

EE 322 Advanced Analog Electronics, Spring 2013

Homework #10 assignment

1. Do H&H Exercise 9.5 in the body of the text.
2. Design a PLL for FM radio demodulation. Follow the example in H&H Figure 9.72 and accompanying text. Use a VCO with gain 100 MHz/V , and use a loop filter bandwidth of 20 kHz (to capture audio up to that frequency). Use a XOR phase detector. The carrier frequency is 90 MHz .
 - (a) What should be the values of the components of the LP filter?
 - (b) Explain how the frequency and amplitude of the audio signal are encoded on the FM carrier.
 - (c) Where do you measure the output demodulated audio signal?
 - (d) If the FM band is 50 kHz wide, what is the largest amplitude of the demodulated signal?
 - (e) If you need a maximum amplitude of 20 V to drive the audio speakers, what gain should you apply to the output signal?
 - (f) Design the circuit, including values for components, which will couple the demodulated signal to make a AC signal of maximum amplitude of 20 V to drive the speakers.