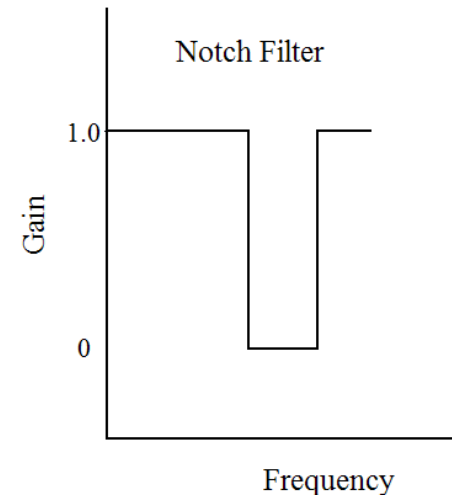
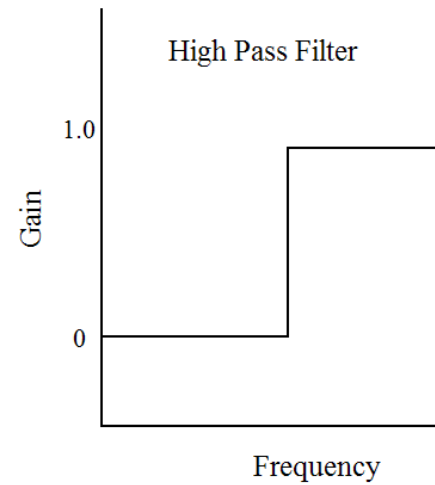
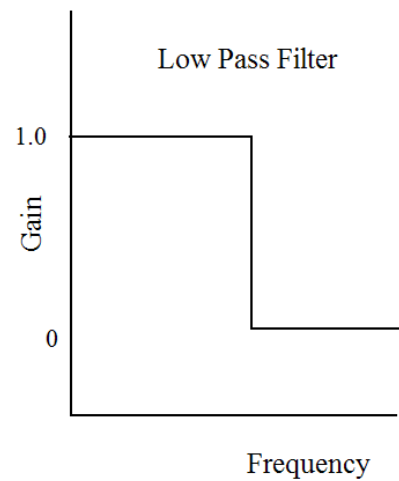
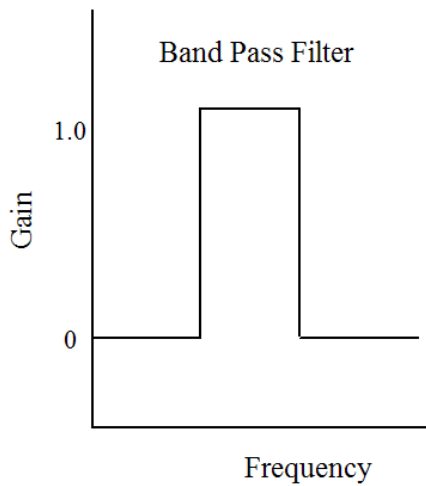
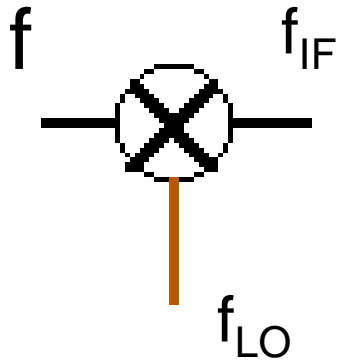


