



REPEATER USE FOR BEGINNERS

**Community-based Education for
Amateur Radio and Emergency Communications**





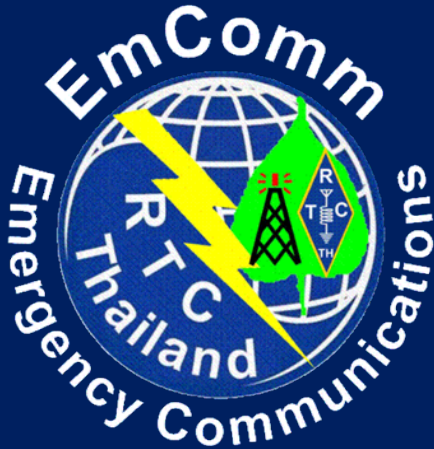
Repeater Use for Beginners

**Community-based Education for
Amateur Radio and Emergency Communications**

RTC-TH / GERC L 4



An RTC-TH EmComm / GERC Collaborative Training Series presentation



Compiled and Edited by
HS0ZHM and N7YLA

For other lessons in the series visit

www.neighborhoodlink.com/org/rtcth
www.neighborhoodlink.com/org/gerc



A part of the RTC-TH EmComm Program

The Rural Training Center-
Thailand Emergency
Communications program is a
volunteer effort to provide
emergency amateur radio
communications for local
community self-sufficiency and
sustainability in times of need.



Ready to serve and sustain our community



The Glendora Emergency Response Communications (GERC)

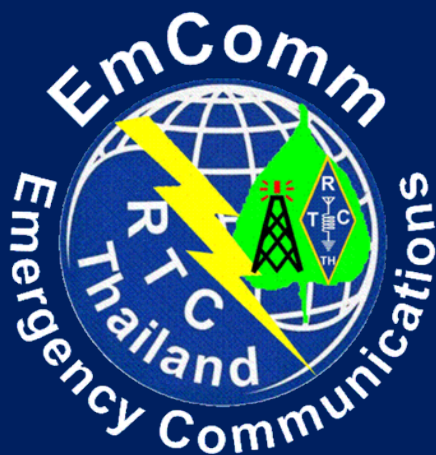


The mission of the Glendora Emergency Response Communications group, herein known as GERC, is to unite those amateur radio operators who have a common interest in communications, specifically to provide training, support and encouragement to radio amateurs who wish to serve as emergency communicators for the Church of Jesus Christ of Latter-day Saints (LDS).



Unless otherwise indicated, photos in this presentation are the exclusive property of the RTC-TH & GERC. Use of RTC-TH / GERC copyrighted materials are available for private / non-commercial educational use without written permission if no changes are made, no fee is charged, and proper attribution is made to the RTC-TH / GERC.

Commercial use of the materials is prohibited without written permission.



FFI: RTC-TH E-mail: rtc2k5@gmail.com
www.neighborhoodlink.com/org/rtcth

FFI: GERC Email: n7yla@arll.net
www.neighborhoodlink.com/org/gerc



Information Sources



This lesson follows the 6th Edition of the GERC Radio Operator's Guidebook and focuses on VHF repeaters in GERC operations

For a more complete discussion of repeaters in general, visit
<http://www.hamuniverse.com/repeater.html>



Repeater User for Beginners

Topics in the lesson

- Why use a repeater
- How a half duplex repeater works
- What you need to know
- Using a repeater (Simple Guidelines)

This lesson is based on topic of the same title in the
GERC *Radio Operator's Guidebook, 6th Edition.*





Our Assumptions for this lesson

Our basic assumptions about you and your amateur radio needs:

- You are not a techno-geek
- You are relatively new to amateur radio
- You are a relatively new to using a 2m VHF repeater
- You don't have a lot of experience talking on your radio



If most of these don't fit you, this may not be the lesson for you at this time.

About Repeaters

Why use a repeater?

Generally, your VHF radio range is limited to its power and antenna to “line of sight”. This means the antennas of the transmitting and receiving stations often need to be in plain sight of each other.



Mark, N7YLA



With “rubber ducks” these 2 HT’s might be able to talk ~1-2 miles if there are no tall buildings / mountains or dense stands of trees between them.



Frank, KG6TQV

“Line of Sight” (LOS) is when antennas are in a plain view of each other or in a straight line (out of visual range) with no obstruction between them.

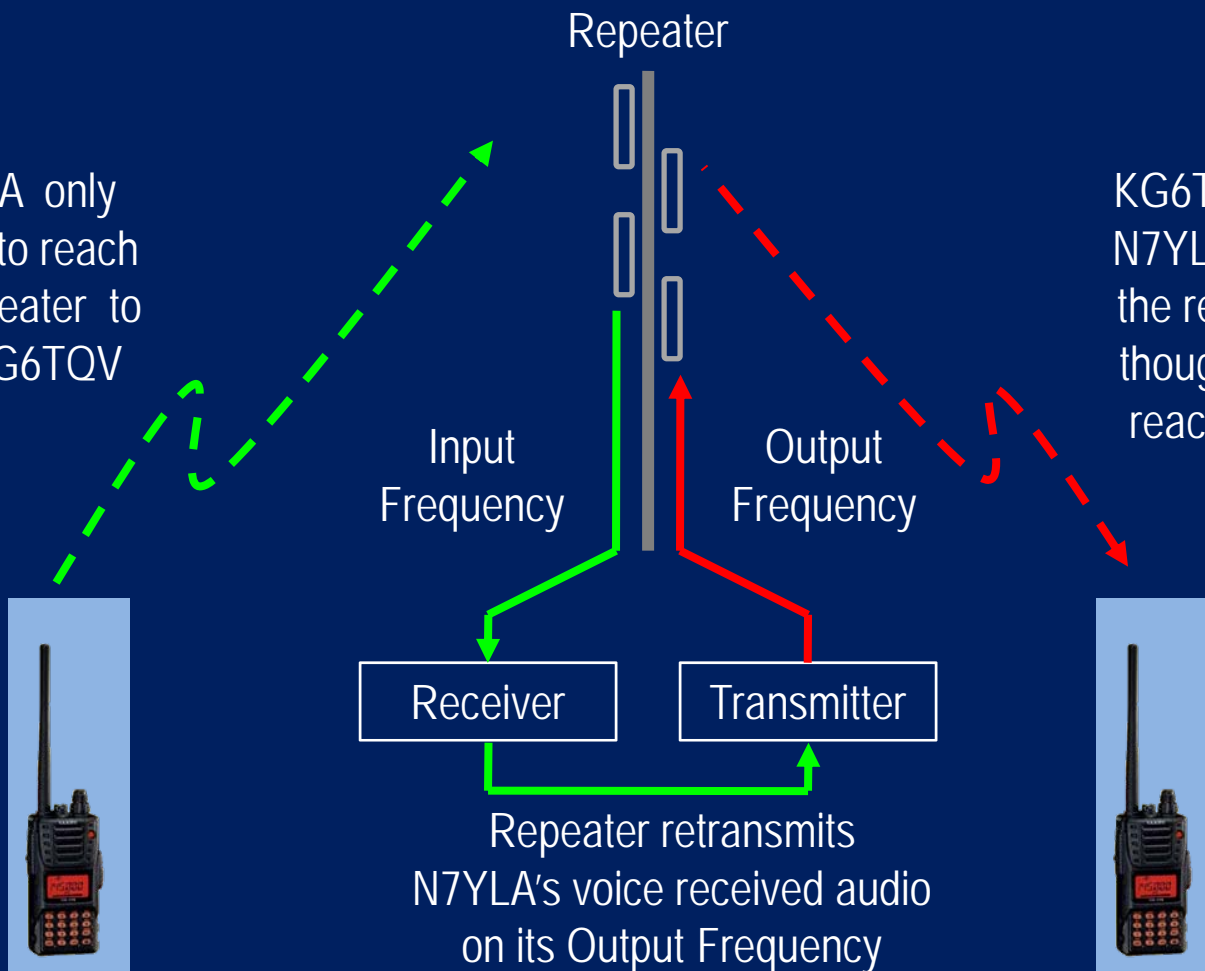


About Repeaters

A repeater extends your range

N7YLA only needs to reach the repeater to call KG6TQV

KG6TQV receives N7YLA's call from the repeater even though he cannot reach N7YLA by simplex



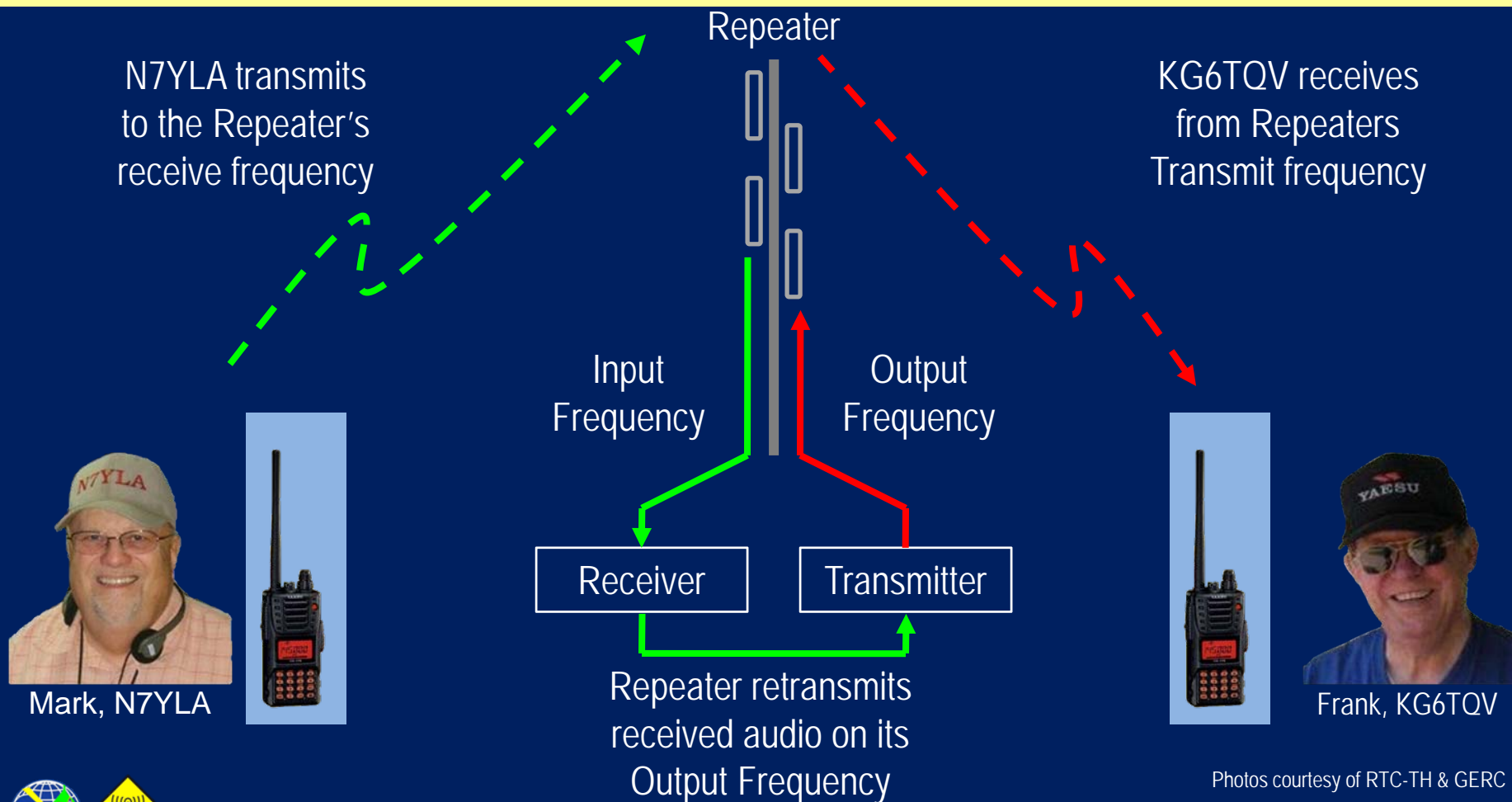
Now if each HT is 2 miles from the repeater (but in opposite directions, the range is now doubled to 4 miles.



About Repeaters

How a Half Duplex Repeater Works

A Half Duplex repeater receives input on one frequency and transmits out on a different frequency.



Photos courtesy of RTC-TH & GERC

Half Duplex means you either transmit (talk) or receive (listen) but you cannot do both at the same time as you can on a cell phone.

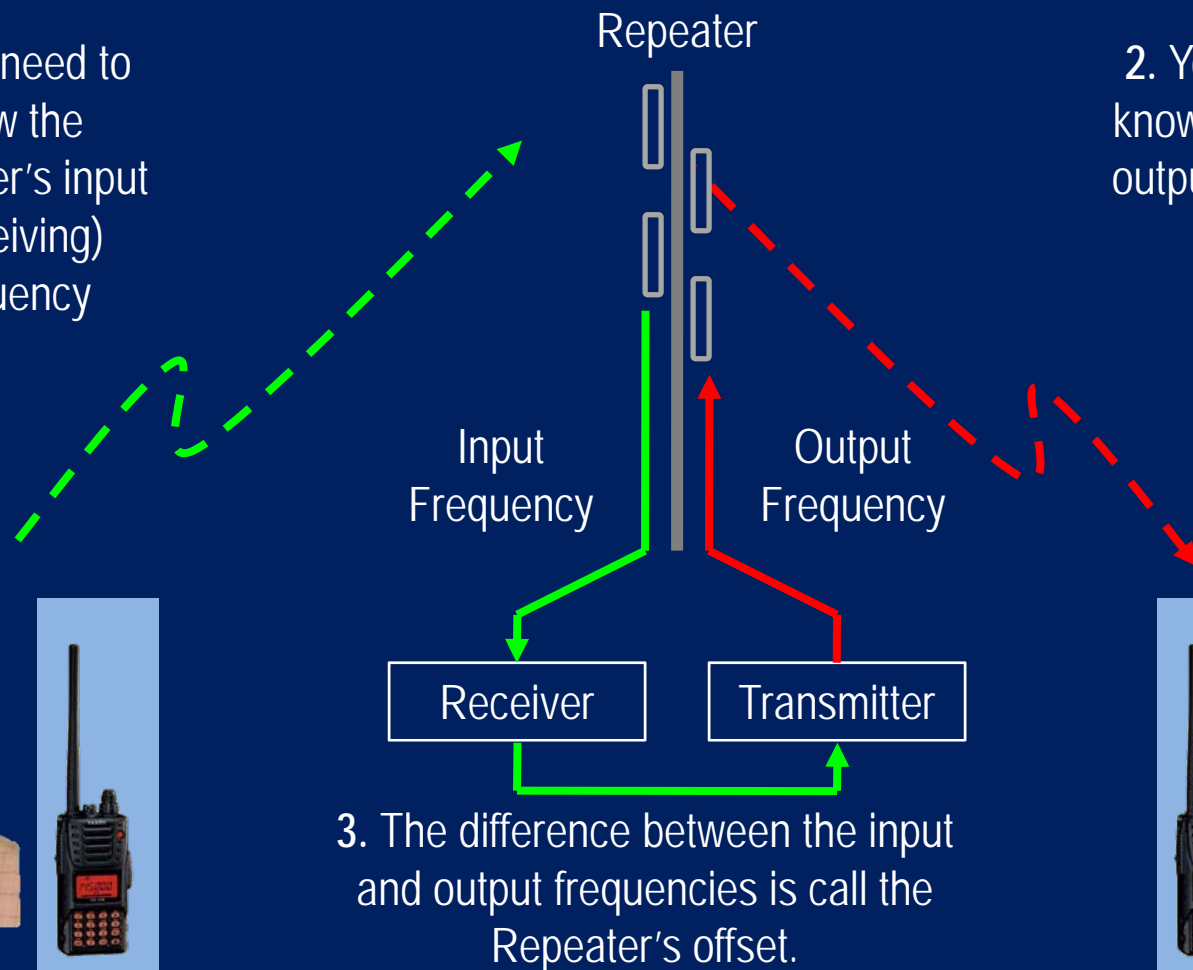


About Repeaters

What You Need to Know

1. You need to know the Repeater's input (Receiving) frequency

2. You also need to know the Repeater's output (Transmitting) frequency



Mark, N7YLA



Frank, KG6TQV



4. Some repeaters also have a subaudible tone (PL) or CTCSS (Continuous Tone Coded Squelch System)



Here is a listing for the Catalina Amateur Repeater Association:

147.090 + No PL

1. You need to know the Repeater's input (Receiving) frequency

147.090

2. You also need to know the Repeater's output (Transmitting) frequency

147.690

3. The difference between the input and output frequencies is called the Repeater's offset.

The "+" tells you the offset is 600 kHz above the input frequency; so do the math and get #2

4. Some repeaters also have a subaudible tone (PL) or CTCSS (Continuous Tone Coded Squelch System)

"No PL" means no subaudible tone is needed to use this repeater.

GERC suggests programming the Catalina repeater into your HT. Its strong signal has a good reach up and down the southern California coast.



Using a Repeater

Congratulations!

Now that you have your new amateur radio license, it is time to “use it or lose it” in terms of your newly acquire knowledge and skills.



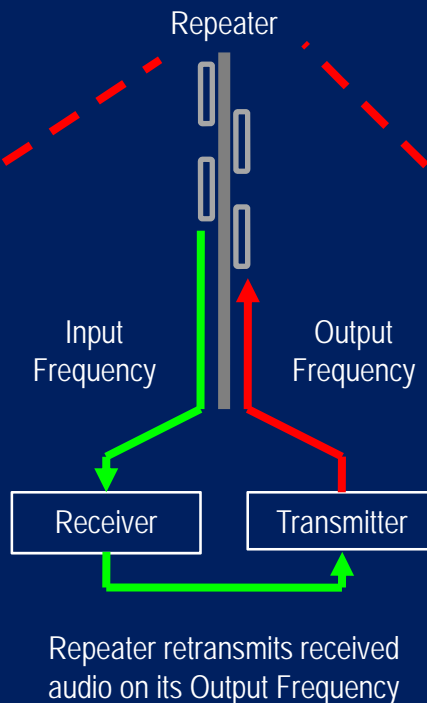
Using a Repeater

Start by Listening

Find a repeater near you and listen to how others talk on the air as they use the repeater.



Mark, N7YLA



Jim, KG6TQT



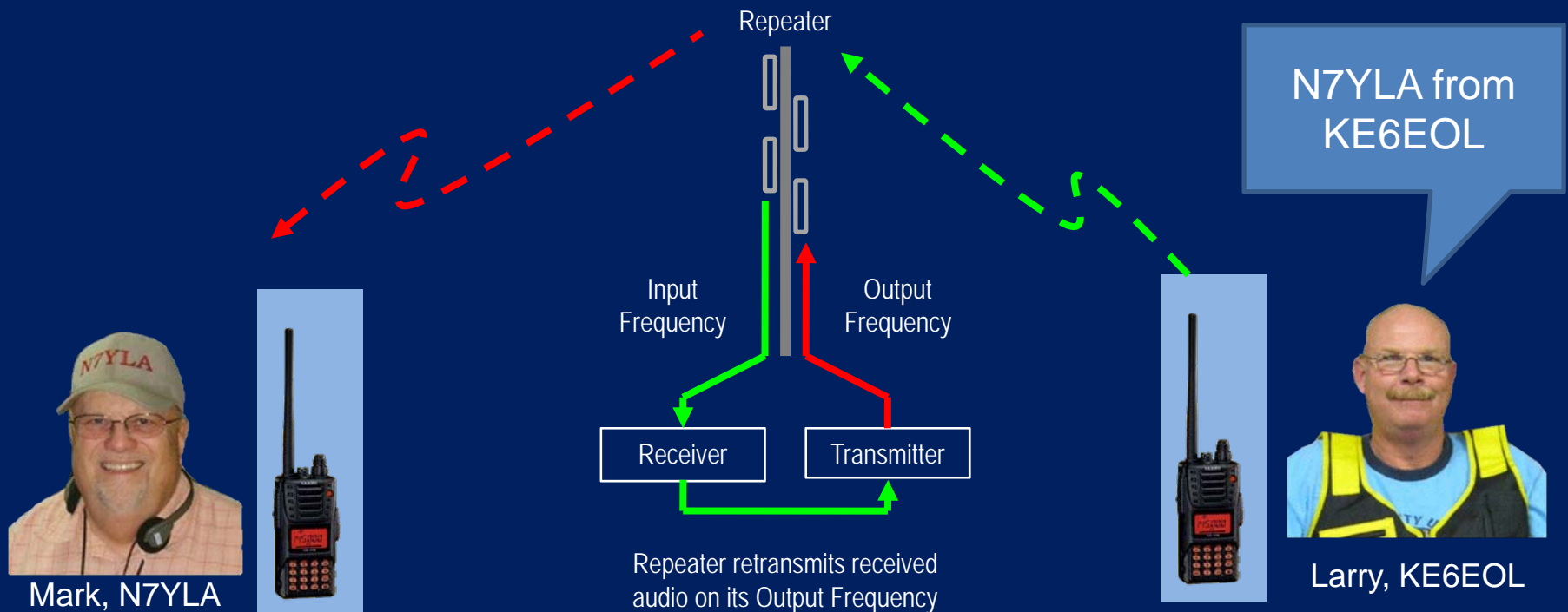
It is important to listen how others talk on the air. Follow the lead of those practicing good behavior (clear speech, courtesy, patience, tolerance, and a non-confrontational attitude).



Good Operating

Identification Requirement

FCC regulations require you to give your call sign at the start, at the end of your conversation, and at 10 minute intervals during longer transmissions.



Good Operating

“Kerchunking” is a No No

Don't key the mic to “hit” the repeater and listen for its courtesy “beep” to test your radio.

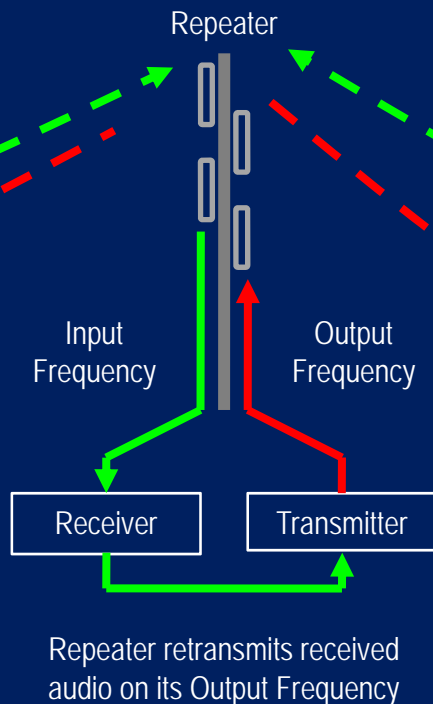
Push the PTT;
don't say anything



Mark, N7YLA



“Beep”



KF6RFA



Cliff, KF6RFA



“Beep”

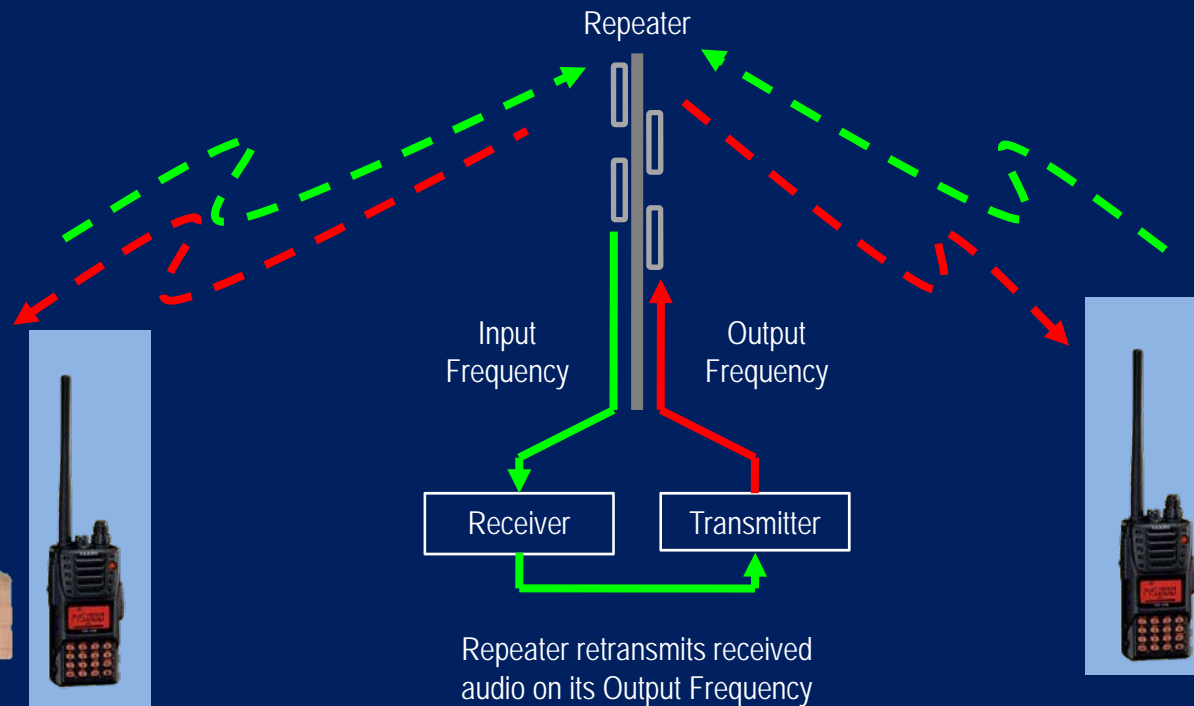
When you key your mic, just give your call sign. The courtesy “beep” will confirm you hit the repeater BUT you will be legal instead of being a nuisance.
Remember, you must identify yourself at the start of a transmission.



