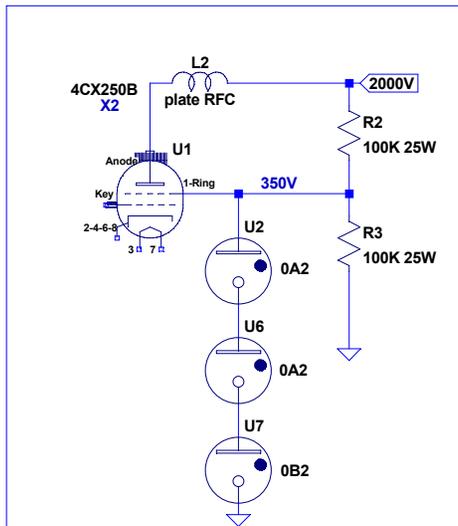
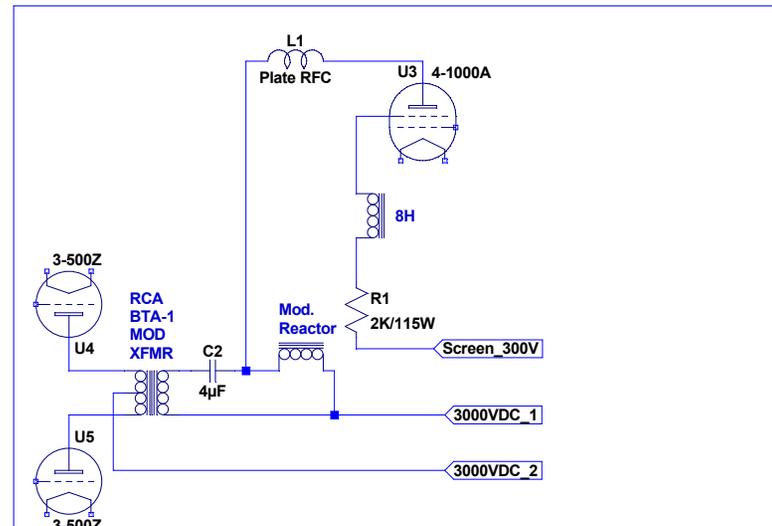


Screen modulator from T-282(*)/GR transmitter. Three 4X150As are plate modulated. R4 is tuning voltage screen dropper. Short R4 for "Operate" The small complexity is used instead of a separate screen modulation winding on the modulation transformer. The advantage is that the carrier-level screen voltage and the level of modulating voltage can be set for best linearity.



This is a linear amp but is an example of a resistor and VR tubes protecting the screens. The two 100K 25W resistors serve as the HV supply bleeder and also provide the screen voltage, which is regulated by R2 and the VR tubes (which should be a zener stack for AM since there is no hysteresis in conduction). The current through the VR tubes is around 25-30mA when the screens are not conducting, but if the screen current gets to large >30mA, the voltage drop across R2 is so great that the screen voltage drops below the regulated voltage and the screen current is limited by R2 the 100K resistor. Negative screen current is consumed by the VR tubes and R3.

The above values are based on the voltage limits for linear amplifier service. The peak modulated plate voltage will be higher for AM. The screen voltage and current will be different, but the screen dissipation must not be exceeded. So it's not a worked-out thing for high level modulation. The military stuff usually runs 4X150/4X250 plates at 850-1000V.



* Screen supply is full wave rectifier with 2-section choke input filter. This gives good regulation, but that is not critical in the self-modulating screen. It is important when using CW and for using the transmitter's RF stage as a linear amplifier. A Powerstat in the screen power transformer is used to set the voltage from 0-700V. For AM the screen is run around 300V at 80mA. p-p audio on the screen is ~500-700V

Except for plate modulated AM mode:
 - the modulation transformer secondary is shorted out.
 - the 8H choke and 2K resistor combination are also shorted out.

At high plate loading, screen current can drop very low but in this transmitter it never goes negative. The screen supply therefore has a light bleeder of ~100K.

The 2K resistor helps limit the screen current when the stage is too lightly loaded, but this is not enough protection. A screen overload relay is therefore included. The 2K resistor and screen overload relay are both on the screen supply chassis.

Plate voltage for RF amp and Modulator are separately adjustable. The effect of a higher voltage modulator plate supply is to allow more positive modulation on peaks. The modulation reactor and blocking cap are shown but are not used because the transmitter is only ever run at 1500W peaks, not the 750-900W carrier it could do, so there isn't saturation.