NWSTC RADAR Pre-Course Material

Basic 88D RADAR

PR_Basic_RADAR_20210204c

How RADAR Works

- Radar is an acronym that stands for <u>RA</u>dio <u>D</u>etection <u>A</u>nd <u>R</u>anging
- How it Works:
  - The radar transmits a burst of radio waves in a certain direction
  - These waves bounce off whatever they hit (raindrop, bird, dust, etc) and some of this energy is scattered back to the radar's receiver.
  - Because radio waves travel at the speed of light, we can calculate the distance of the object from the radar! (Speed of Light x Time from Transmit to Received)/2
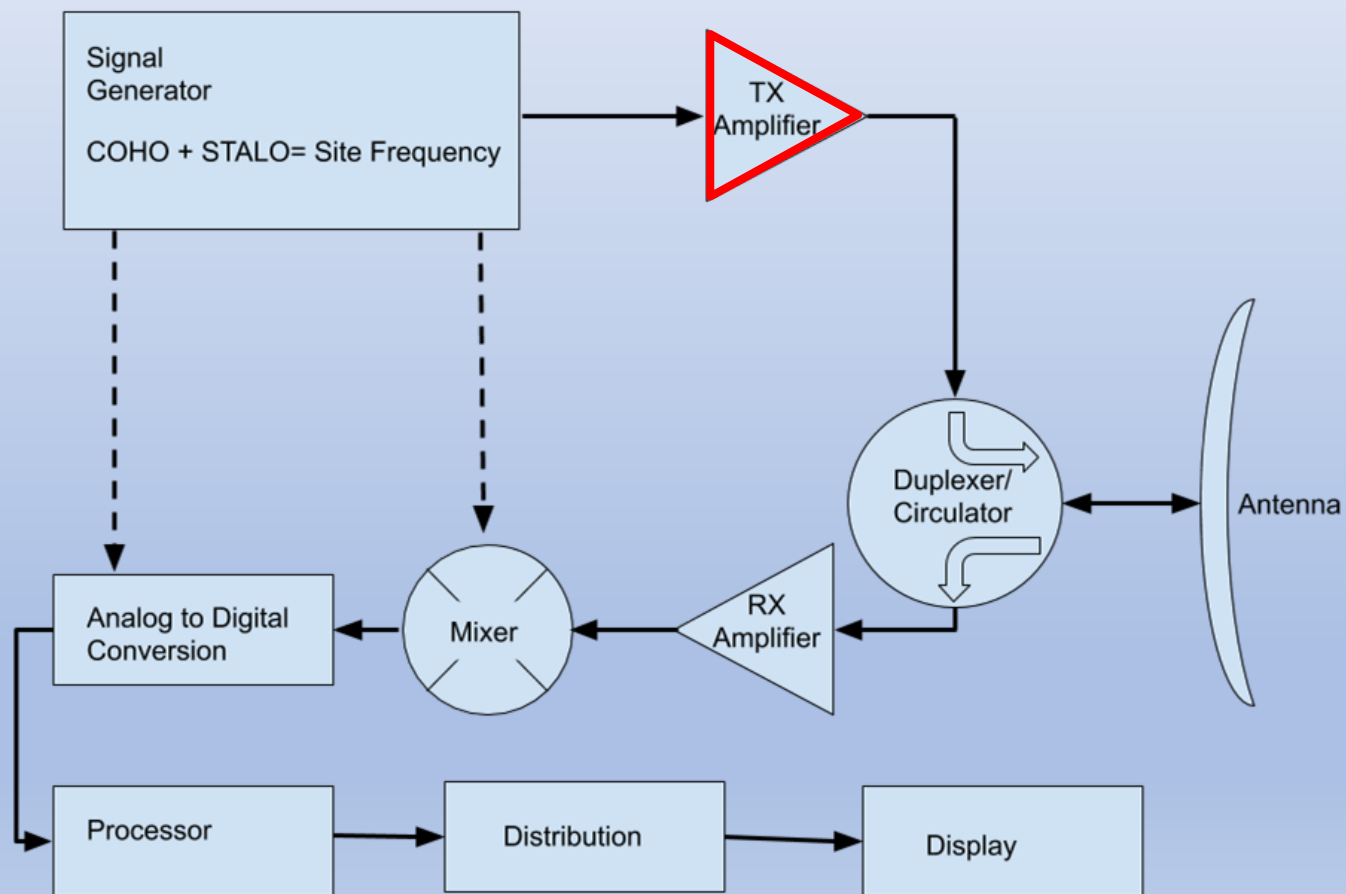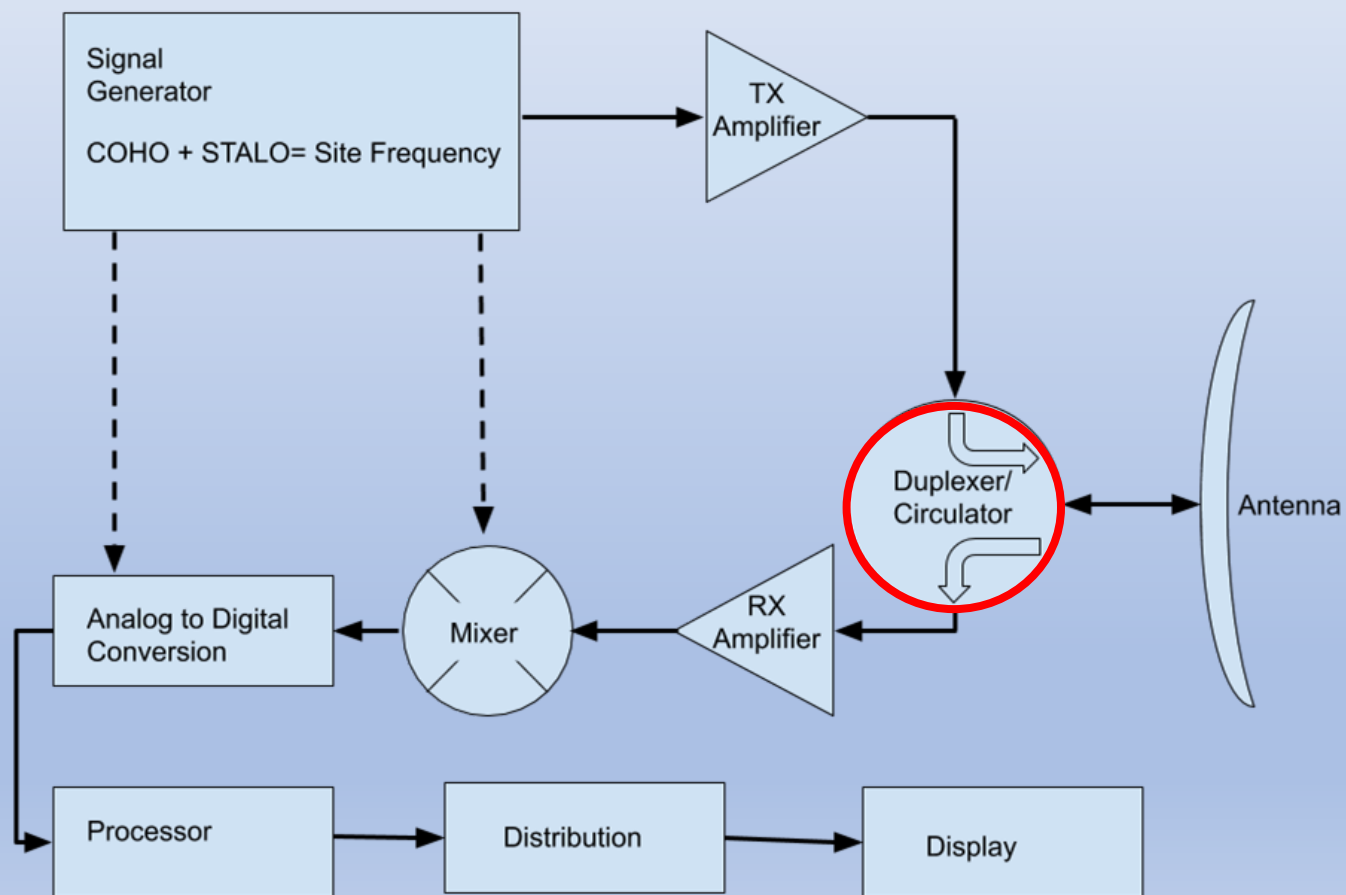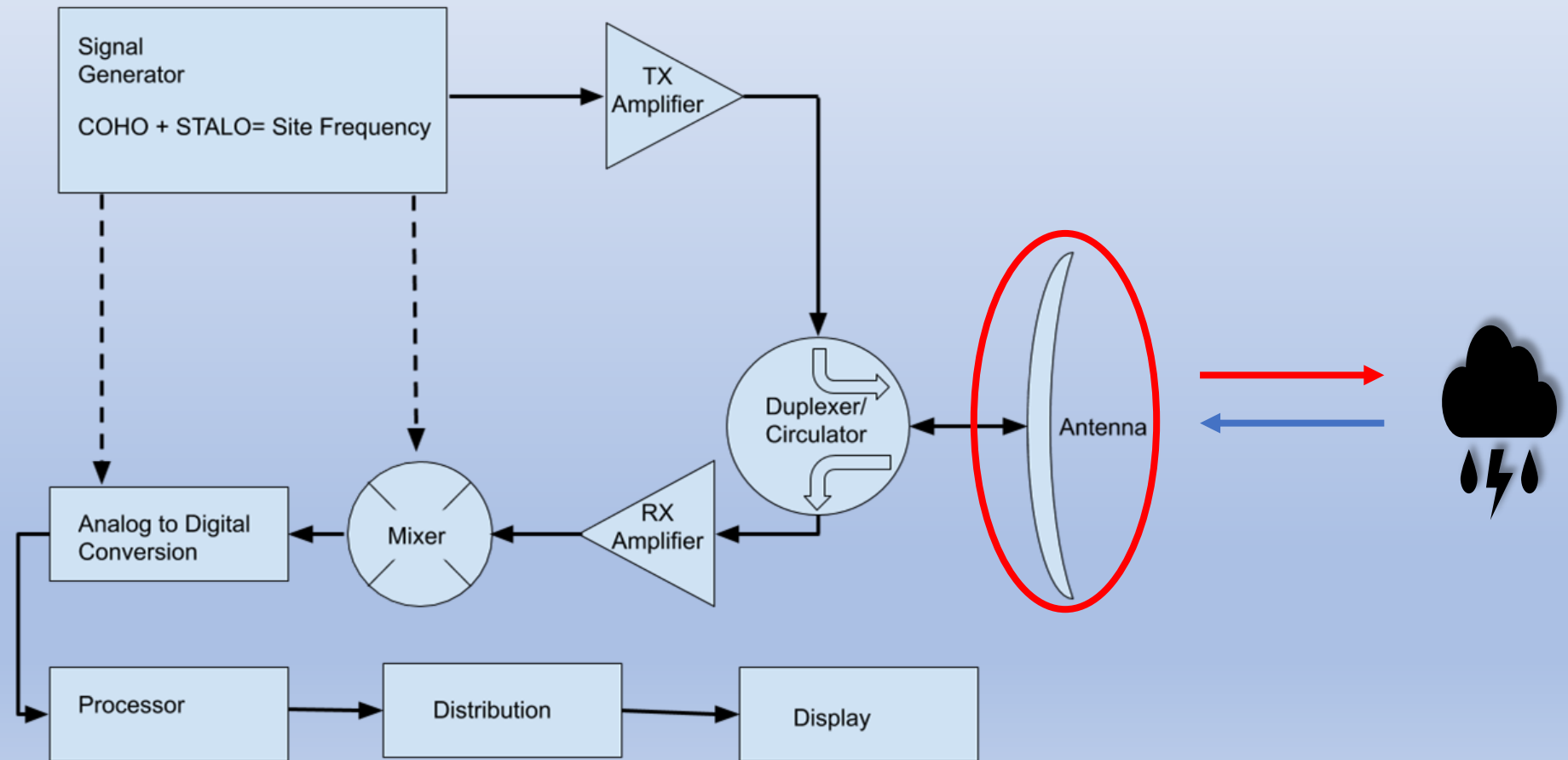
The Basic 88D RADAR
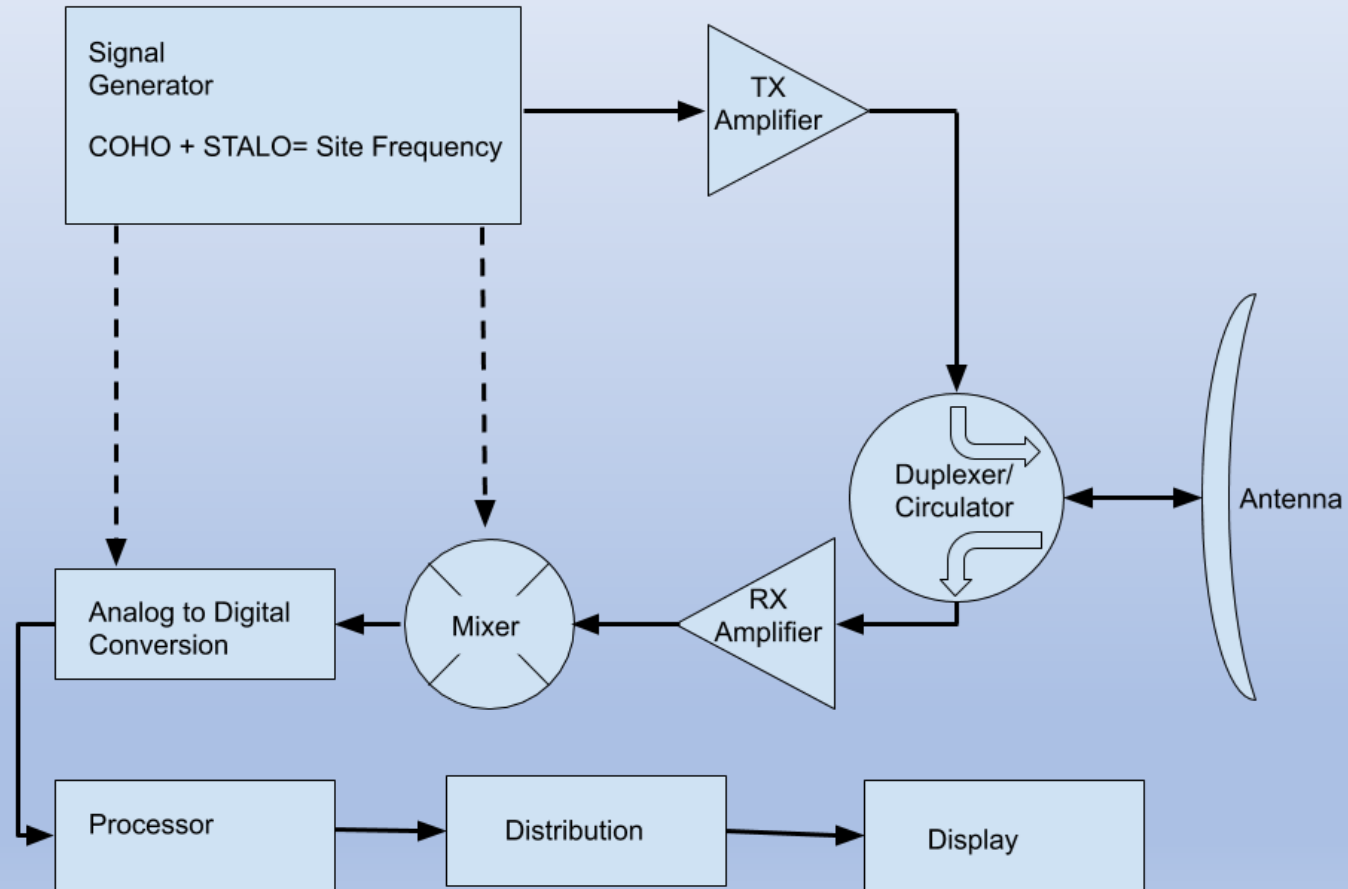
The Signal Generator
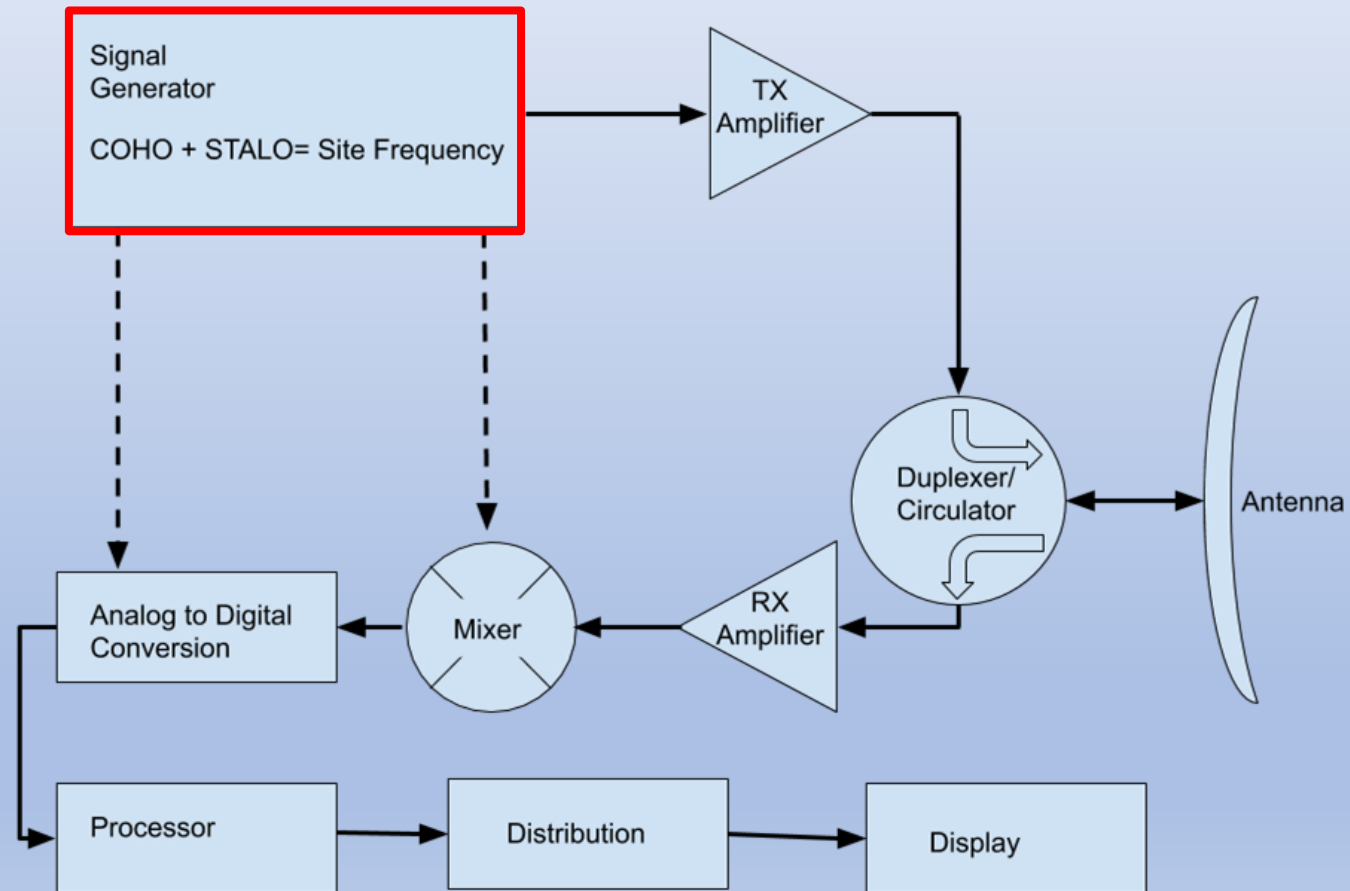
The Transmit Amplifier

The Duplexer or Circulator

The Antenna

The Duplexer or Circulator
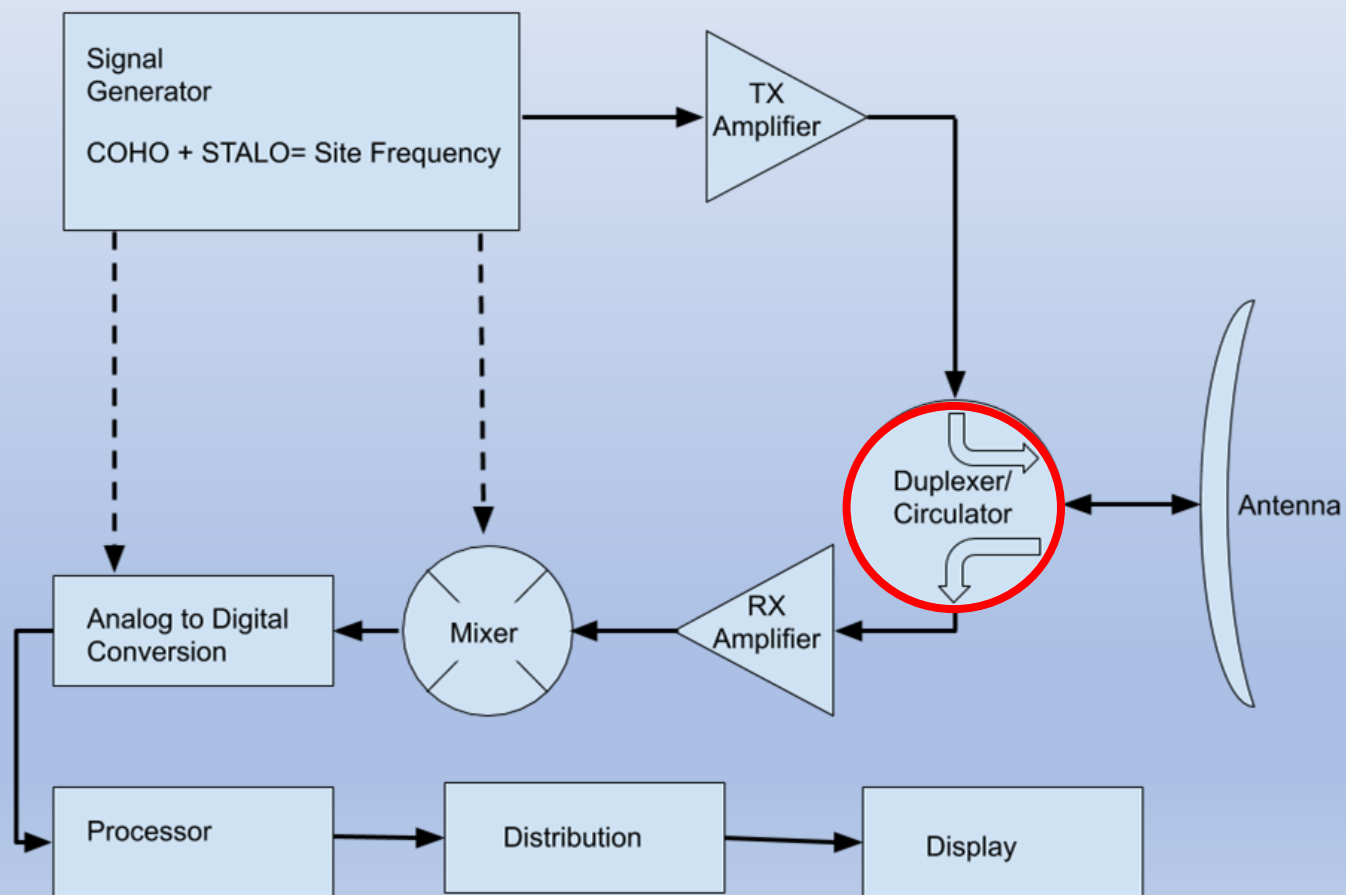
Receiver Amplifier

The Mixer

Signal Generator

COHO + STALO = Site Frequency

TX Amplifier

Circulator

Antenna

RX Amplifier

Mixer

Analog to Digital Conversion

Processor
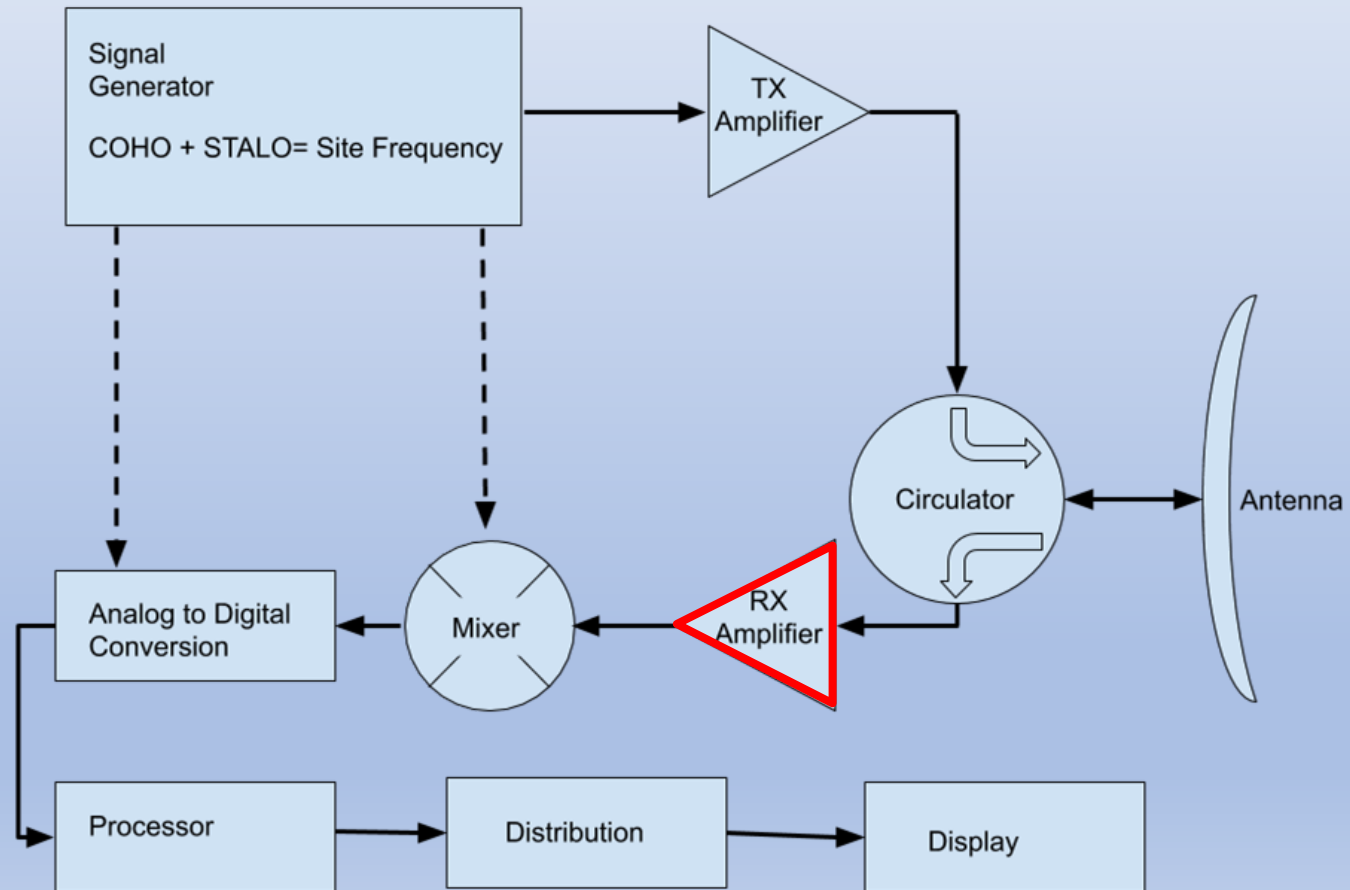
Distribution
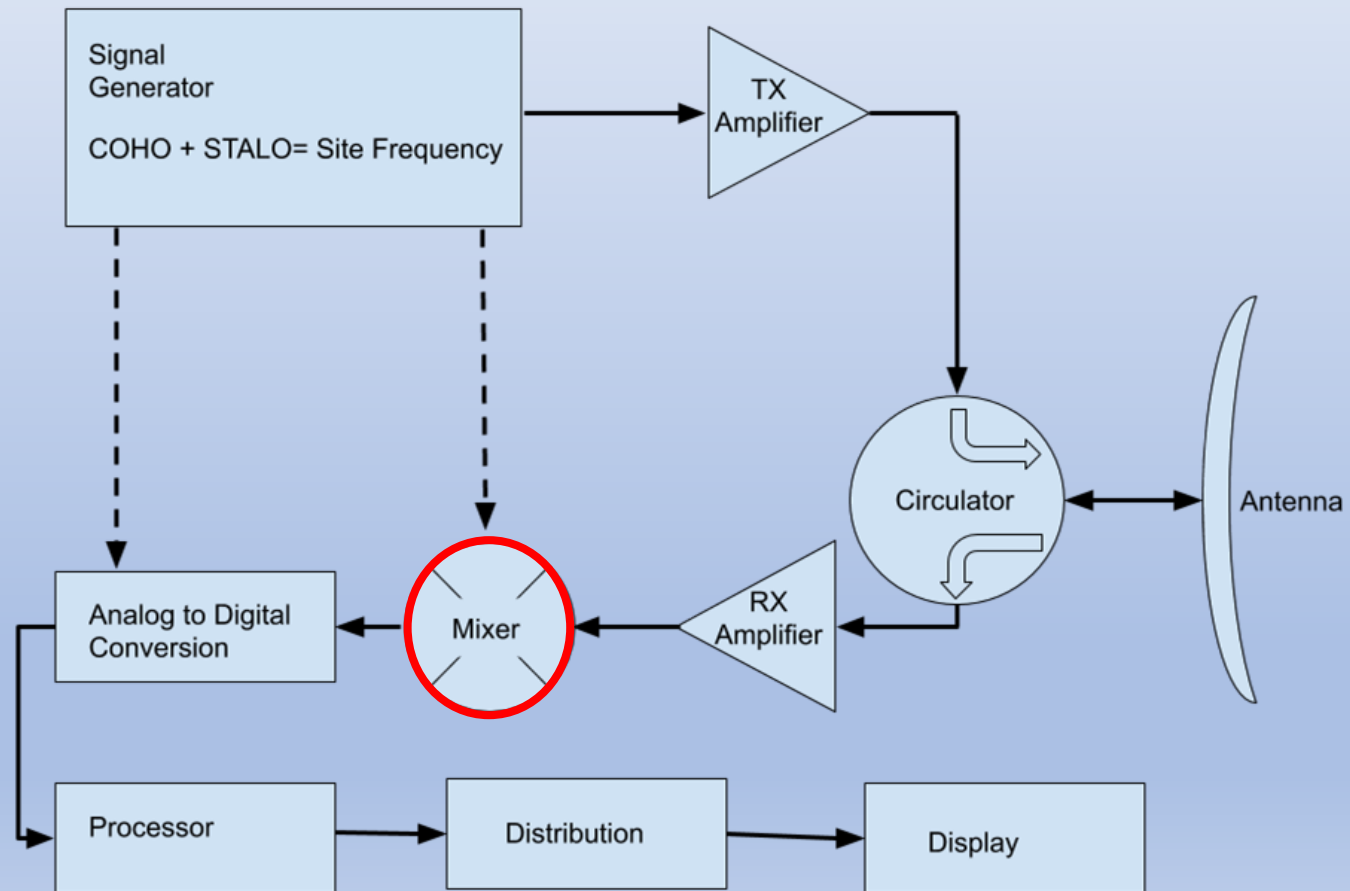
Display

