

PRACTICAL RADIO OPERATIONS...

Using Repeaters and EchoLink



WHAT IS A REPEATER

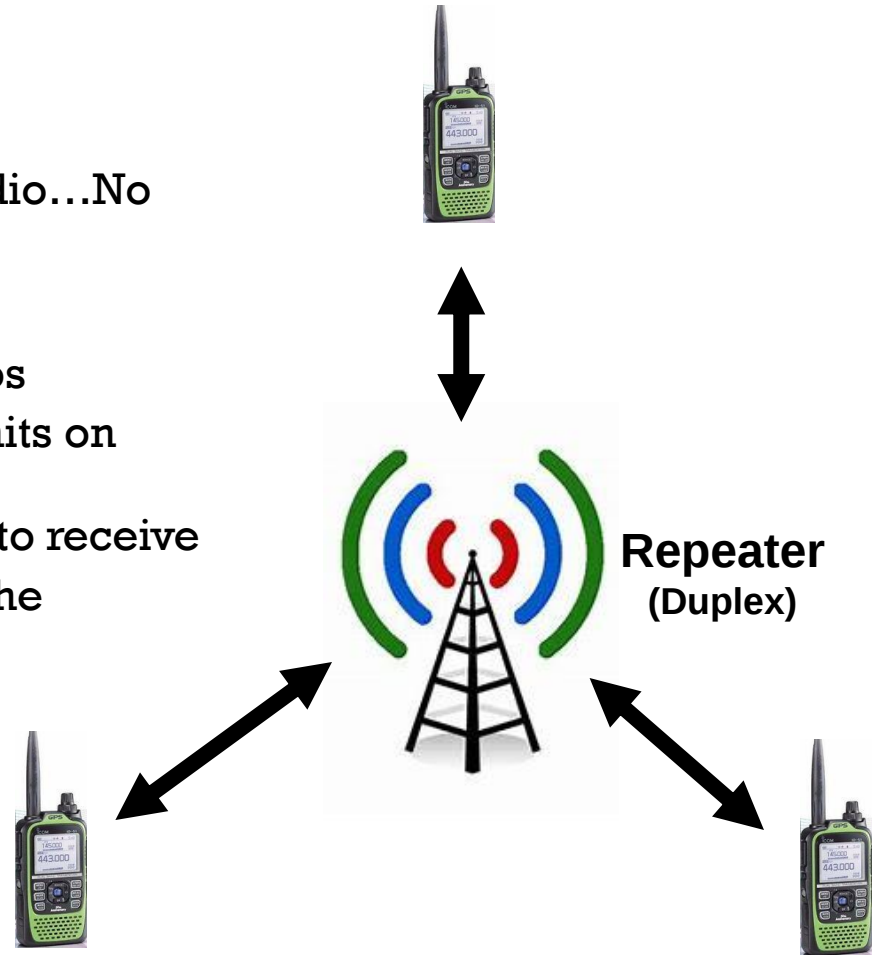
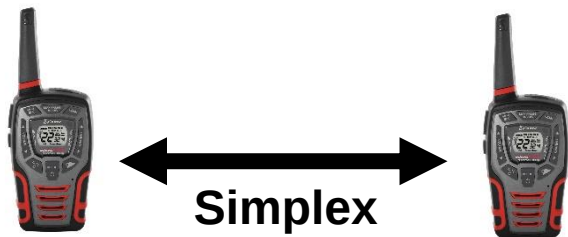
- A **repeater** is a device which will receive a signal on one frequency...and simultaneously transmit it back out on another frequency.
- When we use the term **repeater** we are almost always talking about transmitters and receivers on VHF or higher bands, where radio-wave propagation is normally line of sight.
- Repeaters usually amplify the signal received to extend the range
 - This is especially useful when using a handheld (HT) radio

TYPES OF REPEATERS

- **FM Voice – Very common and most popular.**
 - These repeaters are commonly found on 29, 144, 222 or 440 MHz bands.
 - Though not as popular, there are FM repeaters on the 6m amateur band.
- **ATV – Amateur Television.**
- **AM and SSB - Not very common.**
- **Digipeaters – Primarily used for packet communications.**
- **Multi-channel (wideband) – Amateur satellites.**

SIMPLEX VS DUPLEX

- Simplex is simple
 - Radio talking directly to another radio...No go-between
- Duplex is more complex
 - Repeaters extend the range of radios
 - Receives on one frequency...transmits on another
 - Predetermined offset from transmit to receive
 - Often requires a PL tone to trigger the repeater



