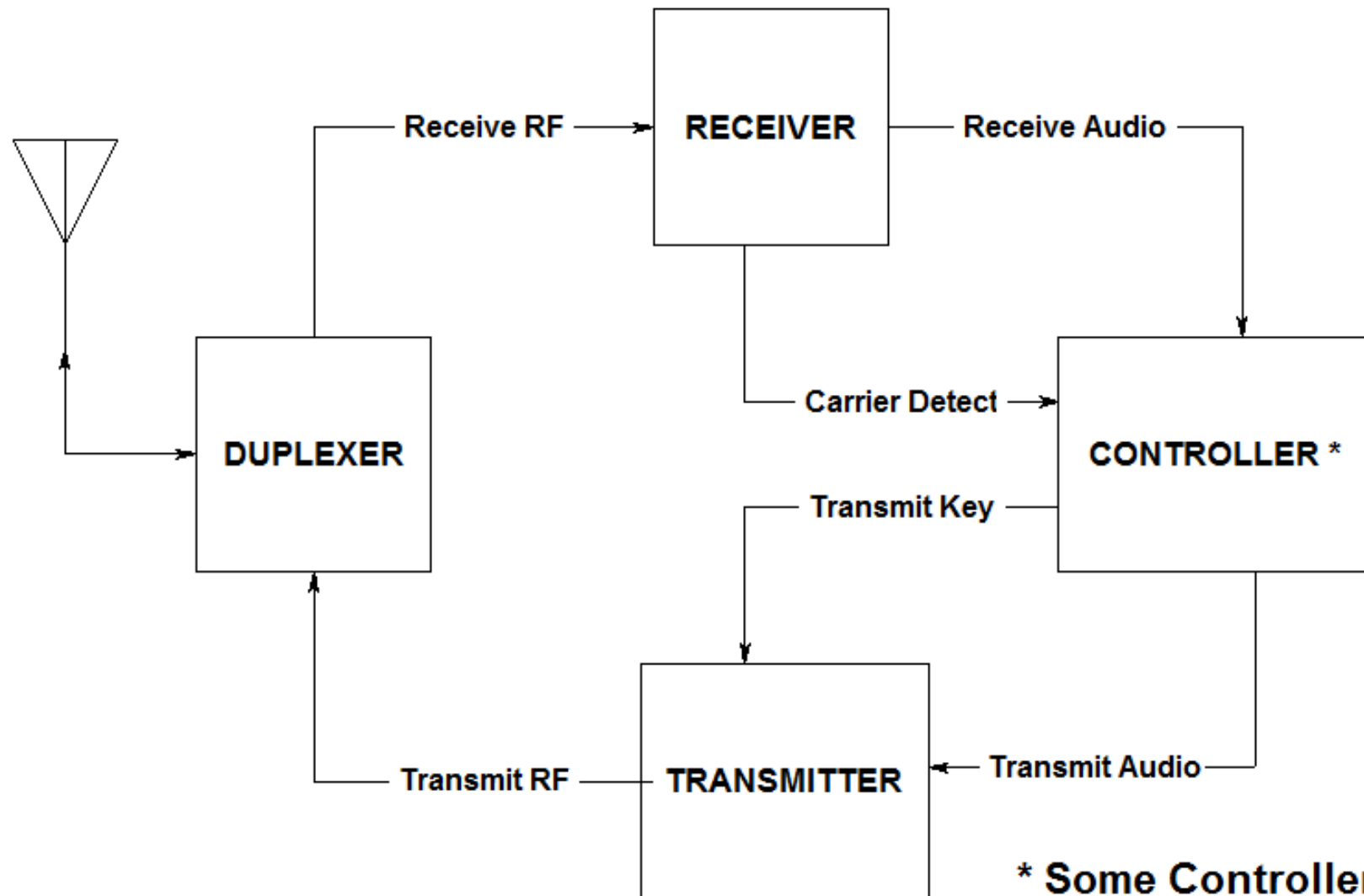


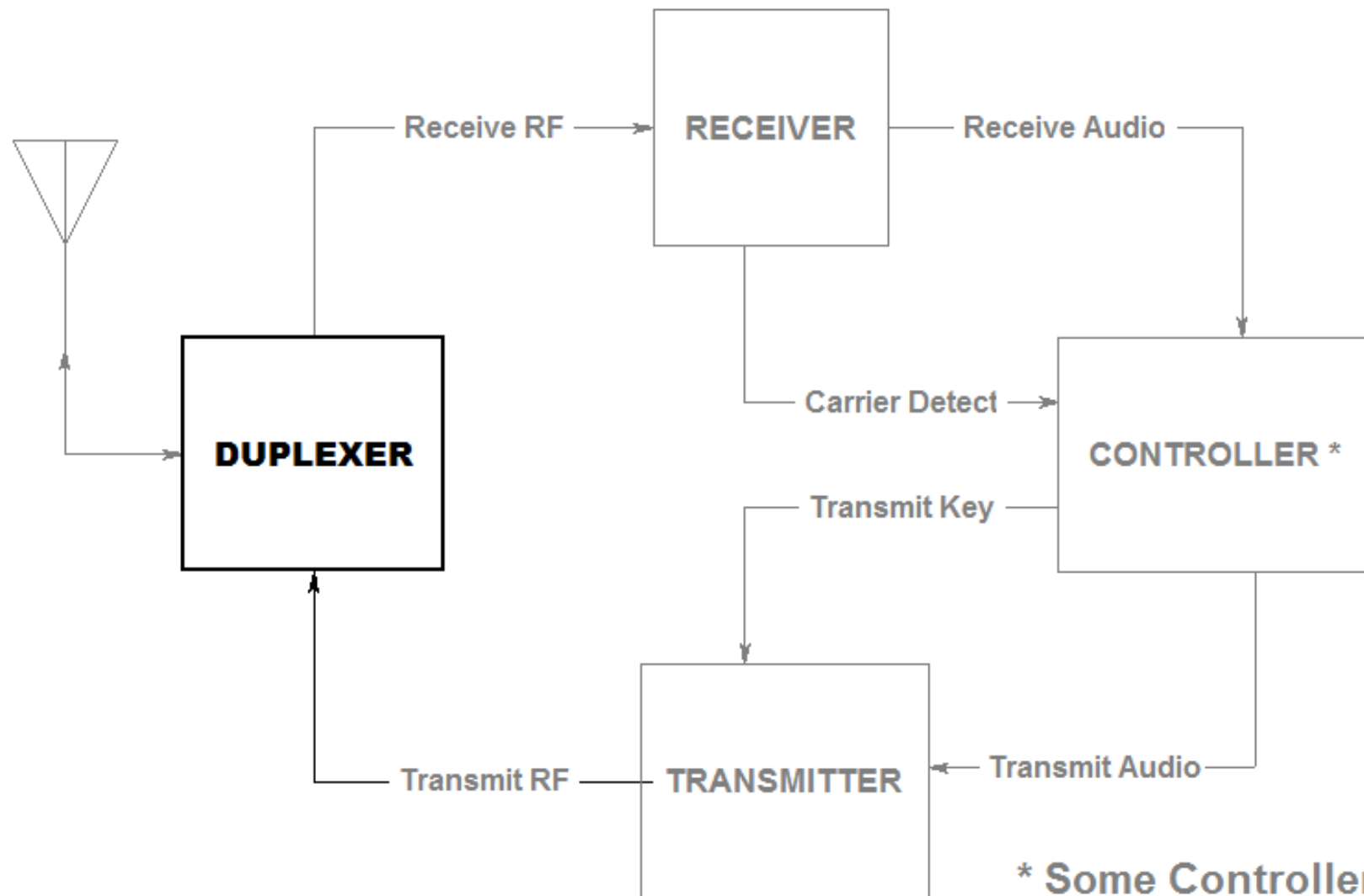
DUPLEXERS

The Major Components of A Repeater



