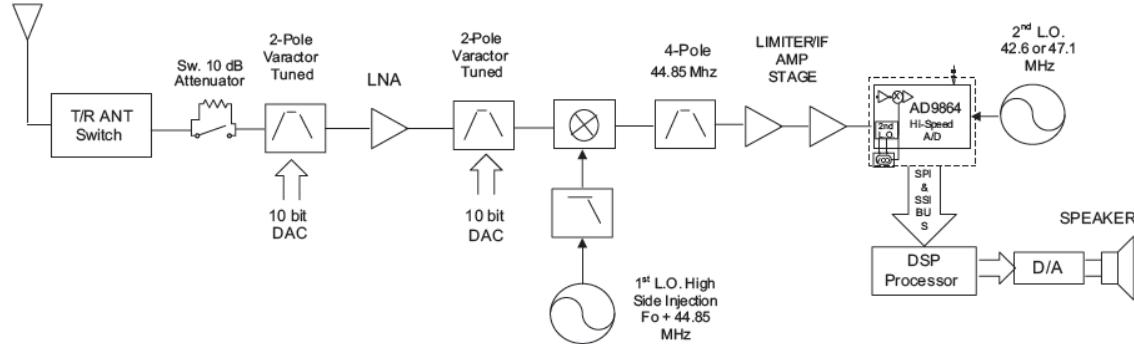


**Exhibit 15****RECEIVER BLOCK DIAGRAM AND DESCRIPTION****Exhibit 15A – Receiver Block Diagram****Exhibit 15B - Receiver Description****RECEIVER FRONT END**

The VHF receiver operates in the frequency range of 136 to 174 MHz.

RF energy is routed from the Antenna to an Antenna switch. The antenna switch is controlled in two different modes, either via the release of the PTT button in Analog mode or by the main processor when in Digital mode. When the radio is receiving, RF energy is routed from the T/R Antenna switch to the Front End. The Front End provides rejection of any unwanted out-of-band energy and the initial frequency conversion to the first IF.

The first frequency conversion process is accomplished with a Class 2 Double-Balanced diode ring mixer. The first Local Oscillator also feeds the mixer stage. The amplified L.O. power then passes through a low pass filter stage, before reaching the mixer. This filter reduces any un-wanted products from the first L.O. that may cause unwanted spurious frequencies in the mixer output.

**RECEIVER BACK END**

After the first frequency conversion, the IF signal passes through a filter with a BW of 13 KHz. The signal is then routed through a 2 stage Limiter/Amplifier. Another frequency down-conversion before resultant RF voltage gets sampled by a Sigma-Delta converter. The Sigma-Delta converter is a high speed DAC that produces 18 KHz data stream to the main DSP.

**RECEIVER DSP (Digital Signal Processing)**

The DSP takes the incoming 18 KHz data-stream and passes the information through a filter, which provides rejection from any in-band adjacent channel interference. The remaining filtered data is then sent through the FM Discriminator routine. This routine provides Baseband Information recovery. Depending on whether the radio is in Analog or Digital mode determines the kind of signal processing used. If the radio is in Analog mode, the recovered Baseband data is sent through FM De-emphasis and sub-audible tone (CTCSS/DTCSS) recovery subroutines in the DSP code. These routines provide for complete backwards compatibility with traditional FM trunking links. If the radio is in Digital mode, the recovered Baseband Information is sent through a “Symbol Recovery” routine. The resultant data is then routed to a standard AMBE Vocoder process.

The resultant audio, from either Analog or Digital mode signal processing (still represented by hi-speed data) is sent to a DAC, which converts the data stream back into usable audio. This stage drives several additional gain stages. These gain stages consist of an audio attenuator and a high power audio PA providing the user with at least 3W of power through an internal speaker and 13 W of drive to an external speaker.