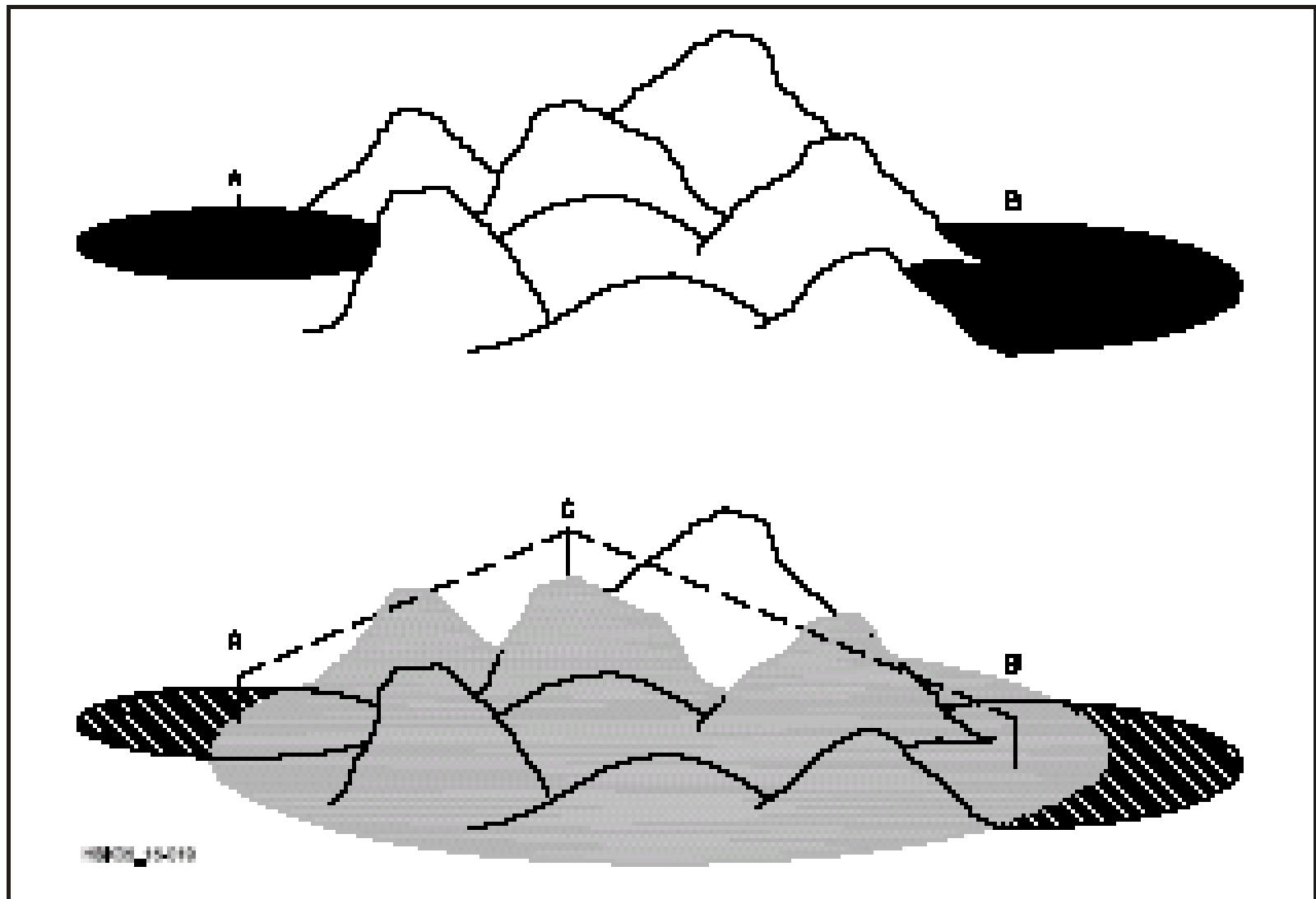


Fig 15.19 — In the upper diagram, stations A and B cannot communicate because their mutual coverage is limited by the mountains between them. In the lower diagram, stations A and B can communicate because the coverage of each station falls within the coverage of repeater C, which is on a mountaintop.



OFFSET AND TONE

- The **Offset** is the predetermined difference between the transmit frequency and the receive frequency in Duplex radios
 - Standard offsets used by most repeaters
 - VHF +/- 0.6 MHz
 - UHF +5.0 MHz
- The **PL Tones** or **CTCSS Tones** are sub-audible tones that are transmitted simultaneously with the speech portion of the transmission.
 - These tones prevent other people from receiving the transmission.
 - PL (or Private Line) Tone was a Motorola patented term that became generic to the industry. Just like Kleenex is to tissues.
 - Continuous Tone Coded Squelch System(CTCSS) is the official government generic term for a PL Tone.

