Radiograms by WB5YYQ

What are radiograms in ham radio?

In the world of amateur (ham) radio, a **radiogram** is a formal, written message transmitted by radio from one operator to another, often as part of a message relay system. It's essentially a modern-day telegram sent over the airwaves.

Purpose and Function

- **Message Handling:** Radiograms are a key component of **"traffic handling,"** which is the practice of moving formal messages from one place to another using a network of amateur radio operators.
- **Public Service:** While they can be used for personal messages, their primary purpose is for **public service,** particularly during emergencies or disasters. When traditional communication infrastructure (like phone lines or the internet) is down, ham radio operators can use radiograms to relay important information, such as health and welfare messages.
- **Skill Practice:** Sending and receiving radiograms provides valuable training for ham radio operators, helping them hone their skills in a standardized format that is critical for effective communication in a crisis.

The Radiogram Format

A radiogram is not just a free-form message. It follows a specific, standardized format to ensure accuracy and efficiency, especially when relayed through multiple operators. The standard format, often associated with the ARRL's (American Radio Relay League) National Traffic System (NTS), includes four main parts:

- **Preamble:** This is the header of the message and contains essential metadata. It includes:
  - **Number:** A unique message number assigned by the originating station.
  - **Precedence:** Indicates the priority of the message (e.g., Emergency, Priority, Welfare, or Routine).
  - **Handling Instructions:** Reply with time & date of delivery, method of delivery, wait for reply, etc**.**
  - **Station of Origin:** The call sign of the ham radio operator who first put the message into the system.
  - **Check:** A word or group count to verify the message's integrity.
  - **Place and Date/Time of Origin:** The location and time the message was filed.
- **Address:** This section contains the recipient's name, street address, city, state, and phone number.

- **Text:** The body of the message. To maintain clarity and speed, certain conventions are used, such as spelling out punctuation (**"X"** for a period, **"QUERY"** for a question mark). There are also **"numbered radiograms"** with pre-defined phrases that can be referenced by number to save time.
- **Signature:** The name and contact information of the person who originated the message.

How Radiograms are Transmitted

Radiograms are relayed through a network of operators and **"traffic nets."** An operator can transmit a radiogram using various modes, including:

- **Voice (Phone):** Operators read the message aloud, often using specific prowords and phonetics to ensure accuracy.
- **Morse Code (CW):** This is a traditional and highly efficient method for transmitting text, especially over long distances.
- **Digital Modes:** Technologies like Winlink allow for the transmission of radiograms via radio email.

The messages are typically relayed from a local net to a section net, then to a region net, and so on, until the message reaches an operator near its final destination, who then delivers it by phone, email, or in some cases, in person.

Who Uses Them?

- **Amateur Radio Operators:** Many hams participate in traffic nets as a form of public service and a way to practice their skills.
- **The General Public:** In the U.S. and other countries, ham radio operators are authorized to send and deliver radiograms on behalf of the public for non-commercial purposes, free of charge. This is a common way for hams to provide a valuable service to their communities.

In essence, radiograms are a testament to the public service mission of amateur radio, providing a reliable, operator-driven communication system that is independent of commercial infrastructure.

How are Radiograms relayed?

A radiogram is relayed through a structured network of amateur radio operators called a **traffic net**, most notably the **ARRL National Traffic System (NTS)**. The process is a systematic chain of command designed to ensure a message is accurately and reliably delivered, even when it has to travel across a large geographic area.

1. Origination

The process begins when an amateur radio operator, or a member of the public they are assisting, creates a radiogram. The message is written on a standardized form and is assigned a unique message number, a precedence (e.g., Routine, Welfare, Priority, or Emergency), and other key header information. The originating operator is responsible for getting the message "into the system." This is typically done by checking into a **local traffic net**.

2. Relay through the System

Messages travel through a hierarchical network, moving from smaller, local nets to larger, regional, and national nets. This system works like a funnel, collecting messages at the local level and passing them up the chain.