*** Some Controller Functions**
TOT - Time-Out-Timer
ID Timer (CW or Voice)
Linking
Remote Receivers
CTCSS

The Major Components of A Repeater



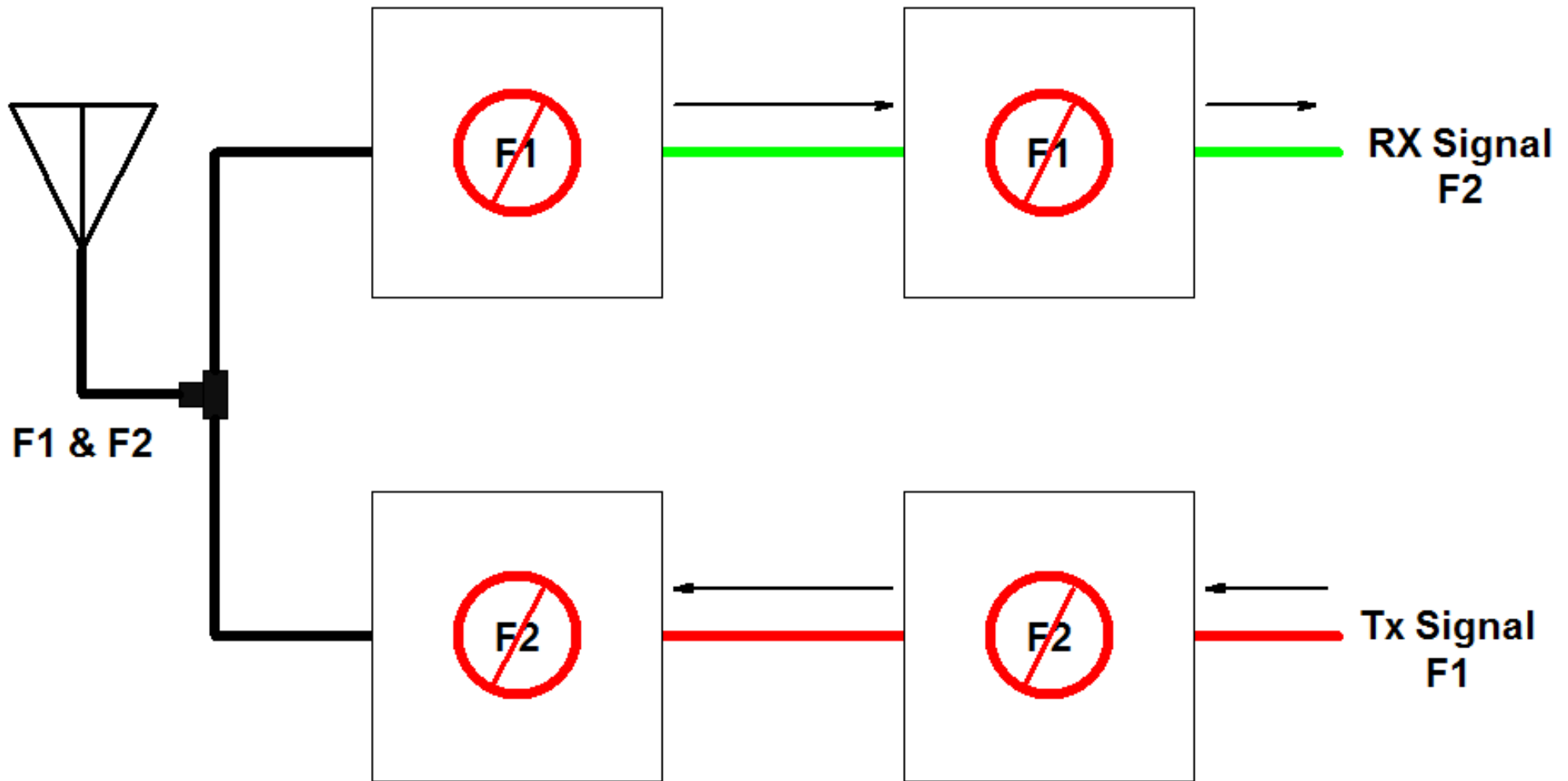
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DUPLEXERS

