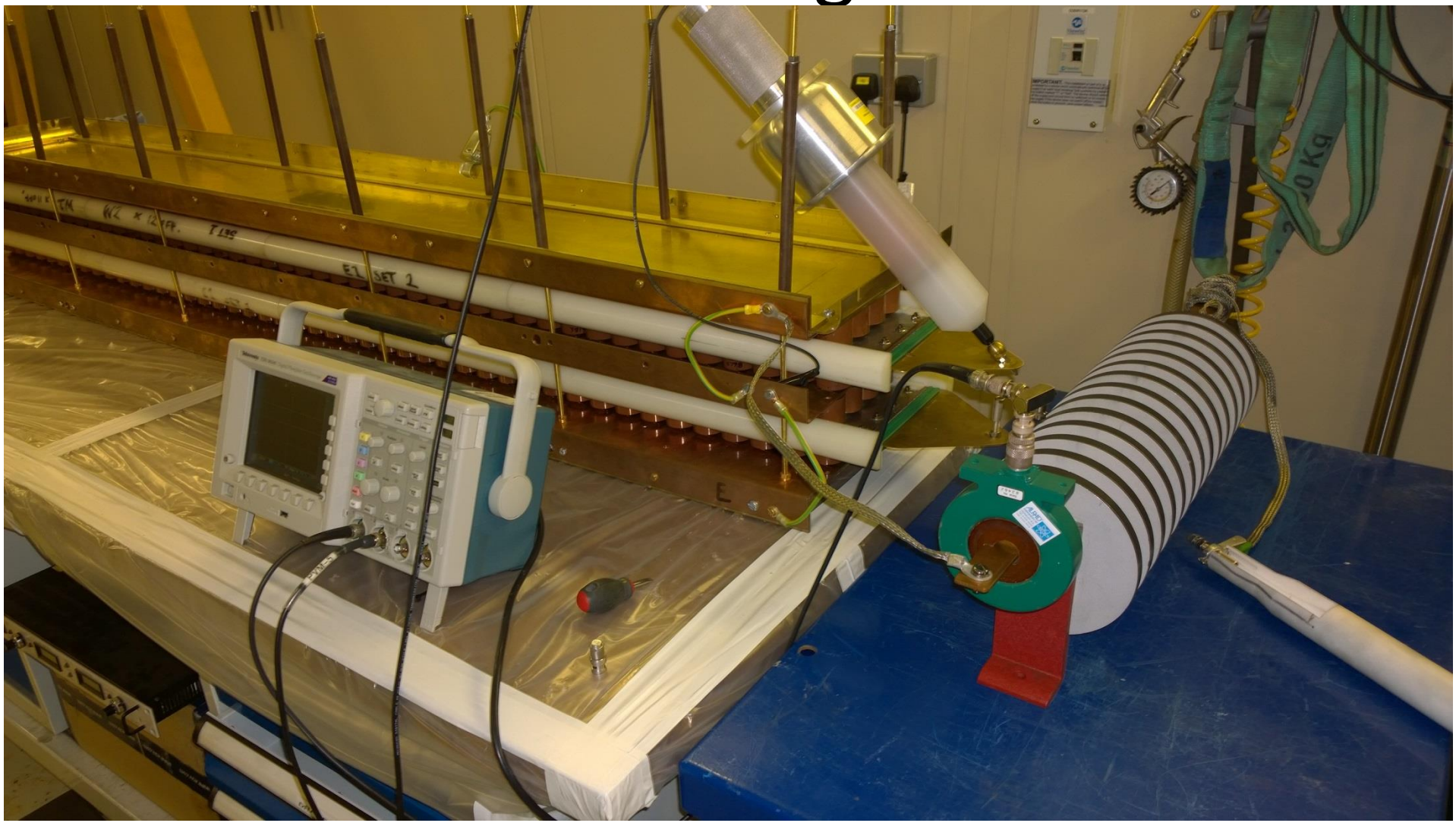
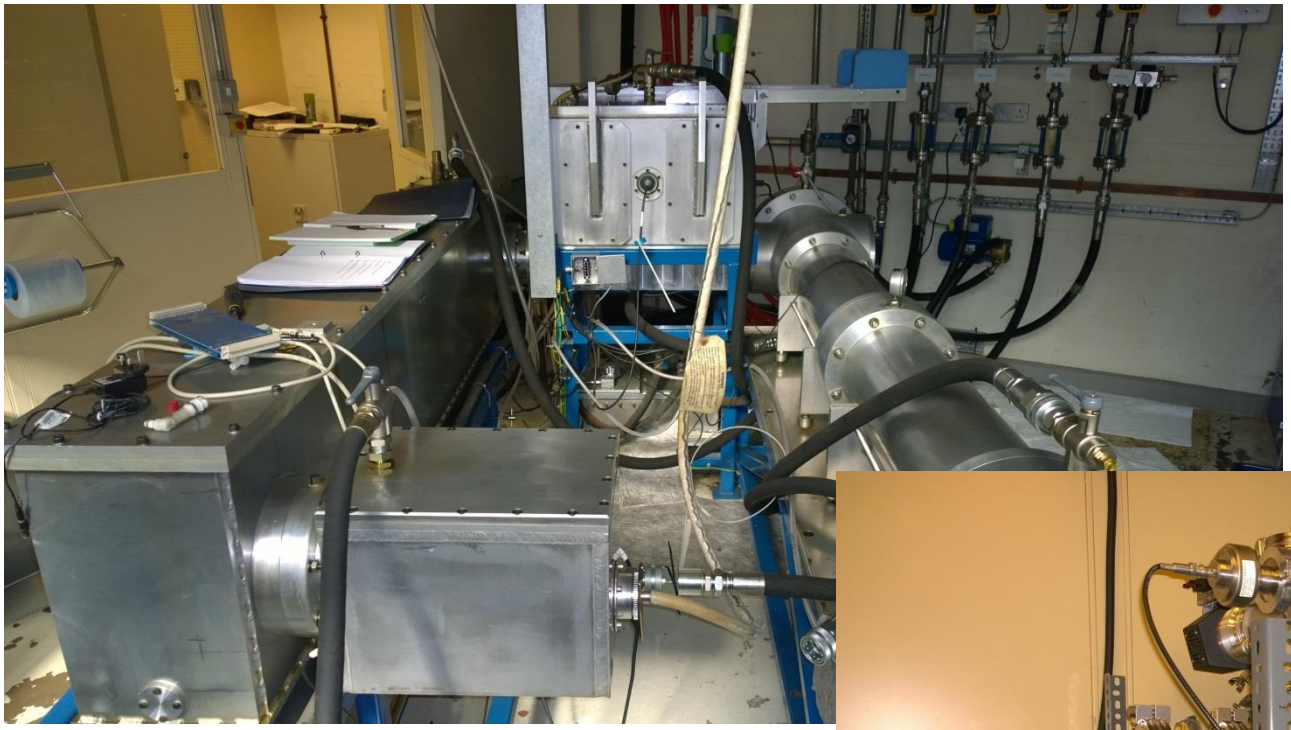
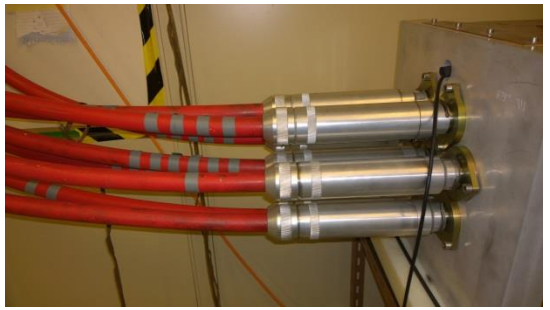
Pulse testing In R4

