History of Amateur Radio Q Codes

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Hi, this is Robert Cain, N4IXT. In this presentation we'll take a look at the history of amateur radio Q Codes.

NEXT SLIDE

About Robert

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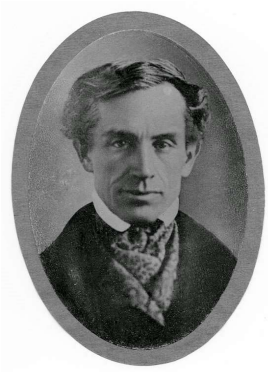
In the beginning…

- Samuel Morse and the telegraph
- His telegraph introduced 1836
- Single wire
- Repeaters!
- Code introduced in 1844
- Became widespread 1840's-50's
- Closely tied to Railroads



CLICK

Most people today are familiar with Samuel Morse and his invention of the telegraph. Many people though, may not realize why he invented telegraph

Samuel Morse was a very accomplished artist. Even today he has several works hanging in the Smithsonian institution. He had been far away from his New England home when he received a letter that his wife was gravely ill. Although he started for home right away, the letter had taken so long to arrive that she had actually passed away before he received that fateful letter. By the time he arrived home she had already been buried.

Samuel Morse realized that there had to be a better way. While there had been others that worked on a version of the telegraph, it was Samuel Morse who actually made the telegraph a useful tool.

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Samuel Morse introduced his version of the telegraph in 1836.

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What made his version of the telegraph unique was that it only needed a single wire to operate. Competitors often required as many as six wires in order to function.

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The other problem that Samuel Morse was able to solve was distance. To solve that problem he used technology that might be familiar to many hams today. Repeaters!

True, not exactly the same type of repeaters we use today. The concept, however, was similar.

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Samuel Morse had been working on his version of code for quite some time. He unveiled the formal version of it in 1844, although it was in use prior to the formal release.

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His version of the Morse code became quite widespread between the 1840s and 1850s.

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This code was closely tied to the railroads. Why, you might ask?

Samuel Morse needed long stretches through property, both public and private, to install his telegraph lines. The railroad companies had already worked out rights-of-way throughout the country. Samuel Morse was able to work a deal to run his telegraph lines alongside the railroad tracks in exchange for telegraph service.

The other man…

- Who was the second operator to use Morse code?
- Alfred Vail
- Worked with Morse on the code
- Made technical improvements to telegraph
- Built & managed early telegraph lines 1845-48

While many people remember the first person to use Morse code, few people remember the second.

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So just who was the second operator to use?

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His name was Alfred Vail.

CLICK

Mr. Vail worked with Samuel Morse on the code.

CLICK

In addition, he made many technical improvements to the telegraph system.

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He also built and managed many of the early telegraph lines from 1845 to 1848. This turned out to be quite lucrative for him.

The first message…

- “What hath God wrought”
- Not so much.
- Used to open line from Supreme Court to US Capitol on May 24, 1844
- The first instance of Morse was between Morse and Vail Jan 11, 1838
- “A patient waiter is no loser”

So what was the first message sent through Morse code?

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History tells us it was "What hath God wrought"

CLICK

Well, not so much. As is often the case, history is a little distorted.

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The "What hat God wrought" message was used to open the line from the Supreme Court to the US capital on May 24, 1844. This was, in essence, a publicity stunt. Samuel Morse was attempting to secure funding from Congress to build more telegraph lines. It makes some sense when you think about it, would you really want the first message you send to be in front of national political figures?

CLICK

The first instance of a complete sentence in Morse code was between Morse and Vail on January 11, 1838. The message read:

CLICK

A patient waiter is no loser.

What'd he say?

- Problem: All operators heard all transmissions
- Lots of interference
- Time is money
- Q Codes introduced to keep it brief
- QRA-QRZ & QSA-QSZ following the R & S rail codes

CLICK

One major problem all early operators had was that everyone heard every transmission.

CLICK

This could cause lots of interference.

CLICK

As with everything, time is money.

CLICK

Q Codes were introduced to keep transmissions as brief as possible.

CLICK

Codes in the range of QRA to QRZ and QSA to QSZ were introduced, following a series of codes named the R & S rail codes.