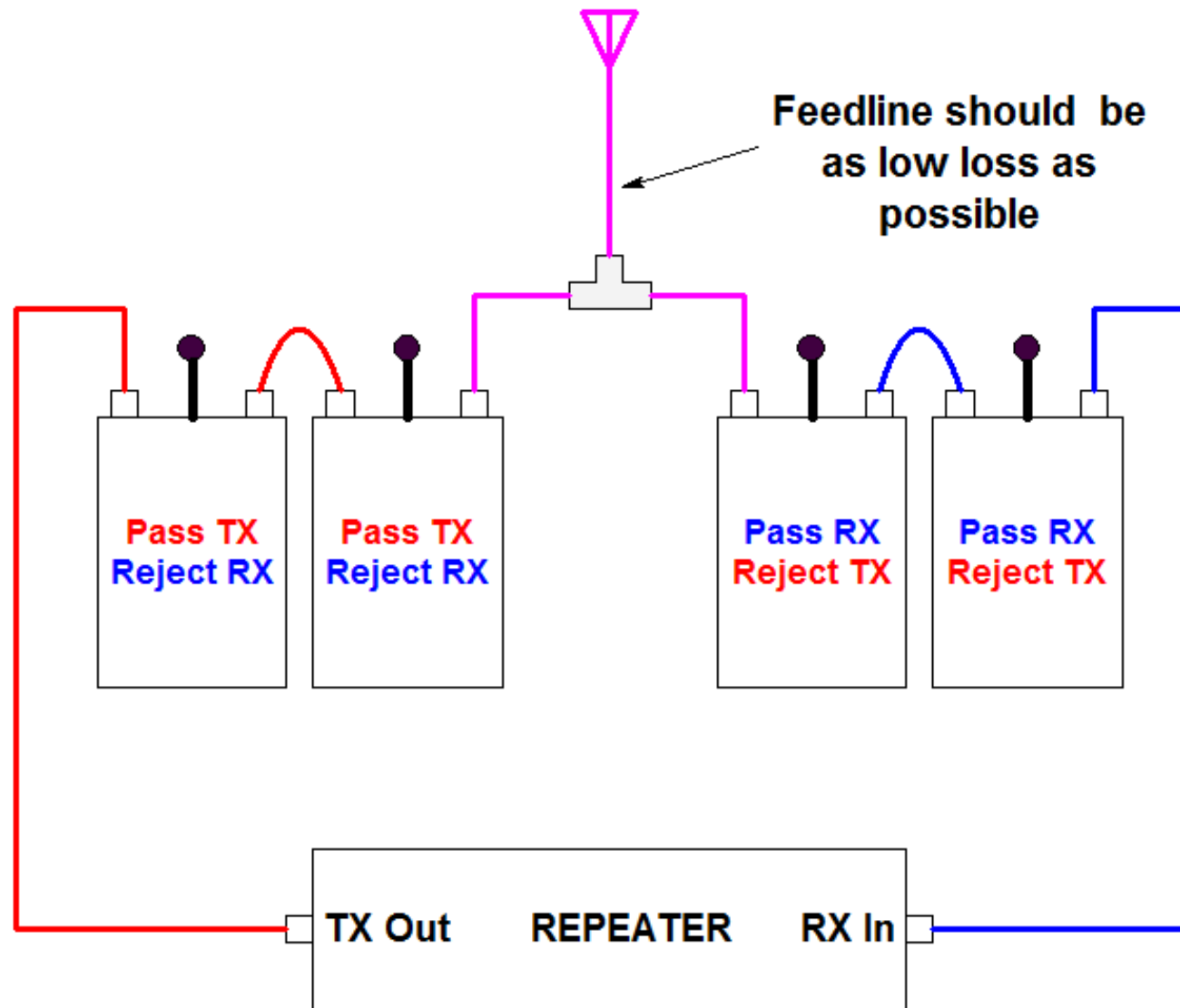
What are they?

- Duplexers are a special type of filter that allows a single antenna to transmit and receive simultaneously on two closely spaced frequencies
- A typical duplexer consists of two pairs of resonant cavities
 - Two pass the transmit signal from the transmitter to the antenna while rejecting the received signal
 - The other two pass the receive signal from the antenna to the receiver while rejecting transmitted signal
- Typical rejection is better than 70 dB, while attenuating the desired signal less than 2 dB