- **Local Net:** The originating operator sends the radiogram to a Net Control Station (NCS) on a local net, which usually operates on a VHF or UHF frequency. This net collects messages from operators in a specific city, county, or region.
- **Section Net:** A representative from the local net, often called a "section manager," takes the collected radiograms and relays them to a higher-level net, known as a section net. These nets typically operate on HF (High Frequency) bands to cover a larger area, such as an entire state.
- **Region and Area Nets:** The process continues, with representatives from section nets passing messages to a region net, which covers a larger geographic area (e.g., a multi-state region). At the top of the hierarchy are the Area Nets, which handle traffic for large swaths of the country, like the Eastern, Central, and Pacific time zones.

3. Delivery

Once the radiogram reaches a net in the recipient's geographic area, it begins its journey down the hierarchy.

- The message is passed from the higher-level net to a local operator who lives near the recipient.
- The receiving operator then takes responsibility for the **final delivery**. This can be done by making a phone call, sending an email, or even by physically delivering a printed copy of the radiogram to the addressee.

This entire process, from origination to delivery, is done by volunteer amateur radio operators who receive no compensation. The structured nature of the system ensures that messages are accounted for at every step, preventing them from getting "lost" and reinforcing amateur radio's role as a reliable public service.

Historical Significance

The historical significance of radiograms in ham radio is deeply intertwined with the very origin and purpose of amateur radio itself. The ability to "relay" messages was the foundational principle that led to the formation of the American Radio Relay League (ARRL) in 1914.
Here's a breakdown of the historical significance:

1. The Birth of Organized Amateur Radio

- **Before organized networks,** early amateur radio was a chaotic and unregulated space. Ham operators, often using rudimentary spark-gap transmitters, would try to communicate

over short distances. Messages were passed on a person-to-person basis, with no formal structure.
- **The "Relay" Concept:** The ARRL was founded by Hiram Percy Maxim with the idea of creating an organized network of operators who could systematically relay messages from one point to another. The "Relay" in the American Radio Relay League's name speaks directly to this founding purpose. This was a crucial step in transforming amateur radio from a hobby for experimenters into a coordinated public service.

2. Lifeline During Emergencies

- **The First Major Test:** One of the earliest demonstrations of the value of amateur radio message handling came in 1913, when severe storms and flooding isolated parts of the Midwest. Amateur radio operators stepped in to pass critical messages when commercial communication lines were down, proving their worth as a reliable communication resource in times of crisis.
- **The Role in Disasters:** Throughout the 20th century, radiograms became the go-to method for emergency communications. They were used extensively during major disasters like floods, hurricanes, and earthquakes, allowing health and welfare messages to be sent in and out of affected areas. The standardized format of the radiogram was crucial during these times, ensuring that even in a stressful and chaotic environment, messages were clear, accurate, and could be quickly relayed.
- **Collaboration with Agencies:** This public service role led to the establishment of formal relationships between amateur radio organizations and relief agencies like the American Red Cross and civil defense bodies. The Military Auxiliary Radio System (MARS) also uses a radiogram-like format (called a MARSgram) to handle health and welfare messages for military personnel and their families.

3. A Legacy of Formal Communication

- **The Telegraphic Influence:** The radiogram format is a direct descendant of commercial telegrams and teletype messages used by militaries and businesses. By adopting a rigid, pre-defined structure, the system ensured clarity and efficiency, even when messages were passed through multiple operators. This created an "audit trail" and reduced the risk of errors that could occur with free-form communication.
- **Maintaining Operator Skills:** Even with the advent of cell phones and the internet, the practice of traffic handling and sending radiograms remains a vital part of the ham radio hobby. It serves as a constant training exercise, keeping operators proficient in the communication skills they might need to use when modern infrastructure fails. The routine, daily operation of traffic nets ensures that the system is always ready for a real-world emergency.

In short, the radiogram's historical significance is that it was the original reason for a unified amateur radio organization and it established the foundation for amateur radio's enduring role as a public service and a reliable communications asset in times of disaster. It is a symbol of ham radio's commitment to serving the community and a reminder that even in a digital age, a well-structured, human-powered communication system remains invaluable.