Types of Filters



Edges are smoother than illustrated

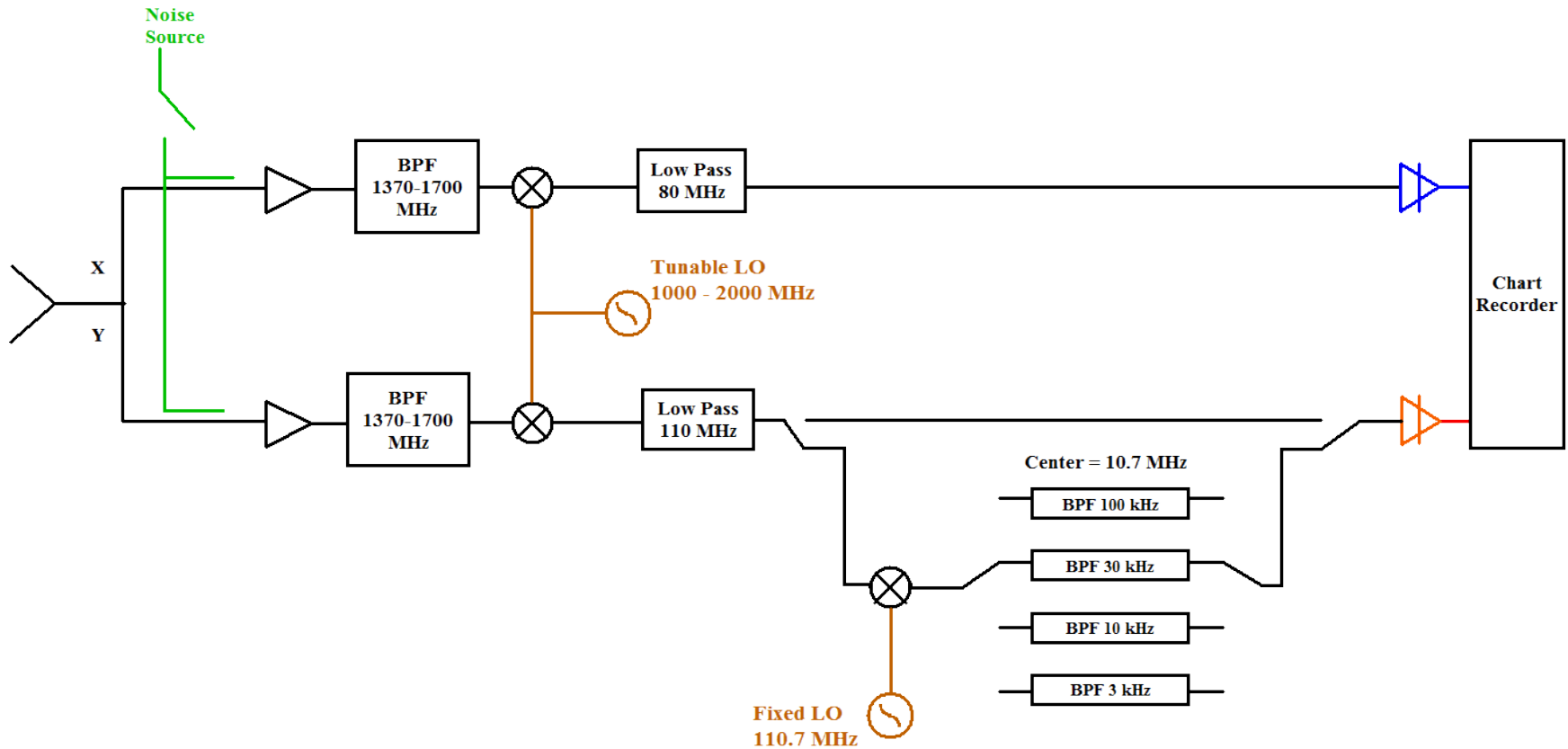
Types of Mixers



$$f_{IF} = n * f_{LO} + m * f$$

- n and m are positive or negative integers, usually 1 or -1
- Up Conversion : $f_{IF} > f$
- Down Conversion : $f_{IF} < f$
- Lower Side Band : $f_{LO} > f$
 - Sense of frequency flips
- Upper Side Band : $f_{LO} < f$

