Technician License Course
Chapter 6
Communicating with other hams

Lesson Plan Module 13:

Contact Basics; Band Plans; Making Contacts; Using Repeaters

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Telephone vs. Radio

Telephone Contact:

- Dial the number or answer a ring.
- Greeting and identify who is participating.
- Exchange information, generally taking turns.
- Salutations.
- Hang up.

Radio Contact:

- Choose a Frequency and Call a station.
- Identify who is participating.
- Exchange information, generally taking turns.
- Salutations.
- Sign Off.

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Radio Manners

Amateur Radio is for two-way communications.
Frequencies are shared and no one “owns” a frequency.

- Listen on the channel before calling.
- Ask “Is the frequency in use?”
- Recognize others’ requests to use the frequency or break in, if reasonable.

Radio is a giant party line – choose topics accordingly.

Beware of arguments and insults.

Speak clearly and distinctly.

Avoid long-winded monologues.

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Radio Manners

Use a standard phonetic alphabet to improve understanding – ITU, Cities, Countries, Names

Station identification

- At least every ten minutes
- At the end of a communication

Schedules with other stations

- Check for a clear frequency.
- Stand by if the frequency is in use.

Radio Manners

Honest signal reports

Power level

- Use minimum level needed for contact.

Location – QTH

- Local geography
- City and State
- Lat. & Long.
- Grid Square

RST (or RSQ)

- **R**eadability (1-5)
- **S**trength (1-9)
- **T**one (1-9 for CW)
- **Q**uality (1-9 For digital)

CW – “RST 599”

Phone – “5, 9”, “Q5, S9”, “5, 9 Plus 10”, “30 over 9”, “Loud and Clear”, “Full Quieting”

Digital – “RSQ IS 599”; Q is signal quality.

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Ham radio has a history of Self-Policing to help hams help each other to follow the rules.

- ARRL Official Observers.
- Severe violations can be reported to FCC.

Logging your contacts

- Paper or computer
- Not required but can be useful legally

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Radio Manners

Acknowledging the contact with a QSL card is the final courtesy of a QSO

- Needed for Awards Programs

Contests

- Calling a station in a “pileup”
- Giving reports
- Listen before calling.
- Plenty of QRM but a good test of operating skill.

Band Plans

A band plan is a way of organizing the use of radio frequencies.

- FCC designates sub-bands for modes and privileges.
- Amateur groups establish what is normal.
  - LSB versus USB
  - CW versus Digital
  - Simplex and Duplex

Making Contacts

Check the frequency

- “Is the frequency in use?”
- Legal to use for your license?

Asking for a contact:

- On Repeaters, just say your callsign or say your callsign and “Monitoring”
- On Simplex or HF:
  - Call CQ to talk to anyone listening.
  - To break into a QSO, Say your callsign when other stations pause or when they ID.

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Making Contacts

Listen to learn the local practices

Practice using your radio

Having trouble making contacts? Do you hear stations that you can't work?

- Off frequency?
- Transmitter output low?
- Is your antenna good enough?
- Distortion and low batteries?

Simplex vs. Duplex

Simplex

- Stations take turns transmitting and listening.
- Receiver is muted while your transmitter is on.
- For “Split” operation the transmit and receive frequencies may differ.

Duplex

- Full duplex means stations can receive while sending by using two frequencies.
- A station transmits on one frequency and receives on a different frequency.
- The transceiver shifts between receive and transmit frequencies.

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What is a Repeater?

A Repeater consists of a Transmitter and Receiver interconnected by a **repeater controller** to allow duplex operation.

- Usually located at a high place.
- Extends line-of-sight range if both users can see the repeater site.
- Receives your signal on an **input frequency** and simultaneously retransmits your signal on an **output frequency**.

