**Pretaks/preps for Wk7**

1. Explain how the transmitter works (higher level description is enough).  
- Transmitter in high level create a message-bearing communication that is suitable to the characteristic of communication channels.

2. Go through each component and explain to yourself what they do, if you can. List the ones you have doubts about. (Also mention where it is in the transmitter.)

- The transmitter comprises 3 main modules, which are the audio amplifier, oscillator and amplitude modulation. The oscillator typed implement in this project is common-emitter amplifier-based crystal oscillator (in yellow) which generate the desired waveform with defined frequency. The 2 10k resistors form a voltage divider and 33p capacitor act as an AC bypass. The 5u coil will provides DC bias as well as frees the circuit output from being affected by the AC signal in power line and the 2.2nF will act as DC block for current fed to modulator.

The audio amplifier (in blue) will amplify the input audio signal to about 0.2 .. 0.5 Vpp and voltage gain should be 50V which are large enough to drive into the modulator. The 100uF capacitors will act as DC blocks which keep DC biasing out from the current, allowing the AC current to flow from microphone to the base-emitter junction of BJT and from collector to AM. The 2.2nF will act as bypass, filtering the audio frequency noise from DC supply.

Diagram, schematic

Description automatically generated

3. Why do we need the 18-MHz carrier wave? Why don't we just feed the microphone signal to the antenna? Why does it have to be modulated upon the carrier?  
4. What size should the antenna be? Suppose we use a quarter wave monopole. Does it fit to the classroom?  
5. Could you think of ways to improve the circuit (e.g. in terms of DC power consumption, component count, output power, range, spectral purity, ...).  
6. Feedback, any other comments?