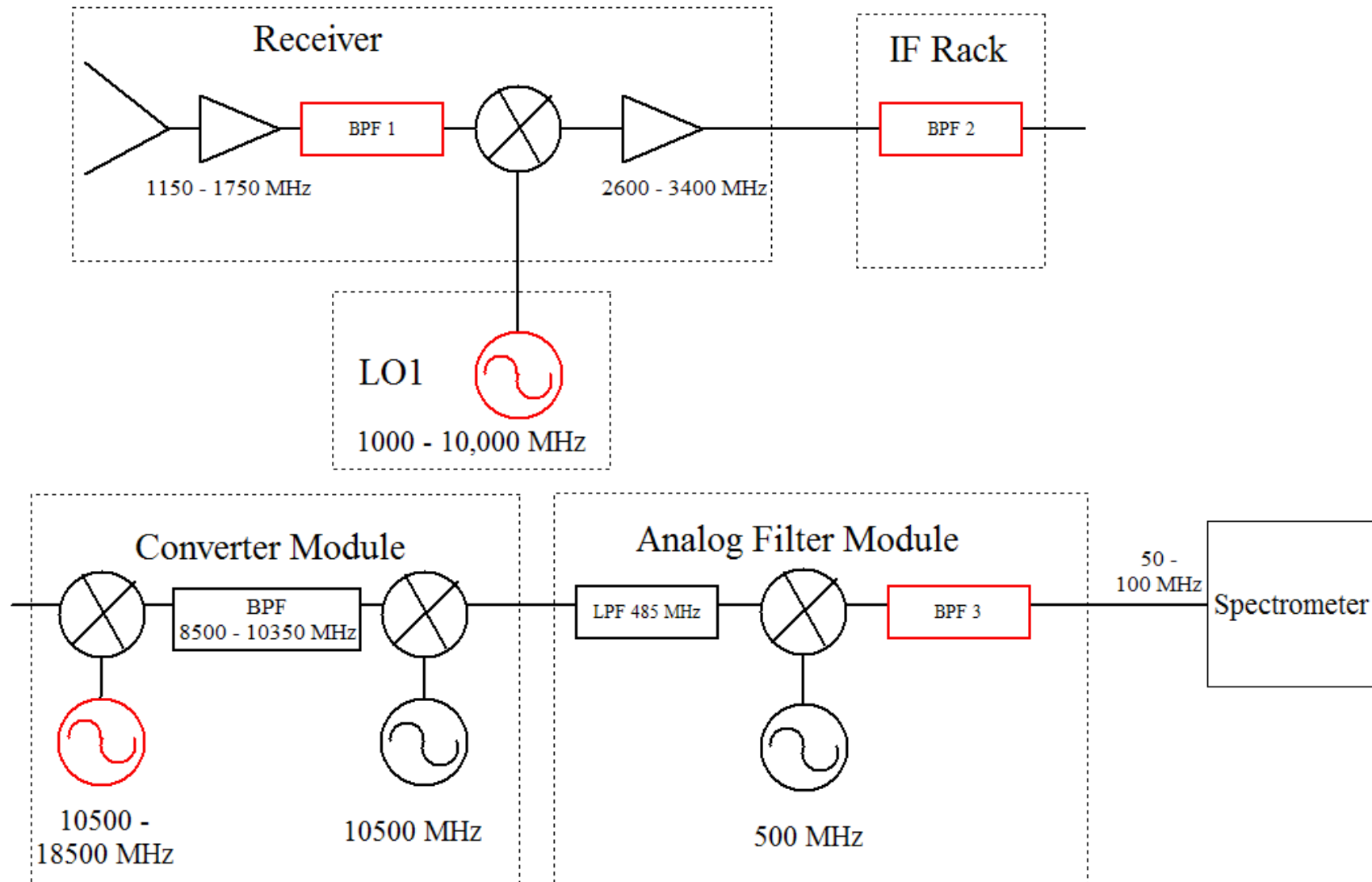
40-Ft System



Quiz 1: Determine values for the first LO for the 40-ft when...

- Observing HI at 1420.41 MHz with a 30 kHz bandwidth
- Observing OH at 1665.6 MHz with a 10 kHz bandwidth