The Analog to Digital Conversion

The Processor

Signal Generator

COHO + STALO= Site Frequency

TX Amplifier

Circulator

Antenna

RX Amplifier

Mixer

Analog to Digital Conversion
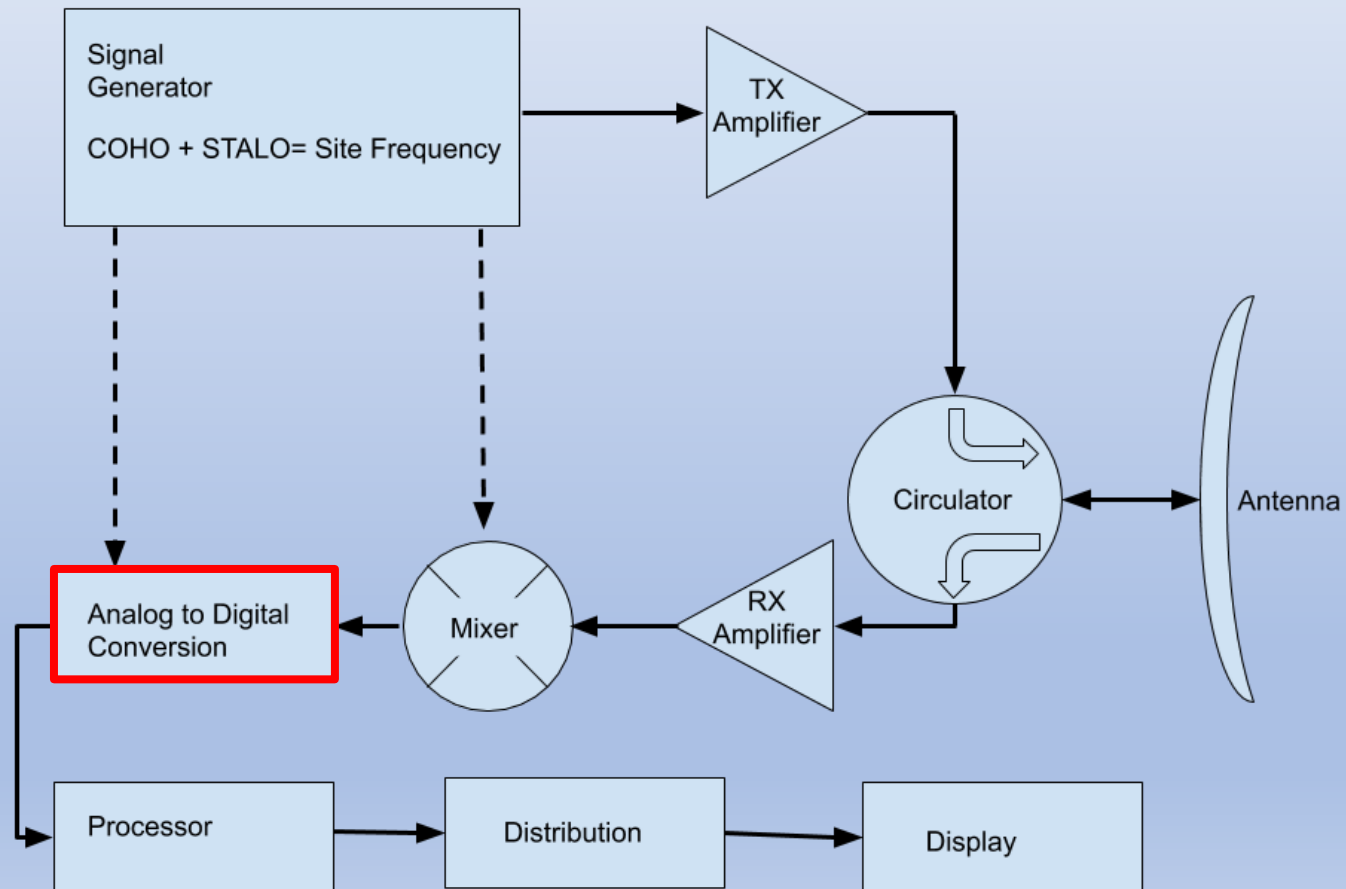
Processor
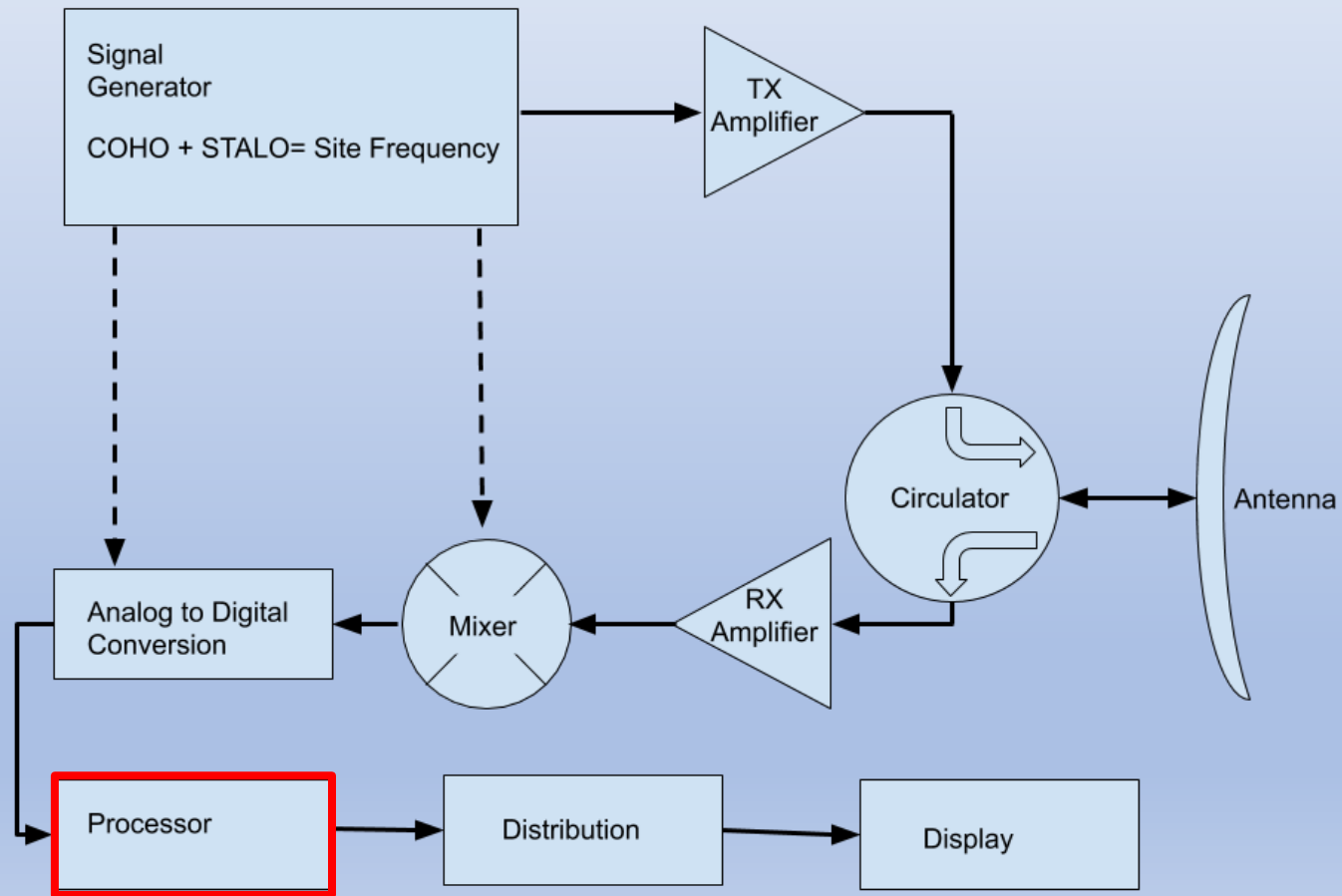
Distribution
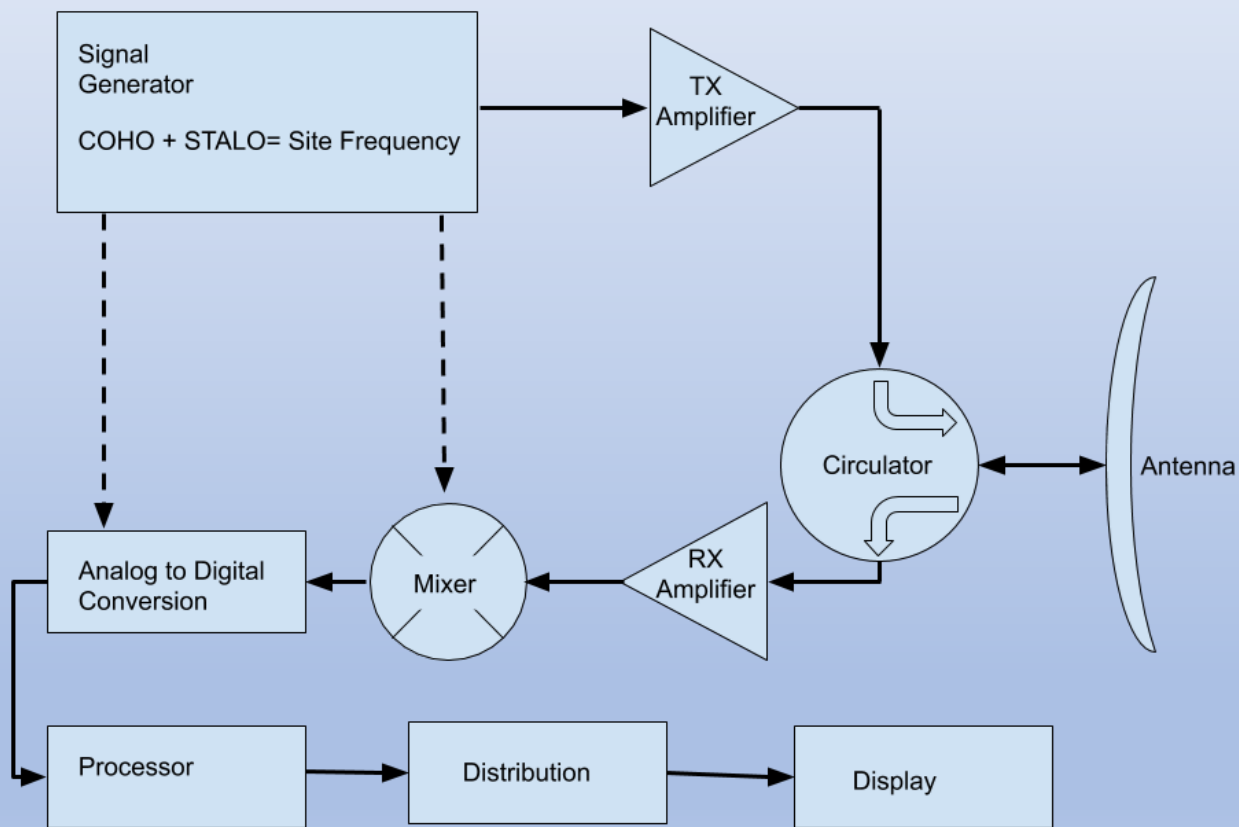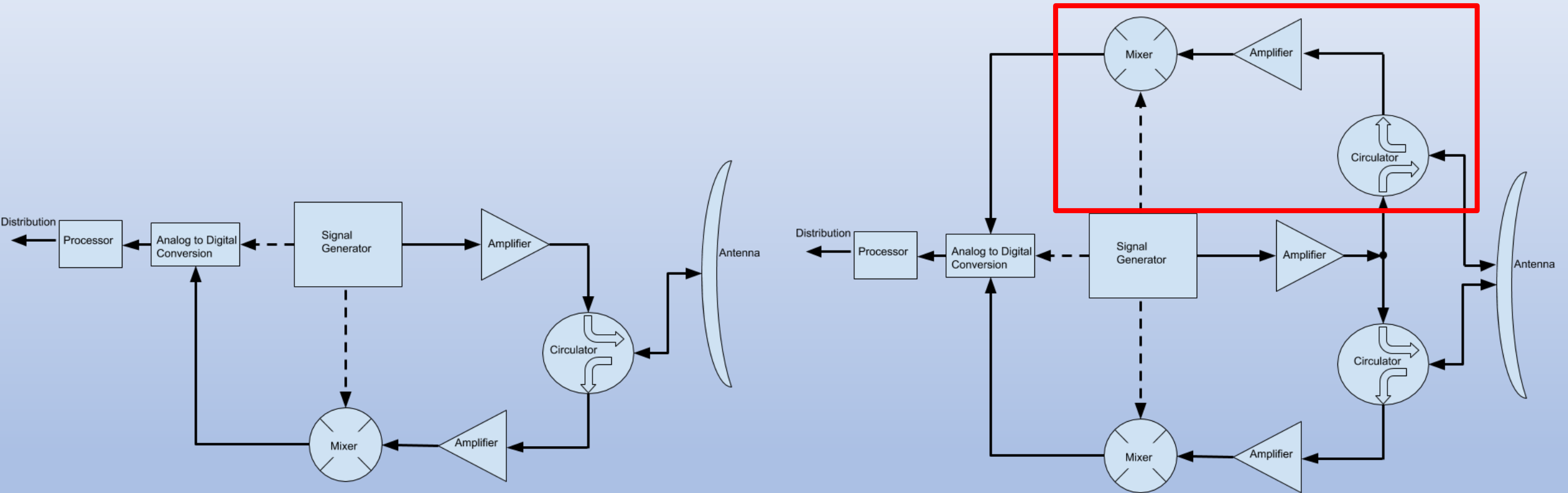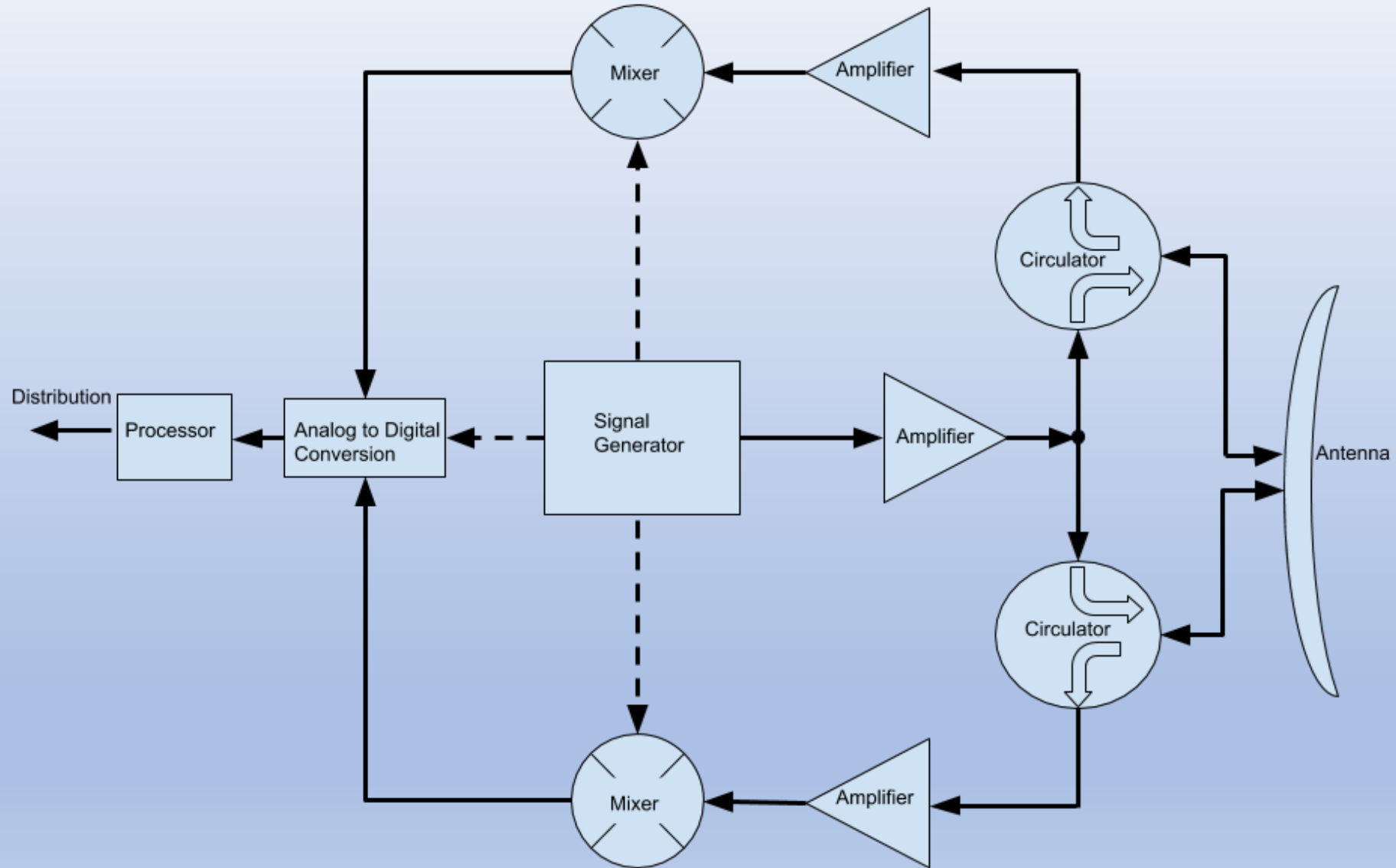
Display