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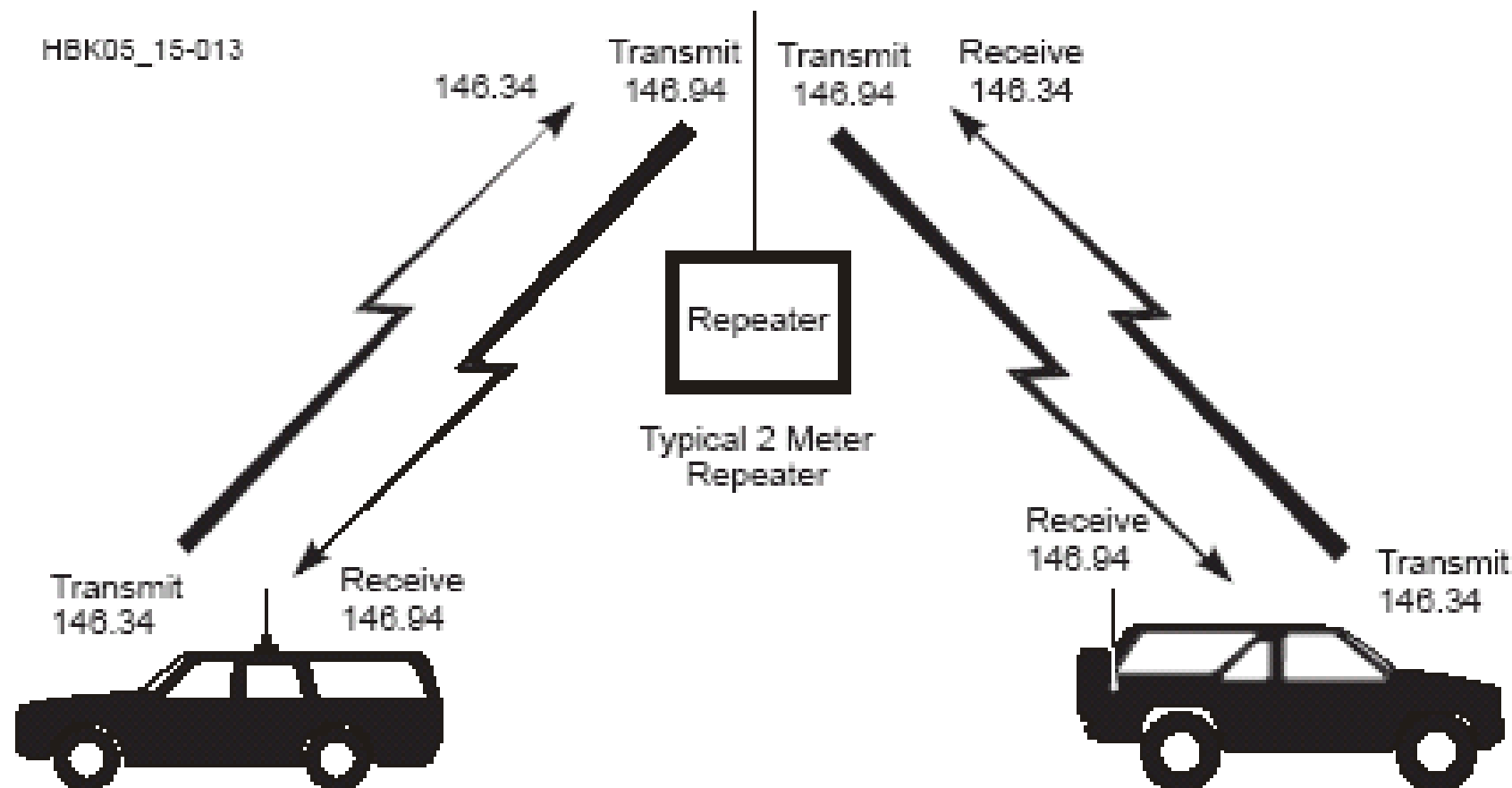


Fig 15.13 — Typical 2-m repeater, showing mobile-to-mobile communication through a repeater station. Usually located on a hill or tall building, the repeater amplifies and retransmits the received signal on a different frequency.



WHAT ARE LINKED REPEATERS

Two or more repeaters transmitting their signals to each other using link radios.