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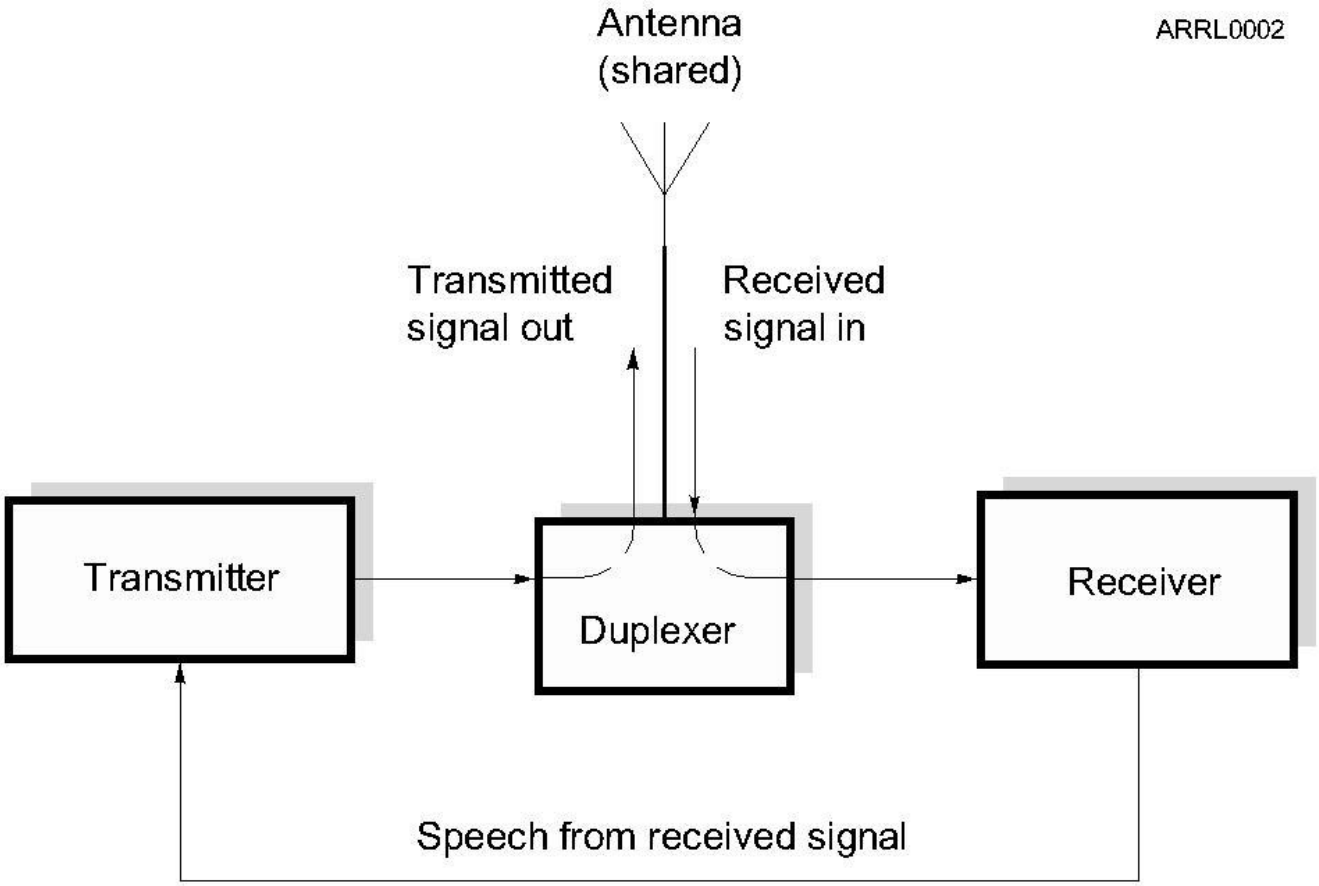

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Repeater Controller

Hardware that controls the repeater operation.

- Keys the transmitter when carrier or tone input is detected.
- Unkeys after input ends, usually after a time delay.

Station identification (Morse code or synthesized voice).

- Same requirements as all stations.

Time-out protection. (Sometimes called the “alligator”.)

- Protects against continuous transmission in the event of a stuck PTT or long winded hams.

Courtesy tone when a station unkeys or when repeater time-out timer is reset.

Repeater Vocabulary

Output frequency – the repeater transmits and users listen.

Input frequency – the repeater listens and users transmit.

Tone or PL – transmitted to open the repeater

Open Repeater – may be used by anyone.

Closed Repeater – can only be used by members.

Linked Repeater – connects to other repeaters.

Kerchunk – Accessing the repeater without talking.

Timeout – Repeater shuts off if you talk too long.

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Things to Know to Use a Repeater

Determine the output frequency to know where to listen.

- Check Repeater Handbook for your region.

Frequency split or shift.

- Standard shifts: 600KHz, 1.6MHz, 5MHz, etc.
- May be plus or minus

Repeater access tones; “PL”, CTCSS

Open or Closed? Clubs? Special uses?

Linking facilities:

- EchoLink, IRLP (Internet Repeater Linking Project), Linked Networks

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Talking about Repeaters

Repeaters are frequently identified by their output frequency.

- "The Four Four Three dot Five machine."
  - Understood to mean 443.50 MHz
- "Let's go to "Six Ninety Four"
  - Understood to mean the repeater on 146.94 MHz.
- "Listen on the Four C's repeater?"
  - Here the repeater is referenced by the sponsoring club name.

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Repeater Frequency Split

The split, shifts, or offset frequencies are standardized to help facilitate repeater use.

There are + and – shifts depending on the plan.

Different bands have different standardized amounts of shift.

Table 3-2
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

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Repeater Access Tones

To preclude unintentional access, some repeaters require a special subaudible tone to be present before the repeater controller will recognize the signal as a valid signal and turn on the repeater.

These tones are called by 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. i.e.,

"W, B, 6, N, D, J, Repeater, P L is 7, 7, point Zero"

Tones are generally programmed into your radio memory channels along with the frequency and offset.

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