Distribution and Display
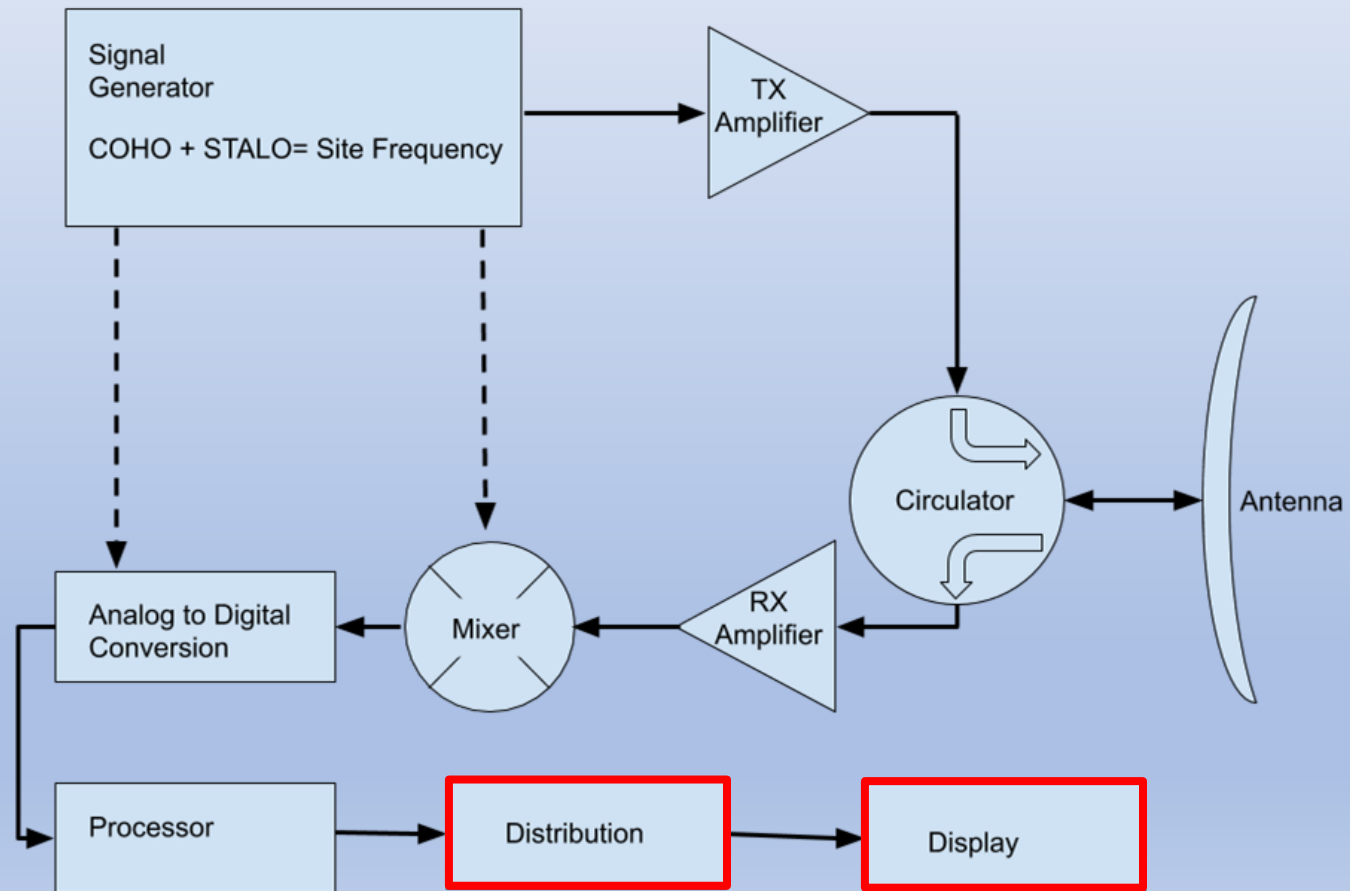
A little rearranging of our simplified RADAR
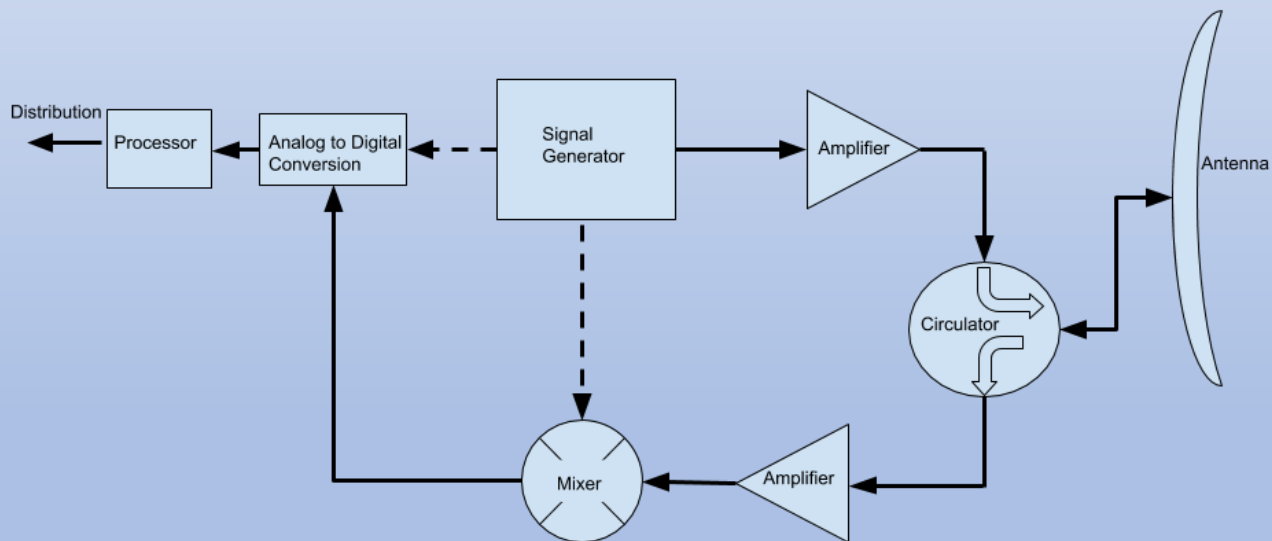
Single Polarization to Dual Polarization RADAR

