

CHAPTER 5

CONVOY COMMUNICATIONS

Although now generally accepted, convoys were once the subject of bitter but sincere arguments by professional seamen, many of whom felt that concentrating the targets in one area merely made it easier for the enemy. Statistics prove the worth of the convoy system of ocean transit and, in the event of future wars, resort to their use again, although probably modified somewhat because of nuclear warfare capabilities, seems inevitable.

When many ships steam in company, the communication problems are difficult. In a convoy the predicament is even more extreme because merchant vessels as well as naval vessels are involved. One must remember that the naval officer spends most of his years at sea steaming in company with other ships, whereas the merchant marine officer, during peacetime, is steaming independently almost constantly. Communications are further complicated by the language barrier. Convoys usually are made up of ships of many nations, traveling in company for mutual safety but manned by people who speak in different tongues. To be able to solve the problems, one must first understand the basic characteristics of convoys. Let us start by discussing the peacetime merchant ship communication systems.

PEACETIME MERCHANT SHIP COMMUNICATIONS

The naval communication network is vast, complicated, and expensive. No privately owned shipping company could afford to support such a network or, for that matter, have need for such extensive facilities. Yet, the need for rapid communications between masters and shipowners is apparent. In the same way that corporations and individuals ashore obtain access to rapid communication facilities by subscribing to commercial telegraph and telephone companies, so the merchant shipping companies contract with radio service companies. There are a number of such companies, but the majority of U.S. flag vessels subscribe to one of

four. They are RCA Communications, Inc. (RCA), a subsidiary of Radio Corporation of America; Mackay Radio and Telegraph Company (MRT); Globe Wireless; and Tropical Radio Telegraph Company (TRT).

The four radio service companies have shore stations located throughout the areas of the world served by them. They have contracts with other radio companies in foreign lands, enabling a merchant ship to remain in communication with its company office. As a ship steams about the oceans, it always has available—depending on atmospheric conditions—a shore-based communication facility to which its messages may be sent. Once a message is received ashore, it is retransmitted through the radios and landlines of the radio service company and its affiliates until it reaches its ultimate destination. Messages to the ship are handled in much the same way.

Communication procedures practiced by merchant ships, regardless of nationality, are comparatively similar to U.S. Navy procedure but less formal, chiefly because of language differences. Operating (Q) signals have extensive application in merchant ship communications. The Q signals are international in the sense that they have the same meaning in any language, enabling radio operators of different nationalities to talk among themselves. (ACP 131 contains both operating Z signals (already discussed) and appropriate Q signals.) Normally, the receipt method of communicating is used, both transmitting and receiving stations being required to use their transmitters. Such a system obviously is reliable, but is unsafe in wartime.

CONVOY PERSONNEL ORGANIZATION

Like any operating force, a convoy must have some sort of organization. From the standpoint of the communication officer, the primary interest is in the personnel organization.

**OFFICER IN TACTICAL
COMMAND (OTC)**

The officer in tactical command of the convoy, who also is the escort force commander, is responsible for the safe and timely arrival of the convoy at its destination. His responsibilities include defense of the convoy, stationing of escorts, employment of aircraft escorts, ordering courses and evasive steering, ordering the convoy commodore to execute emergency turns, liaison with the convoy commodore regarding safety of navigation, and establishment and control of an effective communication plan.

CONVOY COMMODORE

The convoy commodore usually is a naval officer preselected and assigned to the position. If a suitable officer is unavailable, a commodore is selected from among the masters of the ships constituting the convoy. He is designated to command the ships within the convoy subject to the orders of the OTC. The commodore is responsible for the internal arrangements of the convoy, tactical control subject to orders from the OTC, assignment of stations and station keeping, issuing instructions regarding safe navigation (usually in conjunction with the OTC), readiness for action, and conduct of action by the convoy. In the absence of an escort, he is in complete command.

Masters of merchant ships are notoriously independent individuals who, at best, tolerate the restrictions imposed upon them by the rules of the convoy. They have spent most of their lives at sea steaming independently and usually are not expert at station keeping. Many masters take a critical view of young naval officers coming alongside and issuing terse orders for them to "Stop making smoke" or "Douse those lights." Thus, the convoy commodore enters the scene.

During World War II commodores usually were retired Navy captains, recalled to active duty and assigned to permanent duty as commodores of convoys. Their ages and years of experience as sailormen, together with the natural brotherhood of all who make the sea a profession, particularly suited them for command of a convoy. The convoy commodore passes many orders to the various masters from the escort force commander. As naval officers, the commodores more readily accepted the

logic of the escort force commander being in tactical command, although possibly junior in rank.

The convoy commodore may be assisted by a vice commodore and rear commodore, each of whom would assume the duties and responsibilities of the commodore in the event of his removal from the scene. If the convoy consists of more than one section, the vice commodore and rear commodore usually are ordered to command those sections.

When vice commodores or rear commodores are not designated previously, the convoy commodore appoints special commodores, as necessary, to head leaver sections of the convoy; their duties commence when their sections break off from the main convoy.

MASTERS

The escort force commander is designated OTC of the convoy. Masters are obligated, therefore, to obey his commands as well as those of the convoy commodore. A master, notwithstanding, always retains primary responsibility for the safe navigation of his ship, including the ship in which the commodore may be flying his pennant.

In general, commodores and escort force commanders are not answerable for the action or inaction of individual ships, even though they may be responding to a signal ordered by either the commodore or the OTC. Escorting ships and convoy formations are designed to provide military security and defense against enemy attack, but none of these measures relieves the master from responsibility for his ship.

