EE430 Communications systems - Fall 2005 - quiz #4 - Superheterodyne receivers Closed book.

Name	

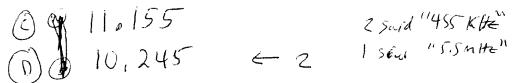
You are designing a citizens band radio AM transceiver for consumer use. It must tune from 26.965-27.405 MHz in 10 KHz steps. To keep the cost down, you need to use cheap ceramic filters. The only one that is cheap enough and meets selectivity requirements is centered at 455 KHz and is 10 kHz wide. Unfortunately, this frequency is too low to get good image rejection, so a dual-conversion design will be used, with the first IF at 10.7 MHz. Use a variable oscillator to convert the incoming frequency to 10.7 MHz, then a fixed oscillator to convert that to 455 KHz.

1. Draw a block diagram of this receiver.

2. What is the first local oscillator tuning range?

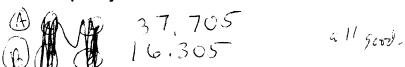
(a)
$$37.665 - 38.05 = 2$$
(b) $16.265 - 16.705 = 3$

3. What is the (fixed) frequency of the second oscillator?



For the remaining questions, assume the radio is tuned to 27.005 MHz,....

4. What is the frequency of the first local oscillator?



5. What is the most significant image frequency?