Dual Polarization RADAR
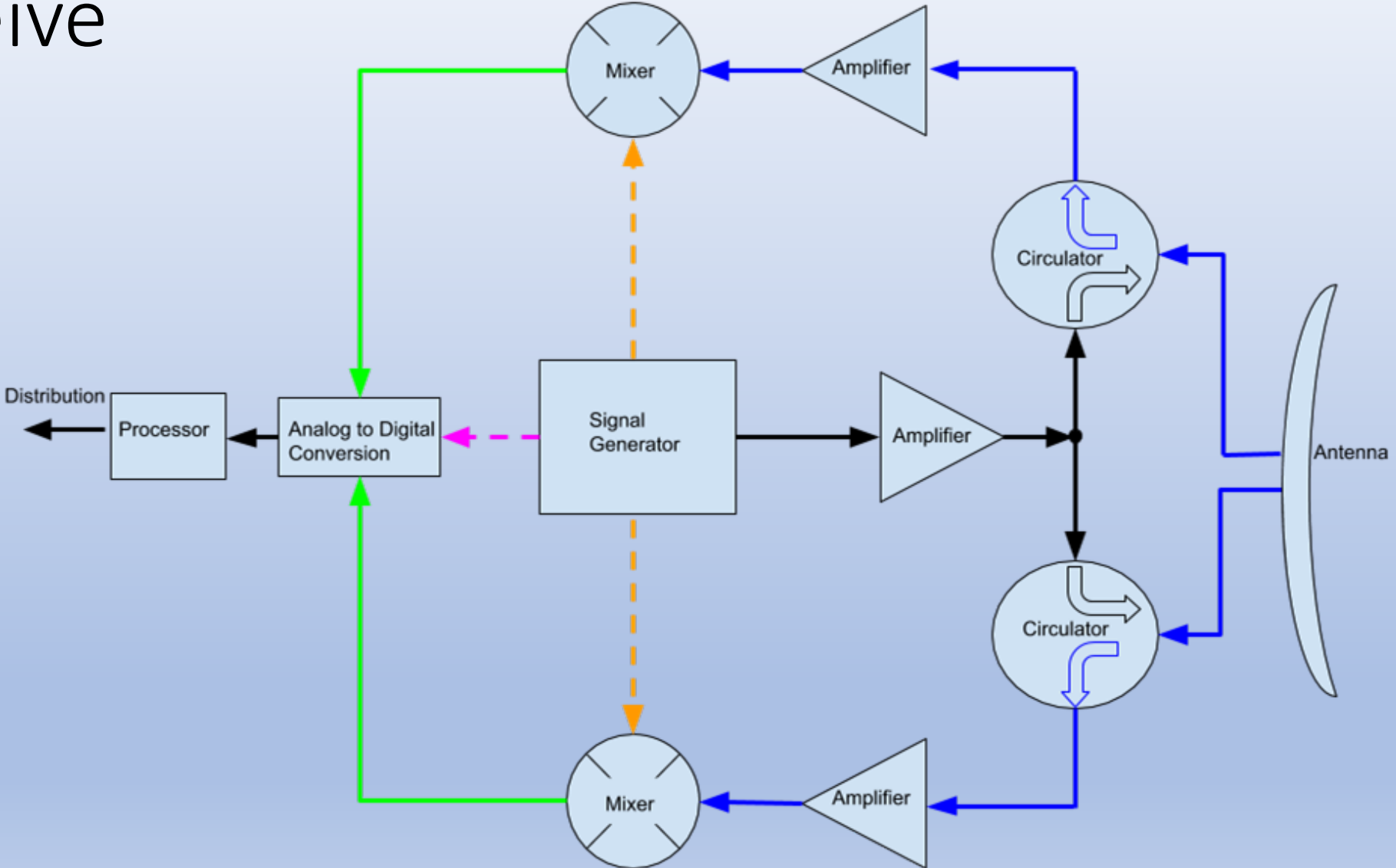

For Training Use Only
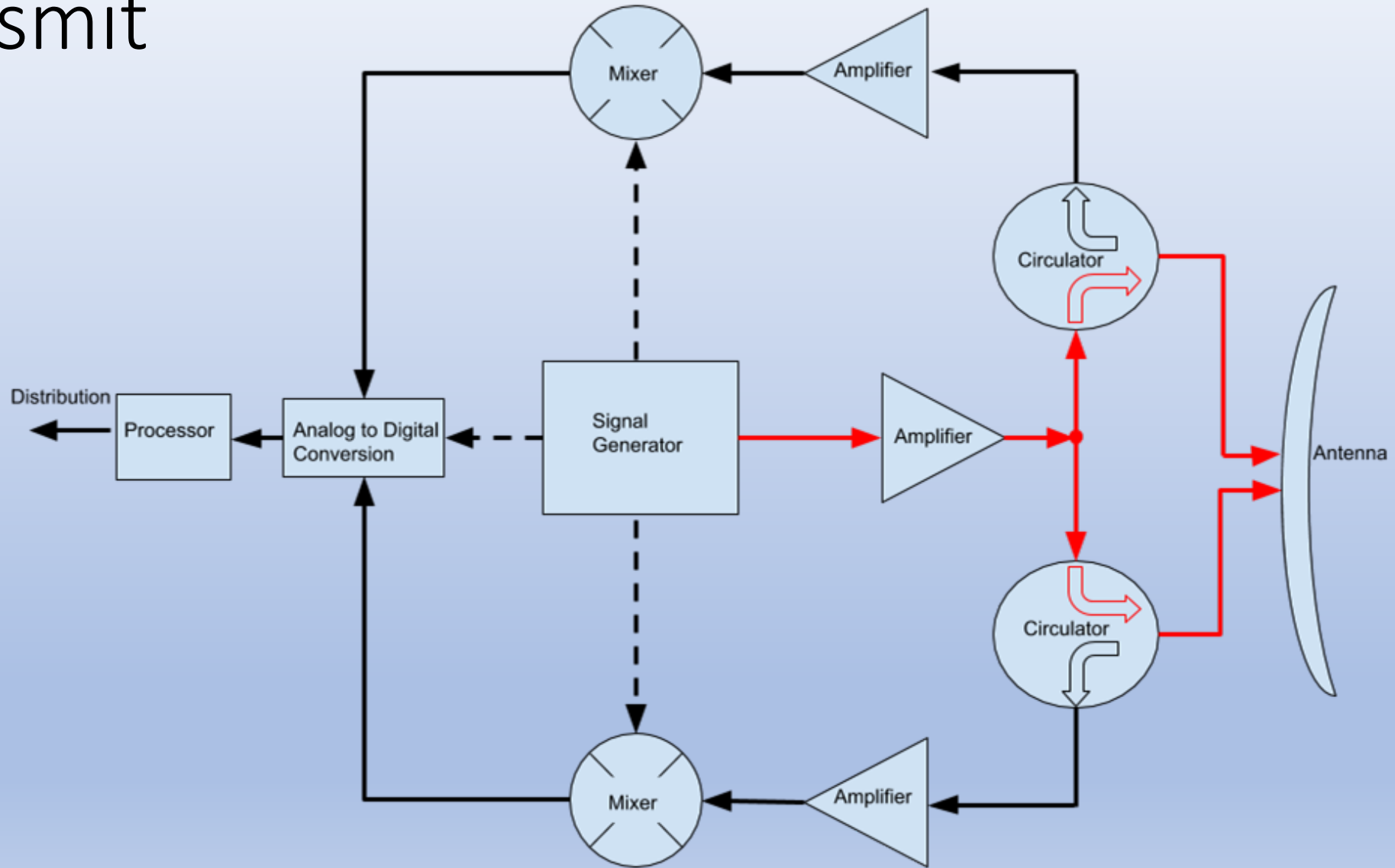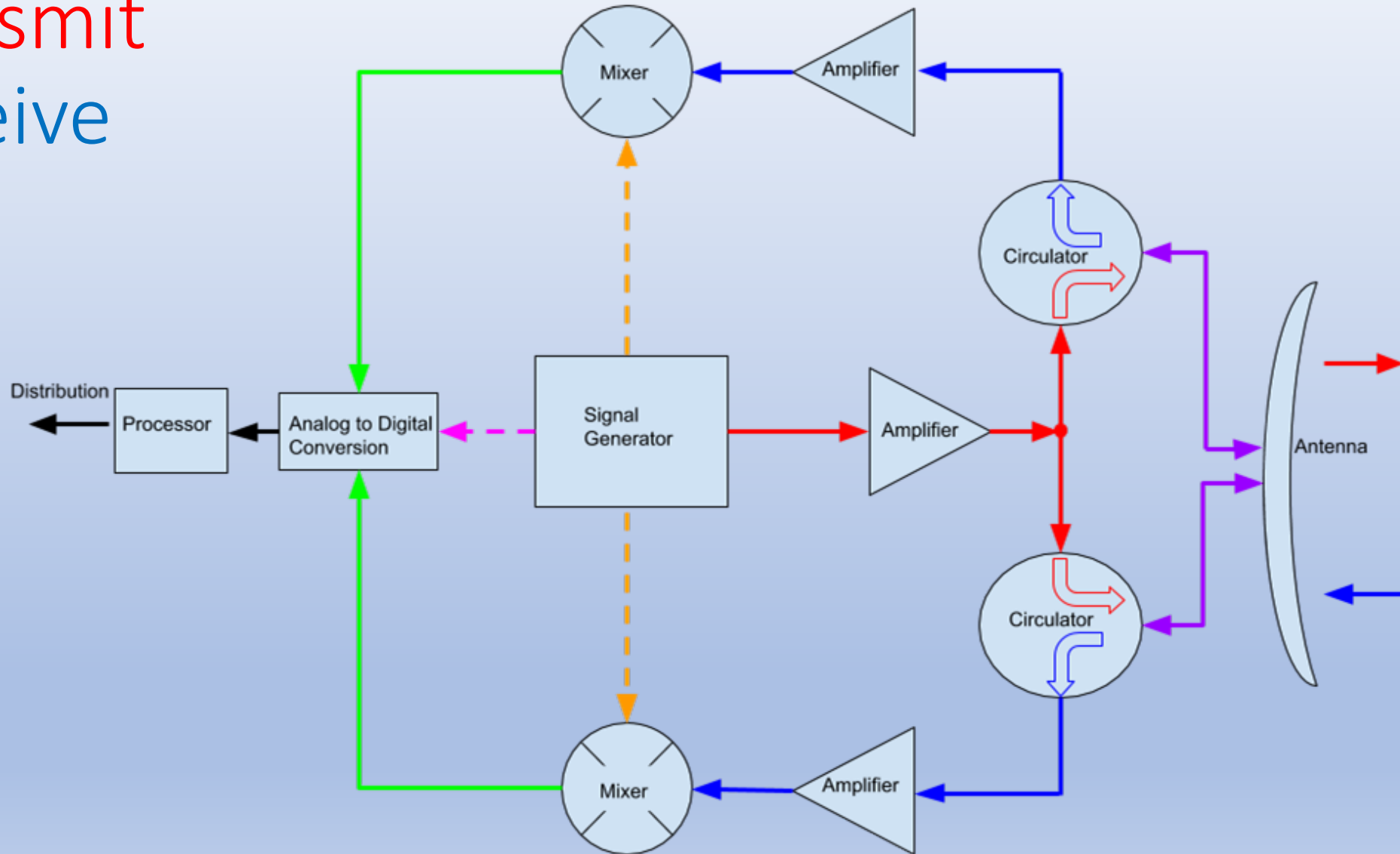
Transmit

Receive

Transmit
Receive

For Training Use Only

Terminology

RADAR Returns
(Site freq +/- doppler shift)
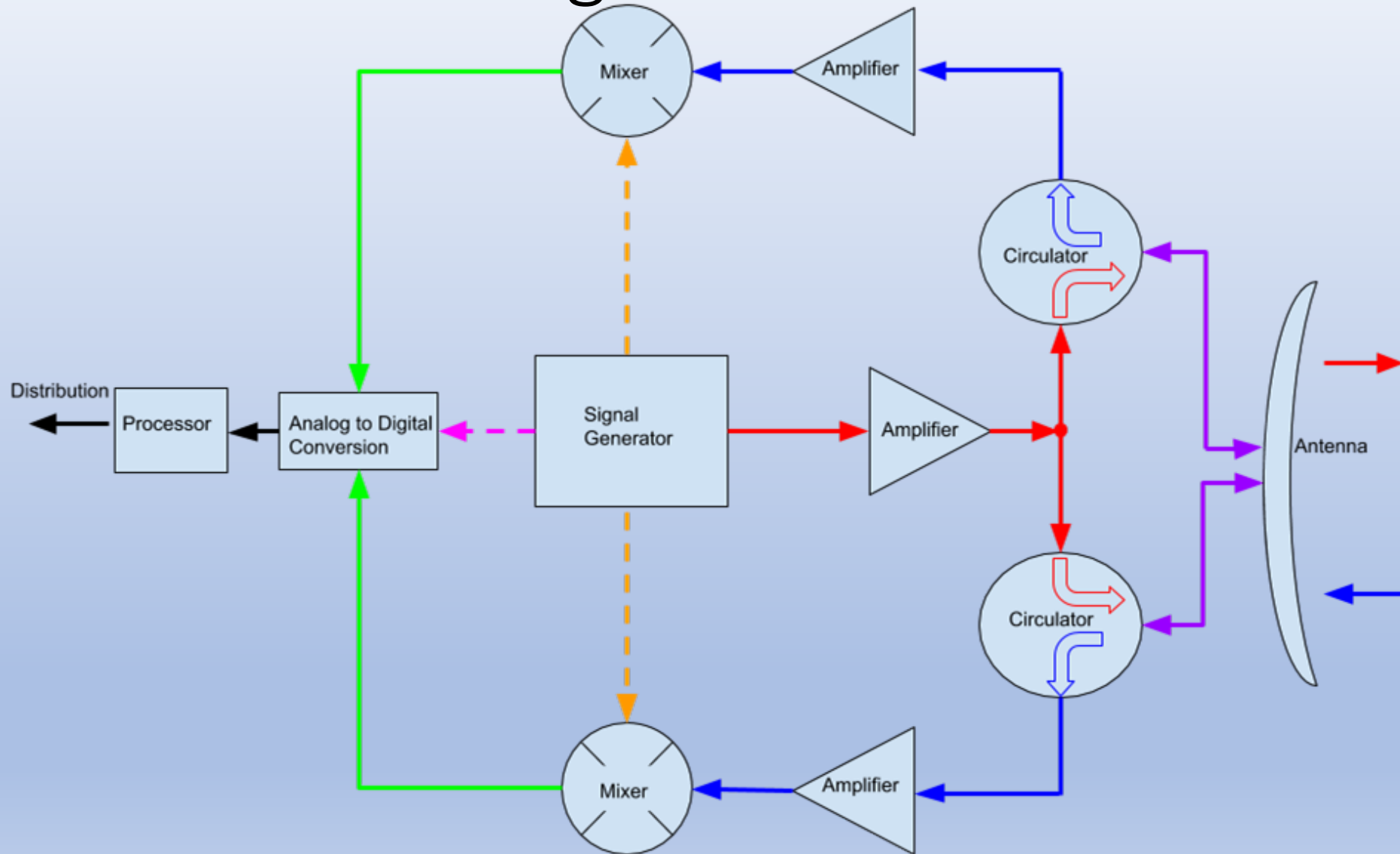
IF
(57.5MHZ +/- doppler shift)
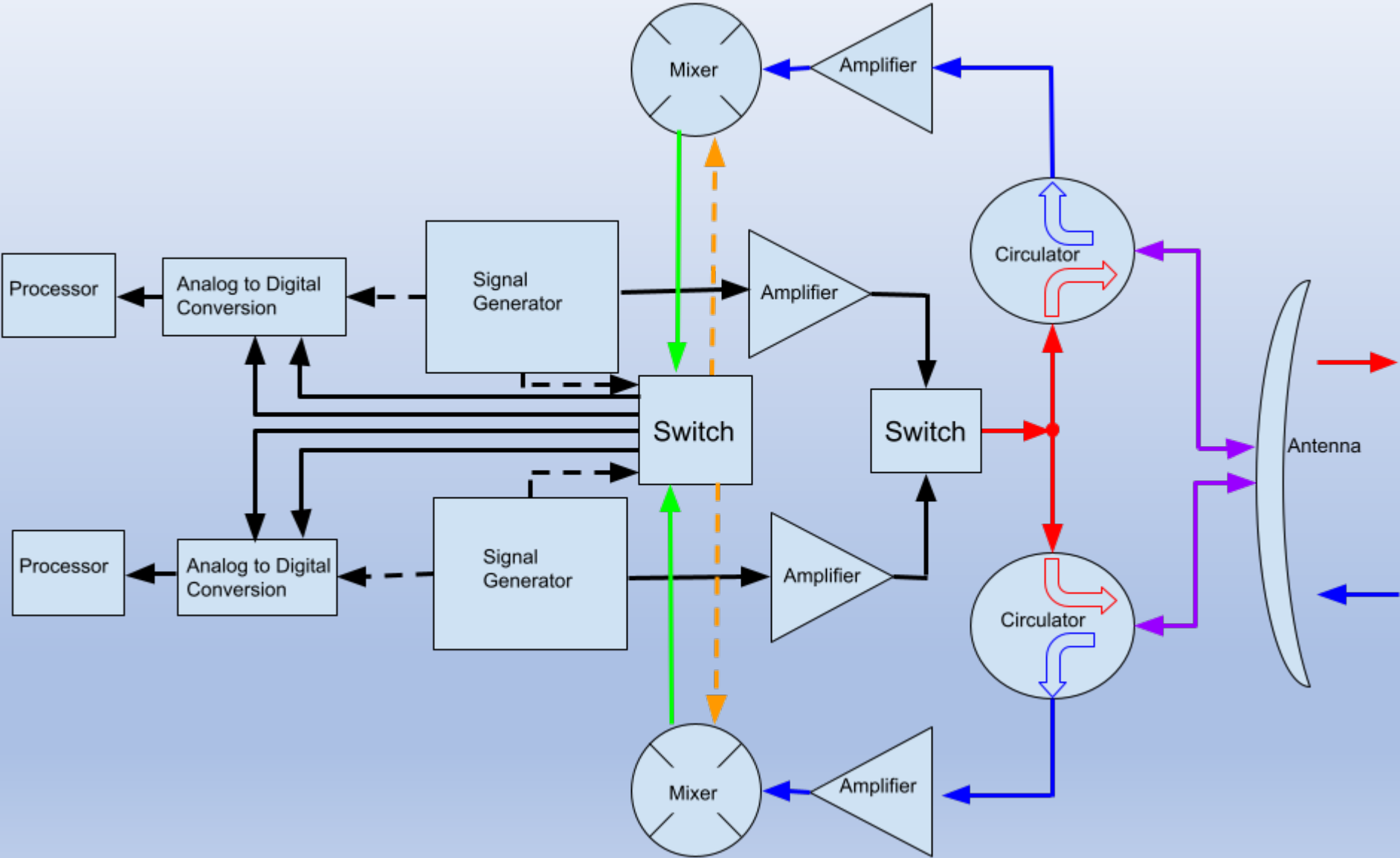
COHO
(57.5MHZ