Under the International Rules of Warfare, a distinction is made between a merchant ship and a warship. The latter is designed to seek out the enemy and destroy him in the Nelsonian tradition. A merchant ship may not attack aggressively. She may, however, exercise her right of self-protection by defending herself. In the event of attack by enemy forces, the decision to resist lies with the master. His decision to resist carries with it responsibility for the consequences of his action. The master is not permitted to ignore the safety of the passengers or crew when escape has been prevented or resistance overcome.

RADIO OFFICER

Each merchant ship carries at least one radio officer. Large passenger liners have

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many more. If there is only one, he holds an officer's rank and prerogatives but does not have executive authority. When more than one is aboard, the senior radio officer has executive authority over the junior radio officers. The radio officer is responsible to the master and receives his orders from him or his designated subordinates, such as the first mate and the watch officer.

To qualify for his position, a radio officer must have attended radio school and must have a second class radiotelegraph license. Where radiotelephone equipment is installed, he also must hold a second class radiotelephone ticket. These licenses are issued by the Federal Communications Commission after successful completion of a comprehensive examination. During peacetime, the operator is required by law to display his licenses in the radio room.

No watches are stood in port during peacetime. Harbor regulations in some ports require that antennas be disconnected or that some other means be used to prevent transmissions. During wartime the standing of radio watches is governed by orders issued by the local naval authority.

Agreements between shipping companies and unions require a radio officer to stand watch no more than 8 hours a day. When only one operator is aboard, it is obvious that continuous watches cannot be maintained. The master may designate the hours of the watch, but he usually defers to the radio officer's greater knowledge, letting him set his own working periods. Working schedules vary, depending somewhat on the location of the ship. The radio officer adjusts his routine to allow transmission of messages during that period of the day when atmospheric conditions are most favorable, yet not prevent him from carrying out his other routine duties, such as taking radio bearings or time ticks.

NAVAL COMMUNICATION LIAISON OFFICER

U.S. convoy ships may have a U.S. naval communication liaison officer (NCLO) assigned. His duties include the efficient conduct of all communications and supervision of all communication personnel. In detailed terms, the NCLO is responsible for—

1. Setting communication and radar watches.
2. Efficient performance of the personnel on watch.

3. Proper logkeeping.
4. Preserving radio silence.
5. Aiding the master in drafting messages that must go by Navy channels.
6. Supervising the delivery of incoming messages.
7. Attending presailing convoy and communication conferences.
8. Preventing unauthorized persons from entering the radio rooms.
9. Making nonapproved private broadcast receivers inoperative at sea.
10. Supervising the upkeep of visual signaling gear (but not the radio equipment, which is maintained by the ship's radio operator).
11. Arranging for the emergency disposal of classified matter.
12. Assuring that identification signals are available on the bridge (if the ship is sailing independently).
13. Seeing that the radio room receives the information and publications necessary for its efficient operation.

14. Assuring that communication and radar personnel are familiar with pertinent publications; that they know the communication plan, distress procedure, the often-used call signs, and appropriate MERCAST information; and that they follow security measures.

In the execution of his duties, the NCLO should display a spirit of courtesy and cooperation with the merchant marine officers, and do everything he can to promote harmony between the Navy and maritime personnel. In supervising radio watches, the NCLO should see that there is no discrimination against either merchant radio officers or Navy radiomen.

Certain merchant vessels have radar equipment for use in navigation. The master of the vessel, in consultation with the NCLO, decides when the equipment should be used. The supervision and security of the radar equipment are the direct responsibility of the NCLO. Radarmen are a part of the Naval communication liaison unit. Security arrangements must be made for the gear, and unauthorized persons are not permitted access to radar equipment either at sea or in port. Detailed instructions and information are promulgated to NCLOs and masters by the Chief of Naval Operations.

Relations With Master

The NCLO is directly responsible to the master of a merchant ship for the performance

of his communication duties. He may have other tasks assigned by the Navy, but none of the collateral duties may be construed as giving the NCLO the right to disregard the ultimate authority of the master.

In accordance with law, the master of a merchant ship commands the vessel, is charged with her safe navigation, and is responsible for everything connected with the operation of his ship, except for certain functions of the armed guard commander.

The Navy holds the master accountable for violation of merchant ship communication instructions; he is required to make all such instructions available to the NCLO.

The NCLO is required to call the master's attention to any breach of wartime instructions for merchant ships or other official instructions concerning the security of the ship. If the master decides to disregard the advice of the NCLO, the latter's responsibility in the matter is ended, unless the problem is of sufficient importance to warrant mention of it in the NCLO's voyage communication report. In this respect corrective action is taken by the Naval port control officer.

The liaison officer is responsible for procuring VHF radio equipment and for providing the master with a list of other needed items before the ship reaches port.

Relations With Armed Guard Commander

The armed guard commander is responsible to the escort force commander for the administration and discipline of naval personnel permanently assigned to the ship. The NCLO, although subject to the military administration of the armed guard commander, is responsible for effective operational communications.

Unless a state of emergency exists at sea, communication personnel are assigned only to communication duties. In planning personnel requirements for gun stations, the armed guard commander consults the NCLO. The NCLO makes provision for emergency communication stations on the bridge and in the radio room, and designates the remainder of the communication personnel as available for gun stations. It is well for all communication personnel to be trained for gunnery duty in emergencies.

The NCLO provides the armed guard commander with copies of incoming messages that concern the safety and defense of the ship.

In port, the armed guard commander sets the security watches, and the NCLO sets required communication watches. Security watches must not interfere with the signal and radio watches. Communication and radar personnel are not assigned gunnery duties while in port. After consultation with the NCLO, the armed guard commander arranges leave and liberty for communication and radar personnel.

