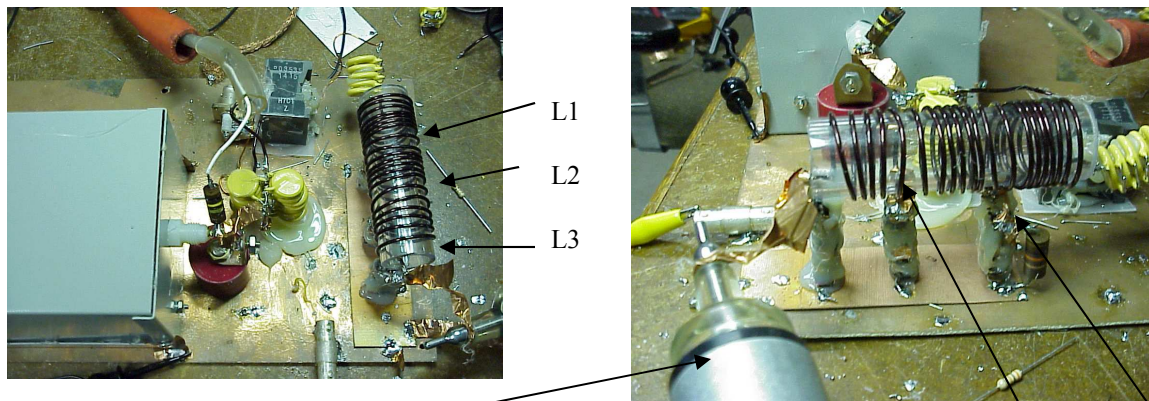


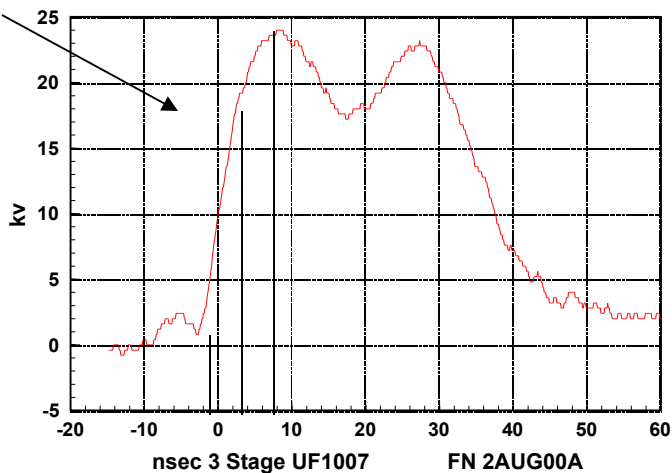
Objective:

Further experimentation of three state SOS devices was investigated based upon the results describes in FN 27JLY00E (see FN 27JLY00A for schematic). L1,2,&3 was wound on a single form using the same diode arrays:



3 Stage Output Waveform

HV PS Vch
~6kv

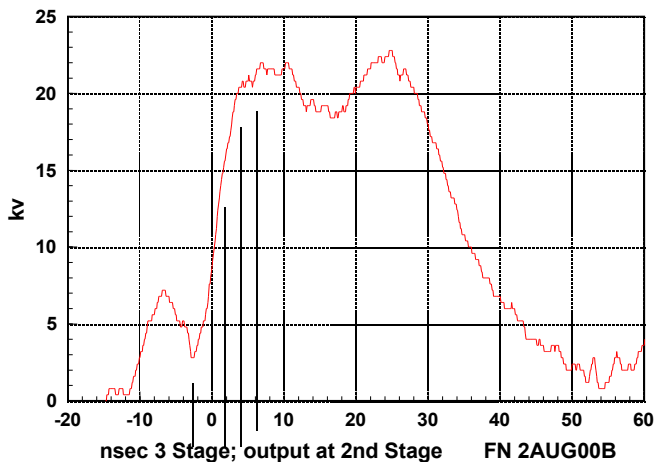


Stage 2 out, 3 out

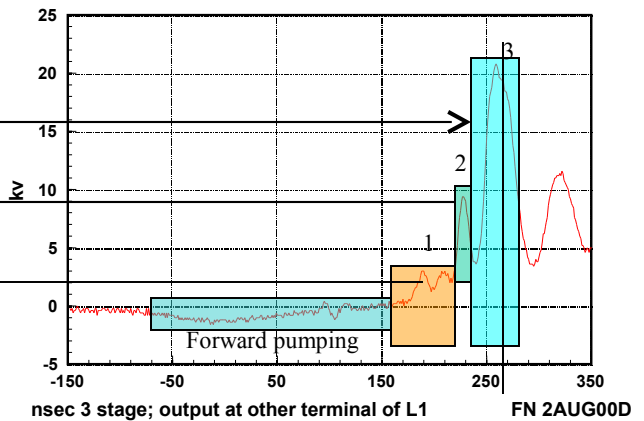
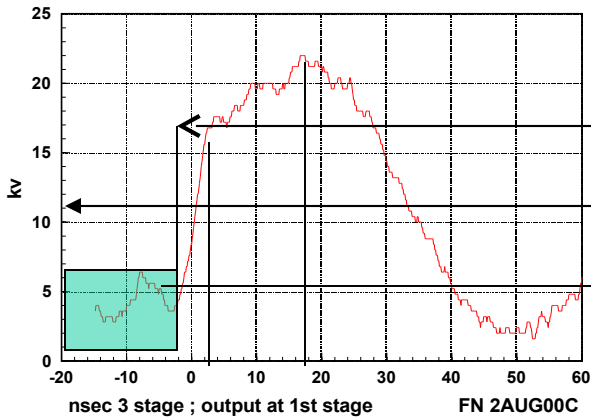
Results:

about 40 nsec.

