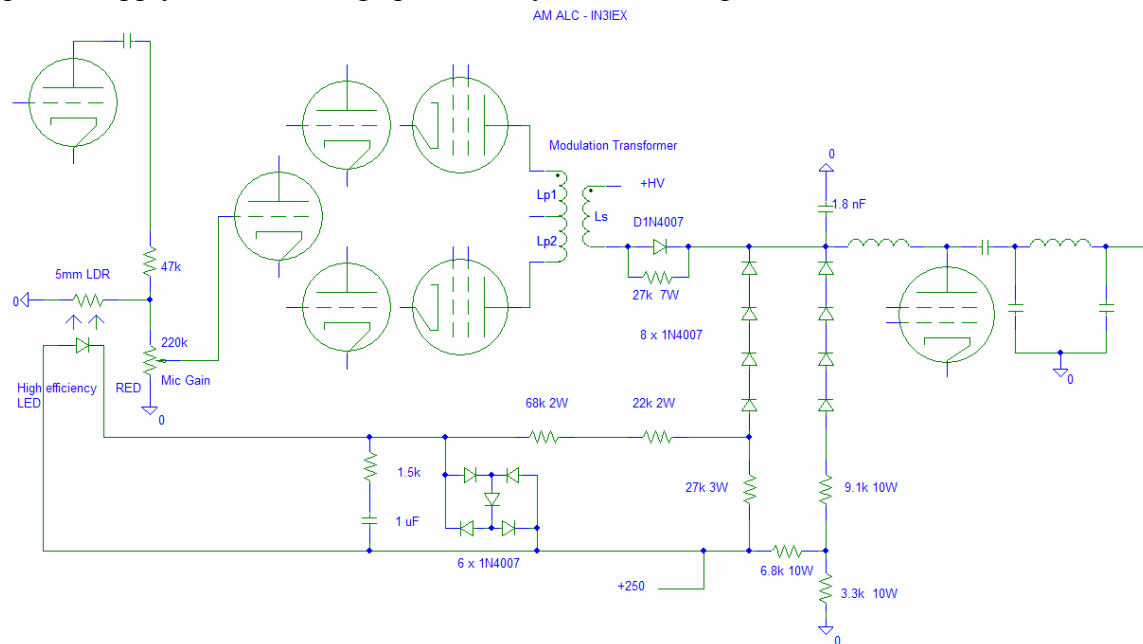


An ALC for Plate Modulated AM Transmitters.

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Transformer plate modulated AM transmitters are efficient, thanks to class C operation of the output stage, but they are susceptible to overmodulation. As shown below, the anode (plate) voltage of the RF output tube on the right is the summation of DC +HV from the power supply and AC voltage provided by the audio amplifier.

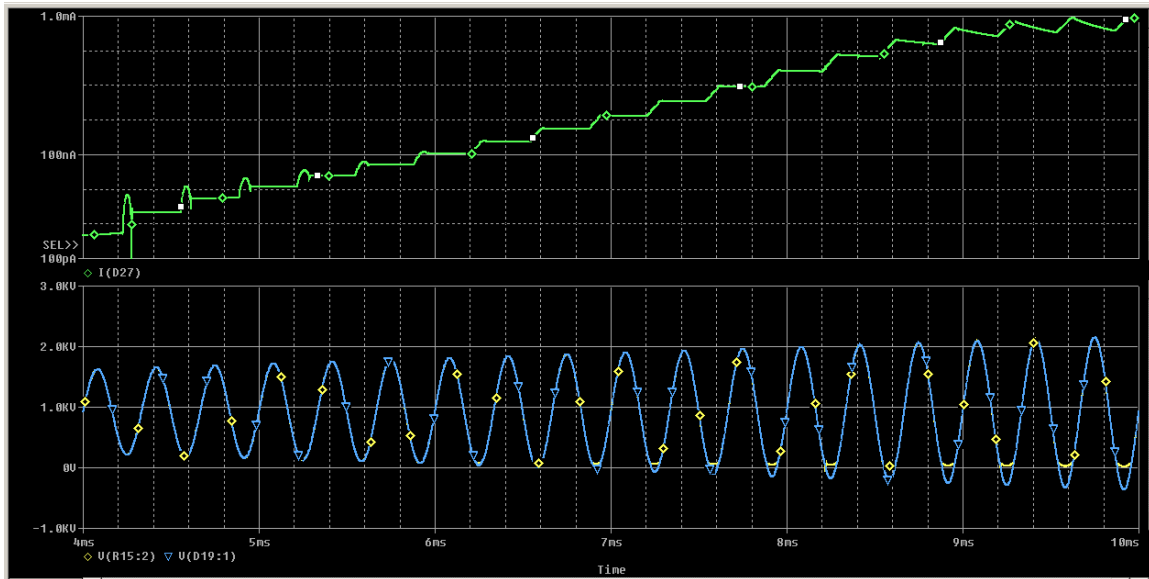


If the anode voltage of the RF tube becomes negative (zero volt threshold) we have “overmodulation” and distortion of the envelope of the AM signal produced by the traditional circuit. With tetrodes in the class C RF stage and +HV about 900V, the zero volt threshold should be increased to about +80V. In addition, if anode voltage goes below the threshold, the RF output tube becomes open circuit and, under such transient condition, the load is abruptly removed from the modulation transformer, causing transients in the modulation transformer and excitation of parasitic resonances of the same with broad-band noise in the RF output. Progressive clipping with two thresholds is used in the above circuit. The circuit also gives a proper load to the modulation transformer.

In addition the voltage that appears on the 27k 3W resistor under first threshold “overmodulation” detection can be used to drive a LED-Photoresistor photocoupler that reduces the gain of the audio amplifier enough for automatically restoring the modulation amplitude to slightly less than 100%. The full voltage gain of the audio amplifier is used in the control loop, therefore no additional gain (transistor or tube) is required for proper operation of the circuit. The home-made photo-coupler must be placed in a dark black box. You can short the LED while transmitting to check the functionality of the circuit. The values of the components are for a tetrode operating at 900V 120 mA anode and with screen grid self modulation with a 10H audio choke.

Next page reports the negative peak limiting behavior and the current in the LED with the

optical feedback loop open.



Green trace is LED current. The LED and the photoresistor are very efficient and the closed loop circuit stabilizes around 0.1mA LED current. Lower traces are clipped and unclipped anode voltages.

Envelopes from the **real** transmitter. The modulation % *NEVER* exceeds the one you see in the pictures:

