Technician License Course

Technician License Course

Chapter 6

Lesson Plan Module – 13

Contacting Other Hams – Part 1

Contact Basics, Band Plans, Making Contacts and Using Repeaters

The Typical Telephone Conversation

- Greeting
- Identify who is participating
- Exchange information, generally taking turns
- Salutations
- End the conversation

The Typical Ham Contact (QSO)

- Greeting
- Identify who is participating
- Exchange information, generally taking turns
- Salutations
- End the conversation

Radio Manners

- Speak clearly and distinctly
  - Remember – you can't see the other person talking!
  - Use phonetics when needed
- Assume all communications are public –choose topics accordingly

Radio Manners

- Before transmitting, be sure the frequency is clear and you are authorized to use it!
- Station identification (10-minute rule)
- Frequencies are shared
  - No one has a prior claim to a frequency
  - Schedules, nets, pre-planned events
  - Be flexible, always have a “Plan B”

Radio Manners

- Signal reports
- Power level
  - Avoid excess power
- Location (QTH)
  - Grid locators

Radio Manners

- Signal reports
- Power level
  - Avoid excess power
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- RST
  - –**R**eadability (1–5)
  - –**S**trength (1–9)
  - –**T**one (CW only 1–9)
  - –"Your signal is 58"

Radio Manners

- Advice and assistance
  - Radio and antenna tests or checks
- Ham radio is self-regulated
  - ARRL Official Observers
- Logging contacts – on paper or computer
- QSLs and award programs

Band Plans

- A band plan is a formal plan for organizing types of operation on a band
  - –Informal agreement – not a regulation
  - –Intended for normal circumstances
  - –Be flexible in times of heavy band use (contests, special events, DXpeditions)
  - –Always have a "Plan B"

Making Contacts

- Repeater operation
  - Listen to see how the regulars operate
  - To announce your presence, just say your call
  - Respond to a call with the station's call followed by your own call
  - Often used by a club or group as a regional intercom

Making Contacts

- Repeater signal reports (examples)
  - Full-quieting: signal is strong enough that no noise is heard
  - Scratchy: occasional noise with your signal
  - Flutter: multi-path from a mobile station
  - In and out: occasionally copyable but mostly inaudible

Making Contacts

- HF on CW or SSB
  - "CQ" means "I am calling anyone"
  - To answer give the station's call followed by your call once or twice
  - Use of phonetics is common

Making Contacts

- Taking turns
  - Nets
  - Roundtables
  - Shared contacts
- Breaking in
  - Wait for a pause
  - Give your call

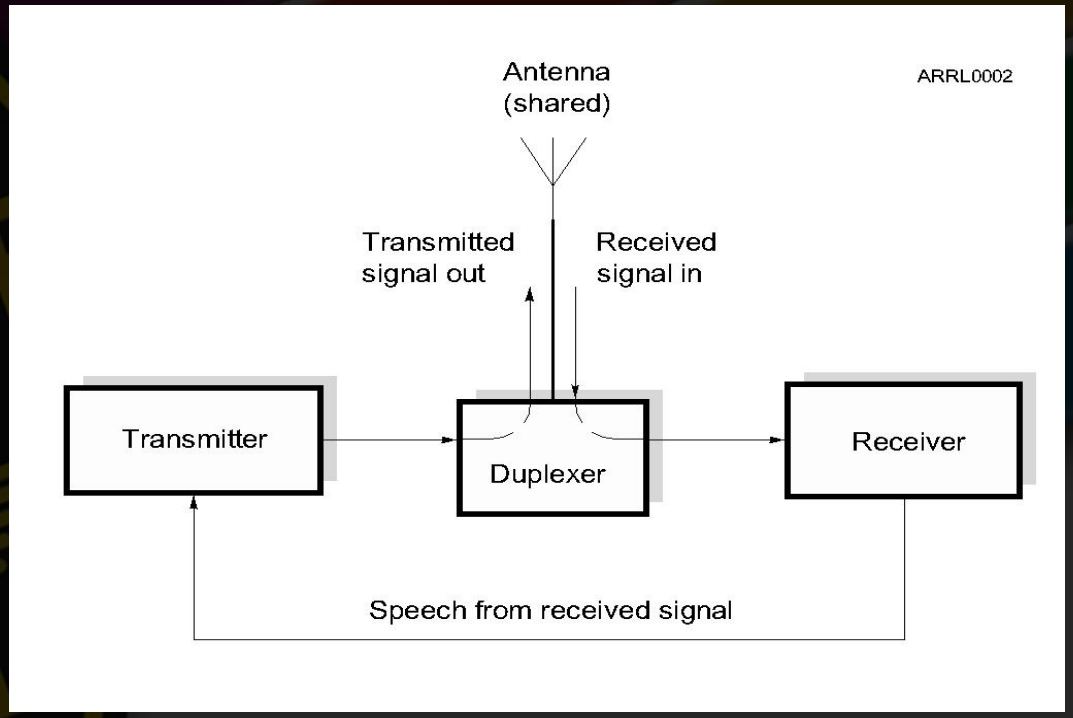
Making Contacts

- Simplex FM
  - Each user takes turns to transmit
  - Works for stations close to each other
  - If you can hear the other station on the repeater input frequency, try simplex
  - 2 meters: 146.52 MHz
  - 70 cm: 446.00 MHz

Repeater Review

- Specialized transmitter/receiver interconnected by a controller.
- Generally located at a high place.
- Receives and simultaneously retransmits your signal on a different frequency.
- Dramatically extends line-of-sight range.

Repeater Review – How They Work



Duplex Communication

- Transmitting on one frequency while simultaneously listening on a different frequency.
- Repeaters use duplex communications.
- **Output frequency** – the frequency the repeater transmits on and you listen to.
- **Input frequency** – the frequency the repeater listens to and you transmit on.

Things to Know to Use a Repeater

- Output frequency
- Frequency offset
  - –And therefore the input frequency
- Repeater access tones (if any)

Repeater Output Frequency

- Repeaters are frequently identified by their output frequency.
  - "Meet you on the 443.50 machine."
    - Here the specific frequency is used.
  - "Let's go to 94."
    - Here an abbreviation for a standard repeater channel is used, meaning 146.94 MHz.

Repeater Output Frequency

- "How about the NARL repeater?"
  - Here the repeater is referenced by the sponsoring club name.

Repeater Frequency Offset

- The offset frequencies (shifts or splits) are standardized to help facilitate repeater use.
- There are + and – offsets depending on the plan.
- Different bands have different standardized amounts of offset.

Standard Repeater Offsets by Band

Band	*Offset*
10 Meters	–100 kHz
6 Meters	Varies by region: –500 kHz, –1 MHz, –1.7 MHz
2 Meters	+ or -600 kHz
1.25 Meters	–1.6 MHz
70 cm	+ or -5 MHz
902 MHz	12 MHz
1296 MHz	12 MHz

Repeater Access Tones

- Prevents accessing multiple repeaters at once.
- Subaudible low-frequency tone must be present before the repeater transmitter will turn on.
- Tones have various names (depending on equipment manufacturer).
  - –CTCSS (continuous tone coded squelch system)
  - –PL (a Motorola trade name for CTCSS)
  - –Privacy codes or tones
  - –DCS (digital coded squelch)

Repeater Access Tones

- Access tones are usually published along with repeater frequencies.
- Could also be announced when the repeater identifies.
  - "PL is 123.0" meaning 123.0 Hz
- Tones are generally programmed into the radio along with frequency and offset.

Repeater Control

- Repeater identification (Morse code or synthesized voice)
  - Same ID requirements as you have
- Time-out protection
  - Protects against continuous transmission in the event of a stuck PTT or long-winded speaker
  - Usually three minutes

Repeater Control

- Courtesy beep or tone signals time-out timer reset
- May have an autopatch system for phone calls

Common Problems

- Off frequency: causes audio distortion
- Low batteries: weak signal, audio distortion
- Poor location: hear repeater OK, can't make or maintain contact
- Access tone off or wrong: repeater is strong but can't access it
- Repeater drops in and out of your receiver: squelch setting too high

Digital Repeater Systems

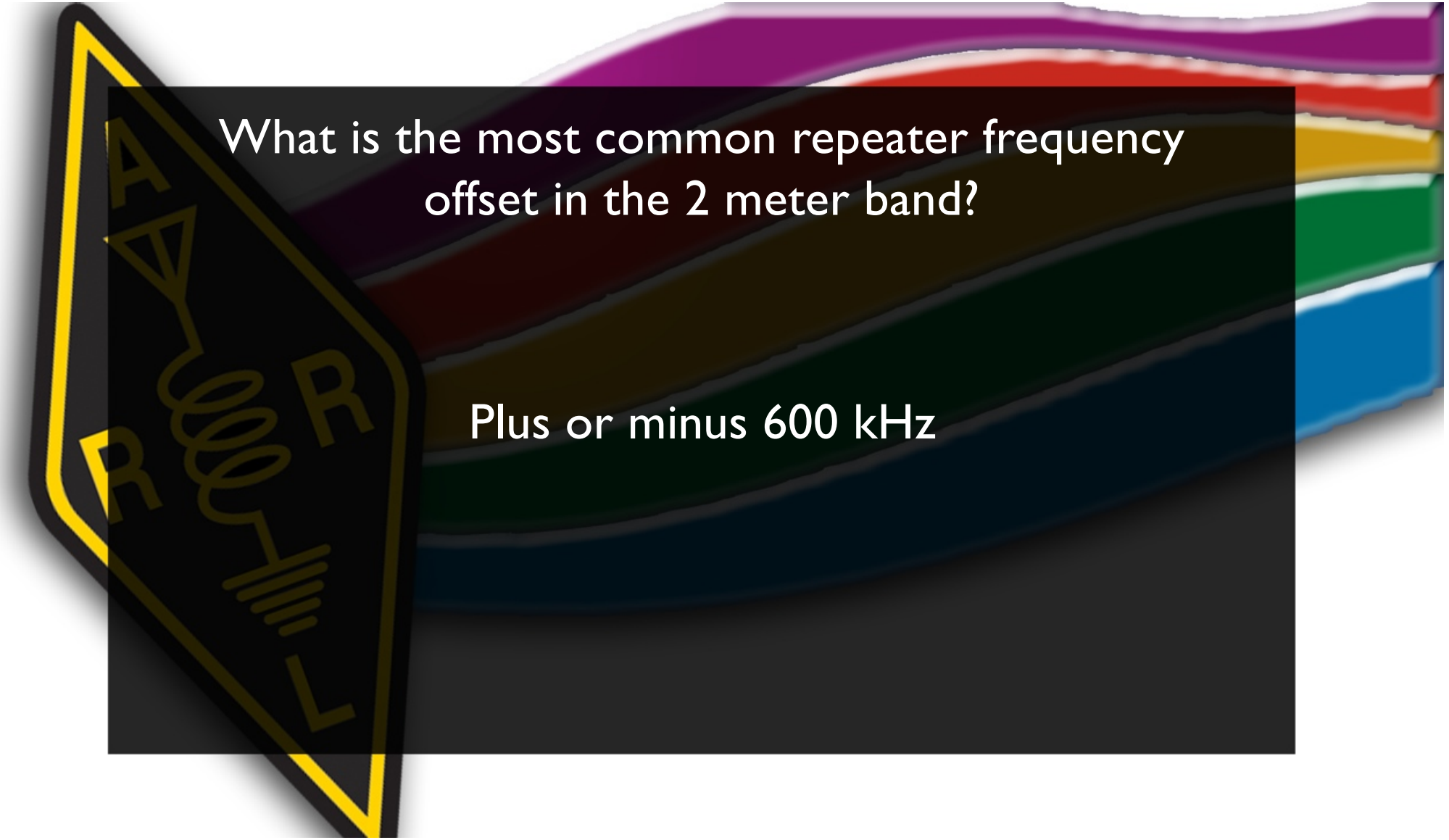
- Repeaters linked by the Internet
- Use digital audio – Voice Over Internet Protocol (VOIP)
  - Similar to Skype
- Allows communication world-wide
- Internet Linking Relay Project (IRLP)
- Echolink
- Access codes on system websites

D-STAR

- Both a repeater linking system and a digital voice protocol
- DV: Digital Voice mode (voice + 1200 baud data)
- DD: Digital Data mode (128 kbps data)
- Repeaters linked together worldwide
- Call user-to-user based on call sign
- Currently an ICOM system
- Yaesu and Kenwood also building digital systems

Practice Questions


What is the most common repeater frequency offset in the 2 meter band?