GOTA

- 1896 Marconi gets on the air with Morse Code
- He adopted some of the codes used in telegraph
- New codes were needed for new uses
- Codes related to radio operation
- Ship to shore, ship to ship

CLICK

Fast forward a few years, and in 1896 Marconi creates the first ever GOTA station, a.k.a. Get on the Air. Naturally, he used the already familiar and existing Morse code for his transmissions.

CLICK

Along the way he adopted some of the codes already in use with telegraph, such as the Q codes.

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In addition he needed to add new codes that were needed for the new use of Morse.

CLICK

Many of these related to Morse code being used in the context of radio operation.

CLICK

In addition new codes had to be added to handle the types of traffic that radio was being called to do. For example, ship to shore, or ship to ship transmissions.

Mr. Bond, meet Q

- Needs of shipping industry impelled British Gov’t to create standardized Q Codes in 1909
- Facilitated communication across languages
- Formally adopted by the ITU in 1912
- Effective July 1, 1913

CLICK

With the popularity of radio onboard shipping, it eventually impelled the British government to want to create a standard set of Q codes, not just for itself but for internationally.

CLICK

Having a standardized set of Q codes would facilitate communication across languages. Even if two people didn't speak the same language, they would at least understand the Q code.

CLICK

The standardized set of Q codes was formally adopted by the IT in 1912.

CLICK

It became effective July 1, 1913..

Divided by Q…

- Q Codes are divided into ranges by service
- QAA to QNZ – International Civil Aviation Organization
- QOA to QQZ – Maritime Mobile Service
- QRA to QUZ – International Telecommunications Union (ITU)
- QN- – ARRL specifically for net traffic

Q Codes are divided into ranges by service.

The range QAA to QNZ are used by the International Civil Aviation Organization.

The Maritime Mobile Service uses codes in the QOA to QQZ range.

The QRA to QUZ was allocated to the International Telecommunications Union (ITU). Many of the codes used by ham's fall into this range.

It should be noted that there is a special set of codes beginning with QN-. These codes were reserved for use by the ARRL for handling net traffic.

I'll take a dozen please…

Code	Question	Answer or Notice
QRA	What ship or coast station is that?	This is ____.
QRB	What is your distance?	My distance is ____.
QRC	What is your true bearing?	My true bearing is ____ degrees.
QRD	Where are you bound for?	I am bound for ____.
QRF	Where are you bound from?	I am bound from ____.
QRG	What line do you belong to?	I belong to the ____ Line.
QRH	What is your wavelength in meters?	My wavelength is ____ meters.
QRJ	How many words have you to send?	I have ____ words to send.
QRK	How do you receive me?	I am receiving (1–5) where 1 is unreadable and 5 is perfect.
QRL	Are you busy?	I am busy.
QRM	Are you being interfered with?	I am being interfered with.
QRN	Are the atmospherics strong?	Atmospherics are very strong.

Q codes can actually have two meanings. It is driven by whether the Q code is used in the context of the question or an answer.

For example, QRA followed by a ? Means what ship or station is that. However QRA followed by a name would be the answer. QRA Titanic equates to this is the Titanic.

Another example might be QRD? The reply could be QRD New York, meaning of course I am bound for New York.

I will go over each individual one of these, but these are a few examples you can look at.

Let’s play Twenty Questions

- Each Q code can have two meanings
- Comes in as a question or an answer
- QTH
  - What is your position (lat/long)?
  - My position is (lat/long)
- Many codes have gained informal meanings
  - My radio only works well with the antenna at my QTH

So I thought it might be fun play 20 questions.

CLICK

As I mentioned a moment ago each Q code can have two meanings whether it is placed in the form of a question, or an answer.

CLICK

Let's try an easy one to start. What do you think QTH means?

CLICK

It is asking for the current position. Originally it referred to latitude and longitude, and could still be that, but mostly it now refers to an approximate location. For example I might say my QTH Birmingham Alabama.

CLICK

Over time many codes have gained informal meanings. When somebody simply refers to their QTH, they generally mean their home. For example, my radio only works well with the antenna at my QTH.

QST

- Broadcast to all amateurs
- QST for emergency information

- Informal: A cool ham magazine

OK, let's try guessing at few more. Let's start with QST

(Pause a moment to let people guess). CLICK

QST is a broadcast message to all amateur radio operators. For example, QST Storm Warning.

CLICK

As we all know, informally it is the magazine put out by the ARRL. "Did you see the annual QST antenna issue yet?"