Relations With Commodore's NCLO

When an NCLO is attached to the staff of the convoy commodore, each convoy NCLO is responsible for his performance of communication duties to the staff NCLO as well as to individual masters. Should there be no staff NCLO, the liaison officer of the flagship acts in that capacity.

Administration

Naval personnel are quartered in their own spaces aboard a merchant ship. They are provided with their own mess and are fed from merchant ship stores provided by the steward's department; the Navy is billed for the food. The NCLO is a member of the wardroom mess and is provided with a cabin in officers' country. Just as aboard Navy ships, he pays a monthly mess bill.

It is vital that the NCLO develop a cordial working relationship with the officers of the ship. Mutual understanding and cooperation make everyone's job easier. The ship's officers will give the NCLO a helping hand when he needs it, and look to him for advice on naval matters.

For certain invasion and support-invasion movements, specially trained communication teams, known as XAK and XAP teams, are assigned to some merchant ships. In communication matters, the NCLO is subject to the authority of the officer in charge of the team.

The NCLO has responsibility over the advancement in rating of quartermasters, signalmen, radiomen, and radarmen. The armed guard officer handles advancements within the gun crew.

MERCHANT SHIPPING CONTROL

In time of war or national emergency, effective control of merchant shipping assumes paramount importance. Indiscriminate sailing of merchant ships presents the enemy with an

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enormous number of ill-protected targets. The demands of military authority on the use of the available ships override their purely economic use.

A future war might develop with such rapidity that many U.S. merchant ships would be at sea. Such shipping would require protection, and at the same time should be available to naval commanders for implementing evacuation and emergency plans.

Should it become necessary, the Chief of Naval Operations, using every available communication system, will broadcast in the clear an emergency message directing masters of U.S. merchant ships to (1) proceed in accordance with instructions included in the message, or (2) proceed to the nearest U.S. or friendly port along their projected route, and (3) place in effect wartime procedures affecting the safety of their ships. At the various ports the masters will report to the appropriate shipping control authorities for further instructions.

U.S. NAVAL CONTROL OF SHIPPING ORGANIZATION

Worldwide direction of naval control of shipping is exercised as the result of agreements between the Allied Governments. The present U.S. Naval Control of Shipping Organization (NCSORG) was established, under the Chief of Naval Operations, shortly after the outbreak of the Korean conflict.

The mission of the NCSORG is to provide for the safety of movement of merchant ships in time of war or national emergency. In peacetime, it prepares to execute that mission. The operational control and protection of merchant shipping are delegated to certain naval theater and area commanders, who are designated as operational control authorities (OCAs). The in-port phases of shipping control are administered by naval control of shipping officers (NCSOs), reporting officers (REPTOFs), consular shipping advisers (CONSAs), and naval control of shipping liaison officers (NCSLOs). Their official titles in the NCSORG are determined by their geographical locations, e.g., NCSO San Francisco or REPTOF Hong Kong. These officers are responsible to their OCAs through the normal chain of command.

An OCA has many responsibilities, among which are—

1. Maintaining a system of communications, intelligence, and plotting to ensure

adequate dissemination of antisubmarine information.

2. Coordinating all convoy schedules for his area.

3. Coordinating shipping movements with OCAs of adjacent areas.

4. Ensuring that ships are sailed in accordance with instructions of the theater commander.

5. Diverting shipping.

6. Designating routes, breakoff positions, joiner positions, and rendezvous positions for convoys sailing from ports in their area.

7. Maintaining operational control over shipping control authorities at ports and bases within their area.

8. Reporting reductions in capacity of ports within their area to the theater commander.

Naval Control of Shipping Officer

It can be seen that the OCA is an area authority concerned with problems of great scope. The merchant ship masters and officers attached to escort vessels, however, are concerned most with the NCSO, who administers the NCSORG for the particular port to which he is assigned. When under naval control, a merchant ship master normally receives his orders from the NCSO at the port from which he is sailing, and reports to the NCSO at his destination promptly upon arrival.

In general, the NCSORG staff is made up of personnel of various Allied Nations, the NCSO himself being senior and normally of the nationality of the country in which the port is located. Under the supervision of his OCA, the NCSO discharges the following duties:

1. Organizes and routes ocean and coastal convoys leaving his port.

2. Routes merchant ships sailing independently.

3. When ordered, routes warships and task forces.

4. Instructs and briefs convoy commodores, their staffs, and masters of independents.

5. Convenes convoy conferences.

6. Issues charts and publications needed for convoys.

7. Reports arrivals and departures.

8. Reports overdue shipping.

9. Maintains shipping plots and convoy records.

10. Prepares convoy communication plans in cooperation with the escort force commander and convoy commodore.

11. Instructs convoy communication personnel and ensures that equipment is in good order.

By means of direct inspections and personal interviews, the NCSO familiarizes himself with the various ships to be convoyed, their destinations, and cargoes. He then decides which ships should proceed in a particular convoy, assigns the flagship for the convoy commodore, and prepares sailing orders.

The basic responsibility of the NCSO is to organize and route both transocean and coastal convoys. Included in organizing and routing are dissemination of the actual routes to be followed and the details of departure, rendezvous, and convoy breakoff into leaver sections. Strict attention to considerable detailed work is required to perform his basic task. Particulars are worked out in the convoy conference held immediately before departure of the ships. The NCSO makes all the necessary arrangements for this conference. It is his duty to conduct the agenda so that there is a free interchange of information and ideas between the commodore and his staff, the OTC and his individual commanding officers, masters of the merchant ships, and the NCSO himself.