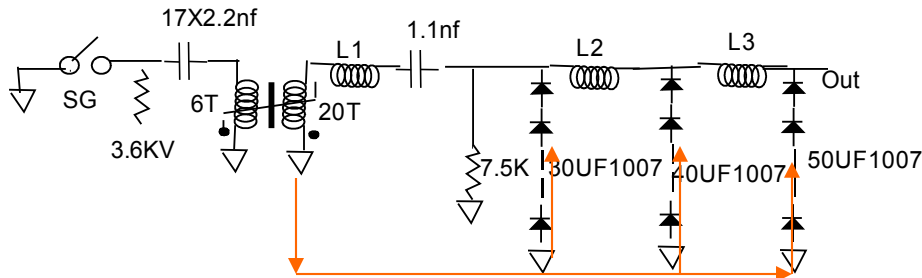
The rise time between 2 to 18 KV is about 6 nsec.; and to peak (24KV) about 10nsec. The pulse width is



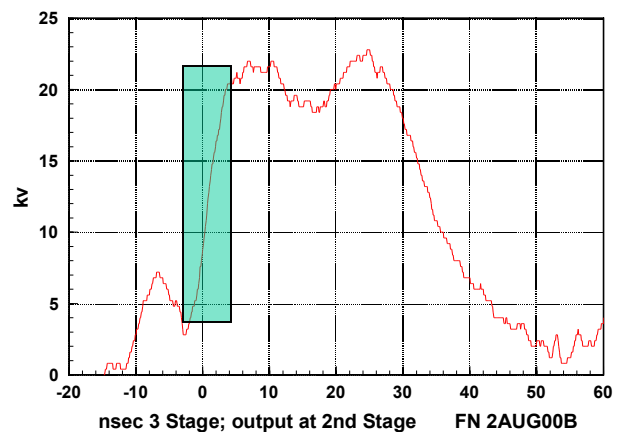
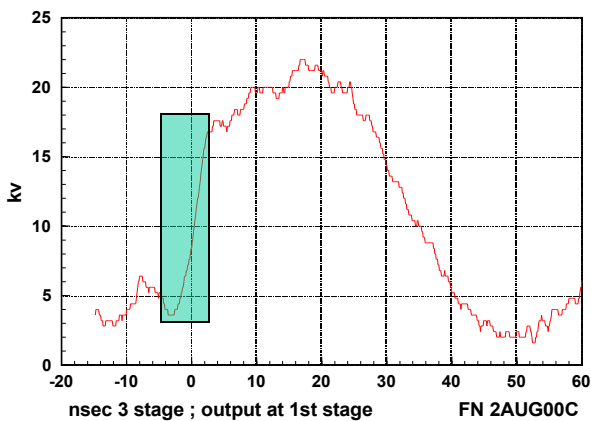
At the 2nd stage from 2 to 15kv the rise is 4nsec; and to 20kv 6nsec (note the rate of change at 15kv point). The first peak is about 22kv ; pulse width ^ 40nsec.



At the 1st stage from 4 to 17 kv the rise is about 5nsec. ; and to the 22kv point 20nsec; pulse width about 40nsec. At the other end of L1 the forward pumping time is about 200ns ; and the first reverse of any significance occurs in region 2 which is responsible for 1st output in the region indicated. Region 3 is responsible for the region indicated from about 0 to 40nsec at the left waveform. Note this was determined by using CH2 temporary to view the 1st stage output relative to the right waveform (ch 1). The orange arrows indicate that all three stages are forward pumped at the same time



Now looking at the reverse pumping action of the first 10nsec of region 3 of the right waveform seems to correlate to 6 ns diode opening as indicated in the left waveform. From 15 to 22kv points of region 3 the reverse pumping time is about 18ns resulting in a similar time frame for the corresponding output of the 1st stage.



The two above waveforms compares the reverse pumping of the 2nd stage by the first. For a 6nsec rising pumping edge the corresponding rising edge for stage 2 is about the same but now matches the peak. The waveforms for 3 and 2 seem to be almost identical.

Comments:

As indicated previously the purpose for using a saturable pulse transformer was for generating relatively fast reversal pumping rise time which is faster than that obtained by the SCRs (100- 120 ns). The first two stages indicate that as the reverse pumping time is decreased the diodes open quicker.