# Lab 2, Approximate Marking Scheme, Oct. 2005

1 Verify carrier at 1.2 MHz, 120 mV RMS; convert to peak, or peak-to-peak [1 marks]

- Observation of effect of carrier null, output frequency (at null) [3 marks]

2 Verify mod signal at 60 kHz, 200 mV RMS; convert to peak, or peak-to-peak [1 mark]

- Observe (sketch, or capture) DSBSC Output, determine output amplitudes of each sideband from time- domain waveform, compare to expected amplitude. [10 marks]

3 Show spectrum analyzer plots, compare to time domain, verify carrier and modulating frequencies, check carrier rejection (relative to sidebands). [6 marks]

4 Plot of output voltage versus modulating signal input amplitude calculate theoretical linear range, compare [5 marks]

5 Design of tuned circuit. Inductors are about 3.3, 10, 33 μH with inductor Q predicted at 1.2 MHz from 15 to 30 - Pick L, calculate C. [2 marks]

- Verify center frequency of tuned circuit is close to 1.2 MHz, adjust carrier frequency to pick out upper sideband, show time domain output [5 marks]

6 Compute theoretical amplitude (of desired single-sideband signal, and of the residual signal from the other sideband), compare to measurement [5 marks]

7 Verify and explain with frequencies of carrier, modulating signal and filter frequency, and by doing fft that it is the upper sideband [5 marks]

8 Adjust carrier frequency to pick out lower sideband, sketch output waveform, and verify with frequencies and fft, that it is the lower sideband [5 marks]

9 Compute amplitude, compare (probably same as 6) [2 marks]

Extra marks:

Discretionary [10 marks]

## Lab Demo [15 marks]

1. Show signs of life, get parts, start building, 2. DC biasing, 3. Carrier Null, 4. Mixing (DSBSC), 5. Check of Linearity, 6. SSB output with tuned load.

## Lab 2 Total [75 Marks]