BANDPASS DUPLEXER



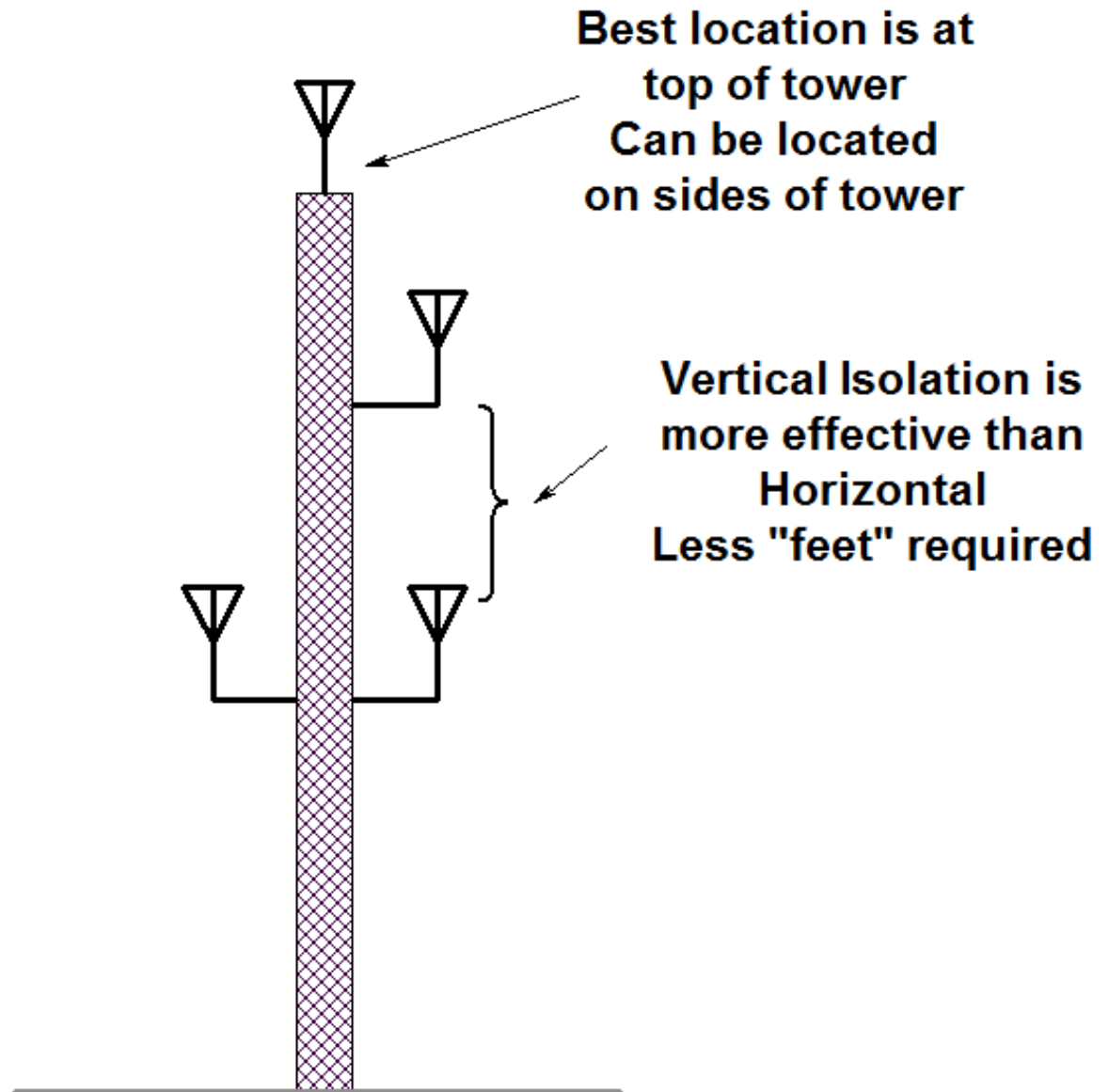
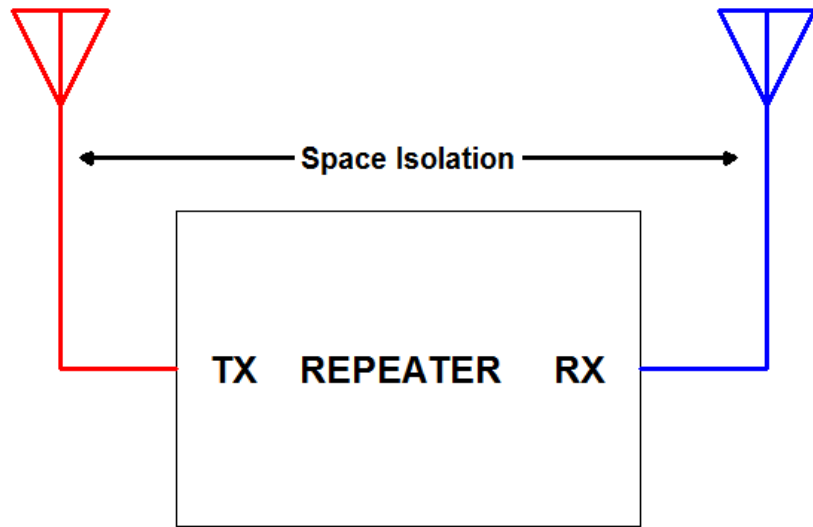
BANDPASS DUPLEXER