Good Operating

Use Minimum Power

Use the lowest power setting needed to effectively communicate



Mark, N7YLA



Cliff, KF6RFA

This is the regulation. It is also a good EmComm habit that will help conserve your battery power.

Remember, you never know how long an emergency may last.



If you can contact your friend on Simplex, do it. Don't tie up the repeater with unnecessary traffic. Try using a simplex frequency in these ranges: 146.40-146.58 or 147.42-147.57 MHz.

Both you and your friend must be tuned to the same frequency



Mark, N7YLA



Cliff, KF6RFA

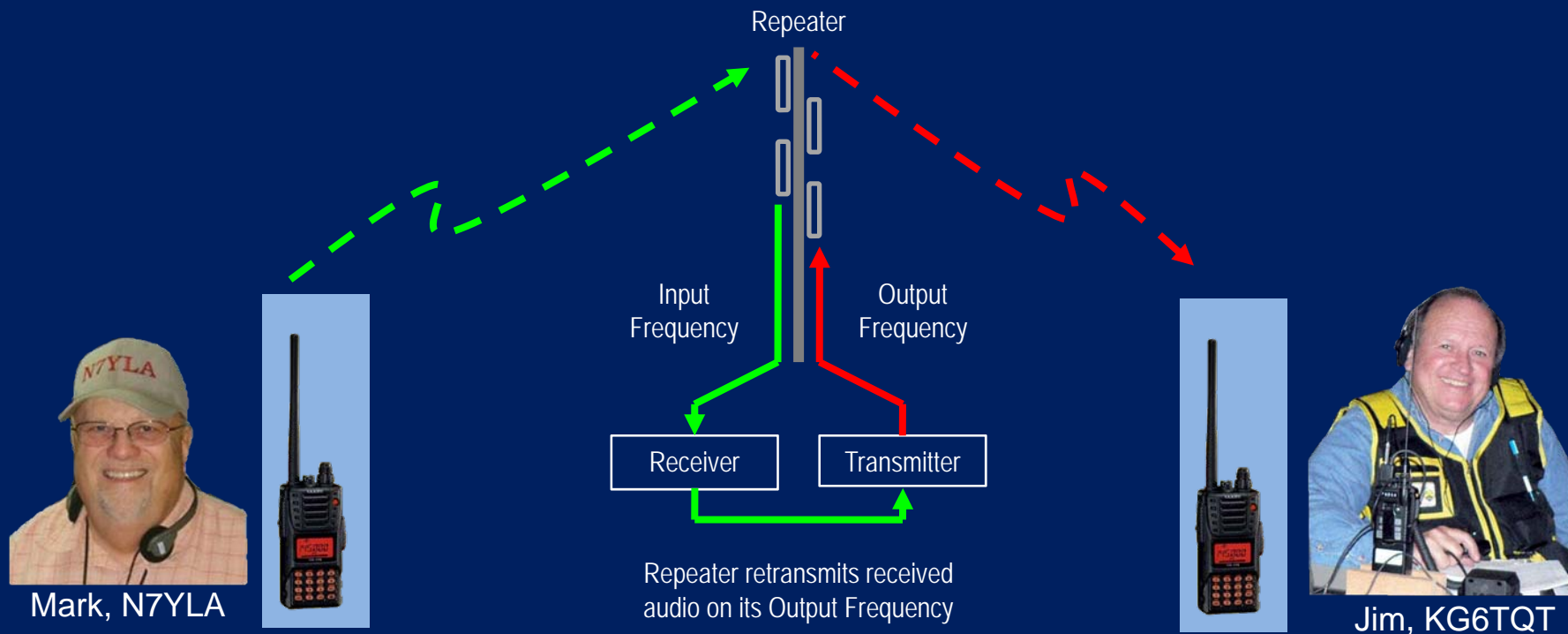
Some repeaters can be very busy. Use them when necessary but don't abuse the use of repeaters.



Simple Guidelines

Talk Normally; Don't Shout

Talk in a conversational way as though you were sitting across a table from someone.



There's no need to shout as though you trying to talk with someone across town or across the country.



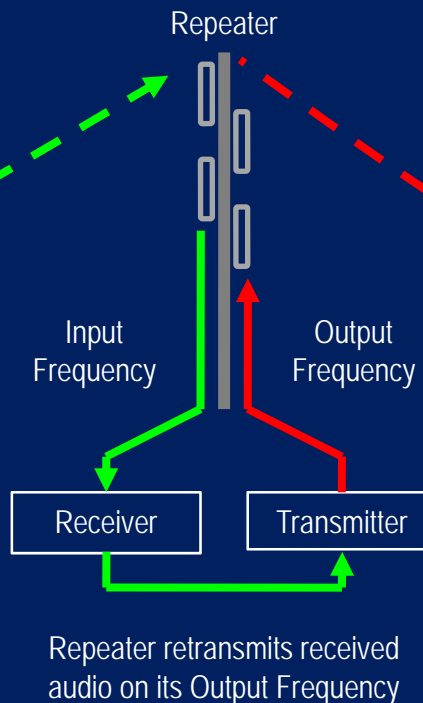
Simple Guidelines Use English; Avoid Jargon

Speak using plain, simple English. You don't always know the other person.

Hi Jim, what are you doing? Over



Mark, N7YLA



Hi Mark! Just sitting at the QTH with my XYL waiting for a QSO. Over.



Jim, KG6TQT



Clear effective communication is the goal. Avoid using "Q codes" from the world of Morse code. Keep it simple and clear.

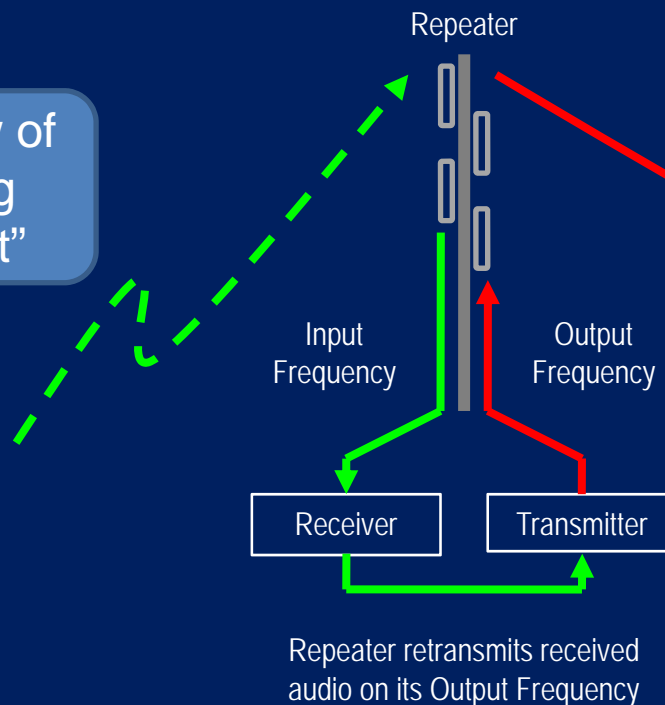


Simple Guidelines

Forget the Movies

Forget what you saw and heard actors in movies as they “talked” on the radio.

We are running low of fuel and are going in...“Over and Out”



Does he want me to reply or is he signing off?