What is the most common repeater frequency offset in the 2 meter band?
Plus or minus 600 kHz


What is the national calling frequency for FM simplex operations in the 70 cm band?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446.000 MHz


What is a common repeater frequency offset in the 70 cm band?


What is a common repeater frequency offset in the 70 cm band?
Plus or minus 5 MHz


What is an appropriate way to call another station on a repeater if you know the other station's call sign?

What is an appropriate way to call another station on a repeater if you know the other station's call sign?

Say the station's call sign then identify with your call sign


What is an appropriate way to call another station on a repeater if you know the other station's call sign?

What is an appropriate way to call another station on a repeater if you know the other station's call sign?

How should you respond to a station calling CQ?


What is the meaning of the procedural signal "CQ"?

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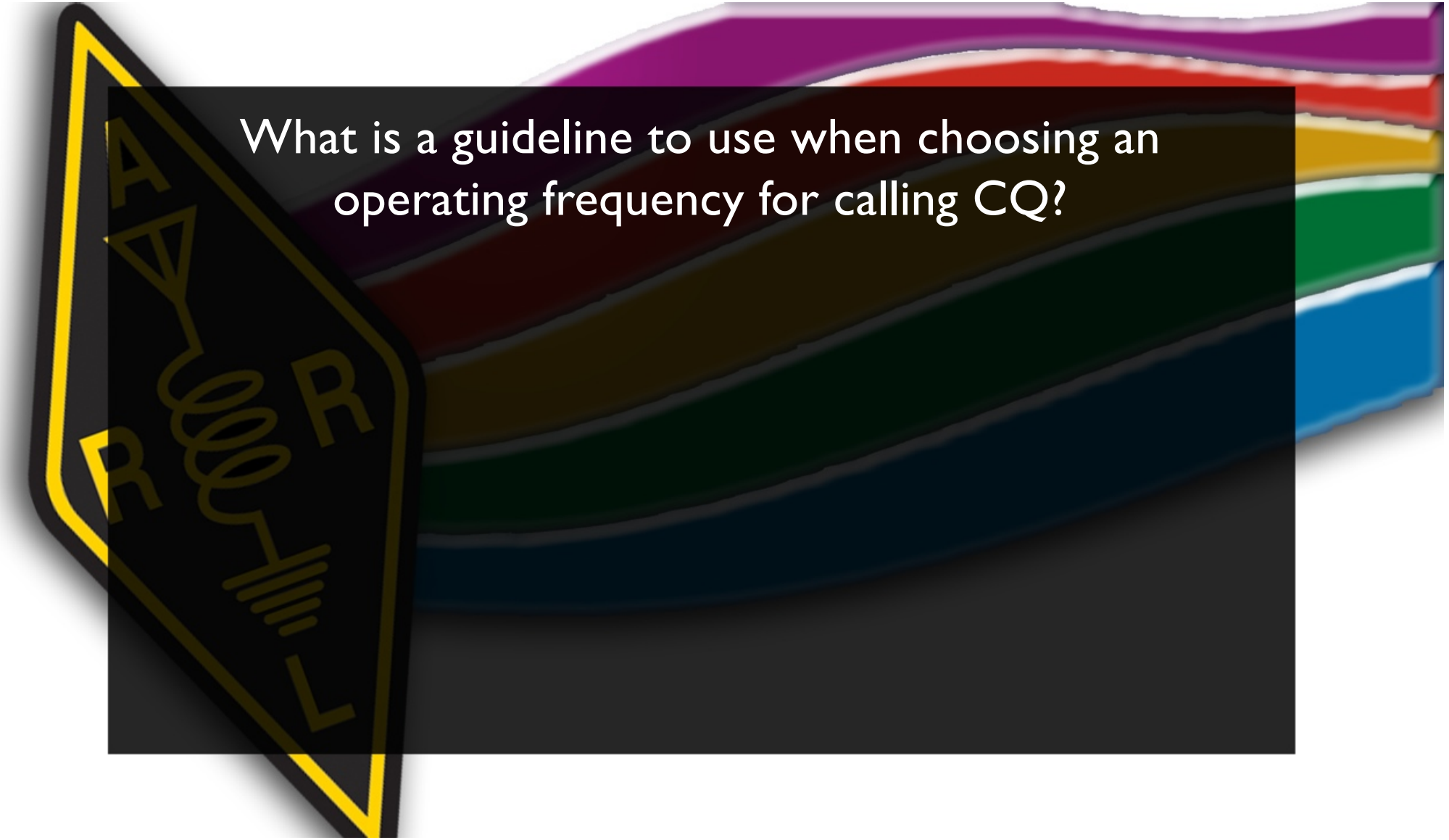
Calling any station

What brief statement is often used in place of "CQ" to indicate that you are listening on a repeater?

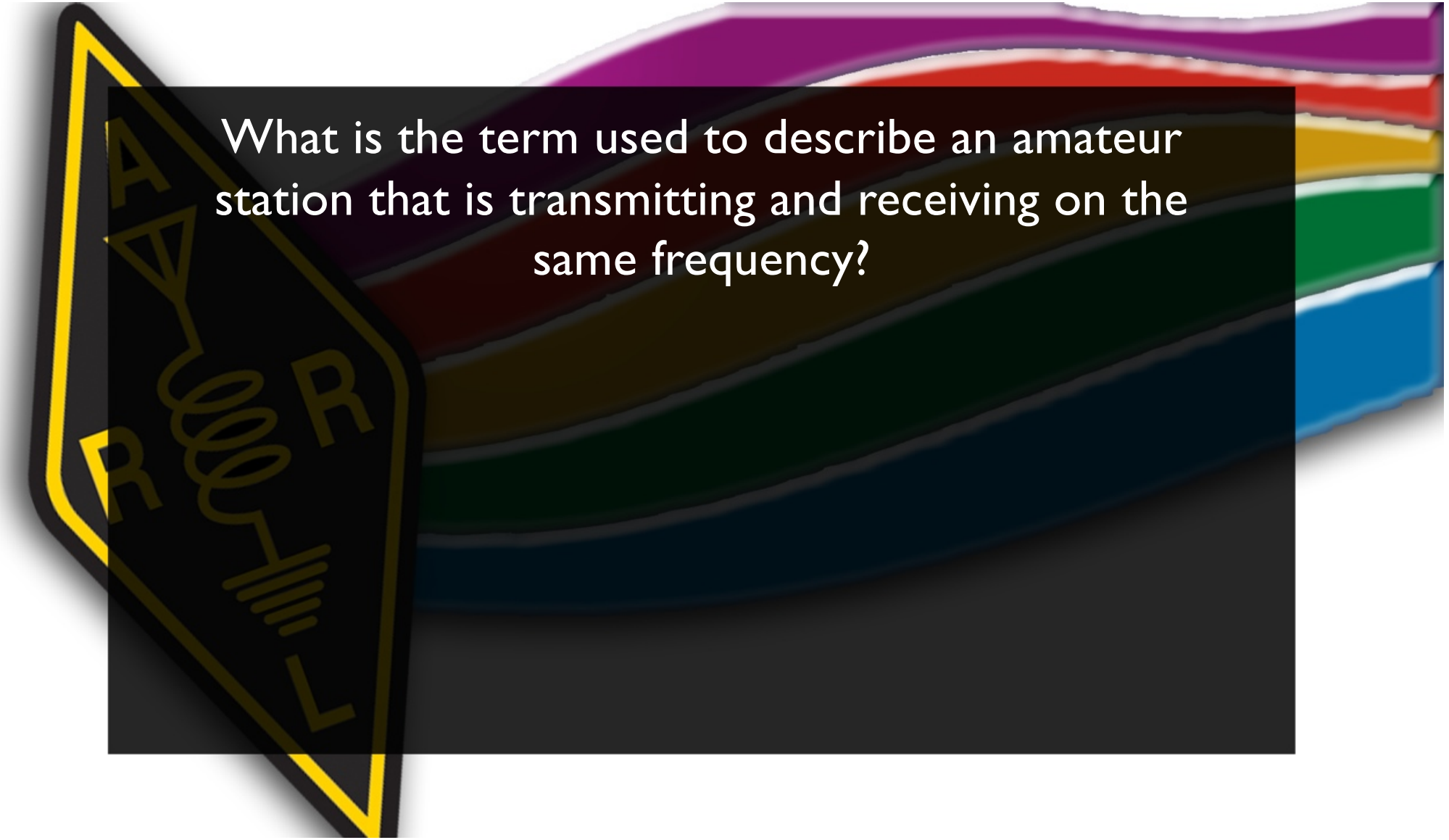
What brief statement is often used in place of "CQ" to indicate that you are listening on a repeater?

Your call sign


What is a guideline to use when choosing an operating frequency for calling CQ?

What is a guideline to use when choosing an operating frequency for calling CQ?

Listen first to be sure that no one else is using the frequency
Ask if the frequency is in use
Make sure you are in your assigned band


What is the term used to describe an amateur station that is transmitting and receiving on the same frequency?