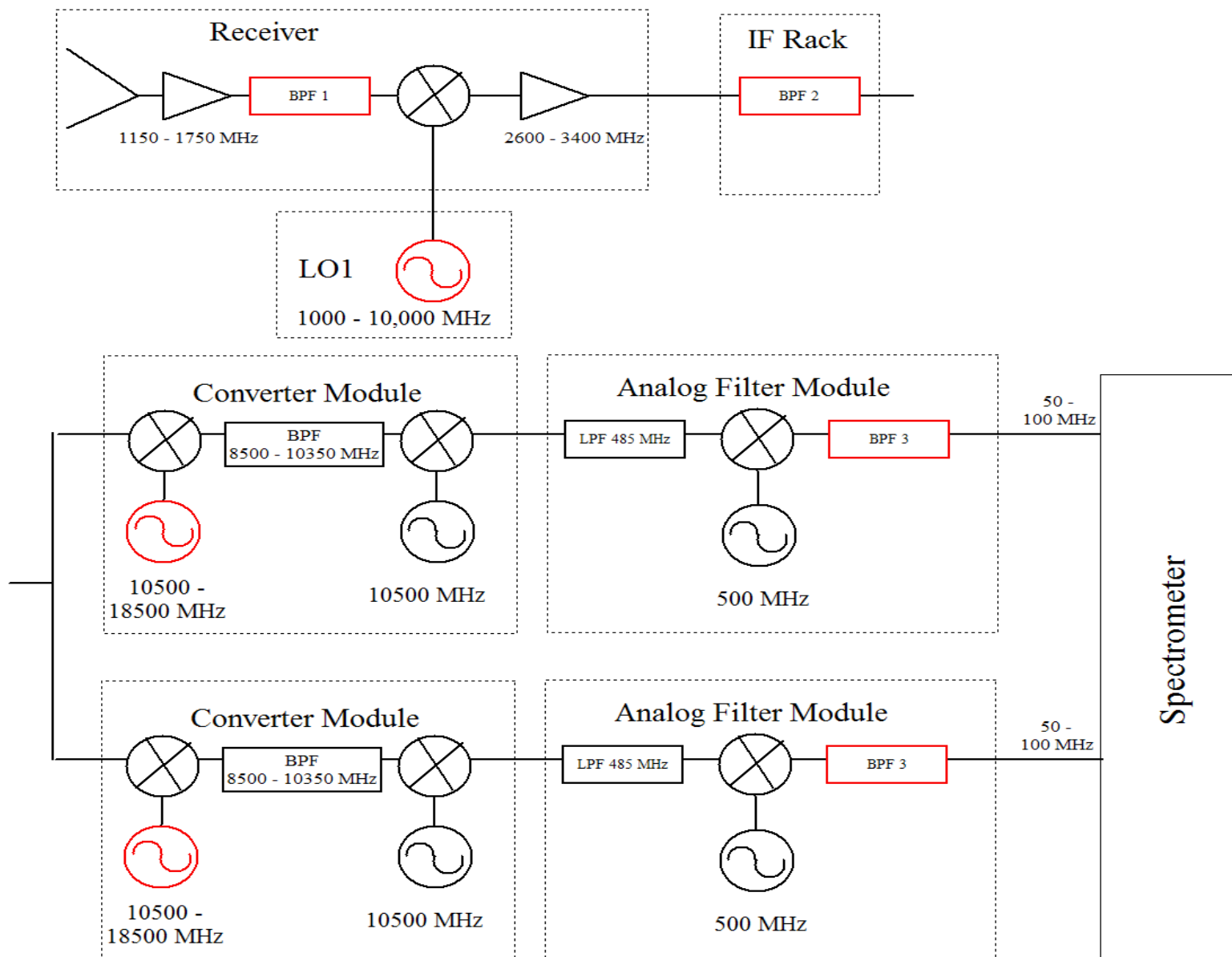
Quiz 2: Determine values for red components



Quiz 2: Determine values for red components

- Goal : Observe 1420 MHz with the 50 MHz mode of the Spectrometer
- Parameters:
 - BPF1 can be: 1100–1800, 1600-1750, 1300-1450, or 1100-1450 MHz
 - All mixers are Lower Side Band. Hint: first two mixers up convert, the last two down convert.
 - BPF2 can be : 2990-3010, 2960-3040, 2840-3160, 2360-3640, 5960-6040, 5840-6160, or 5360-6640 MHz
 - BPF3 can be : 50-100 or 25-37.5 MHz
 - See block diagram for other parameters
- Hint: Work from the receiver down the chain until you get stuck, then from Spectrometer up
- Record values for LO1 and LO2; settings for BPF1, 2, and 3; and values for all Intermediate Frequencies.

Quiz 3: Determine values for red components



Quiz 3: Determine values for red components

- Goal : Observe simultaneously 1420 MHz and 1665 MHz with the 50 MHz wide (75 MHz center frequency) mode of the Spectrometer
- Parameters:
 - BPF1 can be: 1100–1800, 1600-1750, 1300-1450, or 1100-1450 MHz
 - All mixers are LSB. Hint: first two mixers up convert, the last two down convert.
 - BPF2 can be : 2990-3010, 2960-3040, 2840-3160, 2360-3640, 5960-6040, 5840-6160, or 5360-6640 MHz
 - BPF3 can be : 50-100 or 25-37.5 MHz
 - See block diagram for other parameters
- Hint: Work from the receiver down the chain until you get stuck, then from Spectrometer up. Try 1420 MHz first, then add in 1665 MHz.
- Record values for LO1 and both LO2's; settings for BPF1, 2, and 3; and values for all Intermediate Frequencies.