

# VHF & UHF FM Radios and Repeaters

## An Introduction

Repeaters have two primary functional parts – an RF system and a control system.

RF systems are exactly what you would think – antennas, receivers and transmitters. Although quite a bit of expertise is needed to make RF systems function well, their basic function is well understood.

Control systems run the gamut from just connecting a receiver to a transmitter with a Morse code identifier to systems which connect multiple receivers, transmitters and other links together in various dynamic ways while providing many management and interface choices.

One example of such a complex controller is the ARC's Link Communication, Inc. RLC-3. This single controller handles the 2-Meter, 220 and 440 repeaters as well as links to remote receivers, the public telephone system, the Georgia Skywarn network and the IRLP network. The system is controlled by entering DTMF commands and provides status and responses using a library of recorded words as well as a DVR.

As repeaters have gotten more complex, with more features, so have the radios used by individual hams to access them. DTMF tone generation is necessary to enter repeater commands such as accessing an autopatch, but one of the most useful features now on VHF and UHF FM radios is CTCSS or PL tones. These are tones added to the transmitted audio which the receiver or controller uses to distinguish between a legitimate signal and the RF noise that has become so common in big cities. Many radios can also use CTCSS in the same way on their received signals.

## AD

AD – **A**cronym **D**irectory

ARC – **A**tanta **R**adio **C**lub (<http://www.w4doc.org>)

CTCSS – **C**ontinuous **T**one **C**oded **S**quelch **S**ystem – Uses audio tones to distinguish between legitimate signals and RF noise. Can also be used as a method to target messages to specific receivers. (See PL)

DTMF – **D**ual **T**one **M**ulti-**F**requency – a set of 8 discrete audio tones which can be combined in a matrix fashion to indicate the hexadecimal digits 0-D plus \* and #. Also called Touch Tones.

DVR – **D**igital **V**oice **R**ecorder – system which records and plays back voice messages by storing and retrieving them digitally on a random access medium. Because many short messages can be quickly retrieved and played, the system can be used to create voice messages from text.

IRLP – **I**nternet **R**epeater **L**inking **P**roject – (<http://www.irlp.net>)

PL – **P**rivate **L**ine – Motorola's "friendly" name for CTCSS