QSO

- Conversation
- Thanks for the great QSO

QSO is another commonly used code.

CLICK

QSO refers to a conversation. QSO? Might mean do you have time for a conversation. Thanks for the QSO is thanking for a conversation.

QSL

- Please acknowledge receipt / I acknowledge receipt
- My call N4IXT QSL?
- QSL your last transmission

- Informal
  - Cards used to confirm an exchange

QSL

CLICK

QSL means please acknowledge receipt or that you are acknowledging receipt of a transmission.

For example, "My call N4IXT QSL?" Is asking "did you receive my call sign correctly it is N4IXT"

Confirmation might come in simply as QSL, or perhaps QSL your last transmission.

CLICK

Informally it can also refer to cards that are used to confirm an exchange between two amateur radio operators.

QRM

- Man made interference
- Another QSO causing us lots of QRM

QRM

CLICK

QRM Refers to man made interference. That interference might come from other hams operating too close in frequency, or perhaps with faulty equipment. It may also mean other forms of interference, such as noisy power lines.

QRN

- Natural interference
- Band is noisy today, lots of QRN

QRN

CLICK

QRN refers to natural interference. “Solar flares causing QRN today!”

QRP

- Decrease Power
- QRP to 5 watts

- Informally, I am operating a station with a power of 5 watts or less

QRP

CLICK

QRP typically means to decrease power to 5 watts or less.

CLICK

Informally it can also mean you are running a station with 5 watts or less output power. “I’m running QRP on 20 meters today!”

QRO

- More power
- QRO please (i.e. Turn up the power, I can't hear you, propagation is poor, etc)

QRO

CLICK

QRO is the opposite of QRP. It means more power, or a request to turn up your power. QRO please, I can't hear you!

QSB

- Fading of signal
- Your signal is QSB

QSB

CLICK

QSB represents a fading of signal. You start to hear them OK, then their signal fades out. It can be a quick way to let the receiver know their signal is fading away.

QSD

- Your keying is defective
- QSD check your key

- Informal: You can’t send with a dang

QSD

CLICK

QSD means the CW key being used is not functioning correctly, and to please check it.

CLICK

Informally it can also be a jab at another CW operator. That guy was QSD, he couldn’t send worth a dang.

Man shall not live by Q alone…

- Other codes used by hams
- CQ
- 92 Codes
- SOS

While Q codes represent the biggest variety of codes, there are a few other codes also in common use in the amateur radio world.

Let's take a look at the CQ code, the 92 codes, and of course SOS.

CQ

- Calling all stations
- Can be combined with specifics
  - CQ DX (Calling long distance stations)
  - CQ VK (Calling Australia)
  - CQ KA4VCA (Calling a specific ham)
- Seek you?
- Not so much.
- Derived from first two syllables of the French word *sécurité*
- Meant pay attention
- Used by radio ops in WW 1 in France

CQ

CLICK

CQ is a shortcut which means calling all stations.

CLICK

CQ can also be combined with other codes to make it more specific. For example, CQ DX means I am calling somebody long-distance, i.e. someone outside my country.

CQ with the country code such as VK means I am looking to talk to somebody in that specific country. In this example I'm looking to talk to somebody in Australia.

Finally, you can combine CQ with a specific callsign. CQ KA4VCA means I am calling the specific ham radio operator KA4VCA.

CLICK

Many people believe CQ is a shortened form of the phrase seek you.

CLICK

Well, not so much.

CLICK

It is actually derived from the first two syllables of the French word *sécurité* , pronounced see-qu-i-tay.

CLICK

Translated, *sécurité* means pay attention.

CLICK

It was used by radio operators during World War I in France. When American operators entered the war, many worked in the French theater. They picked up the use of this term, and brought it back home with them.

The 92 Code

- Created by Western Union Company in 1859
- Most codes used in controlling of railroad traffic
- A few codes were used to represent common phrases
- What is the one code still used today?
- 73
- Originally “accept my compliments”, by 1908 became “best regards”
- Some QRP operators send 72
- Meaning “I don’t have enough power to send 73”

CLICK

The 92 code was created by Western Union in 1859.

CLICK

Most of the codes were used in controlling railroad traffic.

CLICK

Additionally, some of the codes were used to represent common phrases.

CLICK

There is one code still in common use today in the amateur radio one.