Richard, KG6TRD

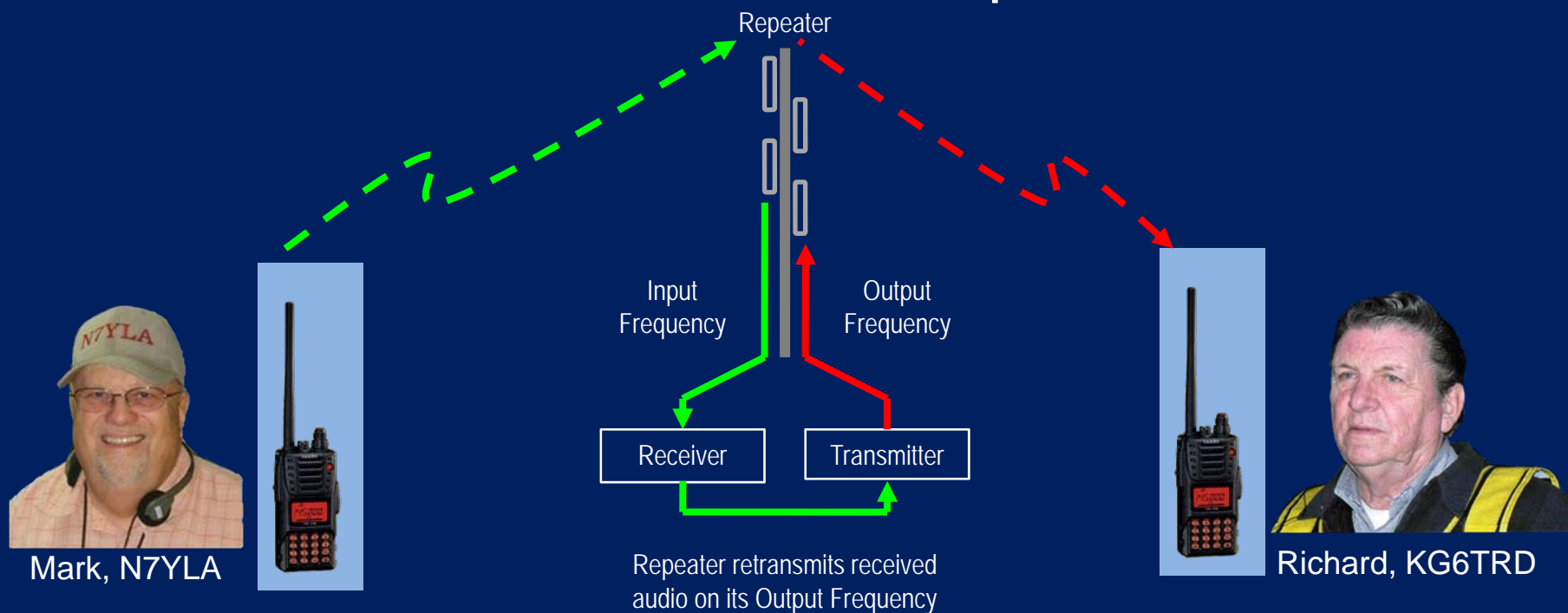
Actors are actors; movies are movies. You are now in the real world with a real radio. Learn how its done for real.



Simple Guidelines

Key the mic, pause, then talk

Repeaters have a short delay before they transmit your call. So get into the habit of pushing the PTT, pause for 1-2 seconds, then speak.

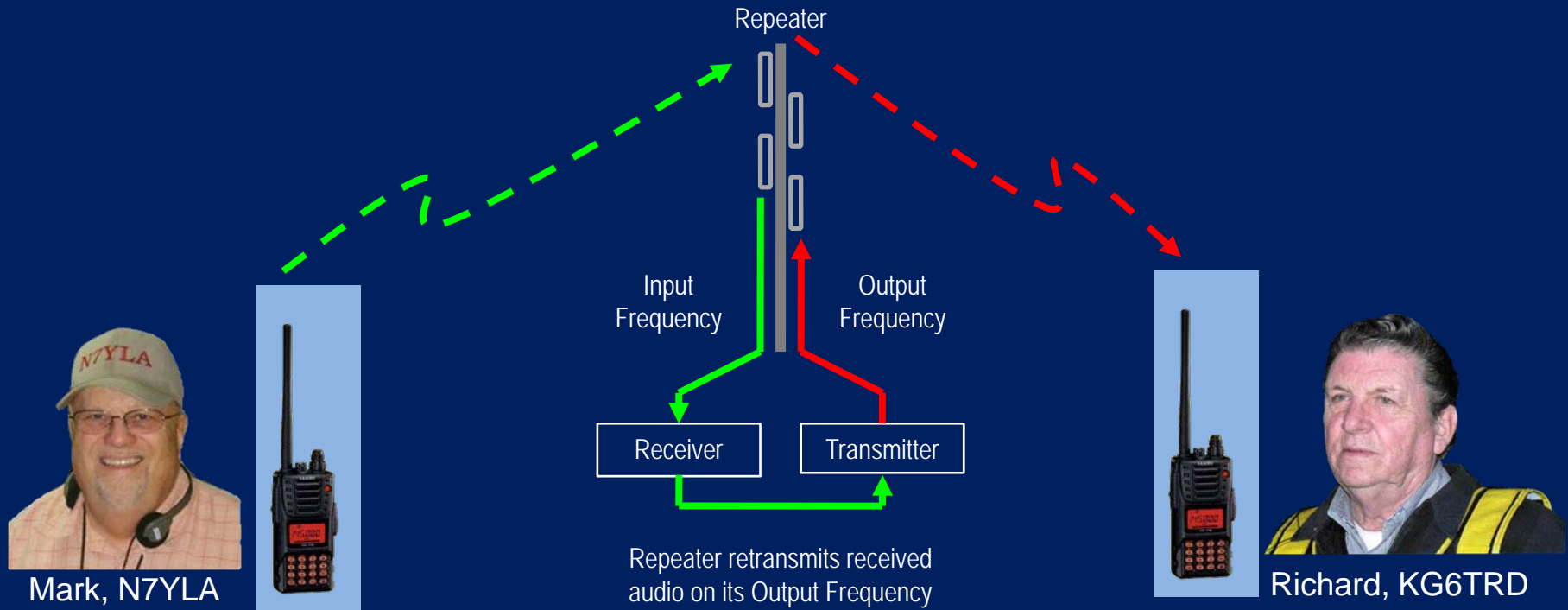


If you key the mic and start talking, the first part of your message will be “clipped” (cut off and not transmitted by the repeater).



Simple Guidelines Stop talking, pause, release the PTT

Be sure you pause before releasing the PTT when you finish talking.



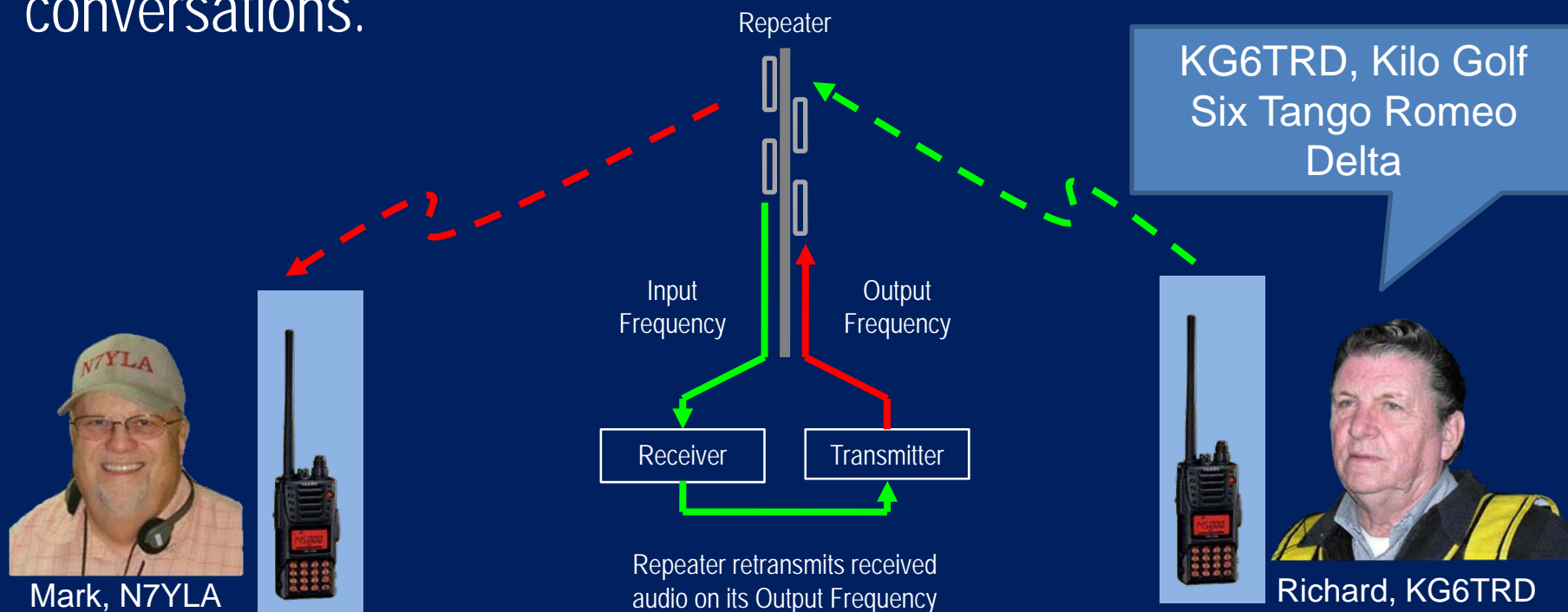
This will avoid the repeater delay “clipping” the tail end of your message.



Simple Guidelines

Give Your Call Sign

You must give your call sign at the start, at the end of the QSO (contact / conversation), and every 10 minutes for longer conversations.



You are legally responsible to clearly identify your station. Don't assume everyone speaks English. Take it slow and easy.