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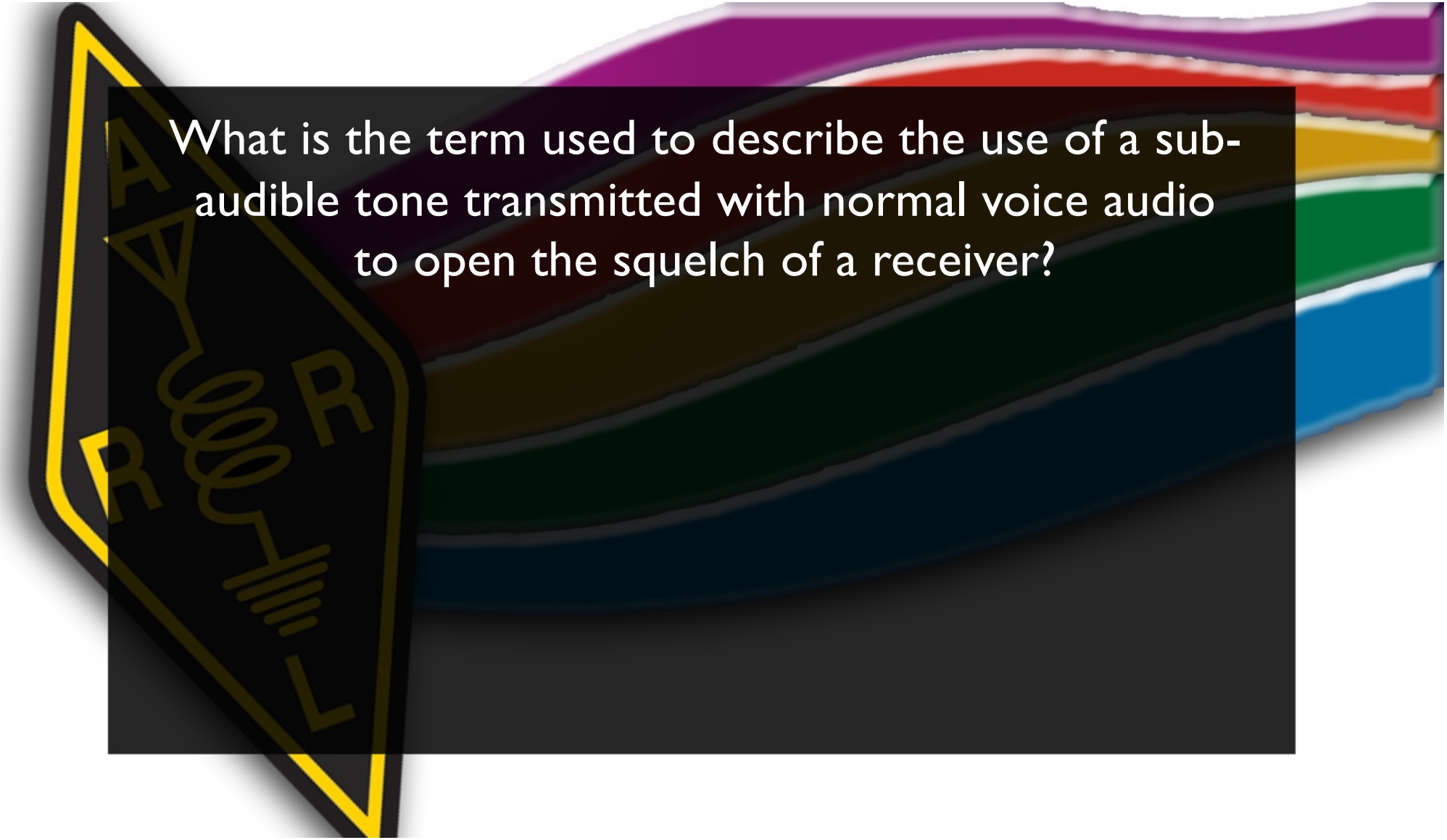
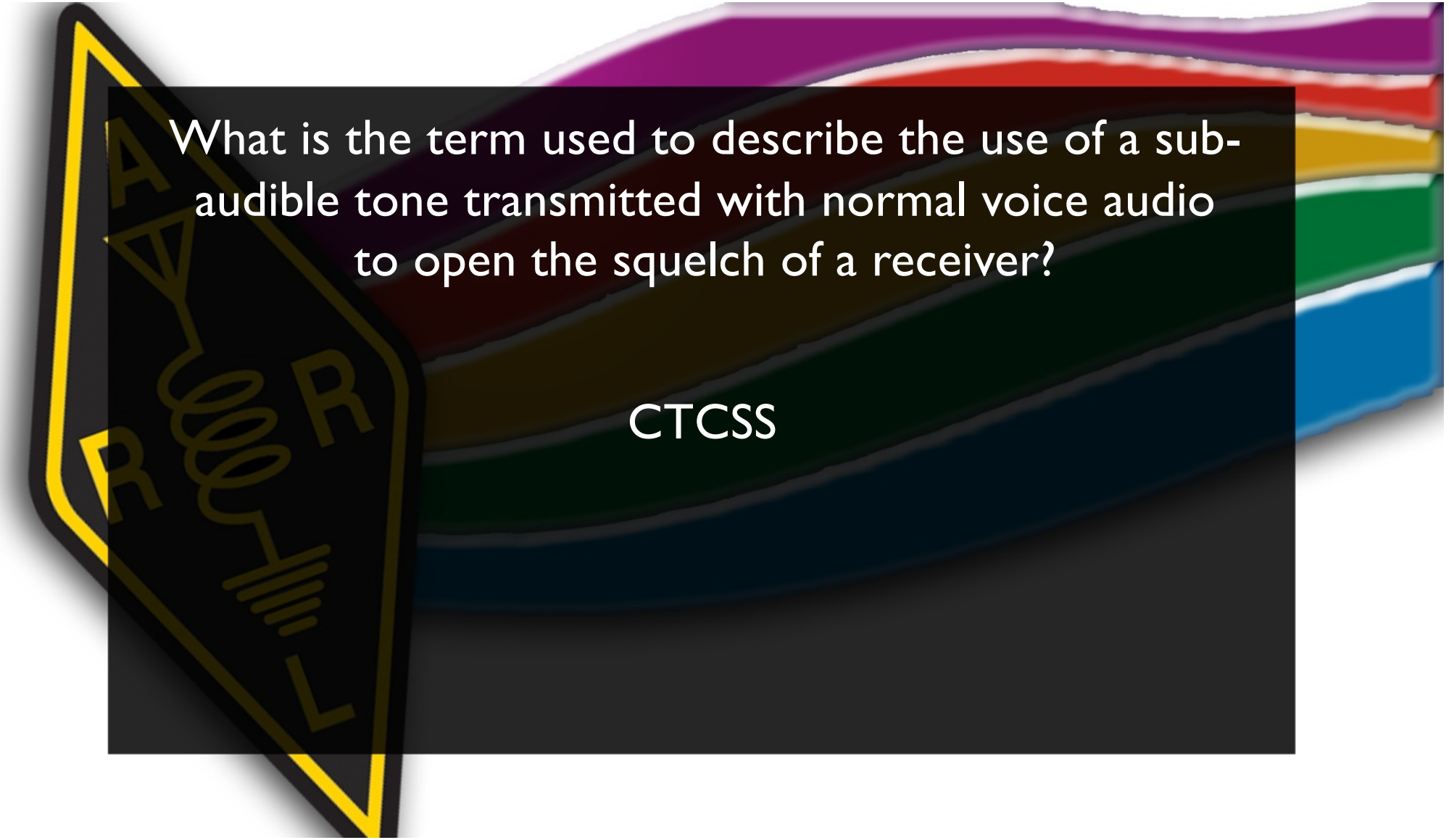
Simplex communication


What is the term used to describe the use of a sub-audible tone transmitted with normal voice audio to open the squelch of a receiver?



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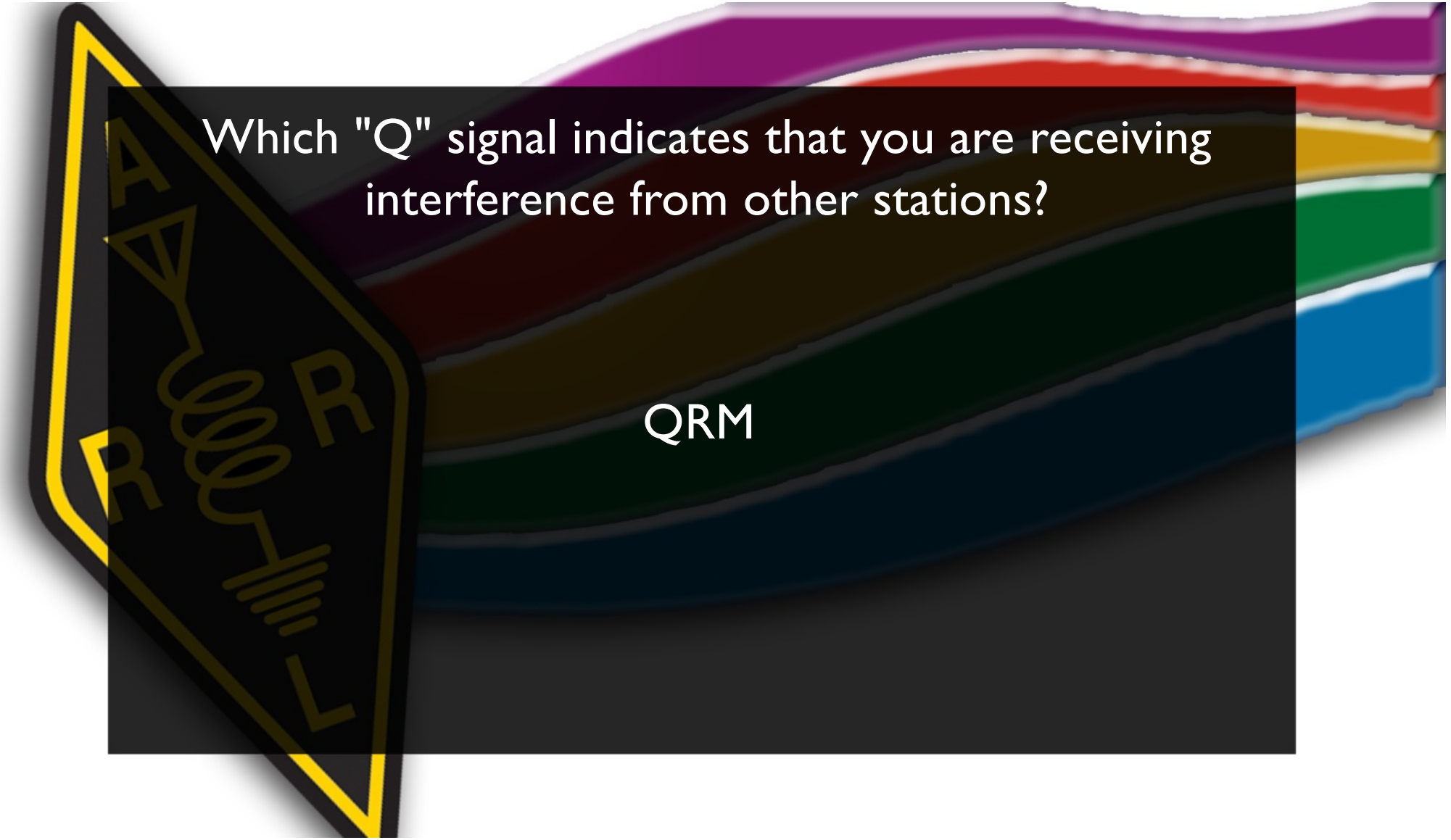
CTCSS