RF
Drive

RF Transmit Pulse
(Site Frequency)
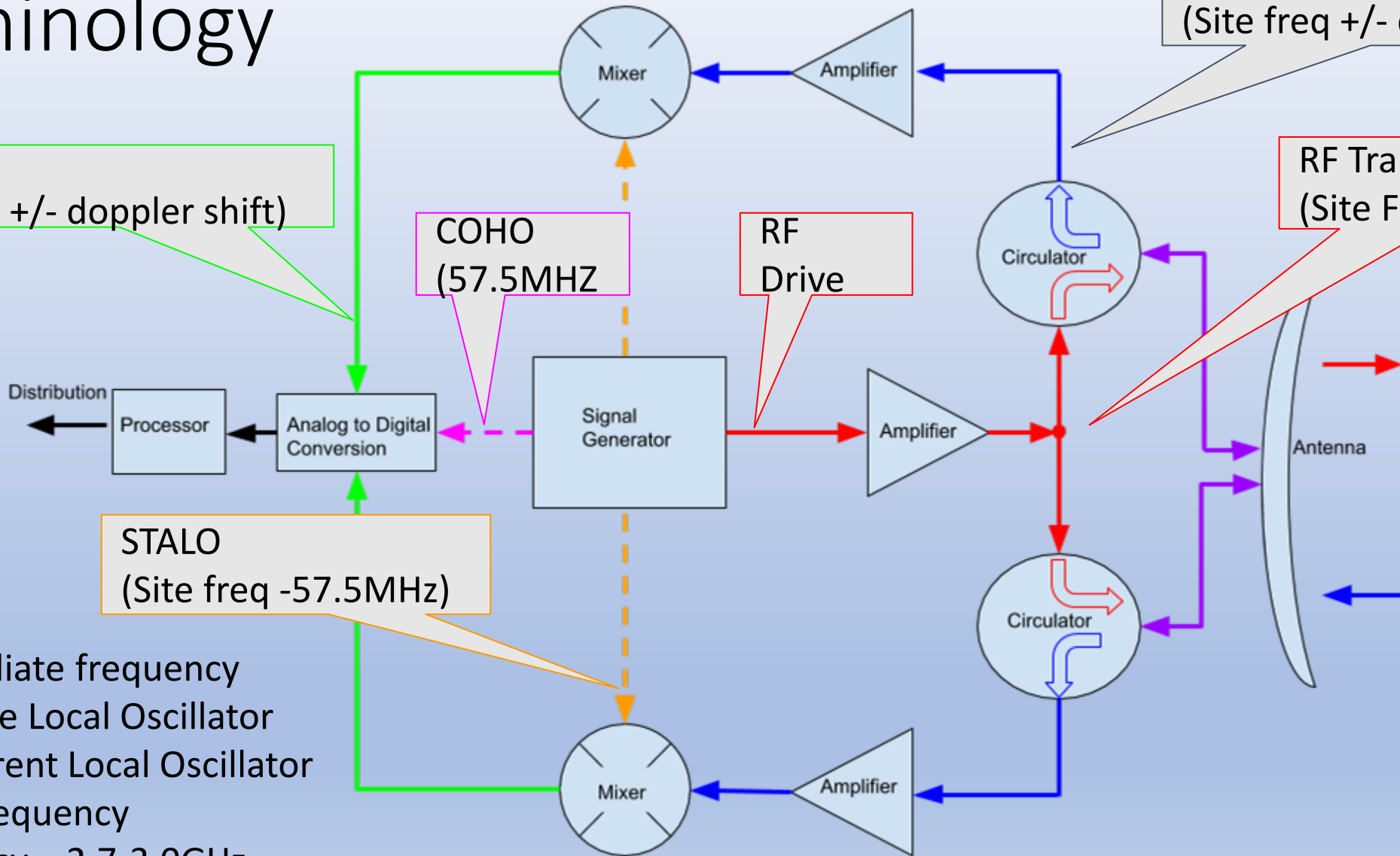
STALO
(Site freq -57.5MHz)

IF = intermediate frequency
STALO= Stable Local Oscillator
COHO=Coherent Local Oscillator
RF= Radio Frequency
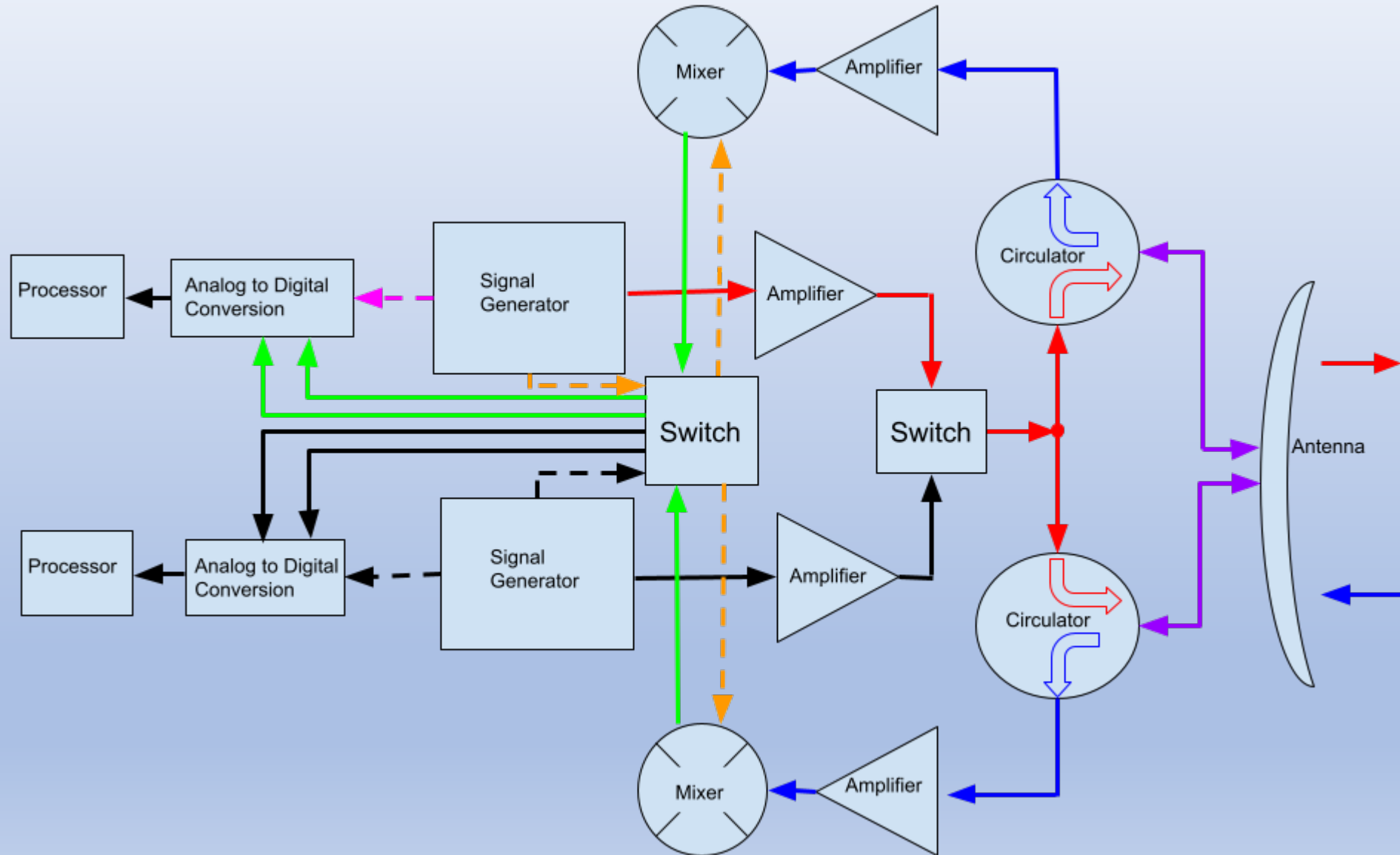Site Frequency = 2.7-3.0GHz
STALO+COHO= Site Frequency

Mixer

Amplifier

Circulator

Antenna

Distribution

Processor

Analog to Digital
Conversion

Signal
Generator

Amplifier

Circulator

Mixer

Amplifier

For Training Use Only
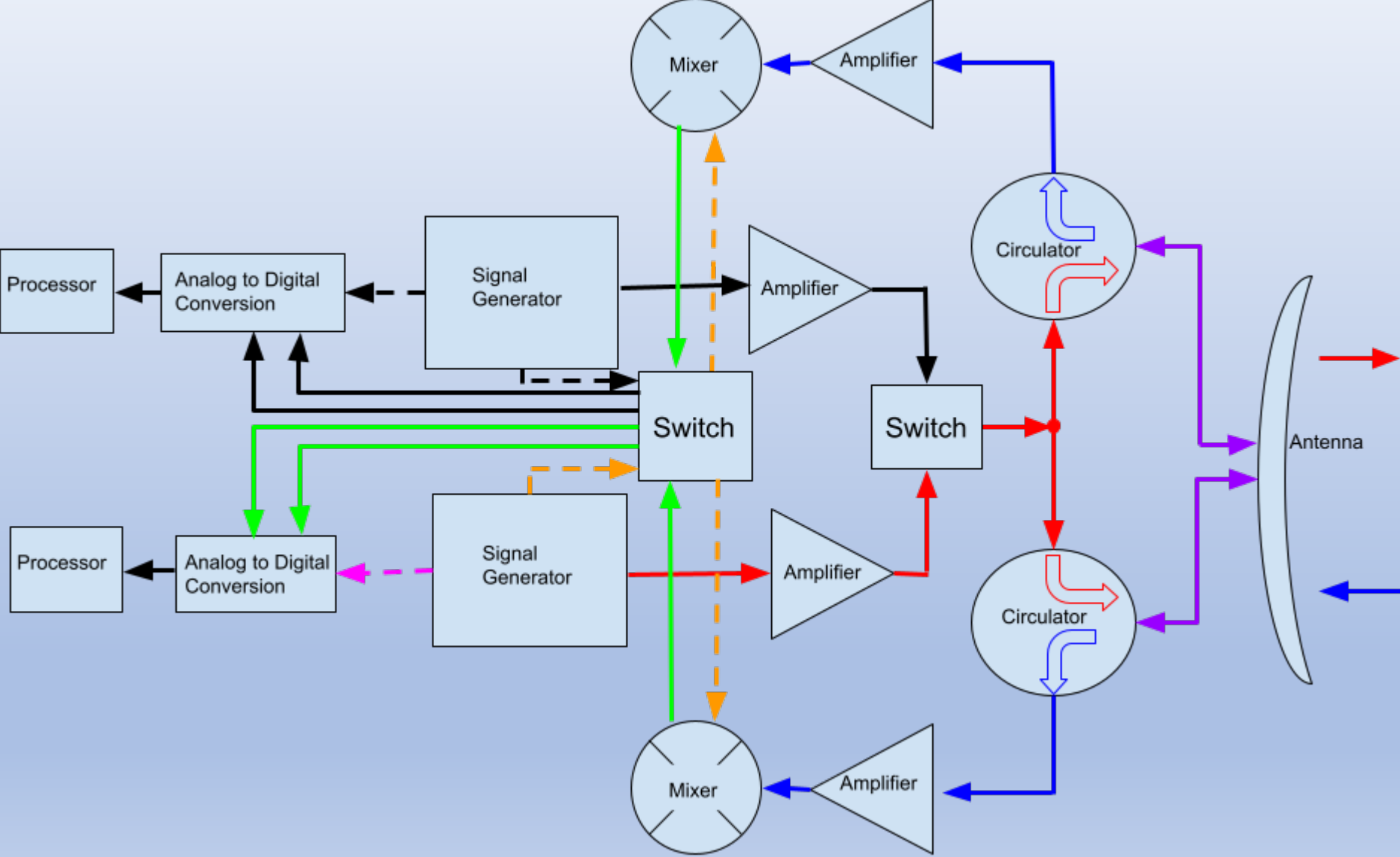
Single Channel Configuration