Simple Guidelines

Use the ITU Alphabet

For clarity, speak slowly and use the ITU alphabet if requested

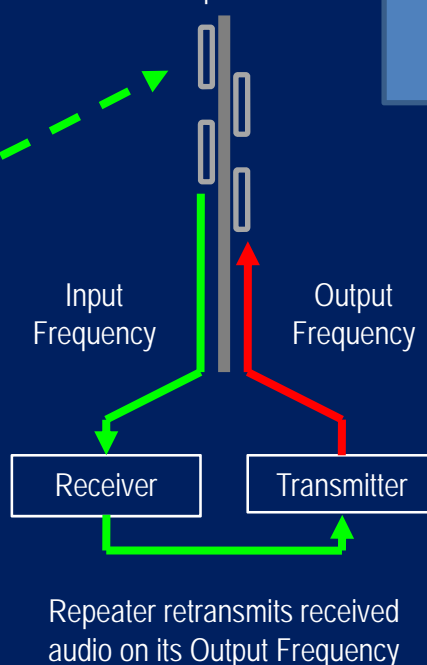
KG6TRD this is
N7YLA



Mark, N7YLA



Repeater



Station calling KG6TRD,
please spell your call sign



Richard, KG6TRD

For clarity, speak slowly and use the ITU alphabet if requested



Simple Guidelines

Use the ITU Alphabet

Be sure to use the ITU alphabet .

KG6TRD, this is
N7YLA , November
seven Yankee Lima
Alpha. Over.



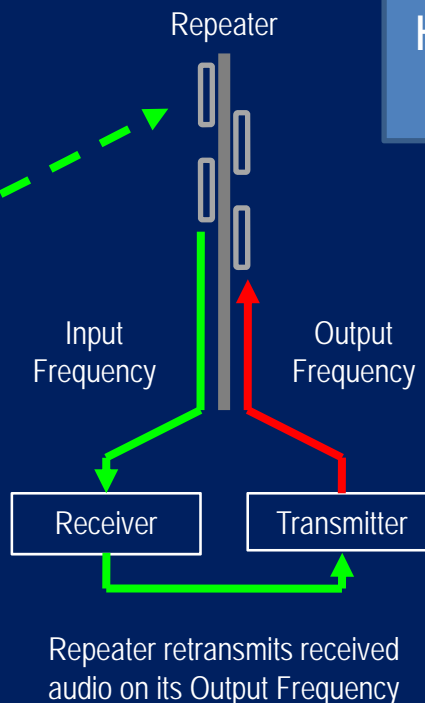
Mark, N7YLA



Hi Mark, how are you doing?
Over.



Richard, KG6TRD



Don't make up your own alphabet
(e.g. Nubia Seven Why Los Angeles) .



Review and know the ITU alphabet

Use these on the air.

This is
HSØZHM,
Hotel
Sierra Zero
Zulu Hotel
Mike

“AL-FAH”
“BRAH-VOH”
“CHAR-LEE”
“DELL-TAH”
“ECK-OH”
“FOKS-TROT”
“GOLF”
“HOH-TELL”
“IN-DEE-AH”
“JEW-LEE-ETT”
“KEE-LOH”
“LEE-MAH”
“MIKE”

“NO-VEM-BER”
“OSS-CAH”
“PAH-PAH”
“KEH-BECK”
“ROW-ME-OH”
“SEE-AIR-RAH”
“TANG-GO”
“YOU-NEE-FORM”
“VIK-TAH”
“WISS-KEY”
“ECKS-RAY”
“YANG-KEY”
“ZOO-LOO”

“ZEE-ROW”
“WUN”
“TOO”
“TH-UH-REE”
“FOW-ER”
“FI-IV”
“SIX”
“SEV-EN”
“ATE”
“NIN-ER”
“DAY-SEE-MAL”

Source: <http://www.wrrl.org/operating/>

This is
N7YLA,
November
Seven
Yankee
Lima Alpha

Write down your call sign and spell it with
the ITU alphabet.
Practice saying it before you get on the air.



Simple Guidelines

To Talk with Anyone

Check that the repeater is not being used.
Then give your call sign

N7YLA
monitoring



Mark, N7YLA



Repeater

Input
Frequency

Output
Frequency

Receiver

Transmitter

Repeater retransmits received
audio on its Output Frequency

Oh Oh; hope he
doesn't need me to
haul a bunch of ham
gear somewhere.



Donny, KH6HZX

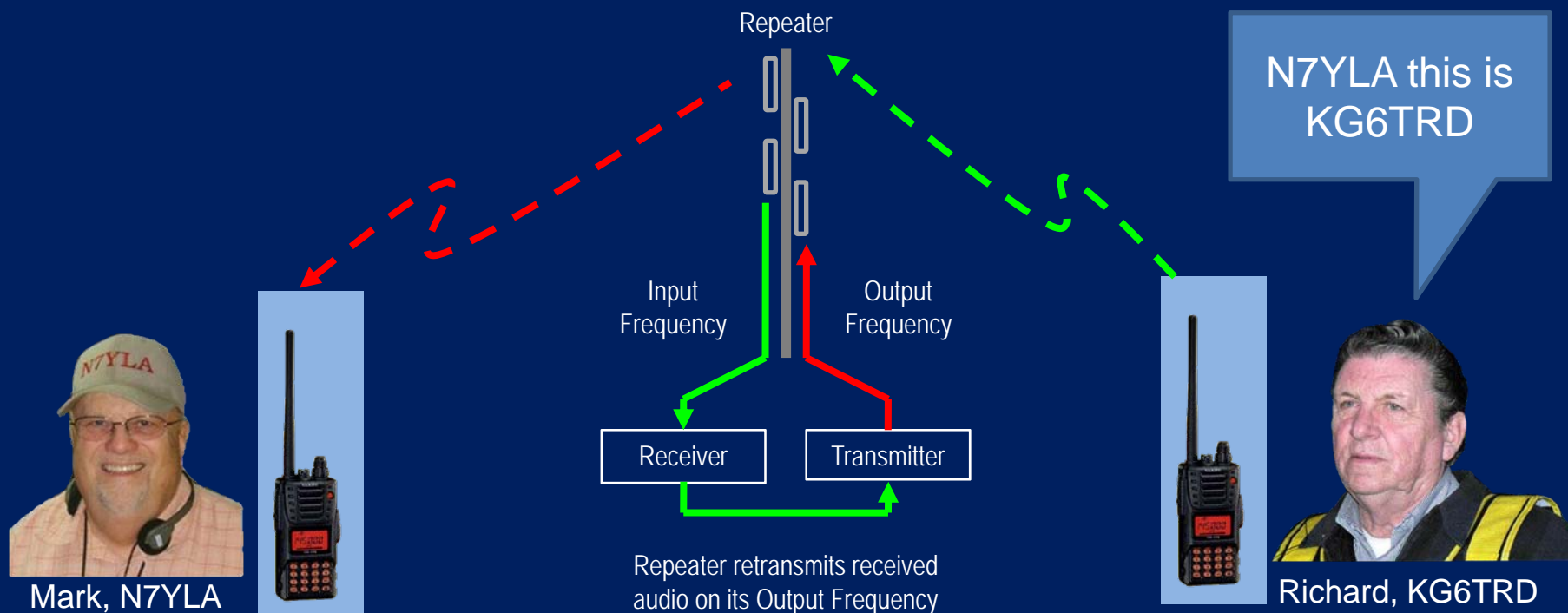
Calling "CQ" is used for HF and is considered unnecessary when using VHF repeaters. Some hams give their call sign and add "monitoring" or "listening". It isn't necessary to say these words, but many people do. This tells other stations "Hi, I'm on the air and willing to talk."



Simple Guidelines

To Call a Friend

Check that the repeater is not being used.
Then give your friend's call sign then your call sign



Repeat your call a few times if your friend doesn't answer right away. If there is no response after several calls, sign off so others know you are done and they can use the repeater.



Simple Guidelines

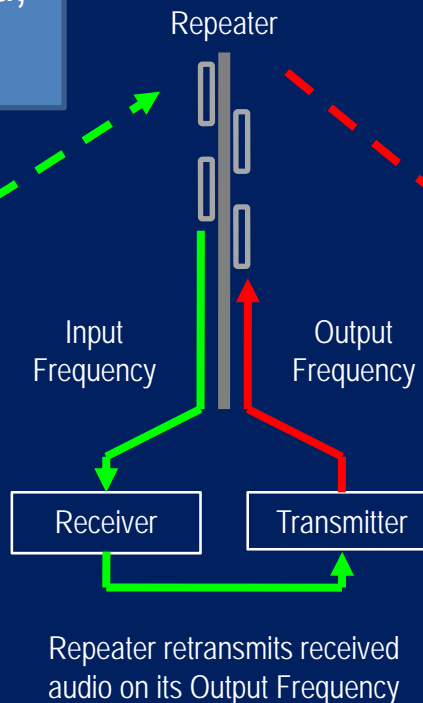
To Call a Friend

When your friend hears you, a typical response might be...