Signals from one can be heard by everyone on the other...and vice versa.



SPALDING COUNTY REPEATERS

- Griffin DSTAR (W4AMI) - 145.480 MHz
 - -0.6 MHz offset - Digital (DV)...no PL tone
- Sun City Analog UHF (W4SCP) – 443.600 MHz
 - +5.0 MHz offset - PL Tone 110.9 Hz
 - EchoLink node – 716008
- Griffin Analog VHF (K4HYB) – 146.910 MHz
 - -0.6 MHz offset - PL Tone 88.5 Hz
- Other repeaters can be found using the Repeater Book
 - The “phone book” of repeaters
 - Hard copy (updated annually)
 - Online or smartphone app (updated continually)

BASIC REPEATER ETIQUETTE

- Listen first – don't interrupt
- Don't respond if you aren't sure the call is for you
- Use plain language – speak like you are face to face
- One at a time – you cannot speak and listen at the same time
- If more than two operators in the conversation, make a positive hand off to the next person to speak
- Never transmit sensitive, confidential, or financial information
- Learn the call signs of persons or stations you communicate with regularly

Identify Your Station Call Sign at the Beginning...at the End...and every 10 minutes in Between

MAKING A CALL

- Follow these steps to make a call to a specific person
 - First, listen to ensure the channel is clear for you
 - Then listen again...
 - Press the PTT (Push-To-Talk) button
 - Wait 1-2 seconds
 - Say "recipient's call sign" twice
 - Followed by "THIS IS" and "your call sign"
- When you release your mic button you should hear the repeater signal for a second or two often followed by a tone or beep.
 - This is called the "squelch tail" or "courtesy tone"
 - The courtesy tone tells you that the repeater has reset its timer and it is ok to transmit.
 - You don't have to wait for the repeater to "drop" altogether
- Once the person replies...
 - Begin your conversation or convey your message.

EMERGENCY CALLS...

WHAT TO DO IF YOU HAVE A PROBLEM

- If you have an emergency message and need to interrupt others' conversations:
 - Wait and listen until you hear "Over"
 - Press PTT
 - Say "BREAK, BREAK, BREAK, and your call sign"
 - I have an emergency message for (recipient's call sign), Over"
 - Or...I have an emergency, Over
- The stations should acknowledge you and stop to help with the emergency

RADIO NETS...THEY AREN'T JUST FOR CATCHING FISH

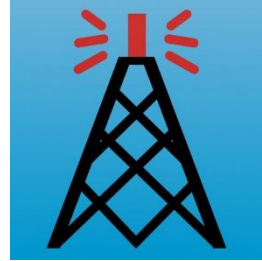
- What is an amateur radio net...or ham net?
 - An "on-the-air" gathering of amateur radio operators.
 - Most nets convene on a regular schedule and specific frequency
 - Most have a purpose...emergency practice, specific topic, or just "rag-chewing"
 - Can be formal or informal
 - Net controller manages the discussion flow
- Protocol and niceties
 - Wait for net control to call for you or your group
 - Thank net control and say hello to all on the net
 - Some use the "This is..." principle...some don't
 - Good way to practice emergency communications
 - Great way to test your equipment



RADIO NETS... THAT I KNOW ABOUT... THERE ARE OTHERS

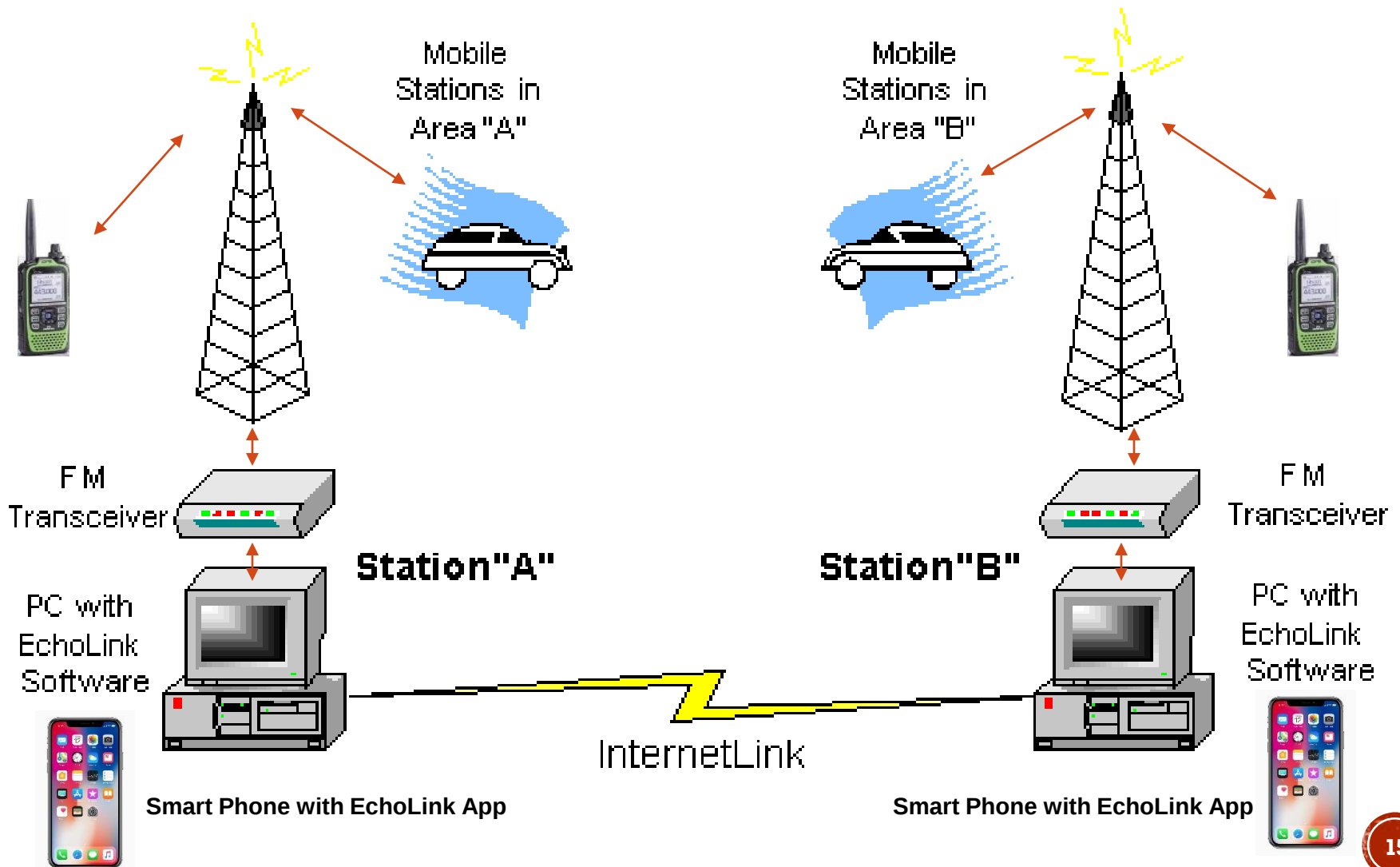
Name	Day	Time	Frequency
Spalding County ARC Radio Net	Monday	8:30pm	145.390
Sun City Amateur Radio Net	Wednesday	7:30pm	443.600 (Echolink 716008)
Barnesville Tech Talk Net	Monday	9:00pm	147.225
Peach State ARES - Thomaston	Monday	8:00pm	147.390
Barnesville Training Net	Tuesday	8:00pm	147.225
Fayetteville ARES	Tuesday	9:00pm	145.210
Peach State ARES - Thomaston	Tuesday	7:30pm	147.390
Southeast Linked Repeater Net	Wednesday	9:00pm	147.390/145.390
Barnesville Triva Net	Wednesday	9:00pm	147.225
Barnesville Local Net	Thursday	9:15pm	147.225
Peach State ARES - Thomaston	Thursday	8:00pm	147.390
Thomaston Local ARES	Thursday	9:00pm	147.390

WHAT IS ECHOLINK



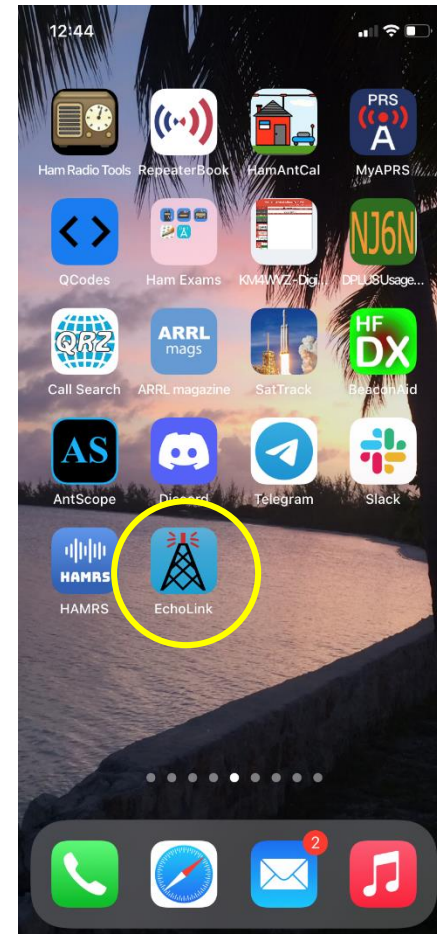
- EchoLink® software allows licensed Amateur Radio stations to communicate with one another over the Internet, using streaming-audio technology.
- Worldwide connections can be made...
 - Station to station; or,
 - Computer to station; or,
 - Computer to computer
 - Smart phones are computers too
- There are more than 300,000 validated users worldwide — in 151 of the world's 193 nations — with about 6,000 online at any given time.
- www.echolink.org