Reporting Officers

Other in-port administrators (REPTOFs, for instance) primarily are reporting links assigned to small ports in the NCSORG. They are either appointed officers or designated agents performing, on a smaller scale, the functions of an NCSO. Ships sailing to small ports usually are given return routes in advance, necessitating only arrival and departure reports by the in-port official.

CONVOY CONFERENCE

A convoy conference is held at the last practicable hour before the ships sail. The NCSO provides a suitable place to hold the conference and notifies, well in advance, all personnel who should attend. Attending the conference should be the escort force commander and his staff; escort force commanding officers and their operations and communication officers; commanding officers of supporting units or activities; convoy, vice, and rear commodores

and their staffs; masters of all ships; all NCLOs; and the senior communication personnel of each ship. The major purpose of the conference is to promulgate the plans adopted for the sailing of the convoy and to resolve any difficulties that may exist.

The NCSO explains the command organization and responsibilities of the various commanders, the procedure for departure, instructions for keeping the various logs and records, and the convoy diagram showing the stationing of each ship. Communication procedures are discussed, as are navigational problems. The NCSO is followed by the convoy commodore and the escort force commander, who elaborate on the convoy maneuvering instructions and ensure that all the masters are familiar with the tactical and communication publications. Methods for transferring and replenishing at sea and special action to take in the event of enemy attack are emphasized. Instructions in recognition and identification are given. The masters are encouraged to ask questions, and the meeting does not terminate until all personnel understand their duties and responsibilities.

A communication conference, conducted by the NCSO or his staff communication officer, is held as part of the convoy conference or immediately thereafter. The conference is attended by the NCLO, the chief radio operator, and the senior Navy radioman of each ship, and by the communication officers of the commodore's staff and the escort ships. It is held to acquaint those attending with the detailed contents of the convoy communication plan, and to resolve any difficulties or misunderstandings concerning requirements and procedures. Communication problems are discussed, and detailed radiotelegraph, radiotelephone, and visual procedures are explained. It is imperative that the communication plan be studied and understood before departure, because it contains instructions vital to the safety of all units in the convoy.

MERCHANT SHIP BROADCAST

The MERCAS (broadcast to merchant ships) system is used for delivering official messages originated by Government agencies and addressed to merchant ships. Personal messages are filed with a commercial carrier.

Under the MERCAS system, a number of naval shore radio transmitting stations are assigned areas of broadcast responsibility. In peacetime, these areas conform closely to fleet

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broadcast areas. (See fig. 4-6.) In time of war, when the Navy may have control over U.S. flag merchant ships, the broadcast areas are augmented to provide both worldwide and local-area coverage through the use of MERCAS^T coastal stations.

Area stations broadcast at scheduled periods simultaneously on one medium frequency and one or more high frequencies. This broadcast method ensures that each ship in the area can copy the schedule on whichever frequency is most favorable, taking into account the atmospheric conditions and the time of day. The transmission of traffic commences precisely at the scheduled time and continues within the scheduled limits until all traffic is cleared. During the international silent periods (from 15 to 18 minutes and from 45 to 48 minutes past each hour, reserved for listening for distress signals) the MERCAS^T schedule is interrupted so that ships may shift to 500 kc (the international distress frequency).

The initial part of each MERCAS^T transmission includes a preliminary callup, a traffic list consisting of the radio call signs of ships to which messages are addressed, and the DTG of each message. All ships at sea are required to copy the traffic list. A ship (except a MERCAS^T guard ship) for which no traffic is scheduled is not required to copy the remainder of the broadcast and reverts immediately to the normal guard of 500kc. Messages ordinarily are transmitted at a speed no greater than 18 words per minute, and normally they are sent only once. Flash and Immediate precedence messages, however, are transmitted on each of two consecutive schedules. Unless specific instructions to the contrary are contained in the text of a message, ships must not break radio silence to respond to, or in any way acknowledge, MERCAS^T traffic. Except for MERCAS^T, messages for an individual ship in a convoy usually are addressed to the escort force commander, with instructions to pass to the ship concerned.

Merchant ship general messages are transmitted on MERCAS^T by means of collective call signs in the traffic list. All merchant ships under Allied control must copy these messages and maintain them until they are cancelled or superseded.

Sailing orders received by each ship before sailing include instructions on the date and time to shift from one area MERCAS^T broadcast to another. The time usually is such that no difficulty is experienced in copying the appropriate

broadcasts. When convoys or independents are diverted, the OCA must include instructions amending the time(s) of shift.

INTRACONVOY COMMUNICATIONS

The remainder of this chapter deals mainly with communications within a convoy. It might be beneficial, however, to first mention some important aspects of convoy communications in general. The term "convoy communications," of course, implies a state of national emergency or wartime conditions.

The CW frequency common to all ships in a convoy is 500 kc. The voice radiotelephone frequency common to all ships in a convoy, and between the convoy and the escort, is determined before sailing and is stipulated in the convoy communication plan.

Safety from enemy attack at sea demands radio silence by all ships of the convoy. Except in the most unusual circumstances, all traffic destined for addressees outside an escorted convoy is transmitted via the escort force commander. If it is necessary—and authorized—for a merchant ship to make direct radio contact with units beyond the convoy or with shore stations, transmissions are on 500 kc, if possible. Otherwise, they are on other frequencies specified in the radio section of the convoy communication plan.

Except in certain well-defined instances, then, transmission by radio is forbidden. Included in the exceptions are contact reports, distress messages, messages in accordance with a special order from some naval or military command, and whenever, in the opinion of the master or the convoy commodore, the necessity for breaking radio silence outweighs the risk of disclosing the ship's position. It should be borne in mind that the use of a radio transmitter endangers all other ships present. Enemy activities and units equipped with direction-finding (DF) receivers can take a bearing on a transmission of very short duration. Two such bearings allow an accurate determination of the transmitting ship's position to be obtained.

To maintain communication discipline, the ship in which the convoy commodore is sailing is usually designated as transmitter ship for the convoy. If a ship in the convoy has a requirement to send a message, the text is transmitted to the convoy commodore by visual means, if feasible, or by VHF/UHF radiotelephone if the

ships are properly equipped. The commodore, provided he concurs that the message is of sufficient importance, arranges for the escort force commander to send the message via Navy channels. In the absence of an escort force commander, only the commodore has authority to break radio silence except in those instances cited previously.

When it becomes essential to break radio silence and transmit a message, UHF, VHF, HF, or LF, respectively, should be used to reduce the probability of detection. Even high frequencies, however, can be detected by proper equipment; therefore lengthy transmissions should be avoided. Transmissions of contact reports and distress messages always should be made initially on 500 kc to ensure receipt by ships in the vicinity. Maintenance of radio silence is meaningless within visual range of the enemy.

All messages transmitted at sea are sent encrypted unless they are contact reports, distress messages, or message of similar extreme urgency. In order to have sufficient personnel available to process coded traffic, a selected number of reliable ship's personnel, cleared to handle the requisite degree of classified material, should be trained in encryption and decryption procedures.

The master is personally responsible for the custody and safeguarding of all classified documents and all cryptographic material, publications, and files. They may be kept by the senior radio officer at sea and must be kept by the master in port; when not in use, they must be retained in a safe or under strong lock and key. These materials have first priority if emergency destruction of classified material becomes necessary. They should be burned, if possible. In deep water, they may be thrown overboard in a weighted and perforated metal box, one of which is kept on the bridge and one in the radio room.

The use of private ship or company codes is expressly forbidden to ships sailing under the NCSORG.

RADIO COMMUNICATION READINESS

Naval control of shipping officers may promulgate special conditions of radio communication readiness to meet unusual or special requirements of a particular convoy. Basically, however, there are only two distinct conditions of readiness for ships in convoy: conditions A and B.

Condition A is the normal steaming condition. Insofar as equipment and personnel permit, guards are maintained as follows:

<u>Station</u>	<u>Guard</u>
Commodore	500 kc. MERCAS T, and convoy radiotelephone (R/T) net continuously.
Vice commodore . . .	500 kc and MERCAS T continuously. R/T net continuously (listening watch on the bridge).
Ships with three radio operators.	Same as vice commodore.
Ships with two radio operators.	500 kc and MERCAS T during watch keeping periods. R/T net same as vice commodore.
Ships with one radio operator.	500 kc during watch keeping periods, shifting as necessary to copy MERCAS T. R/T net same as vice commodore.

Condition B is placed in effect on orders of the commodore during alarm, enemy attack, exceptionally heavy weather, or reduced visibility resulting from snow, heavy rain, and the like. During condition B, both the convoy commodore and vice commodore guard 500 kc, the MERCAS T schedule, and the convoy R/T net continuously. Individual merchant ships give priority to guarding 500 kc; they do not copy MERCAS T unless 500 kc can be guarded simultaneously. The flagship of the commodore acts as MERCAS T guard for the convoy.

CALL SIGNS

Merchant ships utilize both radio and visual call signs. The former are explained in detail in ACP 149.

Visual

A merchant ship's international call sign is displayed by flaghoist (1) when entering or leaving port other than an Allied-defended port, (2) when ordered to do so by signal, (3) for

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identification to an escort when joining, or (4) when reporting to Lloyd's Signal Stations located in the United Kingdom.

Convoy visual call signs are formed by numeral pennants rather than alphabet flags. For other than individual merchant ships, the answering pennant is suffixed to the numeral pennant(s) as part of the call sign. Thus, the commodore's visual call sign is pennant 1 ANS (written p1ANS), the convoy collective call sign is p3ANS, and that for the escort force commander is p8ANS. When signaling by light, the prosign MM is substituted for ANS. The visual call for an individual ship is its station number, as p1p4 (first column, fourth ship). The collective call for each column is the column number preceded by zero, as shown in figure 5-1.

Convoy visual call signs are displayed—

1. When the convoy is forming up or reforming after being scattered.

2. Any time the convoy meets an escort (in addition to displaying international call signs).

3. Upon orders of the commodore.

When a ship leaves a convoy permanently or for a considerable period of time, no change is made in the convoy visual call signs of the remaining ships unless specifically ordered. Ships in the rear of a vacated position are required to

close up without additional instructions. Ships that are directed to change or exchange their positions in the convoy on orders of the commodore must change their call signs accordingly.

EXECUTIVE METHOD OF MANEUVERING

Whenever possible, the commodore maneuvers the convoy by means of visual (flaghoist) communications. For routine changes, this is standard procedure. It does, however, require an element of time. Before the maneuver is executed, each ship indicates by appropriate signal that it has received and understands the signal. Merchant ships without an armed guard attached have no visual communication personnel assigned, and visual signaling normally is the responsibility of the officer on watch in addition to his other duties.