KG6TRD, N7YLA. Hi, Richard,
good to hear from you. Over.



Mark, N7YLA



Richard, KG6TRD

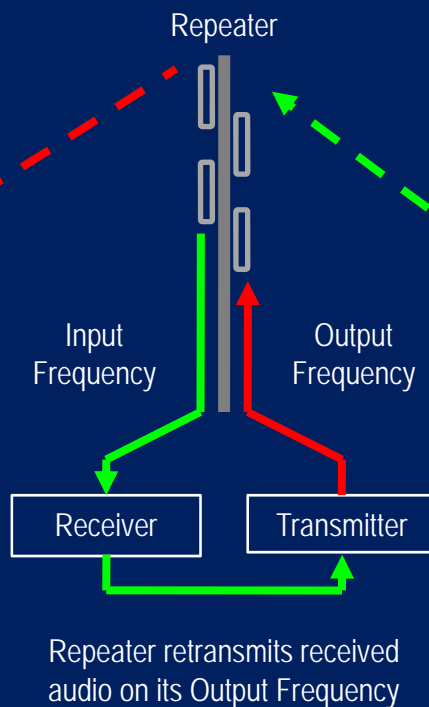
Remember to use proper identification procedures. If your conversation is longer than 10 minutes, both stations need to give their call signs every 10 minutes.



Not all stations are stationary.



Mark, N7YLA



KG6VBM, mobile



Jim, KG6VBM



You may hear some hams their call sign and add "mobile". This tells other stations "Hi, I'm on the air while in my car and willing to talk." This also warns them that signal strength may vary or interruptions may arise due to terrain or other variables because their "station" is moving.



Simple Guidelines

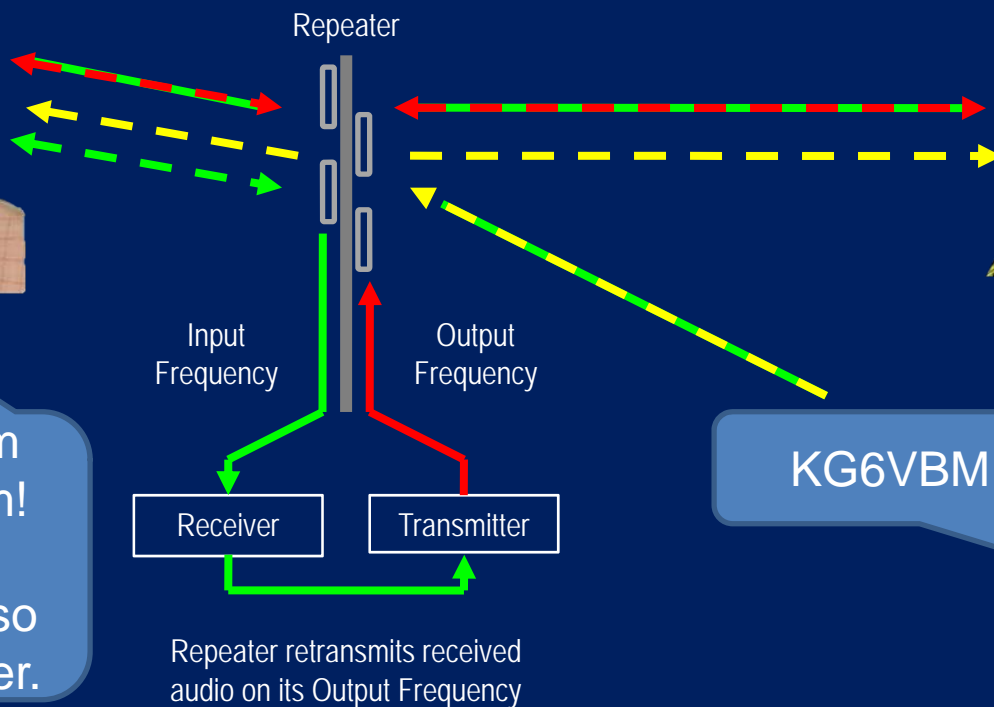
Joining a Conversation

If others are using the repeater, wait for a pause in their conversation and give your call sign.



Mark, N7YLA

KG6VBM from
N7YLA, Hi Jim!
Richard,
KG6TRD is also
on the air. Over.



Richard, KG6TRD



Jim, KG6VBM

Don't say "Break, Break" (this has special meaning in Morse code communications). When the others hear your call sign, they can respond and invite you to join them. If not, just wait quietly until the repeater is free.



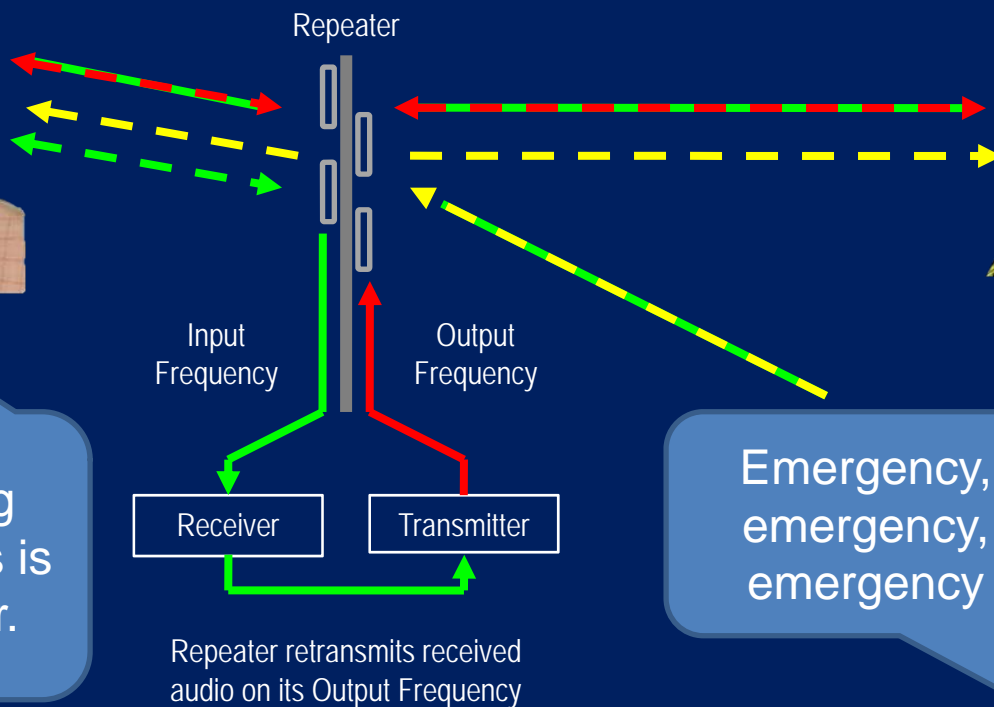
Simple Guidelines Hearing an Emergency Call

If you hear an emergency call, immediately stop your conversation and acknowledge the emergency call.



Mark, N7YLA

Station calling emergency this is N7YLA. Over.



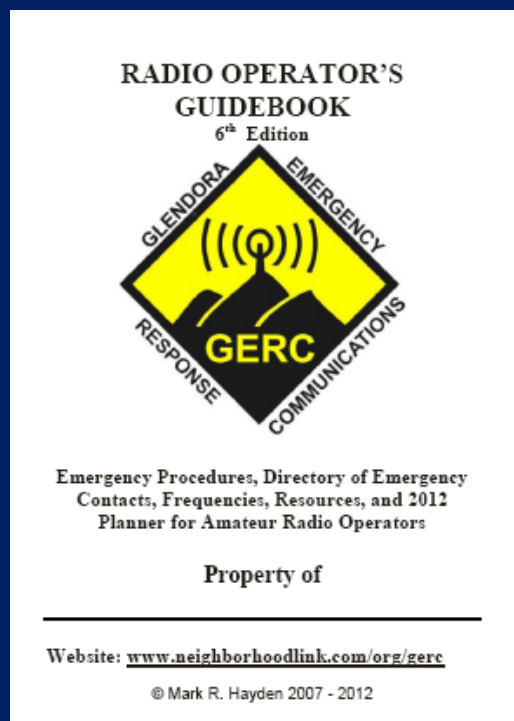
Richard, KG6TRD



Write down the information, noting time, date, and frequency. Wait to see if another station responds. If they do, continue to monitor. If not, you take the lead to coordinate the response.



This will be dealt with in more detail in a future lesson.
Refer to your GERC Radio Operator's Guidebook for specific GERC procedures and for relevant contact information of local area emergency response authorities.