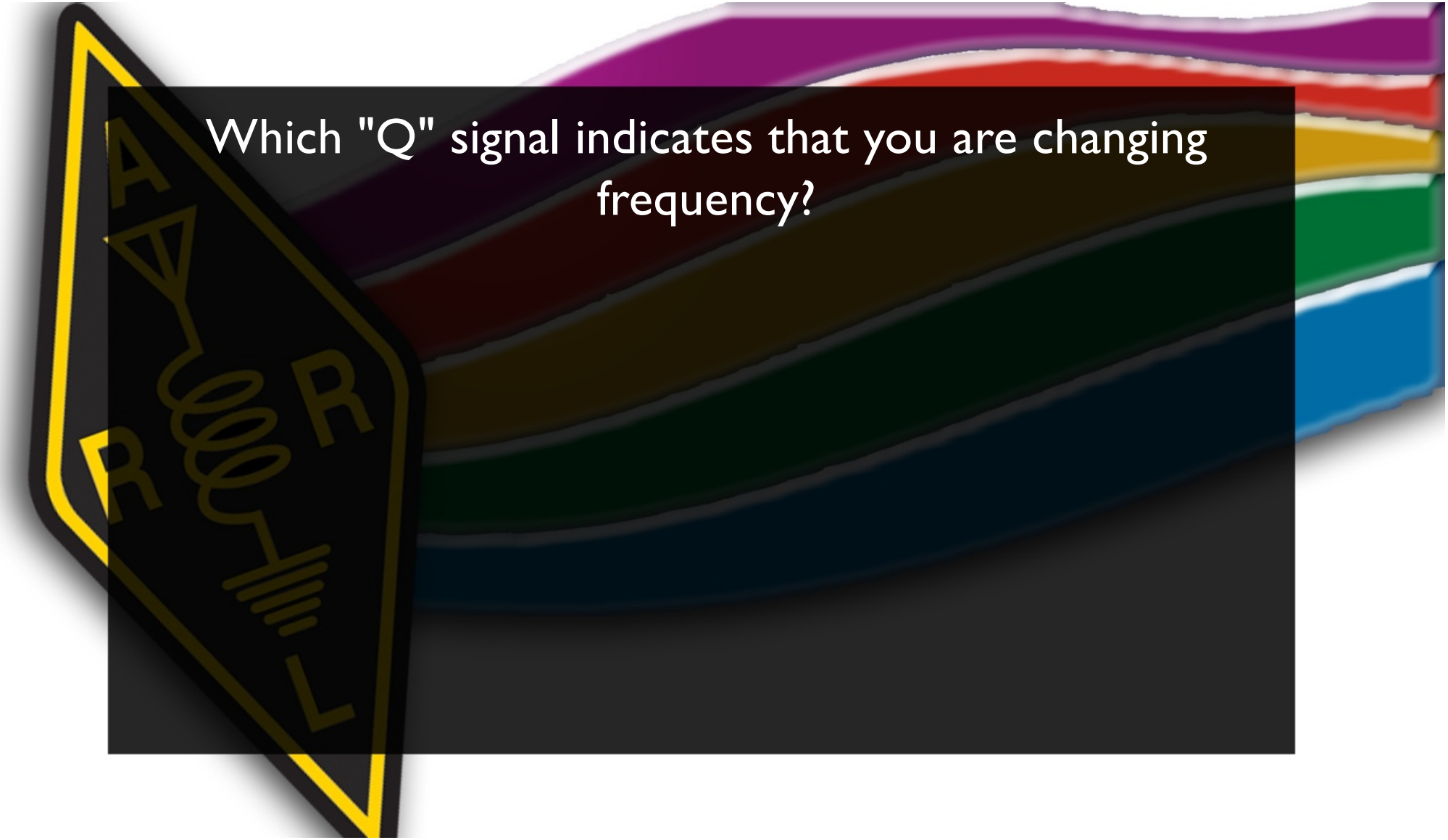

What common problem might cause you to be able to hear but not access a repeater even when transmitting with the proper offset?

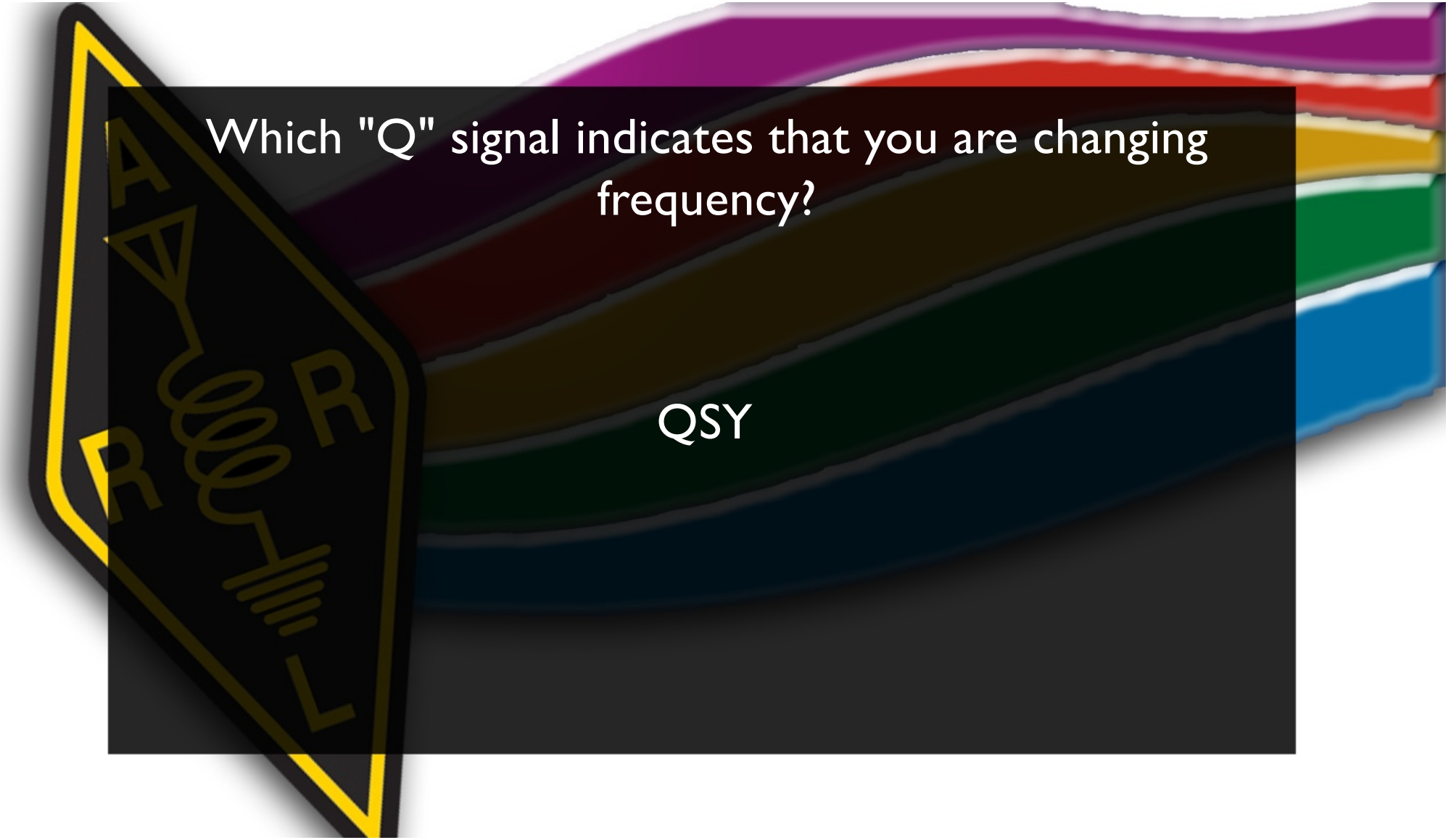
What common problem might cause you to be able to hear but not access a repeater even when transmitting with the proper offset?

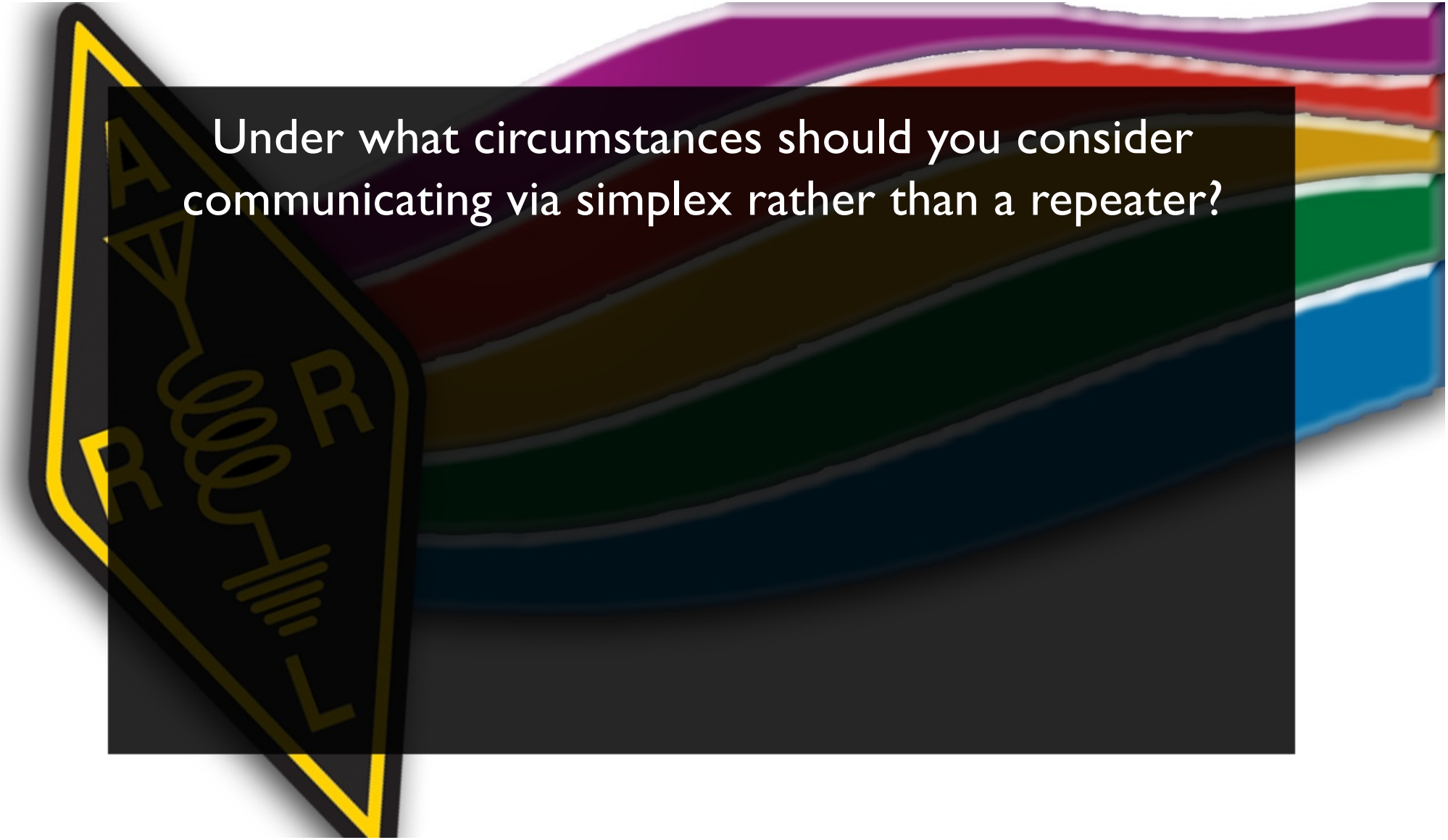
The repeater receiver may require an audio tone burst for access
The repeater receiver may require a CTCSS tone for access
The repeater receiver may require a DCS tone sequence for access