Linking Example



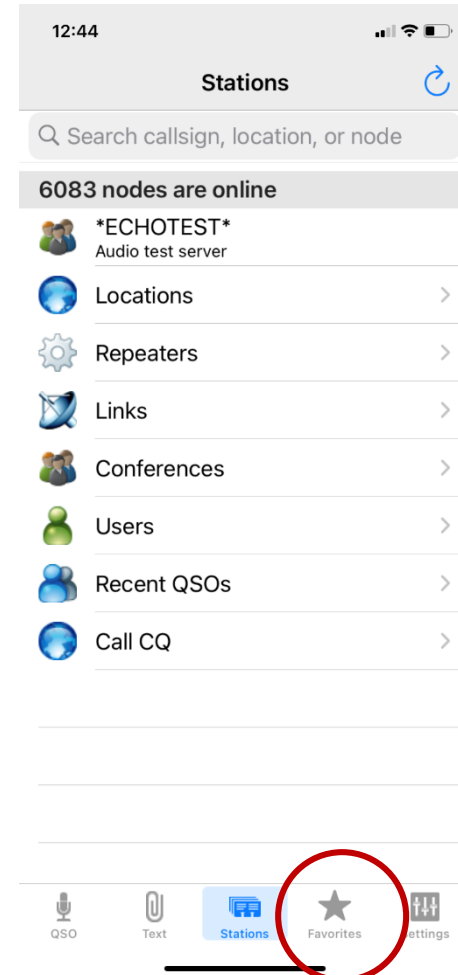
ECHOLINK APP FOR PHONES

- App is free to download in the AppStore
- You must register with EchoLink
 - Only licensed operators can use the app.
- www.echolink.org
 - Download the software or app
 - Go to the validation page to register your call sign



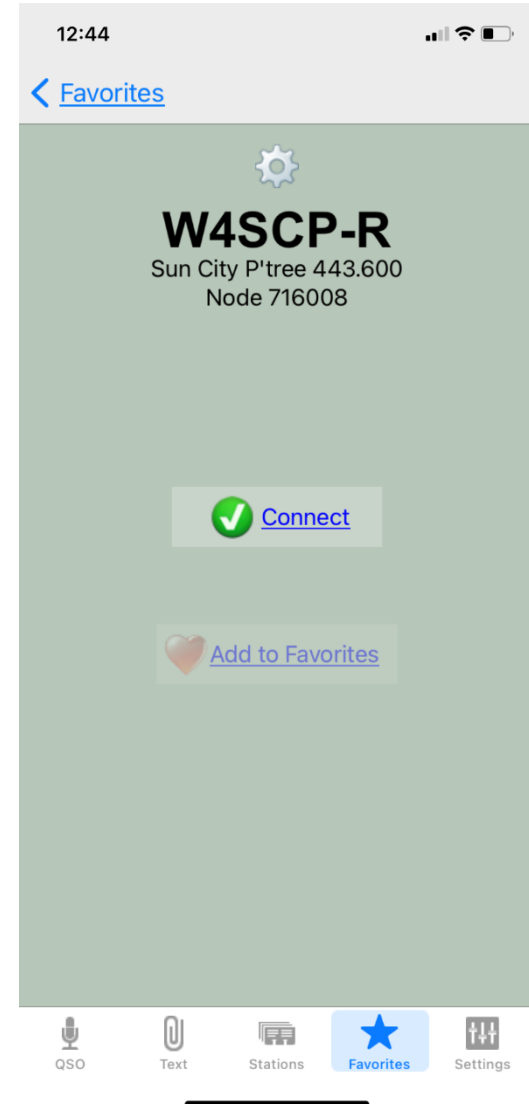
USING ECHOLINK

- Make sure you have internet access
 - WiFi or Cellular work
- Use this page to test your connection and to find a station
- Search by location
- Search by repeater
- Search by user
- Save Favorites for easy access later



