6.1 The discriminator performs FM demodulation in an FM xcvr.

6.14 Limiting nulls amplitude variations. Quieting is the ratio (dB) by which noise is suppressed by the limiter. FM sensitivity is the amount of input required to cause an acceptable level of quieting.

6.15 Given: FM xcvr has 100dB gain quieting voltage = 300mV

Find: sensitivity

Soln: \( (\text{sensitivity})(\text{gain}) = 300\text{mV} \)

\[
\text{sensitivity} = \frac{300\text{mV}}{10^{10}\text{V}} = 300\text{mV} \times 10^{10}\% 
\]

6.24 The VCO's free-running freq is set to the FM signal's fc. When the FM signal's freq \( f(t) \) above fc, the phase detector's output (output of the circuit) goes positive and the freq \( f_{\text{vco}} \) to match \( f(t) \) 's freq. So the phase detector's output is proportional to \( f(t) \) 's freq and is the demodulated info signal.
\[ (6.26) \text{Given}: \text{PLL's free-running freq} = 7\text{MHz} \]

\[ \text{Fin must be within 20KHz for VCO to A freq after lock, VCO maintains to within } \pm 150\text{KHz} \]

\[ \text{Find: lock, capture ranges} \]

\[ \text{Soln: lock range} = 2(20K) = 40\text{KHz} \]

\[ \text{capture range} = 2(150K) = 300\text{KHz} \]

\[ (7.21) \text{Given}: f_R = 1\text{MHz}, N = 61 \]

\[ \text{Find: } f_0 \]

\[ \text{Soln:} \quad f_R = \frac{f_0}{N}, \quad f_0 = Nf_R = 61\text{MHz} \]

Phase detector compares input signal to VCO's freq \( \div N \), so that \( f_R = \frac{f_0}{N} \).