and MINE Umpire is responsible for the conduct of Torpedo fire according to the Rules. He will see that all torpedoes are properly plotted on the Master Plot, and will clear up all torpedo situations shown thereon. He will decide torpedo hits by surface, submarine and aircraft. He will inform endangered ships as necessary. He will decide damage due to Depth Charges and ramming. He will require players handling torpedo craft to keep a record of torpedoes and depth charges expended and on hand. He will inform the Chief Scorer of damage inflicted on vessels by torpedoes, mines, depth charges or ramming.

He is responsible for the conduct of mining operations according to the Rules. He will see that all minefields are properly plotted on the Master Plot, and will clear up all mine situations shown thereon. He will decide all mine hits according to the Rules. He will require all players handling mines to keep a record of mines expended and on hand. He will inform the Chief Scorer of damage inflicted on vessels by mines. He will keep the Director informed of the Torpedo and Mine situation. He will supply the Recorder notes and comments concerning torpe-

does and mines, for the History.

7. The SUBMARINE Umpire is responsible for the handling of submarines by players according to the Rules. He will keep a check-off list of submarines moves. He will see that submarine moves are plotted on the Master Plot and will clear up all submarine contacts. He will keep in constant touch with the Master Plot and give submarine commanders such information as they are entitled to under the Rules. He will decide when and by whom periscopes are sighted, and what results are obtained by listening equipment. He will keep the Director informed of the submarine situation. He will require Submarine Commanders to keep a record of battery life expended and remaining. He will supply the Recorder with notes and comments concerning submarine operations, for the History.

8. The AIR Umpire is responsible for the conduct of aircraft in accordance with the Rules. He will see that the moves of aircraft, aircraft carriers and other vessels flying planes on or off are plotted on the Master Plot. He will receive the Aircraft Flight Form from Aircraft Commanders and will keep and record plane service and operational and other losses. He will decide results of aerial engagements and clear up aerial contacts according to the Rules. He will decide the damage inflicted by aerial bombs and torpedoes and will inform the Chief Scorer of results. He will keep the GUNNERY Umpire informed as to the locations and capabilities of Spotting Planes. He will keep the Director informed as to the Air Situation. He is responsible for that part of the History which concerns aircraft operations.

9. The Plotting Officer is responsible for the proper plotting of moves of all Forces on the Master Plot. He will inform the Director, SUBMARINE and AIR Umpire of contacts between forces not on the maneuver board. He will notify the Director when each move has been cleared up. He will, under the Director, supervise

the preparation of blueprints and slides for use in the critique.

10. The Recorder will keep a record of the maneuver and to this end will keep himself informed of situations on the Maneuver Board and on Master Plot. He will obtain from the Assistant Directors and the various umpires such notes and comment as they desire to be included in the History. In order to facilitate the preparation of the Critique he will divide the History into periods which correspond with those to be covered by the slides.

11 and 12. The MOVE Umpires are aides to the Assistant Directors. They will receive forms from all players whose forces are being moved on the board.

Each MOVE Umpire will keep a check-off list of moves of all forces on his side. He will carefully scrutinize the forms submitted and check moves against capabilities of vessels as effected by the weather, their present condition and their formation, and will inform the assistant director of his side of any discrepancies noted.

After fire is commenced by either force he will fill out Form T-2 showing the fire distribution, any change of course, any change of speed, and final average speed of all units on his side and will then send this form to the Chief Scorer, and the Move and Gunfire forms to the Gunfire Recorder.

The Move Umpire for each side will report to the Assistant Director when all moves for his side have been turned in and checked.

At the end of the game he will deliver his file of forms to the Recorder.

13 and 14. The Assistant COMMUNICATION Umpires, one for each side, are responsible for the communications of their respective sides. They:

(a) Receive the message forms from the players and using the Rules of Section E and the example on page e-6, check them for errors in filling out.

(b) For radio, determine from the Communication Plan which

addressees could be reached on the circuit indicated, and which require relays. For visual, determine whether the positions of the addressees on the Board require relays.

(c) Note whether time of preparation (Rule E-3) has been taken into account by the player when it is known that his message is in response to a message or information slip.

(d) From the values in parts II to V of Table E-4, fill in on the message form the charges for coding, etc.

(e) From these compute the game times of delivery, taking into account necessary relays.

(f) Record each message on the Communication Record Form (S-12), using the "call and heading" and "text" times, to determine the transmission period the circuit would be in use.