The occasion often arises when the commodore must maneuver the whole formation as quickly as possible. This task is difficult at best, because a convoy generally is large and unwieldy, and any change in its direction of movement is limited to 45° in one step. These considerations bear on any decision to break radio silence in order to transmit a maneuvering

COLUMN	1	2	3	4	5
DISTINGUISHING SIGNALS OF COLUMN	01	02	03	04	05
DISTINGUISHING SIGNALS OF SHIPS	11 12 13 14	21 22 23 24 25	31 32 33 34 35	41 42 43 44 45	51 52 53 54 55

Figure 5-1.—Individual ships are allotted call signs according to their stations.

signal. Once the decision is made, the executive method invariably is employed.

The executive method is characterized by two procedure signs (see chapter 2) to accomplish simultaneous action by all units: IX (execute to follow) and IX followed by a 5-second dash (execute now).

The prosign IX alone is a preparative or warning signal indicating that the signal following will be a tactical maneuver. The same prosign followed by a 5-second dash is the executive signal, the maneuver being executed at the end of the dash. The text of each signal is transmitted twice, separated by the prosign IMI. To ensure effective communications, at least one ship receipts for each maneuvering signal.

Message Cancellation

On occasion the commodore may decide that an executive method signal already sent out should be canceled, or that a series of unexecuted signals may be extraneous due to a change in the tactical situation. If it is desired to cancel all signals outstanding, the commodore sends: BT NEGAT IMI NEGAT BT K. Again, the text is sent twice separated by IMI; and, because the message ends with K, all ships answer in turn.

If a particular message among the unexecuted signals is to be canceled, leaving the remainder in force, the text of that message is included with the NEGAT signal. Similarly, when the commodore decides to execute only one of a group of outstanding signals, he includes the text of that message in the executive signal to prevent misunderstanding.

Signal Repetition

Some convoys are so widely dispersed that a maneuvering signal must be repeated by a ship some distance from the flagship. To accomplish this, the commodore designates a repeating ship by including that ship's call sign and the procedure sign G before the ending K.

SIGNALING BY FLAGHOIST

Flag signaling in a mercantile convoy is similar in most respects to that in common use throughout the U. S. Navy (see chapter 10). The code of signals, however, is contained in ACP 148 rather than in the Allied Naval Signal Book. The encode/decode sections of ACP 148 should

be familiar to communication personnel and others concerned with maneuvering ships in convoy. The signals listed therein may be supplemented by those included in the International Code of Signals, Volume I.

As a rule, the commodore originates all visual signals to ships in the convoy, and all acknowledgements are made to him. When he finds it necessary to use an international signal, the commodore displays that signal inferior to (below) the international CODE pennant. Addressees also hoist the CODE pennant to indicate their understanding. The CODE pennant when used in this way is referred to as CODE. This is the same pennant we met previously as the answer (ANS) pennant when it is flown in a position other than above a signal to indicate a convoy visual call sign.

When the commodore addresses a signal to the whole convoy, all hoists are repeated at the dip immediately, flag for flag. Ships repeat the signal at the dip as soon as it is seen and close it up when it is understood. In a convoy of any size, visual responsibility is an important function. Each ship in a column is responsible for ensuring that the ship astern as well as the lead ship in the next column outboard from the commodore fly the proper hoist as originated by the commodore.

Signals from the commodore to a part of the convoy are preceded by a collective visual call sign for that part of the convoy. To expedite transmission, the signal is repeated by all lead ships between the commodore and the part of the convoy addressed. Signals made to an individual ship are prefaced by the convoy visual call sign of the ship addressed. Signals to the commodore are acknowledged by the ANS pennant.

The signals contained in ACP 148 which convey orders do so in nearly all cases in a positive sense. To impart some other sense to a signal, it is preceded by a "governing flag," of which there are five:

- A flag—Immediate execution;
- C flag—Affirmative;
- N flag—Negative;
- P flag—Preparative;
- Y flag—Interrogative.

In all instances, the governing flag is hoisted superior to the signal and separated from the latter by a tackline. A tackline (usually spoken as TACK) is a length of halyard about 6 feet long used to separate flags on the same halyard which, if not separated, would

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convey a different meaning than that intended. Assuming that the signal PD2 means "Proceed in execution of previous orders," governing flags alter the sense of the signal as follows:

- A TACK PD2: Proceed in execution of previous orders at once. (In other words, proceed as soon as the signal is understood, without waiting for the signal of execution.)
- N TACK PD2: Do not proceed in execution of previous orders.
- P TACK PD2: Prepare to proceed in execution of previous orders.
- Y TACK PD2: By a senior—Are you prepared to proceed in execution of previous orders? By a junior—May I proceed in execution of previous orders?

C TACK PD2 or C alone are correct replies by a senior to the junior's request immediately above and signify "Affirmative" or "Approved."

It should be emphasized that the meanings of the governing flags do not apply when the Allied Naval Signal Book is followed; the flags are used only in conjunction with ACP 148. Signaling procedures otherwise are essentially similar to those contained in chapter 9.

FLASHING LIGHT PROCEDURE

Signaling by flashing light in time of war is restricted as much as possible. The light is of minimum practical brilliance and at night must be screened and covered by a colored filter. It may be used during daylight only when it is inexpedient to use flaghoist or semaphore. It is used at night only in an emergency or if more secure means of communication do not exist. When using any type of directional light, it is most important to keep the light trained accurately on the receiving ship throughout the transmission of a message. Failure to do this makes it difficult, and perhaps impossible, for a receiving ship to read the message.

The flashing light signaling procedure in convoy is similar to methods used in the fleet. Generally, however, the process is considerably slower to ensure understanding and prevent errors in transmissions.

To send a message using directional procedure, the sender (not necessarily the originator, as seen later) calls the receiving ship by making, until answered, the latter's

convoy visual call sign. Example: 35 35 35 until answered by a long dash meaning "I receive you" (written as TTTT).