Consult other Emergency Communications information sources such as the ARRL
<http://www.arrl.org/emergency-radio-org>



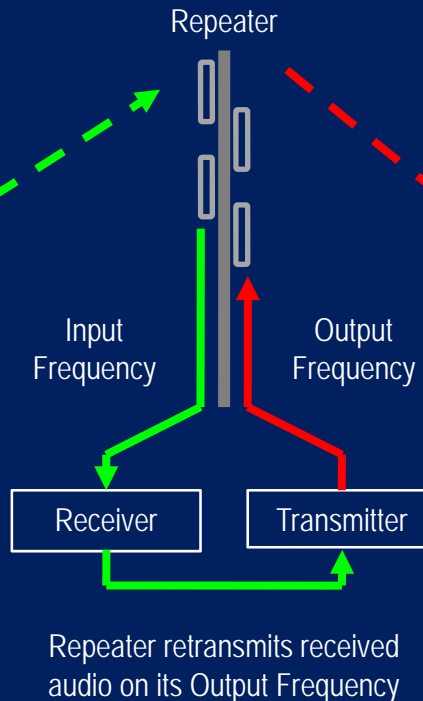
Simple Guidelines To Make an Emergency Call

Say the word "emergency" 3 times, your call sign and pause.
When the repeater is clear, give your call sign and your emergency message.

Emergency, Emergency,
Emergency! This is N7YLA.



Mark, N7YLA



Carolyn, KG6RFJ

Emergency calls are for "life threatening" situations. A personal situation of forgetting to feed the cat after you left for work is not an "emergency."



Avoid using “Break” or the phrase “Break Break”.

- Times and practices change. Today use of “Break” and “Break Break” varies among groups and can mean different things.
- “Emergency” is plain language and is clearly understood as is the radio term “Mayday”.

In the interest of clear and effective communications, get into the habit of using either Emergency or Mayday. Traditional practice is to say the word 3 times, followed by your call sign. Pause and wait for a response.

Repeat several times, pausing each time.

If there is no response, change to another frequency and repeat the procedure.



Simple Guidelines To Make an Emergency Call

Keep calm; give specific and detailed information about the emergency. Speak slowly and clearly for effective communication

- **Location:** be very specific so help can get to you quickly.
- **Nature of the emergency:** brief, concise description of the emergency and if danger to life is involved.
- **Type of assistance needed:** be specific about what help you need.

Think “Safety First”. As an emergency communicator, your safety is vital. If you put yourself in a dangerous situation, you may not be able to communicate at all.



Location: be very specific so help can get to you quickly.

GOOD	Not so Good
At the northwest corner of Sepulveda Blvd and Burbank in Van Nuys, CA	Downtown Los Angeles, CA
I-10 westbound side, 2 miles west of the Jct with I-15, number 1 lane.	Somewhere on I-10 near San Bernadino, CA



Nature of the emergency: brief, concise description of the emergency and if danger to life is involved.

GOOD	Not so Good
Traffic accident, 6 vehicles, 4 cars and 2 big rigs, spilled fuel, several injured, 2 persons trapped in vehicles with head injuries, 4 persons thrown from vehicles with major injuries.	Car accident, Help! It's a big mess!



Type of assistance needed: be specific about what help you need.

GOOD	Not so Good
Requesting medical aid, ambulances, fire protection for spilled fuel, tow trucks to clear wreckage.	We need help NOW!



Be prepared to report additional information if requested by responding authorities.

- Give FACTS clearly and calmly. If you have to guess, make it clear it is an estimate.
- Respect the privacy of people involved. Avoid giving names of persons over the air unless requested by the authorities



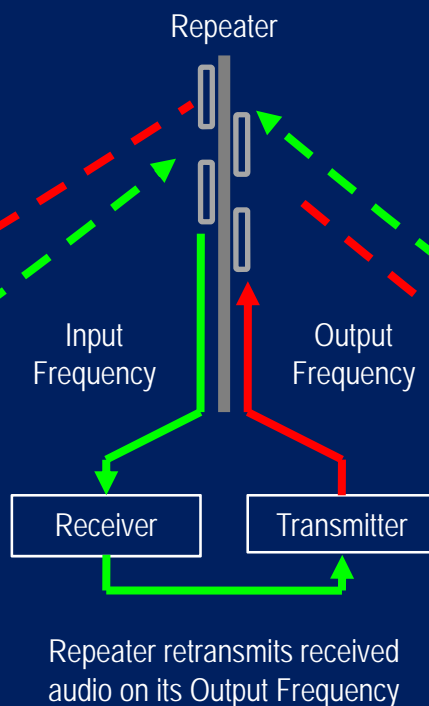
“73” (Seven Three) is Morse code short hand for “Best Regards” and is often heard in voice communications as “seventy threes”

OK Rich, thanks for the QSO. This is N7YLA, I will be clear on your final.

Mark, seventy threes to you. This is RG6MXP, clear.



Mark, N7YLA



Rich, KG6MXP



...but that's like saying Best RegardsS which is making a plural of a plural.



“88” is Morse code short hand for “Hugs and Kisses” and is often heard in voice communications as “eighty eight”

88's May. N7YLA, clear.



Mark, N7YLA



Repeater

Input Frequency

Output Frequency

Receiver

Transmitter

Repeater retransmits received audio on its Output Frequency

Oh Oh...hope KG6 MXP and KG6RFJ don't take it the wrong way?!



May KE6QVJ



Be careful who you say this to on the air; you never know who is listening and who might freely misinterpret or misconstrue what they hear.



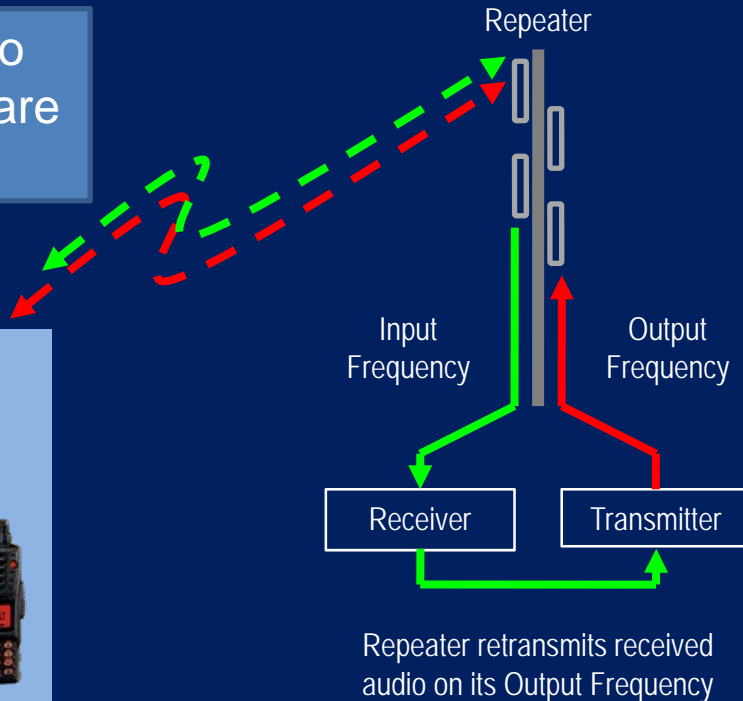
Simple Guidelines Courtesy First and Foremost

It is a privilege to have an amateur license, so do your utmost to uphold the fine tradition of ham radio by exercising good conduct and citizenship.

N7YLA back to
KC6PSH, how are
you Shane?



Mark, N7YLA



Hi Mark, I just wanted to
thank you and Greg for
another interesting lesson.



Shane, KC6PSH

Whatever you transmit can be heard by anyone listening on that frequency.
You never know who is listening. So be on your best behavior.



For More Information about us: Contact



Greg HSØZHM
hs0zhm@gmail.com



Mark, N7YLA
n7yla@arri.net

For other lessons in the series visit

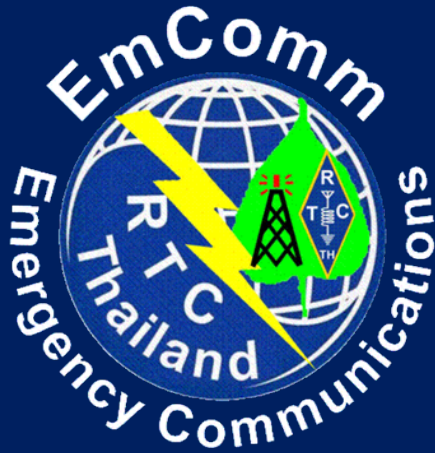
www.neighborhoodlink.com/org/rtcth
www.neighborhoodlink.com/org/gerc



**To learn more about repeaters in
general (both VHF and HF), visit
<http://www.hamuniverse.com/repeater.html>**



Community-based Education for the Amateur Radio and Emergency Communications



The End

(of this lesson; the beginning of more amateur radio adventures)