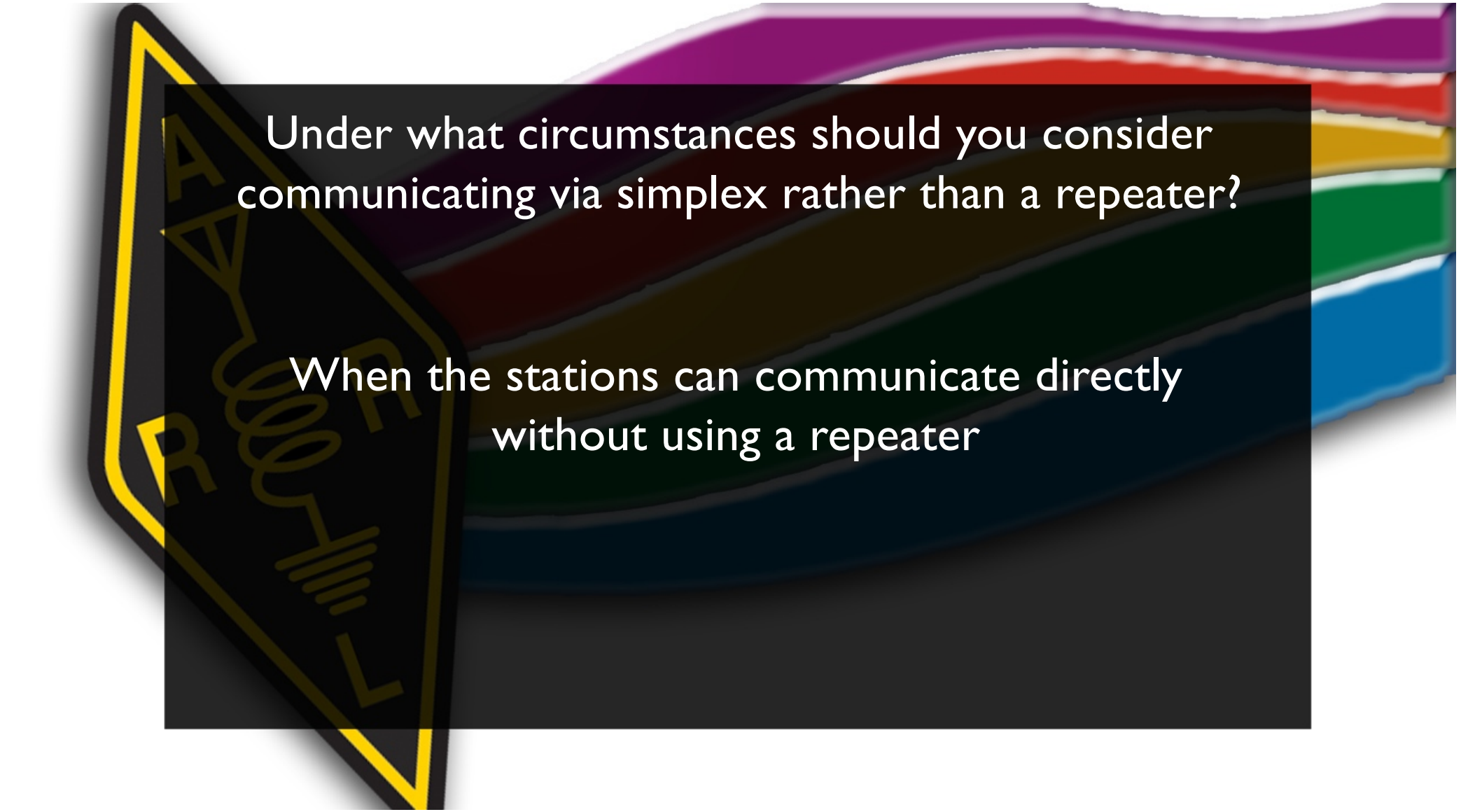

Which "Q" signal indicates that you are receiving interference from other stations?

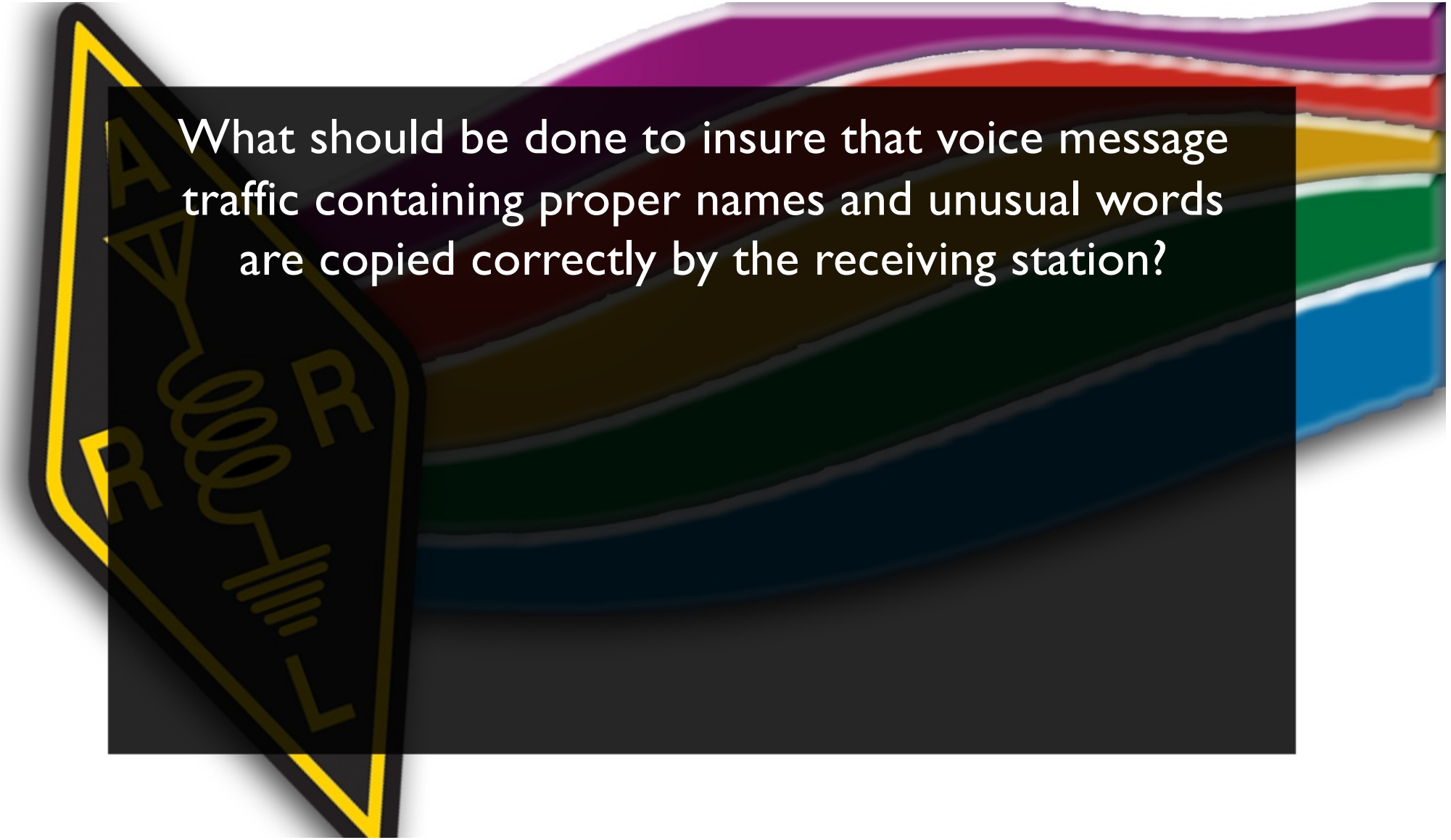

Which "Q" signal indicates that you are receiving interference from other stations?
QRM

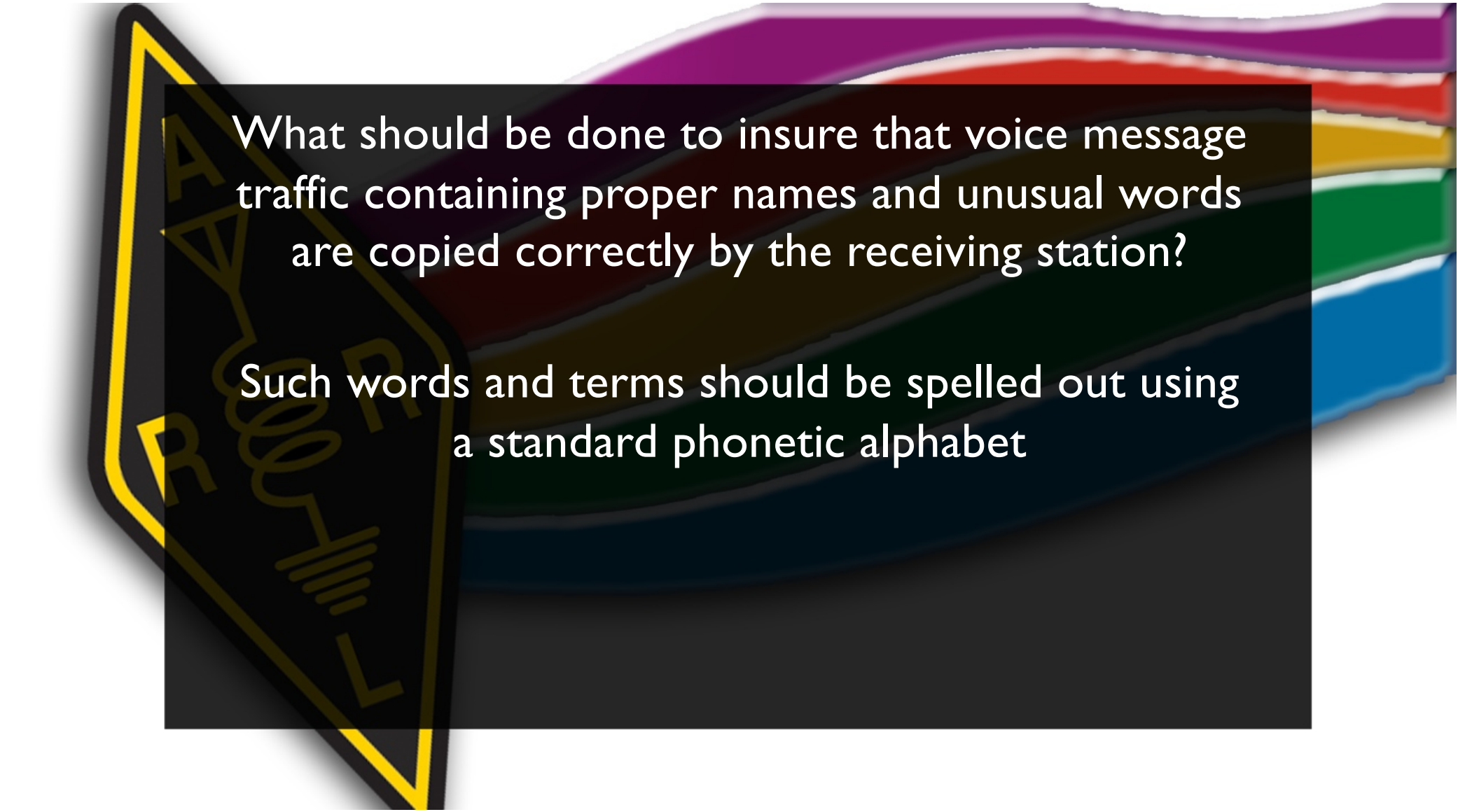

Which "Q" signal indicates that you are changing frequency?


Which "Q" signal indicates that you are changing frequency?
QSY


Under what circumstances should you consider communicating via simplex rather than a repeater?