The identity of the calling ship usually is apparent. When it is necessary for her to identify herself, she does so by sending her visual call after receiving the answering sign from the ship called. The ship called repeats the identity. Example:

Ship 23 (sender)	Ship 35
35 35 35	<u>TTTT</u>
DE 23	DE 23

If several ships are being called in the same general direction, so that there might be some doubt of who is answering, the answering ship may identify itself. For example, 23 has called 35. To answer, 35 sends: 23 DE 35 TTTT.

The heading of a visual message may include many of the prosigns used in radio procedure. Except for messages sent to guardships for retransmission by radio, however, the abbreviated form usually is used. The receiving ship acknowledges receipt of each plain language word with a short dash (Morse code T) on the light. In transmitting a code signal (one taken from a signal book), each letter is spelled out using the phonetic alphabet.

To illustrate the foregoing, consider these two examples:

Ship 23 sends to ship 35:

Ship 23	Ship 35
35 35 35	<u>TTTT</u>
DE 23 (may be omitted)	DE 23 (may be omitted)
<u>BT</u>	<u>BT</u>
URGENTLY	T
NEED	T
DOCTOR	(Does not T; missed the word.)
DOCTOR	<u>T</u>
<u>BT</u>	<u>BT</u>
<u>AR</u>	R

In the second example, 6ANS transmits to a screen ship whose international call sign is NBGC:

6MM	<u>NBGC</u>
NBGC NBGC NBGC	<u>TTTT</u>
<u>BT</u>	<u>BT</u>
KILO	T

ALFA
BT
AR

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Message Relay

A message for part of the convoy or a column is passed to the leading ship(s) of the column(s) concerned. Having visual responsibility, they relay the message down their column(s) and or to the adjacent lead ship. This continues until all ships addressed have received the message.

So that the lead ship of a column may know when all ships of the column have received the message, the visual call sign of the last ship addressed, preceded by R DE, is passed back up the column. The same reverse-route procedure is followed by column leaders to inform a senior officer that a message has been received, the outboard leaders informing the next leader inboard. If the commodore, in ship 51 of a nine-column convoy, sends a message to all ships, acknowledgments flow back in this way:

- Ship 91 receipts for column 9 to ship 81; R DE Ø9.
- Ship 81 receipts for columns 8 and 9 to ship 71: R DE Ø8 Ø9.
- Ship 71 receipts for columns 7, 8, and 9 to ship 61: R DE Ø7 to Ø9.
- Ship 61, in turn, receipts to 1MM for all four columns.

The same system is used for ships on the other side of the convoy, Ø1 to Ø2, and so on.

Figure 5-2 shows graphically how the relay system operates. In the example, the commodore (in ship 51) sends a message to all ships in column 3, the latter consisting of three ships.

All-Around Procedure

To send a message by all-around (nondirectional) procedure, the commodore transmits the international general call AA on a light visible in all directions. After a short pause he sends the message straight through slowly. After transmitting the text, the commodore sends UD (equivalent of IMI), AA, a complete repeat of the message, and finally AR. Example:

AA AA AA (pause) DE 1MM (may be omitted) 0857Z BT UNIFORM HOTEL UD AA DE 1MM 0857Z BT UNIFORM HOTEL AR

No ship gives any indication that the message is being read. Light repeating ships receipt for the message directly to the commodore (e. g., R DE 73 R DE 73) using a directional light. Any ship failing to copy correctly obtains the message from the responsible light repeating ship.

SIGNALING BY SOUND

Convoys may be maneuvered and messages transmitted by sound signals, a system having no parallel in the U. S. naval service. The procedure is outlined in the International Code of Signals, Volume I, and as contained therein is intended primarily for signaling between two ships. In convoys, however, sound signals generally are intended for all ships, signals between individual ships being comparatively rare.

The lead ship of each column repeats all signals except those addressed to an individual ship. In addition, the NCSO or the commodore may designate other ships as sound repeating ships. Only ships so designated repeat sound signals except when a ship relays a message between two other ships that are out of sound range of each other.

General Signals

General signals normally are confined to emergency (other than alarm) situations and in practice are seldom used. These signals commence with the general call AA AA AA on the ship's whistle. On hearing this call, all ships should listen attentively for the signal which will follow. The signal itself is transmitted twice, with a short pause between the call and each transmission; e. g., AA AA AA (pause) WN1 (pause) WN1.

Column leaders and sound repeating ships repeat the message. Column leaders repeat, in order, outboard from the flagship beginning to port. The starboard column leaders start repeating when the signals to port no longer can be distinguished clearly. Each leading ship is responsible that both the leading ship next outside her and the first sound repeating ship in her own column repeat the signal correctly. Sound repeating ships repeat signals immediately after the leading ships of their columns. When there are two or more repeating ships in a column, they repeat in sequence from front to rear of the convoy. A request for a repetition is made by sounding UD. Although usually this signal is made by a repeating ship, it may be made by any ship missing a signal.