Note: Cables can be length sensitive

ALTERNATIVE TO USING DUPLEXERS

Use separate TX/RX antennas separated either horizontally or vertically from each other.



TYPICAL ANTENNA SPACING ISOLATION VALUES

Based on vertically polarized half-wave dipoles. Actual experience will vary due to local conditions, antenna variations, etc.

BAND	VERTICAL			HORIZONTAL		
	5'	10'	15'	25'	50'	100'
6M	--	--	28dB	--	25dB	32dB
2M	22dB	36dB	48dB	28dB	35dB	42dB
70CM	35dB	48dB	62dB	47dB	52dB	57dB

Tuning Rods

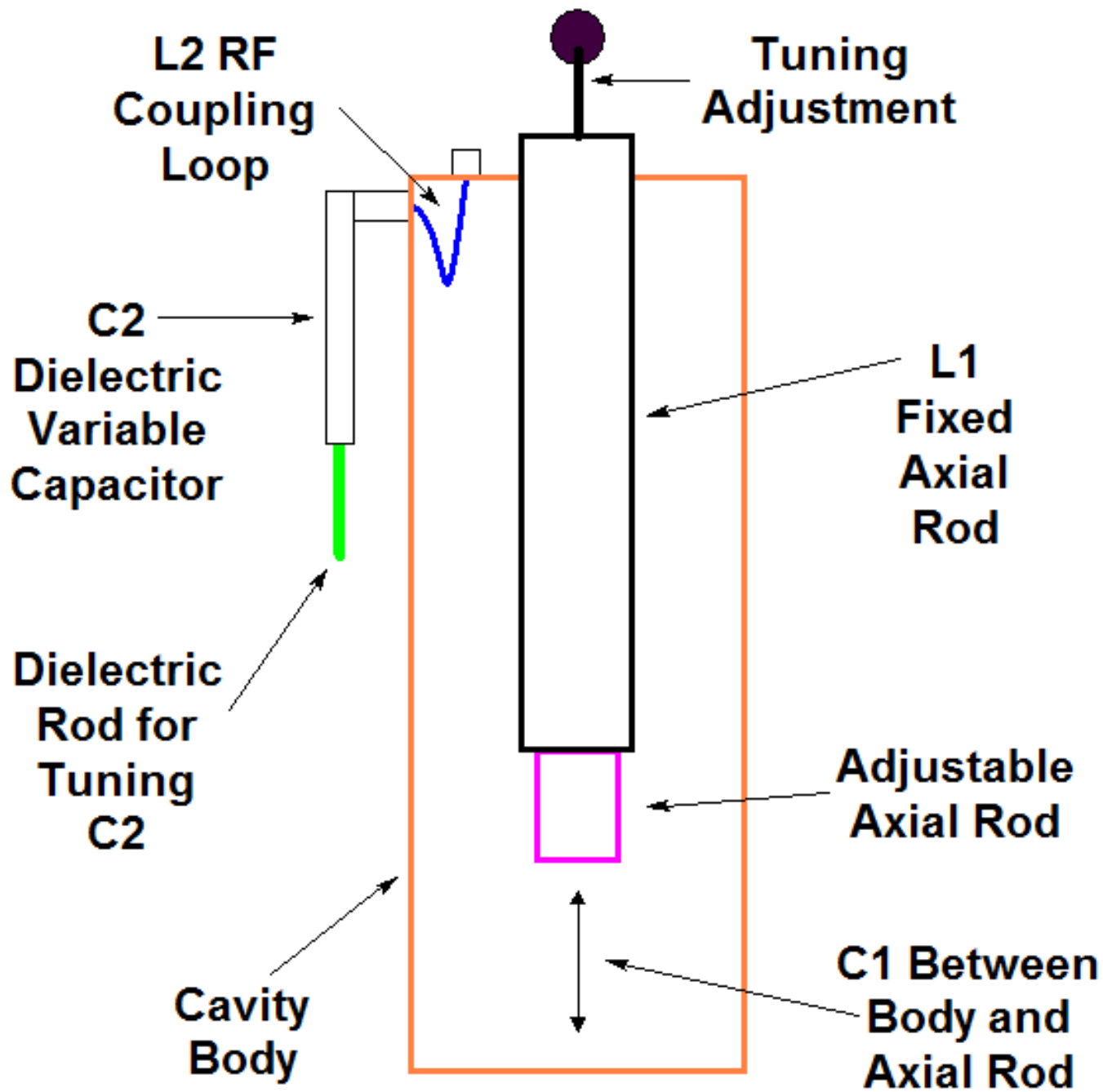
