

Ham Radio Repeaters 101

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- Why a Repeater

Allows user to get greater range

Takes low power & re-transmit at higher power

Equipment durable designed for continuous duty

Antennas located at high elevation

Low Loss Feedline

Repeater Definitions

- Simplex

 - Point to point communications w/o a repeater

 - Uses the same frequency for TX & RX

- Duplex

 - Full Duplex both people talk at the same time

 - Example = Cell Phone

 - Half Duplex one person talks at a time

 - Example = Ham Transceivers & Repeaters

- CTCSS or PL Tone

CTCSS Continuous Tone Coded Squelch
System Communications standard
signaling scheme

GE Channel Guard or GC

PL Private Line - Motorola proprietary name

System is used to prevent a repeater from
responding to unwanted signals or interference

PL Tone Mode requires a CTCSS tone to
activate a repeater

Tone Squelch allows a repeater to respond only
to stations that encode or send proper tone

- Offset

Stations use a different frequency for transmit and receive

Separation prevents repeater from hearing itself or interference from own signal

Transmit frequency below the Receive =
Negative Offset

Example TX = 146.940 RX = 146.394

Offset - 600 KHZ

Example TX = 448.500 RX = 443.500

Offset - 5 MHZ

- Repeater Components

Transmitter

Exciter Modulates the Audio

Power Amplifier Boosts audio signals

Receiver

Accepts the incoming signal

Decodes PL signal

Contains CTCSS circuitry

Duplexer (Cans or Cavity)

Separates and isolates incoming from outgoing

Designed to pass narrow range of frequencies

Controller (Heart)

Activates the transmitter

Handles station ID CW / Voice

Controls linking or remote base

Autopatch

Allows placing phone calls from radio

Antenna

Use one antenna for TX & RX

High performance / gain

Located at high elevation

Feedline

Hardline

Hard to work with

Low signal loss

Durable

- LVRAC Repeaters as of Jan. 2021

Westgate VHF 146.94 PL 100 HZ Offset - 600 KHZ

Repeater GE Master II 100 W

Controller Link Communications RCL2

Link Radio GE MVP

Duplexer Unknown

Antenna VHF vertical 5 db gain 340 feet above
gnd.

UHF Link Yagi

Feedline Hardline 1/2 inch

Westgate UHF 447.200 PL 100 Offset - 5 MHZ

Repeater Bridgecom BCR 40DU 40 Watt

Controller Bridgecom

Duplexer Bridgecom

Antenna Diamond X50A 7.2 gain 340 feet above ground

Feedline Hardline 1/2 inch

So Hills UHF 448.500 PL 100 HZ Offset - 5 MHZ

Repeater Motorola MF5000 100 W

Controller Link Communications RCL2

Link Radio GE MVP

Duplexer Wecom

Antenna VHF vertical ? gain 90 feet above ground

Feedline Hardline 1/2 inch

- LVRAC Repeaters 2021

Las Vegas EOC Buffalo & Cheyanne

Repeater Bridgecom BCR 50V VHF 146.91 PL 100

Offset - 600 KHZ

Controller Bridgecom

Duplexer Bridgecom BCD 144250

Antenna Diamond X50A 7.2 gain 50 feet above ground

Feedline Hardline ½ inch

Future Considerations ??

Northwest, North, Far West