

RCN Communications Procedures 1950s – 1960s

By Dennis Stapleton (RCN Ret'd)

Security

Radio transmissions are the least secure of all the various means of communicating. These signals are easily intercepted for analysis and extraction of intelligence. This is especially applicable to naval ships operating off shore when communicating with other vessels or to shore stations. To offset this liability, strict adherence of Circuit Discipline will reduce the chance of compromising and identifying naval warships. These rules are especially applicable to messages sent in Morse code as identification can be made from the sending mannerisms of an individual operator. As well, the characteristics of the transmitter can be analyzed and identified. Therefore radio operators must ensure transmissions are held to a minimum amount of "on the air" time to get the job done - short succinct radio operating procedures, no personal "chatter", the tuning of transmitters to yield a clean signal with minimum power, and have excellent knowledge of frequency and antenna usage to direct the signal accurately to the receiving party.

In the modern navy, radio security is maintained by digitally enciphering messages using secure algorithms that virtually conceal communications procedures, ship identity and message content. However, three or four decades ago the fleet observed radio security specific to the technology of the time. Shorter range voice communications presented its own security risk as "scrambled" voice technology was still in its infancy. This called for strict rules when communicating by voice. Voice communications for ships operating closely in tactical situations, a task force or working in squadrons or groups were usually in the VHF and UHF radio spectrum. These were line-of-sight transmissions not extending much beyond the horizon and thus were less susceptible to intercept.

Examples of breaches of Circuit Discipline include:

- the transmission of encrypted call signs in the call-up and unencrypted call signs in the message address.
- violation of radio silence.
- unofficial chat between operators.
- transmitting in a directed net without permission.
- individual operator mannerisms which can identify a unit or station .
- identification of locations.
- identification of individuals belonging to an organization.
- use of excessive transmitting power.
- tuning transmitters with antenna connected.
- use of profane or indecent language.

A competent operator always observes circuit discipline, including :

- maintaining the prescribed speed and does not receipt (Roger) for a message until he checks the group count, understands the message indicators and transmitting instructions.
- sends Morse code accurately at moderate speed.
- logs everything he hears on the frequency he is guarding.
- able to tune any transmitter on board within 3 minutes with calibrated settings or with a frequency meter with no radiation from the antenna until the last stage and coupling are given final adjustment.

A staff of civilian radio operators (usually retired naval operators) were employed by the Flag Office to monitor fleet radio communications for breaches of circuit discipline and security violations. These were written up and reported. If one of these reports was received by the radio department on a ship, it was not advisable to approach the Chief Tel before at least two days.

Decoding/Encoding

Radio traffic for ships at sea containing high security levels were encrypted prior to transmission by either by "Book" method (called "one-time pad" - very secure but tedious) or by a machine into which plain language traffic was typed and automatically encrypted yielding groups of five letter characters. When received, the enciphered message was again typed into a decoding machine resulting in the plain language version of the message and the intended addressee.

Call signs

Every warship or commercial vessel is allocated a "CALLSIGN" by the country to which they are registered. These are used to identify each ship for radio communication purposes. Canadian warships are allocated four letter call signs beginning with letter "C". Call signs were also used for visual signalling; flags spelling out the ship's call sign are hoisted on halyards on the mast for visual identification. When entering and leaving harbour these are always displayed.

Naval Broadcasts

The primary communication means for shore based command authorities and offices to send messages to the Fleet was by daily scheduled radio BROADCASTS from facilities located on both coasts. These high power ZONAL broadcasts reached large expanses of the Atlantic and Pacific Oceans and even to the Canadian Arctic Archipelago. During this era, long distance radio communications were transmitted entirely in Morse Code. Although from the mid 50's radio teletype (RATT) began to appear as an alternate transmission method but was yet unproven and mostly used to backup the tried and true CW Morse transmissions. Broadcasts also provided a measure of security as ships were not required to respond and thus reveal their position.

Western Atlantic coverage was the responsibility of the Naval Radio Shore Stations (NAVRADSTA) at Albro Lake, call sign CFH, in Dartmouth Nova Scotia designated "L" (LOVE) Zonal Broadcast. For Pacific waters the shore station was located at Aldergrove B.C., call sign CKN, designated "EA" (EASY ABLE) Zonal Broadcast.

Once a message was received at the shore station, final routing and message preparation for the Broadcast was carried out by the radio staff then passed to the broadcast operator who typed the messages into a punch machine which created a paper tape perforated with Morse code characters. The tape was wound on reels and placed on a transmitting "head" ready for the next scheduled broadcast session. This method delivered precise, clear, perfectly delineated and reliable Morse for shipboard reception at 25 wpm. The Broadcast was simultaneously transmitted on LF and HF bands.

When not in scheduled broadcast mode the station's presence on the radio spectrum was maintained

by continuous transmission of its call sign and frequencies. This information was also punched out on paper tape which was joined end-to-end to form a "Round Slip" for continuous repetition.

Broadcasts were scheduled several times throughout the day and numbered 'one-up' monthly - e.g. L001, EA023 etc. Preceding every broadcast transmission there was a short call-up period when the shore station transmitted its call sign notification that traffic was about to begin: e.g. "CGNS de CFH" (All Canadian Naval Ships this is Halifax Radio).

