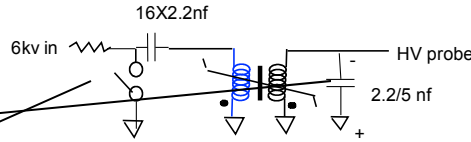
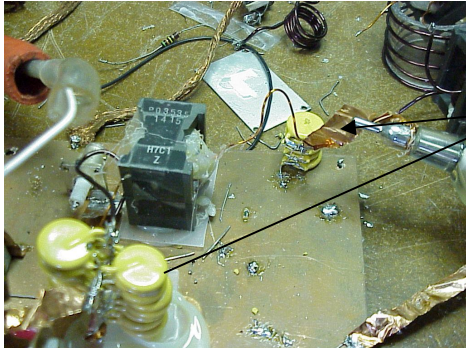
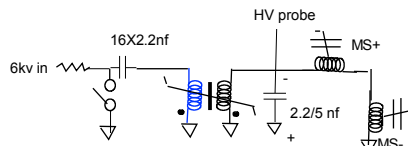
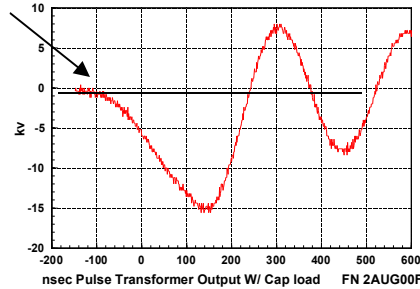


Purpose:

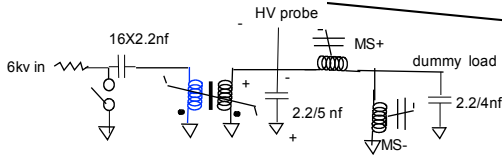
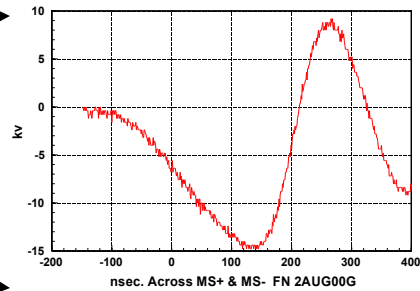
Ref: => "Subnanosecond High-Density Current Interruption In SOS Diodes", Instit. Electrophy. Russian Acad. Of Sci... indicates that when the reverse current input time is reduced from 80-100ns to 10-15ns the current cut-off time decreased from 5-10ns to 500-700ps. Fig 3 for about 33ns pumping the opening is about 4.7ns. Extrapolating this curve to 40 ns would increase it to 5ns. It is apparent that the design keeps this in mind by using several magnetic switches to compress the pumping pulse The purpose of the next several tests was to emulate (on a small scale) portions of the compression techniques used but not identical:



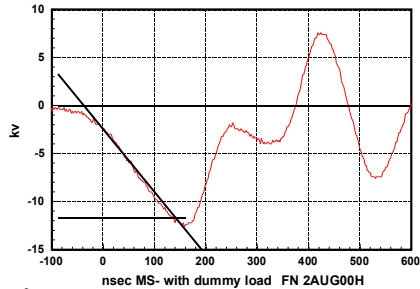
The purpose here is to transfer the energy stored in the primary capacitors to the secondary capacitors. The neg. portion is 300ns and the 1st pos. portion is about 150ns.



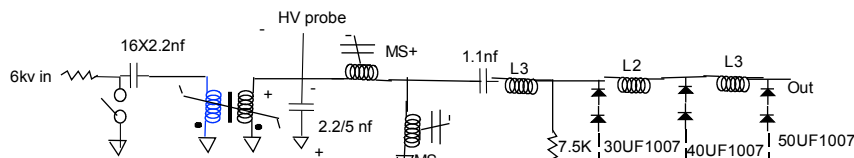
The wave form across MS+ & MS- with no load across MS- shows no indication of magnetic switching



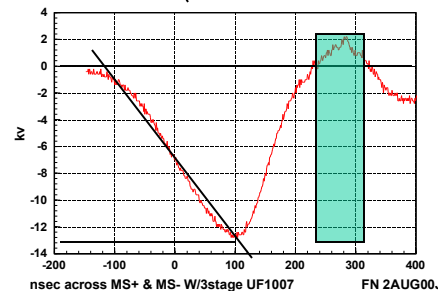
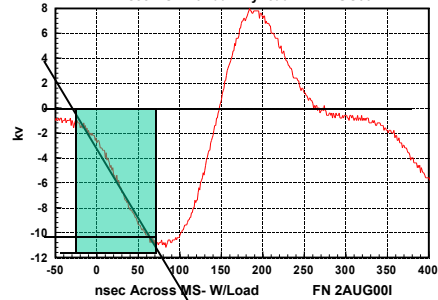
With the capacitive dummy load across MS- saturation occurs so that MS+ switches at about 200 ns (estimate $12/2kV * 200ns = 0.0012$ volt-sec). As can be seen the neg. portion is about 400 ns wide; the pos. 100ns. MS- appears to switch in about 100ns ($11/2kV * 100ns = 0.00055$ volt-sec) which is shy of the full voltage build up; hence it would appear that MS- needs tweaking (extended some) in order to switch exactly when the maximum voltage occurs. The neg. portion is about 150nsec. And the pos. 100nsec. However MS- swings smoothly from the neg. to pos. peak suggesting that it was saturated in negative portion followed by positive saturation. Hence if the Diode array is connected to MS- then when compared to previous pumping without MS+ & MS- the forward pumping would appear to decrease from 300 to 150ns and reverse from 150 to 100ns



Now replacing the dummy load with the 3 stage UF1007 array



MS+ appears to switch in 200ns ($13/2kV * 200ns = 0.0013$ volt sec; the neg. portion is about 250ns and the pos. 80ns.



nsec across MS+ & MS- W/stage UF1007 FN 2AUG00J

Notes: Continue FN 2AUG00A Investigation
Add Magnetic Switches

The next waveform (across MS-) indicates neg. duration of about 110ns (7kv avg * 110ns = 0.0008 volt sec); the pos. duration less than 80 nsec

Comments:

- It appears that MS+ & MS- has the potential for reducing the reverse pumping time.

- The operation consists of first charging the secondary capacitor and near or at its peak MS+ switches on discharging the stored energy for forward pumping the diodes while initial MS- is open. When MS- closes (in about 50ns) the energy stored in the capacitive load of the array discharges provides the restoring force for the positive portion of the oscillation.