(g) Note from Form S-12 whether the circuit is already in use and, if visual, note from Table E-2 how many circuits can be used simultaneously. Then, if appropriate, delay the transmission period and time of delivery of later messages, having regard to their order of precedence (Rule E-5).

(h) Have the orderlies prepare the requisite number of copies (including one for Master Plot) and deliver them to the addressees via pneumatic tube when the game time reaches the determined time of delivery.

(i) Keep informed from Master Plot or the Board of the position of forces so that transmission distances may be checked, apply Rule E-19 and assist the Director and Communication Umpire to apply RulesE-12 and E-13.

(j) Delay the delivery of messages to submerged submarines to conform to their radio listening periods.

(k) In cooperation with the Assistant COMMUNICATION Umpire of the other side, decide and apply the effect of jamming plans if they are placed in effect.

(l) At the close of the game turn over message files and Com-

munication Record to the Recorder.

15. The Chief Scorer has supervision over gunfire scoring, the expenditure of ammunition, and recording and reporting of damage and ammunition expenditure. He sends damage and ammunition reports to the Director (or Assistant Director, as instructed), and informs the Communication Umpire of damage to ships when it reaches 30% or above.

16. The Gunfire and Damage Scorers are Aides to the Chief Scorer. They compute damage inflicted by gunfire, record damage sustained and keep a record of ammunition expenditure.

General. All members of the Maneuver Staff must work together in close coordination. This is especially true of the MOVE, COMMUNICATION and GUNNERY Umpires. The free interchange of information between these three is vital to the success of the maneuver.

Umpires will refrain from rendering decisions outside of their own particular jurisdictions.

II. THE BOARD MANEUVER

The Approach.

The board maneuver usually begins with the opposing forces sufficiently far apart to permit of maneuvering for advantageous positions, thus affording practical experience with different methods of approach.

Length of Move.

The length of move is at the discretion of the Director. It will be three minutes unless announced otherwise. Aircraft moves will be designated by letter instead of number, and may be of a different length than the surface vessel moves.

Routine of a "Move" on the Maneuver Board.

(1) The Director or Assistant Director, after announcing the length of the Move, calls: "Hand in Move No.--".

(2) Each officer commanding a force at once submits to the appropriate Umpire:

(a) Move and Gunfire Sheet (T-1), showing exactly what movement his vessels will make during the impending move, and what gunfire, if any, they will deliver. If firing both main and secondary batteries he uses an additional form for the secondary battery, filling out only those columns marked on the top with an asterisk.

(b) Message blanks showing any communications to be started from his ships during the impending move.

(c) Torpedo fire blanks, Mine laying blanks, or other appropriate forms covering any other action to be taken during the impending move.

The forms thus submitted must be complete and definite, and not dependent upon what any other force may do.

Copies of all forms submitted are retained, except that in the case of the message form, a file copy is obtained by the player including himself as an "information addressee".

(3) When all players have turned in their moves, and the forms submitted have been checked, the MOVE Umpires inform the Assistant Directors and the COMMUNICATION Umpire, respectively, that they are ready to make the move.* Ships on the board will not be moved until the Director orders the move to be made.

(4) A move which has been turned in may not be altered, without the approval of the Assistant Director, but vessels must in any case move for at least one minute in accordance with the move handed in.

(5) After receiving the "Ready" reports from the Assistant COMMUNICATION Umpires and MOVE Umpires, the Assistant Director announces: "Make Move No. ---", whereupon each mover moves his unit strictly in accordance with the data on the Move and Gunfire Sheet. On the announcement "Make Move No. ---" the Game Time at once advances to that of the end of the Move.

(6) Should a new move be ordered before damage has been determined the Director will determine when to apply the effects of damage as to sinking or losing speed.

(7) (a) Tracks made on the board by vessels proceeding on the surface will be plotted in white chalk.

(b) The tracks of a single vessel will be plotted as a broken line. If more than one vessel proceeds on the same track, it will be plotted as a full line.

(c) End of move positions will be indicated by numerals in white chalk corresponding to the number of the move.

(8) Aircraft and submarine moves are called for separately and are usually at least one-half hour in length. For each aircraft move, all flights must be specified on the Aircraft Flight Form (S-10). If aircraft are to be moved on the Board they will be represented in a manner determined by the Director and their

* If a move blank or other forms turned in call for a ship's doing more than she can actually do under this rule and the conditions then existing the Move Umpire will return the form to the player for correction.

tracks will be indicated by yellow lines.