CLICK

73

CLICK

73 originally meant accept my complements. By 1908 it had become best regards. Today, it is the equivalent of having a nice day.

CLICK

Some QRP operators will send 72.

CLICK

Meaning, I don't have enough power to send 73.

SOS

- Original distress call was QRR, used by the railroads
- ARRL changed to QRRR to avoid confusion with the international version of QRR which simply meant “please wait”
- England began using CQD (CQ Distress) for it’s version of help
- Germany used SOE
- 1906 radio conference decided on SOE, but due to the chance of a Morse E being lost in static changed it to SOS
- Contrary to belief, SOS does NOT stand for “Save Our Ship”
- Titanic radio operators used both SOS and CQD

SOS

CLICK

The original distress call was QRR, which was used by the railroads.

CLICK

The ARRL changed the code to QRRR, to avoid confusion with the international version of QRR, which simply meant please wait. Even that could be problematic. You can imagine an operator on one end going “help help“ and the receiver going “he keeps telling me to wait, but I don’t know what for”.

CLICK

England began using the code CQD, or CQ Distress, for its version of help.

CLICK

Germany, meanwhile, used the code SOE.

CLICK

At a 1906 international radio conference, it was felt that a single code need to come into common use across all nations. At that radio conference, they were wanting to use SOE. However, there was some concern that the Morse code for the letter E might get lost in static. Therefore they settled on SOS.

CLICK

Contrary to popular belief, SOS does not stand for save our ship. In fact, the letters don't actually stand for anything, it is just a shortened way of saying help.

CLICK

The Titanic radio operators use both SOS and CQD.

Radio Heroes

- John (Jack) G. Phillips – 25 years old, Sr. Operator RMS Titanic
- Harold Bride – 21 years old, Jr. Operator RMS Titanic
- Employed by Marconi Company, not White Star Lines
- Operated until 3 minutes before the ship went under
- Phillips passed away in the water
- Bride was rescued.
- On the Carpathia, Bride finds out it's operator Harold Cottam had been working nonstop. Bride gets out of his sickbed (frostbite and sprained ankle) and begins assisting Cottam.
- Greeted in NY by Marconi himself.
- NYT paid him $1,000 for story ($24,297 in today's value)

Speaking of the Titanic, I want to bring your attention to two men who should be known as heroes in the world of radio.

CLICK

The first is Jack Phillips. At 25 years old he was the senior radio operator onboard the RMS Titanic.

CLICK

The second was a gentleman named Harold Bride. The junior operator on board the Titanic was 21 years old.

CLICK

Many people don't realize it, but in the early days when a shipping company purchased radio equipment, that equipment was still owned by the Marconi company. Additionally, the operators were employed by the same Marconi company. Thus, Jack and Harold were actually employees of Marconi, not White Star Lines.

CLICK

These men stayed at their station, operating the radio until just three minutes before the ship went under the water.

CLICK

Sadly Jack Phillips perished in the water.

CLICK

Harold Bride however was rescued.

CLICK

Onboard the Carpathia Harold Bride found out it's radio operator, Harold Cottam, had been working the radio alone, nonstop since the first distress call had come in.

Despite frostbite and a sprained ankle Harold Bride got out of his sickbed and began assisting Cottam. The two men worked nonstop until the ship docked in New York.

Even then they continue to operate until most of the passengers had disembarked.

CLICK

Bride was actually greeted at the ship by Marconi himself, who heaped praise for his hard work and dedication.

CLICK

The New York Times paid Harold Bride $1000 for his story. That is roughly $24,297 in today’s currency.

Summary

- Telegraph
- Morse
- Marconi
- Evolution of Q codes from telegraph to airwaves
- Other codes

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We begin this presentation by exploring the origins of the telegraph. We then saw the role Samuel Morse played in creating a viable telegraph system, as well as developing a code that could be used for transmitting.

We then saw how Marconi used and expanded upon the codes adapting them for use in radio.

After that we saw some common Q codes, as well as learned about their evolution from the telegraph to the airwaves.

Finally, we looked at a few other codes that are commonly in use. Namely CQ, 73, and SOS.

If you have any questions feel free to contact me at n4ixt@outlook.com, or through my twitter handle @n4ixt.

If you want to learn more about me and the other work I do, just look up my information page at http://arcanecode.com/info. There you'll find a link to my github site where you can find a copy of this presentation for download.