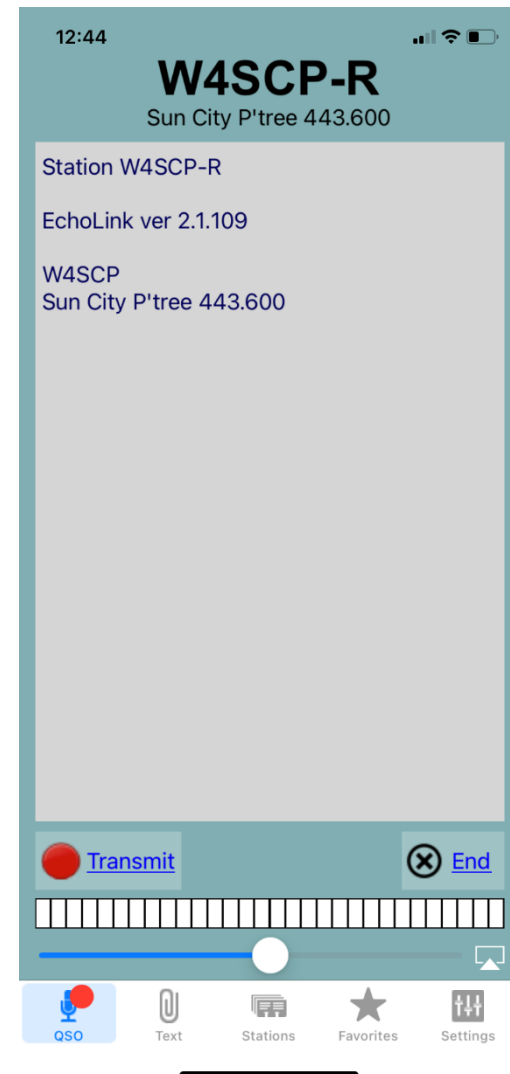
USING ECHOLINK

- When you identify a station, this screen lets you connect.
- If the station is not already a favorite...you can add them on this screen



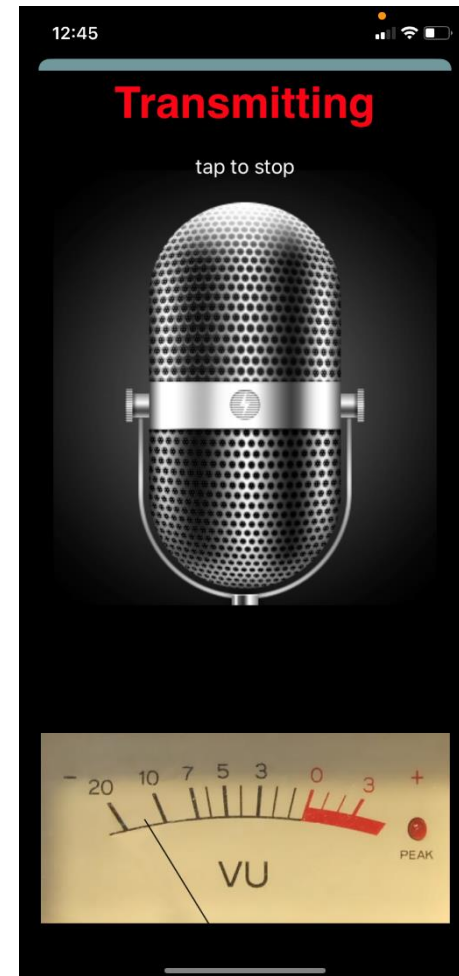
USING ECHOLINK

- This screens shows the activity on the station you have selected.
- If others are also on this EchoLink station, they show up on this screen.
- There is a meter at the bottom for signal strength
 - This will light up when there is activity
- You can only transmit when the Transmit button is available.
 - Be aware of the delays
- To leave the station, hit End

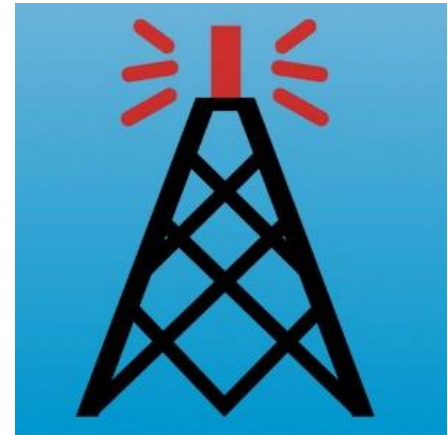


USING ECHOLINK

- When you touch the transmit button...this screen appears
- The meter shows your signal strength
- To stop transmitting...touch the microphone and it takes you back to the previous screen