Close of the Maneuver.

The maneuver is closed when, in the opinion of the Director, the tactics to be demonstrated by it have been developed.

Critique and History of the Maneuver.

At the close of the Maneuver the Director may call upon the respective Commanders-in-Chief for a written Estimate of the Situation together with any comment they may wish to make. Other unit commanders may also be called upon for similar Estimates and comment. At a subsequent convenient time the players will be assembled and the Director will deliver a History and Critique of the Maneuver. At appropriate times during the Critique, players will be given opportunity to ask questions and submit observations pertinent to the maneuver. Free discussions of matters pertinent to the maneuver are encouraged.

III. THE RECORD

The Record of the maneuver will contain the following:

(1) Statement of Problem.

(2) History of Maneuver.

(3) Critique of the Maneuver with prints of the whole and particularly significant parts.

For use in preparing this record all messages, Move and Gunfire Sheets, Damage Records and Reports, Torpedo fire blanks, Mine laying blanks, Aircraft Flight Forms, etc., are preserved and turned in to the Recorder at the close of the maneuver.

(D) - THE REQUIREMENTS AND METHODS OF SCORING THE EFFECT OF GUNFIRE

Requirements

A satisfactory method of scoring gunfire in maneuver board exercises must

(1) take into consideration all the factors and conditions affecting gunfire;

(2) give a rate of hitting which will be reasonably correct under the conditions existing at the moment;

(3) evaluate with reasonable correctness the effect of damage to the target as a result of the hits made;

(4) be simple and expeditious.

Methods available

The three general methods which may be used to evaluate either the number of hits considered to be made in a given time under the existing conditions, or the damaging effect upon the target of such hits, are

(1) by arbitrary decision of the Director;

(2) by chance;

(3) by the rule of invariable average.

Arbitrary decision.

In order for an arbitrary decision to be valuable as tending to a correct interpretation of a tactical situation, it must be based upon a sound knowledge of the qualities and capabilities of the forces concerned, and a sound estimate of the effect of the conditions actually existing. That is, it must be a mental application of the chances and rules that would govern a more formal and accurate investigation.

Such an arbitrary decision is frequently necessary to avoid excessive delay in settling a minor tactical situation, but is manifestly not suitable for an accurate decision on the results of the gunfire which is the principal factor in a battle.

Chance.

In actual battle, the factor of chance plays a considerable part. Of two salvos, exactly similar except with regard to the accidental distribution of splashes within the salvo limits, one may make several hits and the other none. Of two salvos which make the same number of hits on the target ship, one may do only superficial damage, due to location of hits, while shots of the other salvo may happen to hit such vital parts as engines, boilers, or magazines, and put the ship out of action.

It is possible, by dice or other means, to leave to chance the number of hits made in a given time, and the effect of such hits. This method has been used.

If the chance factor is properly applied in accordance with an accurate study of the existing conditions, the results might be those which, in one instance, obtain in battle. Further, if each tactical problem be repeated a sufficient number of times, using the chance method of scoring, we may correctly deduce, for the given situation, what the probability is that a particular side will win.

The principal objection to the chance method is that time is not available to re-play each tactical problem a number of times, and in any one playing this method may lead to false conclusions as to the relative strength of forces or the relative merits of different formations and maneuvers.

Invariable average.

The principal purpose of the maneuver board is to develop our tactical knowledge and skill by showing the relative advantage of one force, position, formation, or maneuver over another. For this purpose, it is considered desirable that for any given situation, the results shown on the maneuver board be invariably those which it is believed will, on the average, obtain in actual battle. This rule of applying the invariable average has been followed in the tactical maneuver since 1916.

Gunfire is reckoned according to rules contained in the War College Publication, Maneuver Rules; the effect of gunfire being taken from the Fire Effect Tables or Fire Effect Diagrams.

Fire Effect

For full information reference may be made to the pamphlet "Construction of Fire Effect Tables", which is a confidential publication obtainable from the War College Archives, and to the Fire Effect Tables and Diagrams themselves.

Damage

Damage to ships is classed as (1) above-water damage due to gunfire or bombs, and (2) under-water damage, due to torpedoes, mines, depth charges, bombs or ramming. Above-water damage and under-water damage differ in effect. (C-24, 25; F-23; G-217, 218; J-17, 18, 19). (Maneuver Rules).