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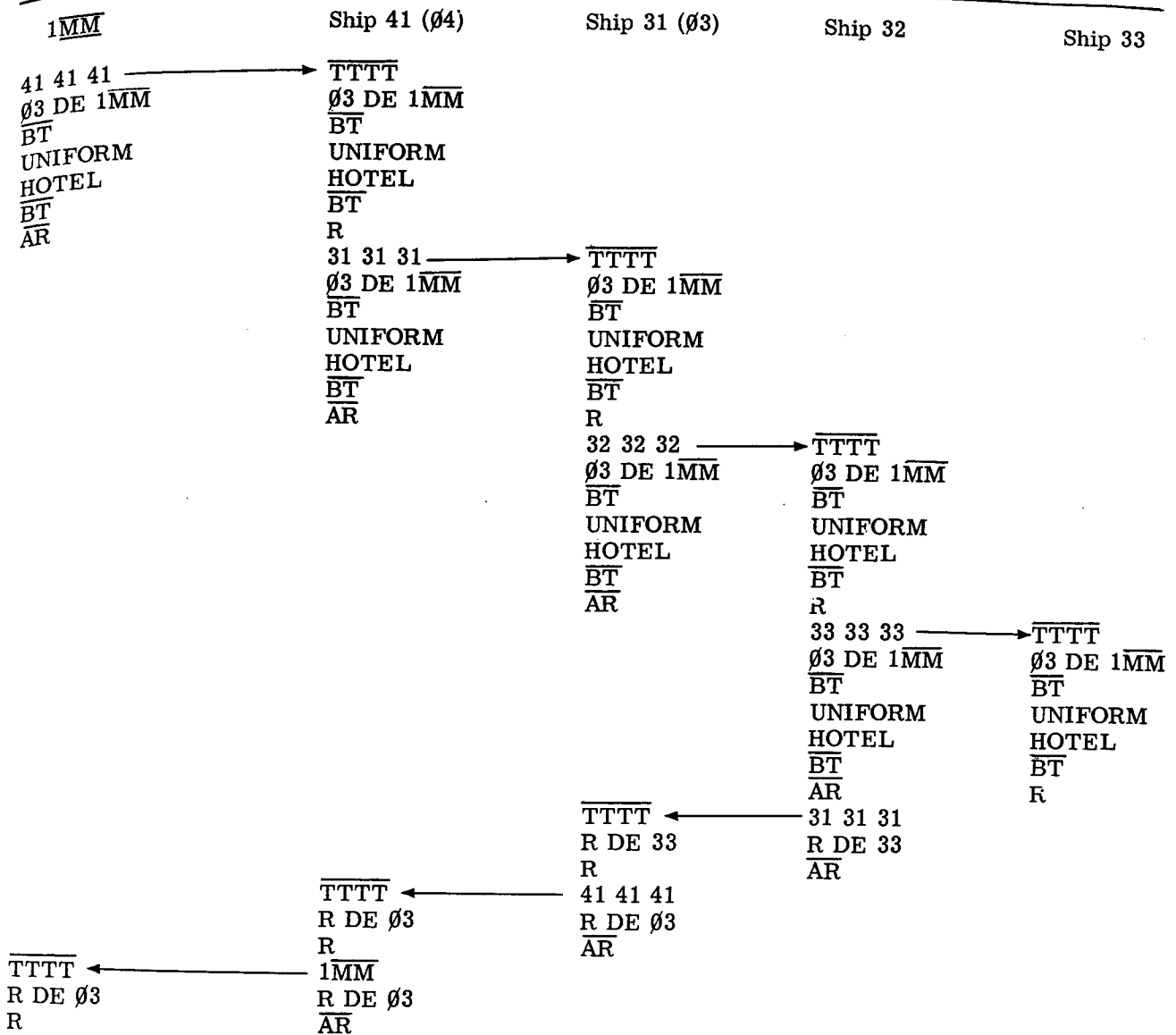


Figure 5-2.—Relay system in operation.

Alarm Signals

An alarm signal is not used with a call or ending sign. Such a signal contains a single-digit number that indicates the type of danger. The number is sounded twice in groups of three, followed by the call of the sounding ship.

If alarm signal 4 means that any enemy ship has been sighted, detecting ship 35 immediately sounds 444 (pause) 444 (pause) DE 35.

Maneuvering Signals

Certain emergency maneuvers may be transmitted by sound signals. For example, if the commodore decides to make an emergency convoy turn of 45°, he sounds a preparative 15-second continuous blast, which is repeated by the sound repeating ships. The direction of turn is indicated by the appropriate international turning signal, one short blast for a

starboard turn and two short blasts for port. Each ship starts her turn as soon as the turning signal is heard, repeating the turn signal as the rudder is put over.

The whistle may be used to send signals by the executive method in the same way as by flashing light.

SIGNALING WITH PYROTECHNICS AND COLORED LIGHTS

Pyrotechnics can be seen at great distances and their use is limited to extreme emergencies when, in all probability, the enemy already knows the location of the convoy. Colored Very lights are used for urgent maneuvering, and their use is left entirely to the discretion of the commodore.

No fewer than two white rockets or roman candles are fired by a ship to signal that she has been torpedoed by a submarine or surface ship, or that a submarine or torpedo boat is in the area.

From an aircraft, a single white Very light or yellow star indicates that a submarine is held below.

A special list of colored light signals, included in ACP 148, allows the commodore to maneuver the convoy rapidly at night. The same considerations of security are applied as with pyrotechnics. Lights are exposed as briefly as possible and their visibility is limited to 2 miles. Only designated colored light repeating ships repeat the signals. Signals are executed the moment the lights are switched off, or, for flashing lights, when the flashing ceases.

RADIOTELEPHONE COMMUNICATIONS

Radiotelephone communication procedures of a convoy are, for all practical purposes, identical to those that apply for the fleet as explained in chapter 8.

The escort force commander is the control for voice radio communications on the convoy common frequency. Masters and the ship's officers must be made aware of the need for strict compliance with the escort force commander's orders, adherence to prescribed procedure, and good circuit discipline. Before sailing, the master and the ship's officers must be informed of the contents of ACP 149 and its coverage of radiotelephone procedure.

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