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Redundant Configuration

Redundant Configuration Upper Channel

Redundant Configuration Lower Channel

WORLDWIDE WSR-88D NEXRAD NETWORK
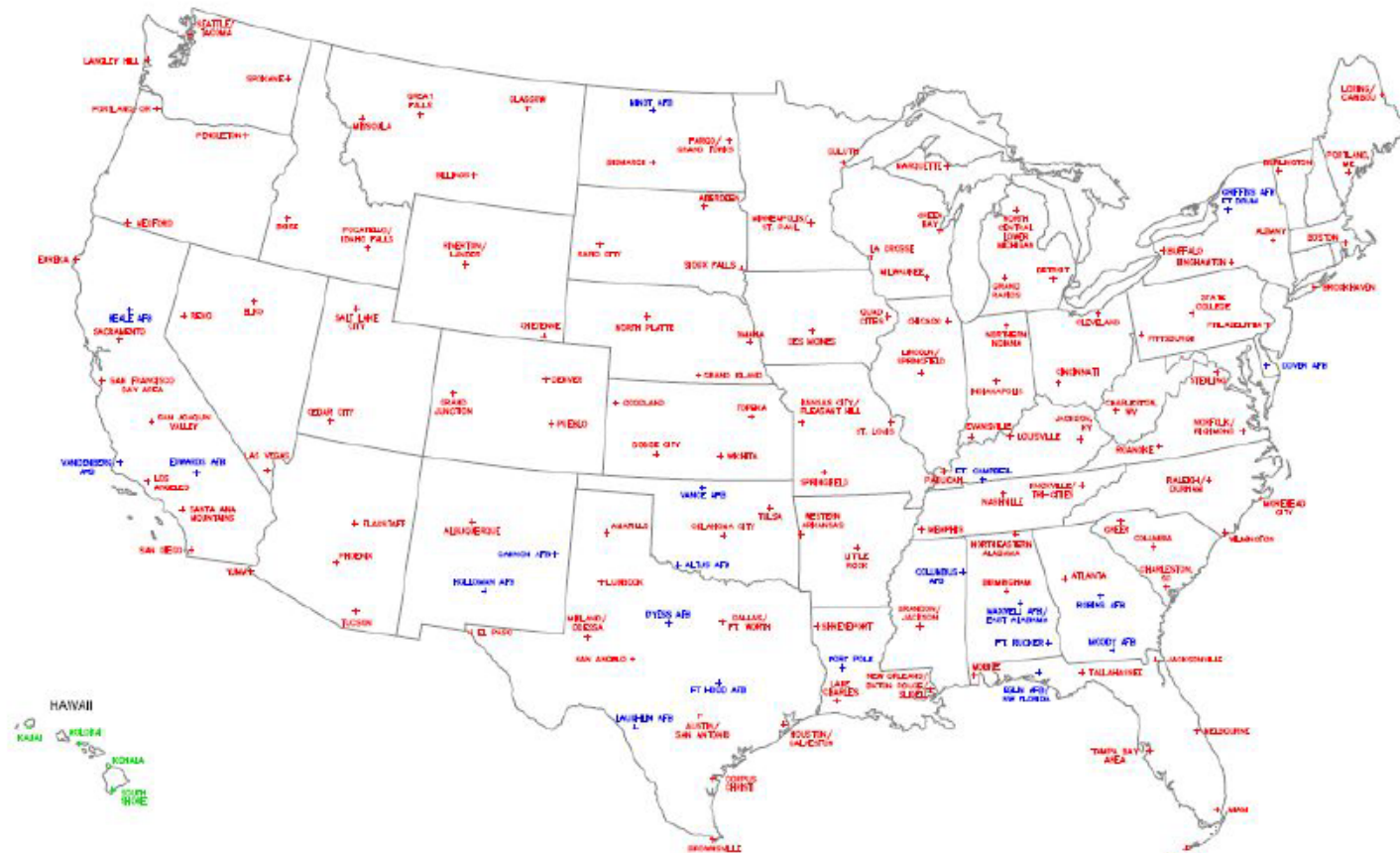
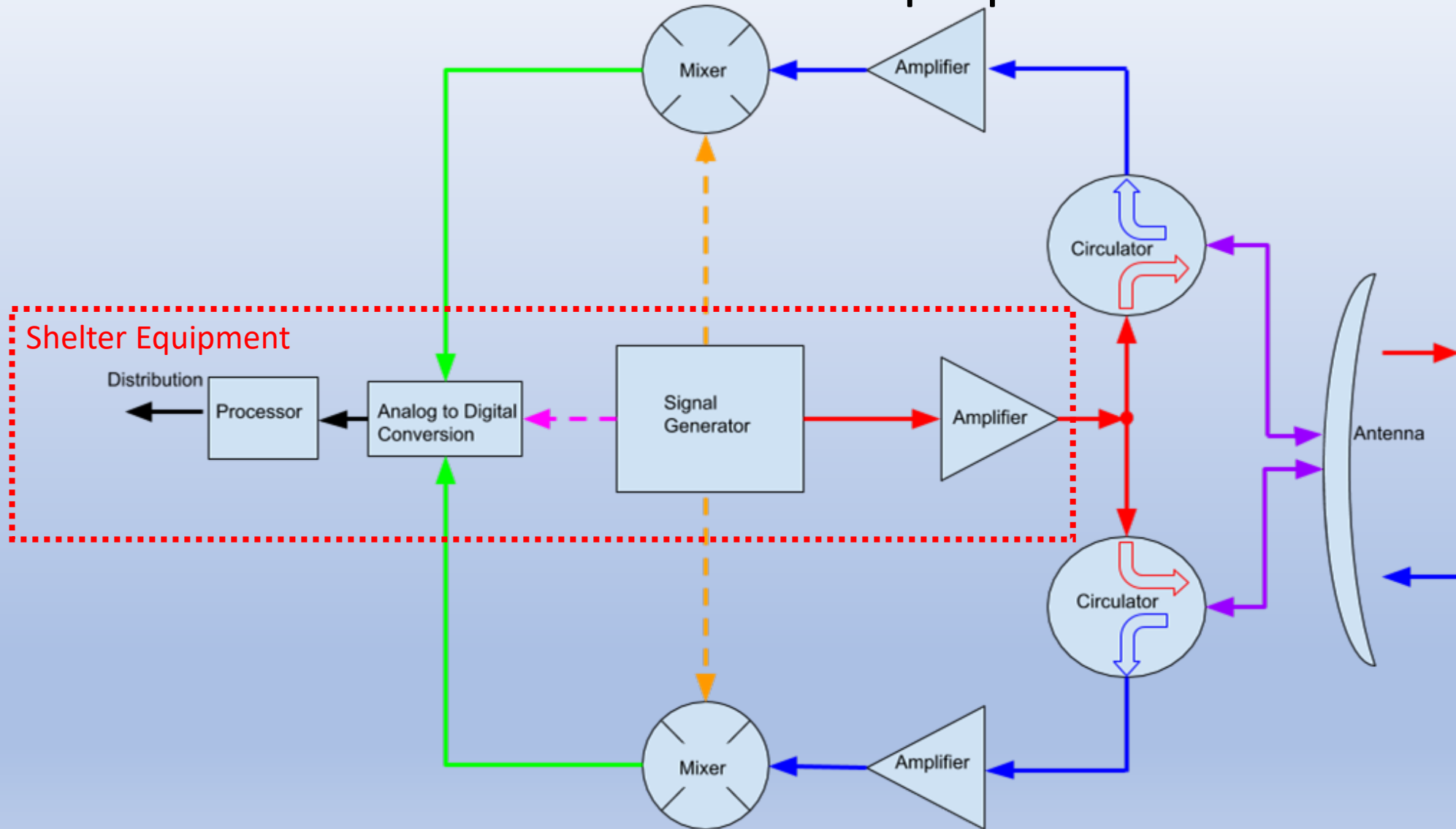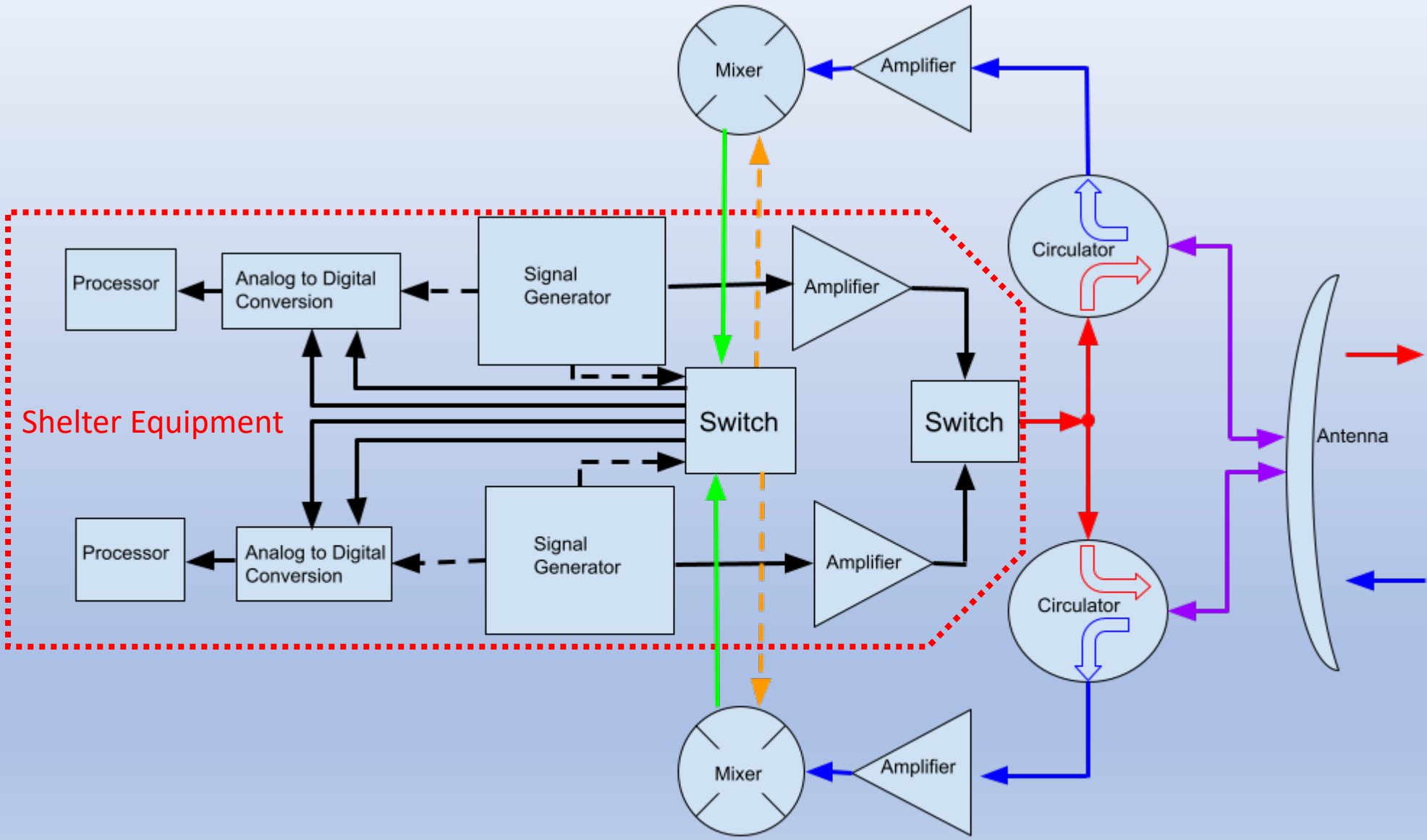# Shelter and RADAR dome equipment

Redundant shelter and RADAR dome equipment

For information on the products created by this RADAR please look at the products module.