Lives of ships and absolute amounts of damage are expressed numerically, using as a unit of value of a 14" penetrative hit. (F-23(a)(3), Maneuver Rules).

In notifying and in assessing the effect of damage, damage received will be expressed in percent of original life. If this percent is not an even multiple of ten, it will be reported as the next lower percent which is an even multiple. That is 0% to 9% is taken as 0%; 10% to 19% as 10%; etc.

As soon as damage is determined, each commander will be notified of the state of damage of the vessels under his immediate personal command.

A commander can ascertain the damage of ships of his own side not under his immediate personal command only by means of signal or despatch to the commander of each ship.

The state of damage of ships of one side may be made known to players of the other side, in accordance with decisions of the Director.

All damage received during a three minute move becomes effective at the end of the move in which received.

(E) - TORPEDO FIRING

Theory and rules.

The theory of the fire of torpedoes and a complete explanation of the method of firing are covered by "Manual of Torpedo Fire" (Confidential).

The rules are given in full in Section "G" of "Maneuver Rules".

Torpedo Fire Cards.

The torpedo fire cards are used in connection with the maneuver board.

Instructions for the use of the cards are found on the cards themselves, while a sketch attached to the inside of the front cover assists in interpretation.

Dispersion.

Salvo firing, or multiple launch, permits covering variations in the course and speed of the target by introducing dispersion or spread. This dispersion is horizontal and is expressed as the angle between the paths of the two exterior torpedoes of a salvo. It is, in fact, the difference in offset between these two torpedoes, although in actual practice dispersion may exist even when all shots are fired with the same offset.

For efficient salvo firing it is just as necessary to prescribe the courses of the torpedoes as in the single launch.

The dispersion purposely introduced in the multiple launch is used, in firing at a single ship, to cover errors in the estimate of the course and speed of the target; in firing against formations, to cover more than one ship of the formation.

Scoring.

The plotting of torpedoes fired and the determination of hits will be in accordance with MANEUVER RULES, Section "G".

(F) - MINES

Mining operations are governed by the provisions of standard publications. The Rules governing their use on the Maneuver Board are covered by Section H, "Maneuver Rules".

(G) - SUBMARINES

The officer detailed to the command of submarines is assigned a separate room and is not permitted to see the Maneuver Board or Master Plot, except as authorized by the Director.

In moving and operating the submarines as sub-surface vessels, the officer commanding them is governed by the Rules in Section "I", Maneuver Rules. When operating them as surface craft, he is governed by the same rules as for other surface vessels, except that he still remains in his room with his plotting sheet and continues to submit "flimsies" instead of Move and Gunfire Sheets (T-1).

When the submarine wishes to periscope or come to the surface, the same is indicated on the "flimsy" and the Assistant Director for SUBMARINES furnishes the information that would have been obtained under actual conditions. (Maneuver Rules, Section "D").

Officers detailed to the command of submarines will study carefully the "I" Rules as well as the "C" and "D" Rules bearing on the employment of submarines. They will also familiarize themselves with the Department publications on the subject.

(H) - AIRCRAFT

The rules for the conduct of Aircraft are given in Section "J" of the Maneuver Rules.

The air commander is assigned a separate room and is not permitted to see the Maneuver Board or Master Plot, except as authorized by the Director under special circumstances.

He will familiarize himself with the proper method of making "flimsies" as shown on pages 13, 14, 15 and 17 of this pamphlet.

Officers detailed to the command of air forces will study carefully the "D" Rules as well as the "J" Rules bearing on the employment of aircraft. They will also familiarize themselves with the Department publications on the subject.

(I) - BOMBS

The subject of bombing operations and the method of determining damage from bombs is covered in Section "J", Maneuver Rules.

(J) - COMMUNICATIONS

All students will familiarize themselves with the Department publications on this subject, the "E" Section of the Maneuver Rules, pages 37 and 40 of this pamphlet and Form S-5 (Message blank).

With three-minute moves, all communications to be started during a move must be submitted when the move is turned in. After a three-minute move has been made, no additional communications for that move will be received except those specifically permitted by the COMMUNICATION Umpire as being based on unforeseen developments during the move.

With other than three-minute moves, players will be permitted to submit messages at such game times as the COMMUNICATION Umpire shall decide.