**Antenna
Connection**

**Receiver &
Transmitter
Connections**

**Cavities or
“Cans”**

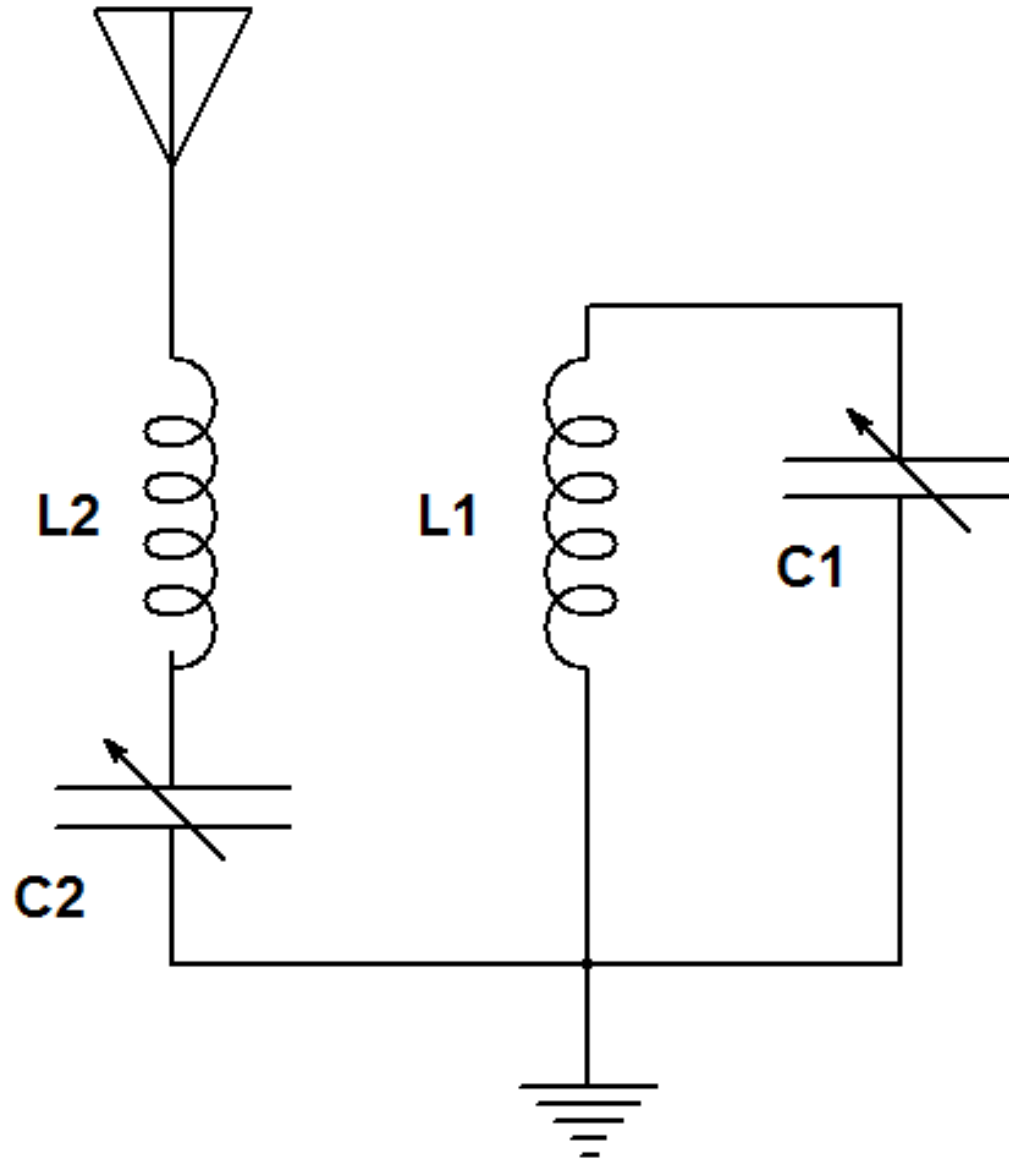
A TYPICAL DUPLEXER





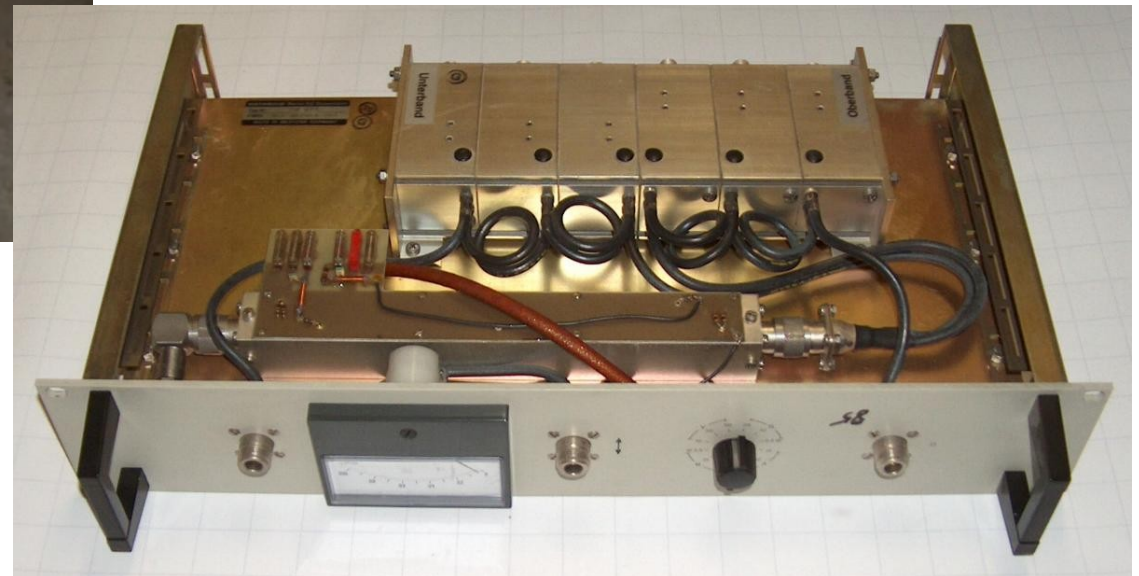
**LOOK
UNDER
THE
HOOD**

ELECTRICAL EQUIVALENT



A tuned circuit is formed by $L1$ and $C1$ which are the cavity body and a "central" tuning capacitor and a tunable series LC coupling circuit using $L2$ and $C2$.

OTHER STYLES OF DUPLEXERS



OTHER CONSIDERATIONS

Quality duplexers are designed and built to perform within certain ranges of power, temperature, and frequency separation. The materials used in the manufacture of duplexers usually control the power rating and temperature range of the duplexer.

The frequencies to which the TX and RX sides of the duplexer are tuned cannot change due to something moving when it heats up and expands or cools down and shrinks. Detuning of a duplexer in this manner, in the worse case, can render a repeater inoperative. Materials with a low coefficient of thermal expansion are therefore used in critical areas such as the cavity main tuning control.