Under what circumstances should you consider communicating via simplex rather than a repeater?
When the stations can communicate directly without using a repeater

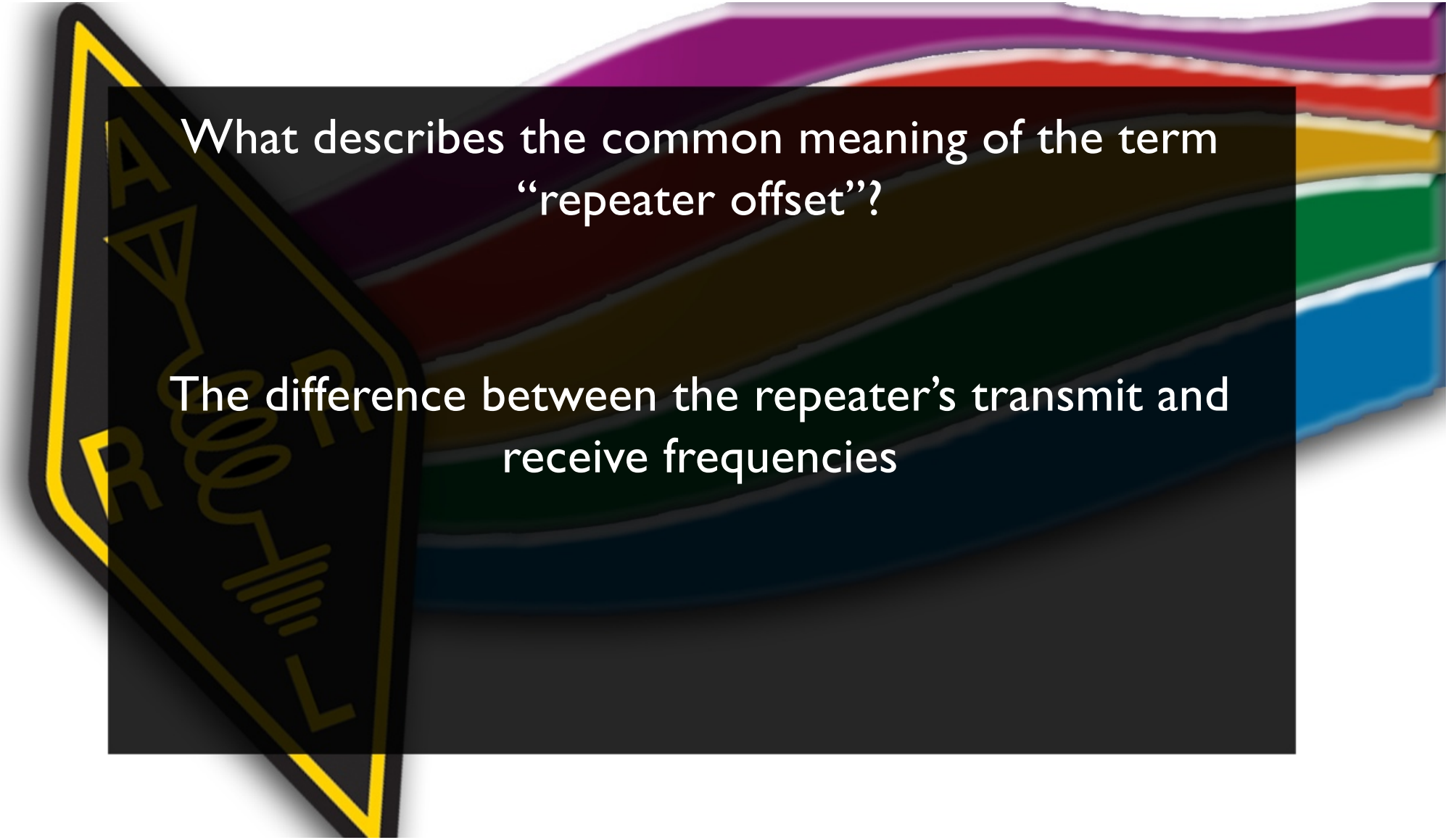

What should be done to insure that voice message traffic containing proper names and unusual words are copied correctly by the receiving station?



What should be done to insure that voice message traffic containing proper names and unusual words are copied correctly by the receiving station?

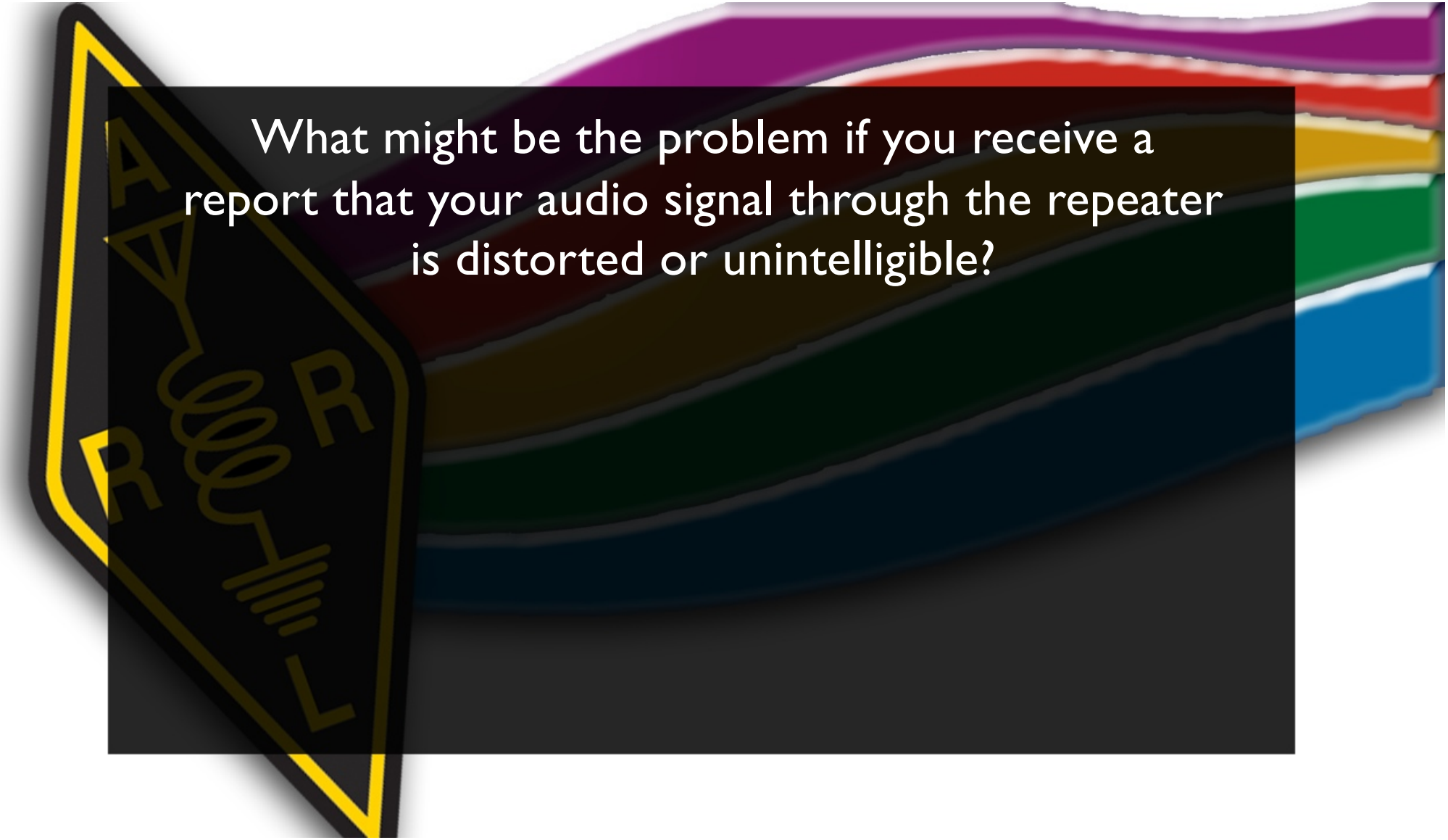
Such words and terms should be spelled out using a standard phonetic alphabet


What describes the common meaning of the term
“repeater offset”?



What describes the common meaning of the term "repeater offset"?

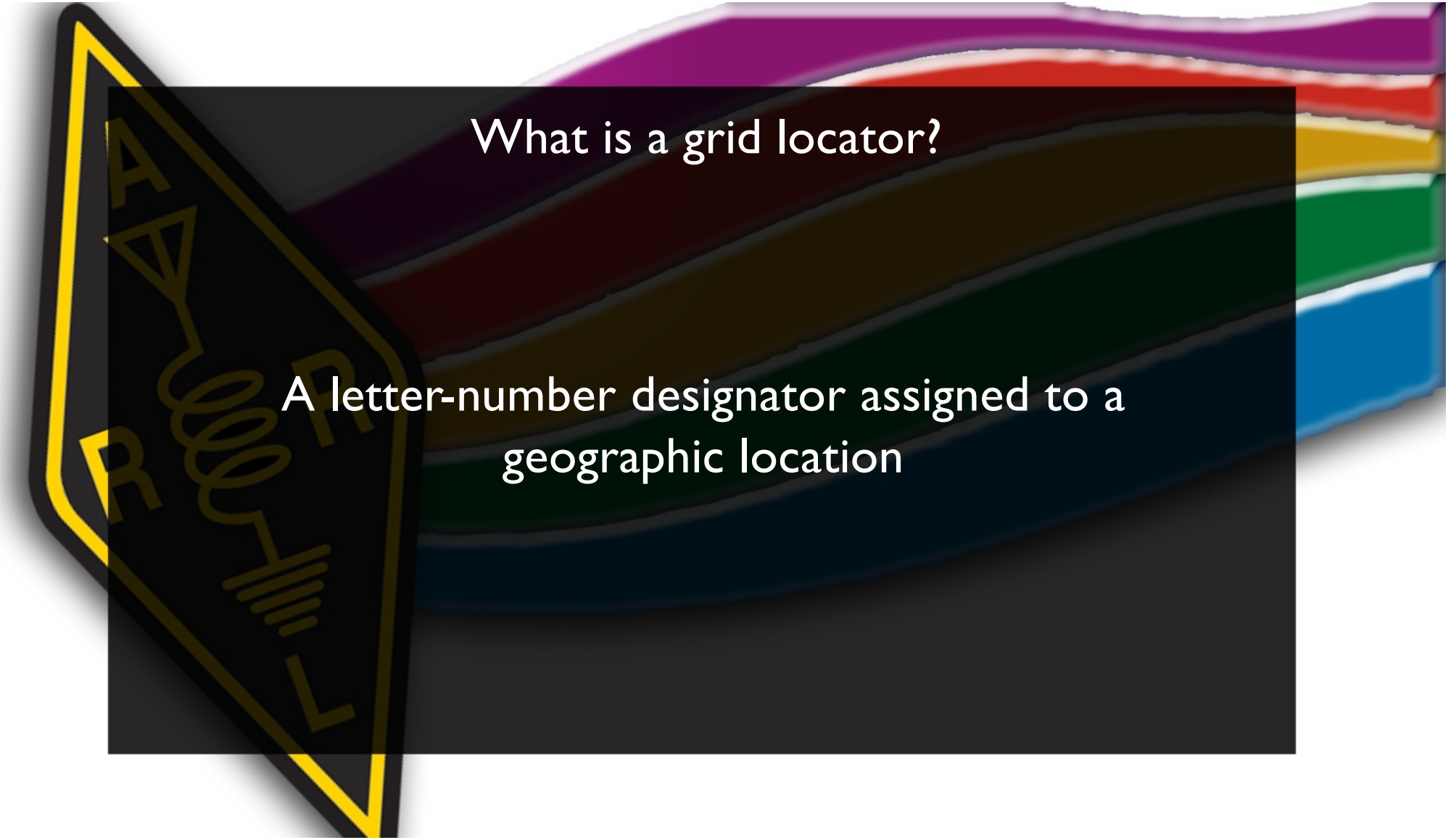
The difference between the repeater's transmit and receive frequencies


What might be the problem if you receive a report that your audio signal through the repeater is distorted or unintelligible?

What might be the problem if you receive a report that your audio signal through the repeater is distorted or unintelligible?