Next came a list of Call signs of the ships for which there was traffic, in alphabetical order. These including enciphered call signs. A number suffix to each call sign indicated the number of messages for that ship e.g. CYVN3 (Micmac, 3 messages), CGJD2 (Haida, 2 messages) etc. Radiomen listened for their call sign and get ready to receive their traffic if any.

After the call sign list, a short pause ensued before the actual transmission of traffic, again in alphabetical call sign order. When the broadcast session ended the shore station would transmit the procedure signal QRU QRU to indicate "I have nothing more for you."

Separate broadcast arrangements were made for smaller ships such as minesweepers which carried a single radioman only. Transmissions for these vessels were scheduled less frequently throughout the day, allowing the "Sparker" sufficient rest time over a 24 hour period. These were known as "Single Op Periods".

If naval ships were working in a squadron or tactical group, one ship was often designated as a guard ship to copy traffic addressed to ships in his group. In foreign ports this method was often used when two or three ships were tied up in harbour at the same time.

After reception the message details would be entered in the radio logbook then passed on to the message centre, recorded and typed on an official message form and hand delivered to the addressee. This task was usually carried out by signalmen. The Captain would also receive a copy of any message for the ship. If the message was encrypted it would be passed to the cipher operator for decryption before processing for delivery.

Other Broadcast Information

In addition to naval traffic, shore stations were tasked with broadcasting other information of great interest to all ships at sea such as: Weather Reports, Notices to Mariners, Aids to Navigation and Safety Warnings. These advised the movement, placement, removal or changes to navigational aids, such as buoys, markers, lighthouses, lightships and radio beacons. Warnings of navigational hazards were also transmitted, these could include the positions of drifting or abandoned ships, wrecks, deadheads, floating debris or chart corrections. After the end of WWII, these messages often included positions of floating undetonated mines mostly confined to the North Sea area and waters surrounding Great Britain. Weather reports always held high priority for ships at sea. This information was separately scheduled from the regular naval broadcasts.

Ship-Shore Communications

Since the Department of Transport at this time did not operate their own (long range) shore stations for working commercial shipping, the responsibility was assumed by the RCN in addition to their own naval operations. Civilian DOT supervisors were assigned to each watch at the shore stations to

process, cost out, administer and advise on non-naval traffic. Traffic was taken at the station by the "ship-shore" facilities at CFH/CKN manned by Naval Ship-Shore Operators.

Vessels at sea, both naval and commercial who had radio traffic destined for shore establishments or offices would be required to first raise the shore station on designated ship-shore frequencies on the 4, 6, 8, 12, 16 and 22 MHZ bands. Each band was assigned to a "bay" manned by a ship-shore operator on a 24 hour basis. Once received the message was processed for onward relay by landline (teletype) to final destination. Naval traffic held priority over commercial traffic.

Initial contact by the ship was made via an assigned "Calling Frequency", continually monitored by the shore based operators. After establishing the link, the naval operators would shift the calling vessel to a "Working Frequency" where the message was taken and acknowledged as received.

When in their home harbour, Naval ships used voice to communicate with the shore station usually by a CM11 transmitter/receiver, on a frequency known as "Harbour Common". Mostly used when entering and leaving harbour. Once tied up in the dockyard, personnel from the ship could pick-up their messages by hand from the communication centre.

Staffing the Radio Office

A typical Radio Staff for a Tribal and most destroyers during peacetime could include :

Head of Department: Chief Petty Officer, Radio (CPO) or
Petty Officer 1st Class (P1CR)

Dayman : Petty Officer 2nd Class (P2CR) or
Senior Leading Seaman (LSCR)

Watchkeepers: 2 LSCR's - Leading Seamen
3 ABCR's - Able Seamen
2 OSCR's - Ordinary Seamen (usually under training)

Giving a total complement of approximately 8 - 9 to man a 24 hour, 3 watch system, which was normal for destroyers. Each watch was designated as Red, Blue, or Green. With manpower as above, a three watch system may allocated as thus :

Red - 2 ABCRs

Blue - 1 LSCR, 1 ABCR, 1 OSCR (under training)

Green - 1 LSCR, 1 ABRC,

The head of dept. did not stand watches.

The dayman also did not stand watches but could be called upon to stand in.

This division of experience would ensure each watch was manned by trained, competent radiomen. When not standing their regular watch during daylight hours watchkeepers were required to turn to for the general maintenance of the radio offices, masts/antennas and any other duty the Chief Tel required of them.

Sea-Watch Systems

3 Day Dogged Watch System

Watch Name	Watch Time	Day 1	Day 2	Day 3
Middle	0000 - 0400	R	B	G
Morning	0400 - 0800	B	G	R
Forenoon	0800 - 1200	G	R	B
Afternoon	1200 - 1600	R	B	G
1 st Dog	1600 - 1800	B	G	R
2 nd Dog	1800 - 2000	G	R	B
Evening	2000 - 0000	R	B	G

The 2 hour Dog Watches keep Watchkeepers from standing the same watch on consecutive days.

Watch systems were applicable to the entire Ship's Company as they also served for administrative and regulatory purposes. An individual department could amend the system depending on duty required and available personnel.

Larger warships often implemented a 4 watch system, designated 1st of Port, 2nd of Port, 1st of Starboard, 2nd of Starboard. This system also maintained Dog Watches.

In harbour the operational, concentrated sea-watches reverted to a daily watch system.