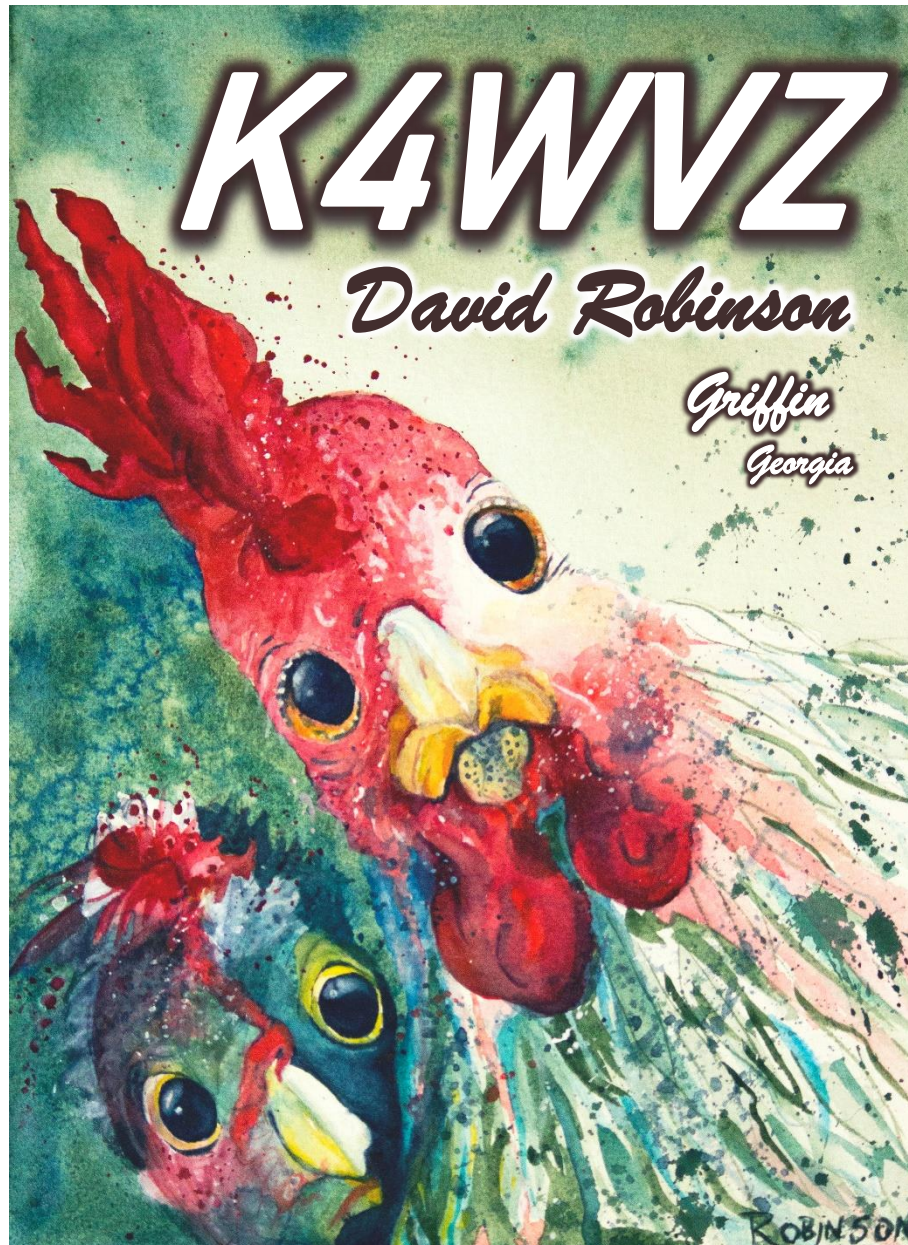


ECHOLINK INFORMATION



- Sun City EchoLink node
 - W4SCP-R
 - Node #716008
 - Linked to W4SCP 443.600 repeater
 - When the SCP machine is linked to the Griffin repeater...EchoLink users can access the Griffin machine
- There is a 5-10 second delay inherent in EchoLink
 - Those on analog machines need to be patient
- All regular amateur radio rules apply
- Great way to stay in touch when out of town...or across town
- www.echolink.org for more information and to register

Questions?



Thank
you for
your
attention!

updated 18 Aug 26 (KA)
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