Your transmitter may be slightly off frequency
Your batteries may be running low
You could be in a bad location

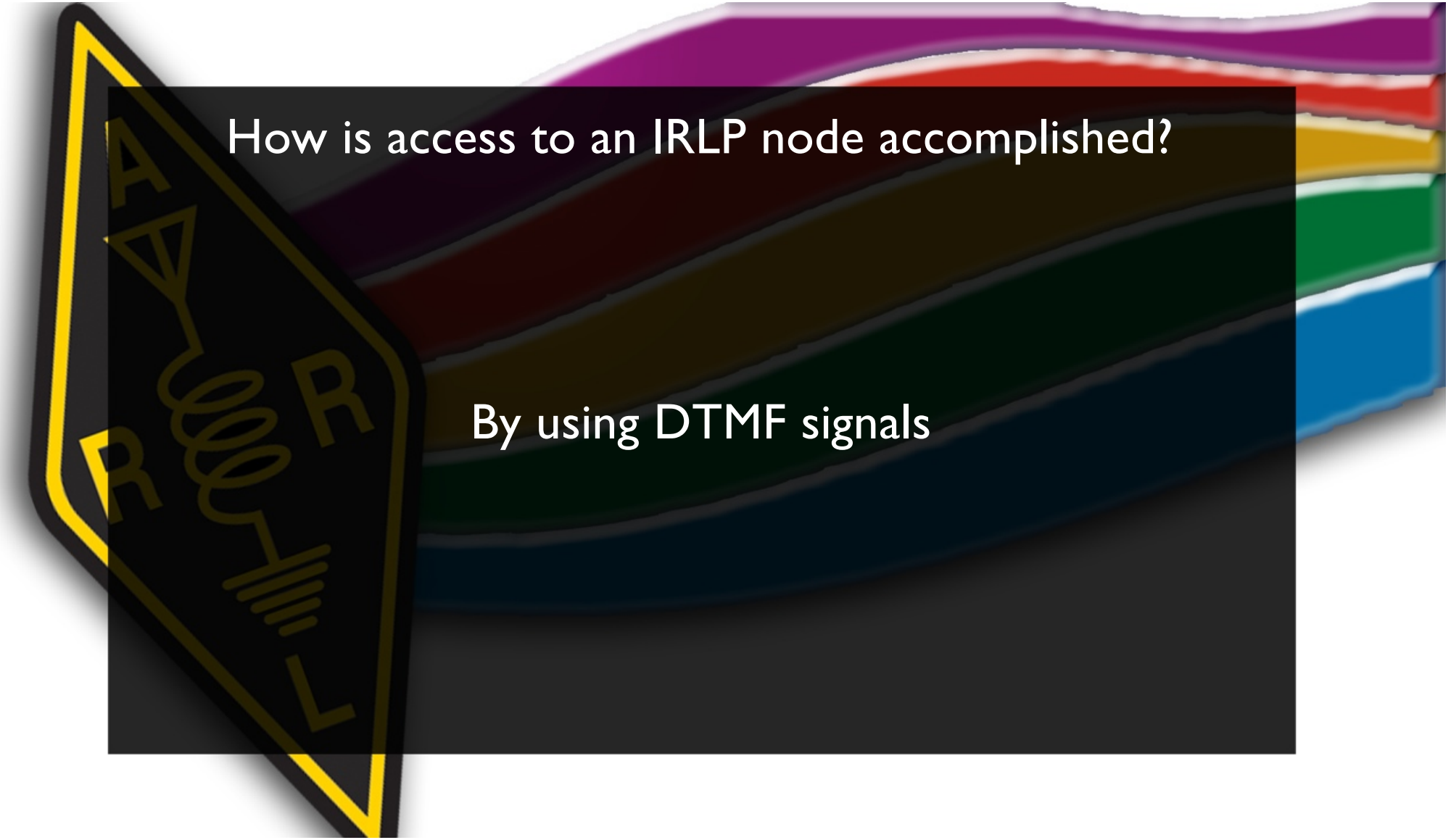

What is a grid locator?



What is a grid locator?

A letter-number designator assigned to a geographic location


How is access to an IRLP node accomplished?

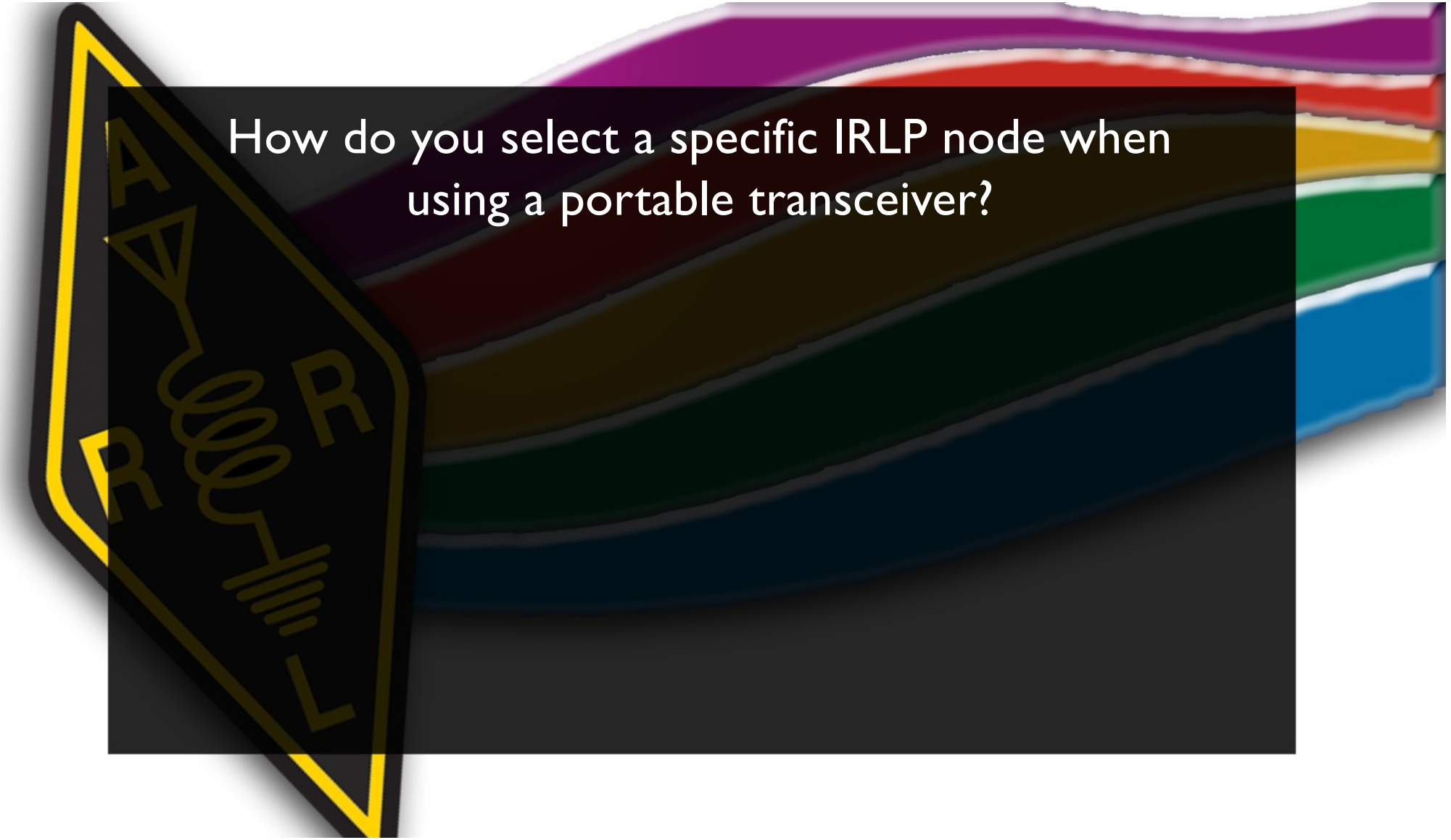


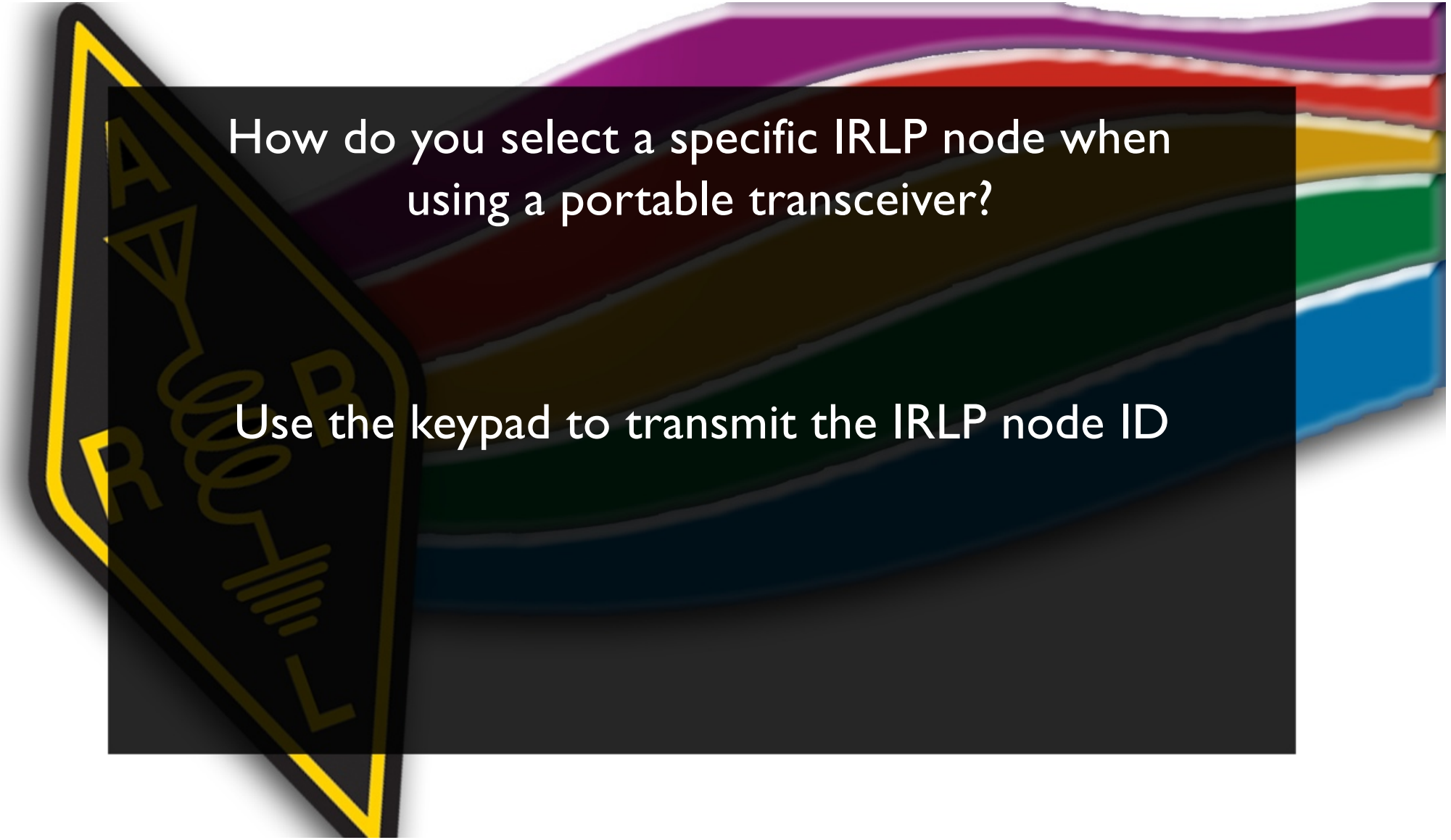
How is access to an IRLP node accomplished?

By using DTMF signals


How might you obtain a list of active nodes that use VoIP?

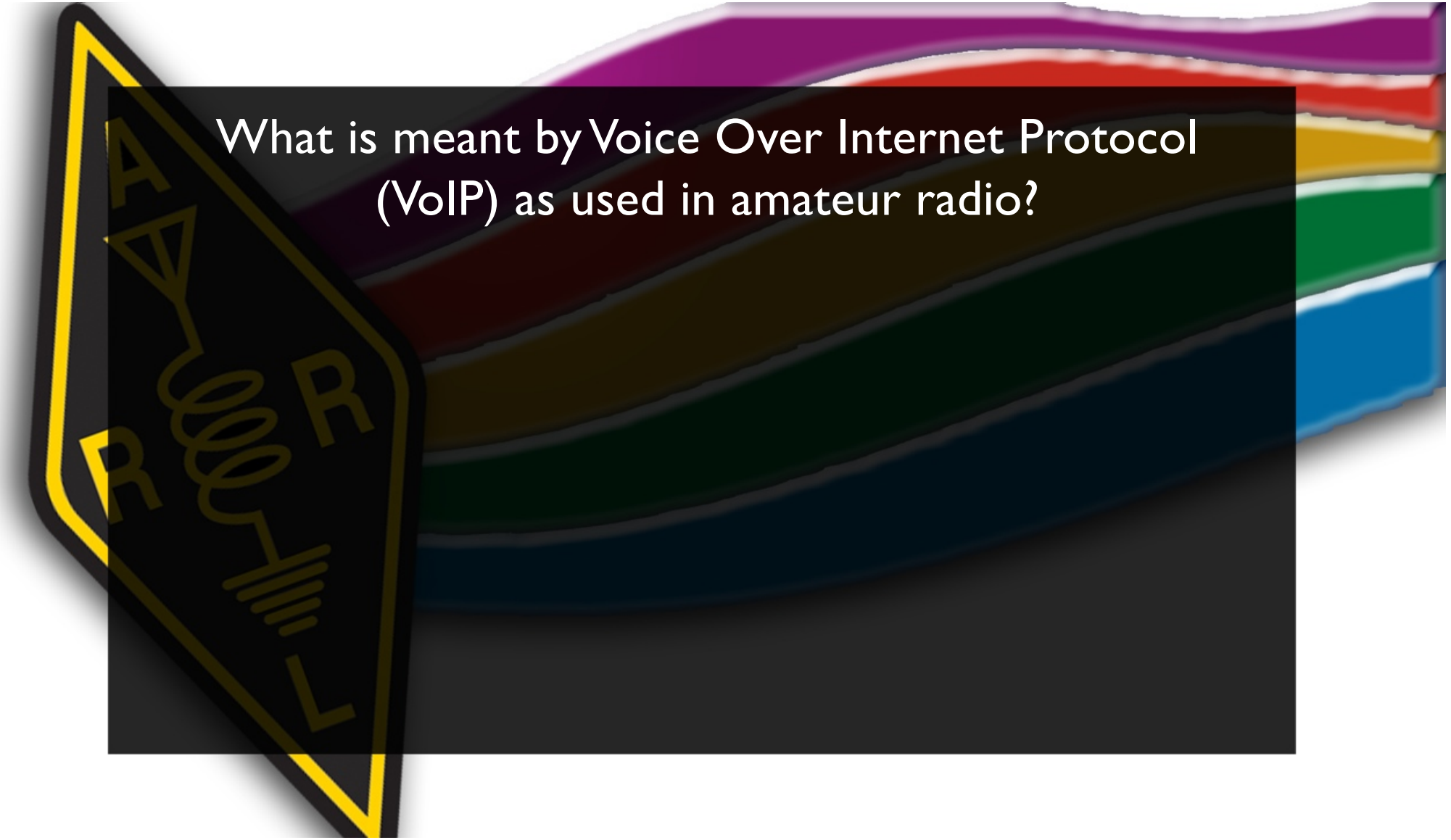

How might you obtain a list of active nodes that use VoIP?
From a repeater directory


How do you select a specific IRLP node when using a portable transceiver?



How do you select a specific IRLP node when using a portable transceiver?

Use the keypad to transmit the IRLP node ID


What is meant by Voice Over Internet Protocol
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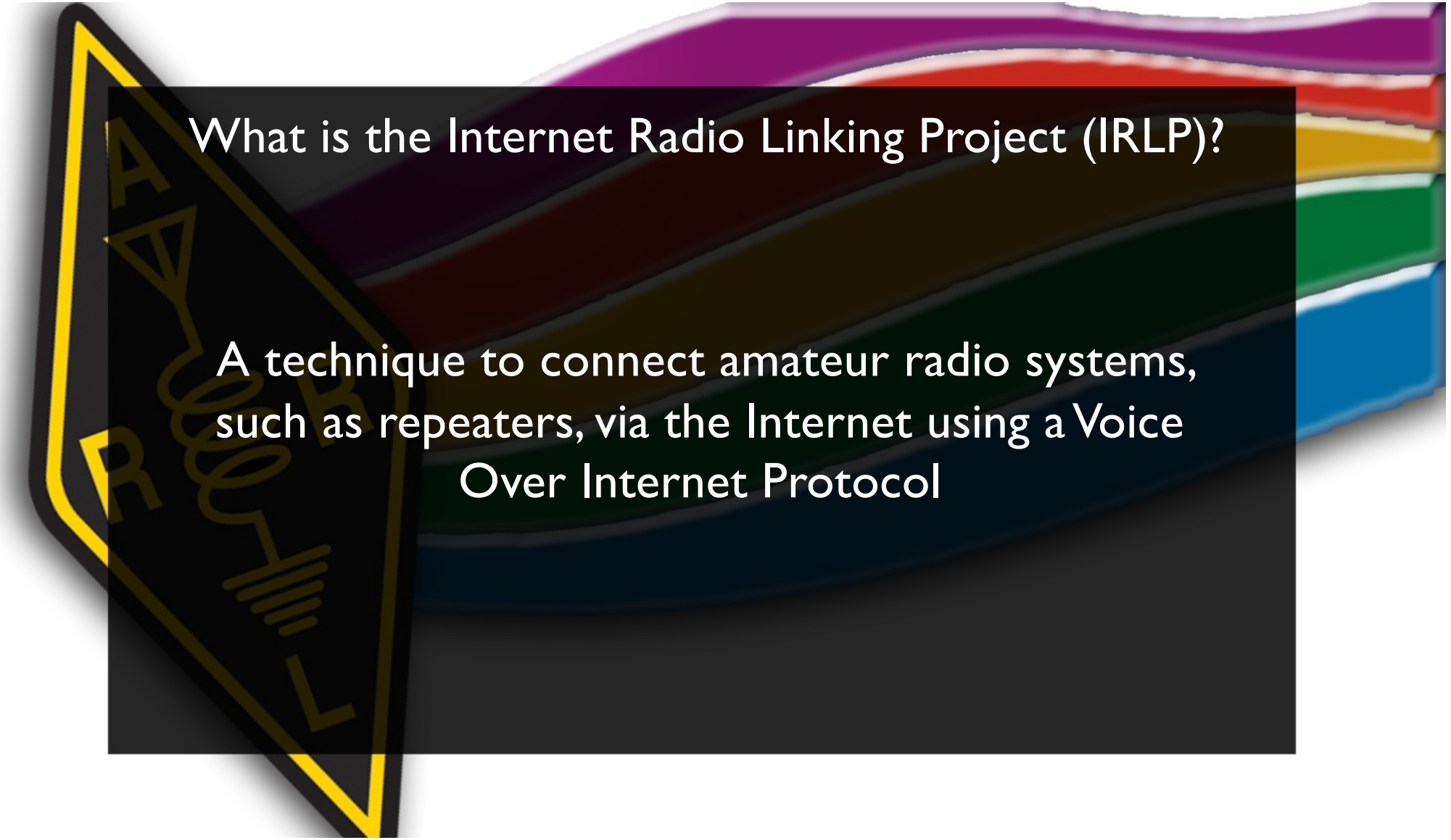
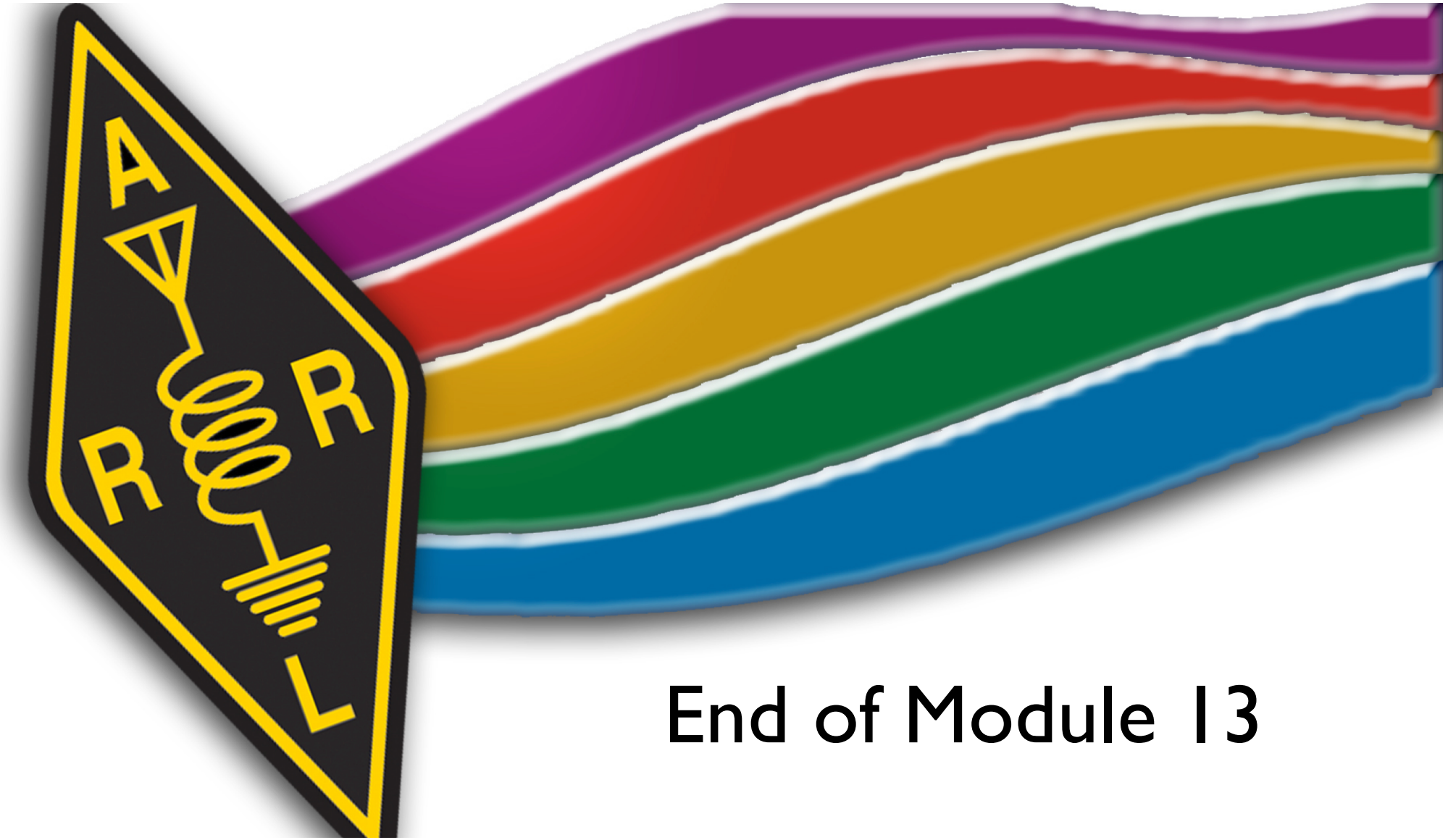
A method of delivering voice communications over the Internet using digital techniques

What is the Internet Radio Linking Project (IRLP)?



What is the Internet Radio Linking Project (IRLP)?

A technique to connect amateur radio systems, such as repeaters, via the Internet using a Voice Over Internet Protocol



End of Module 13