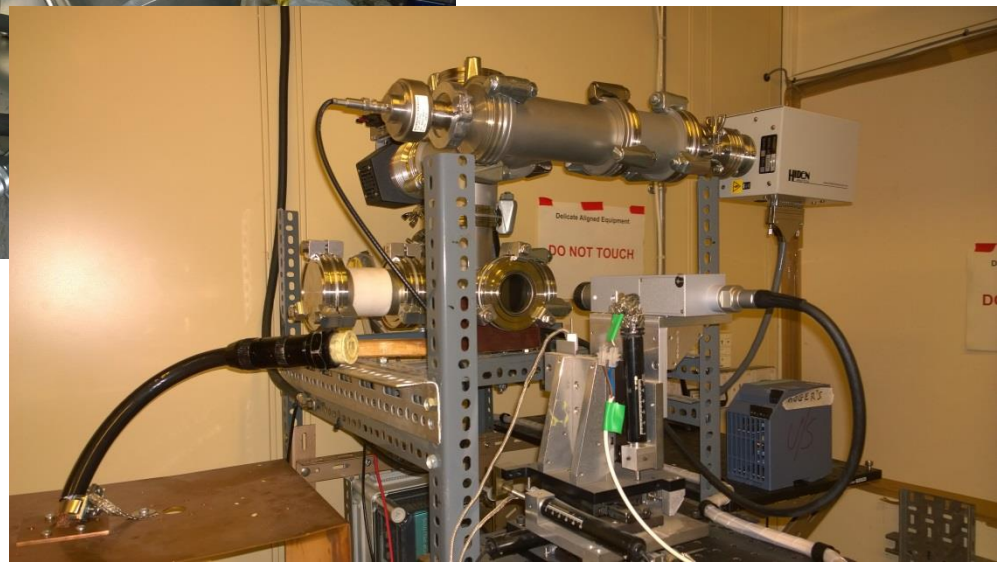


Pulse testing In R4

- After tests on R4 Kicker test bay

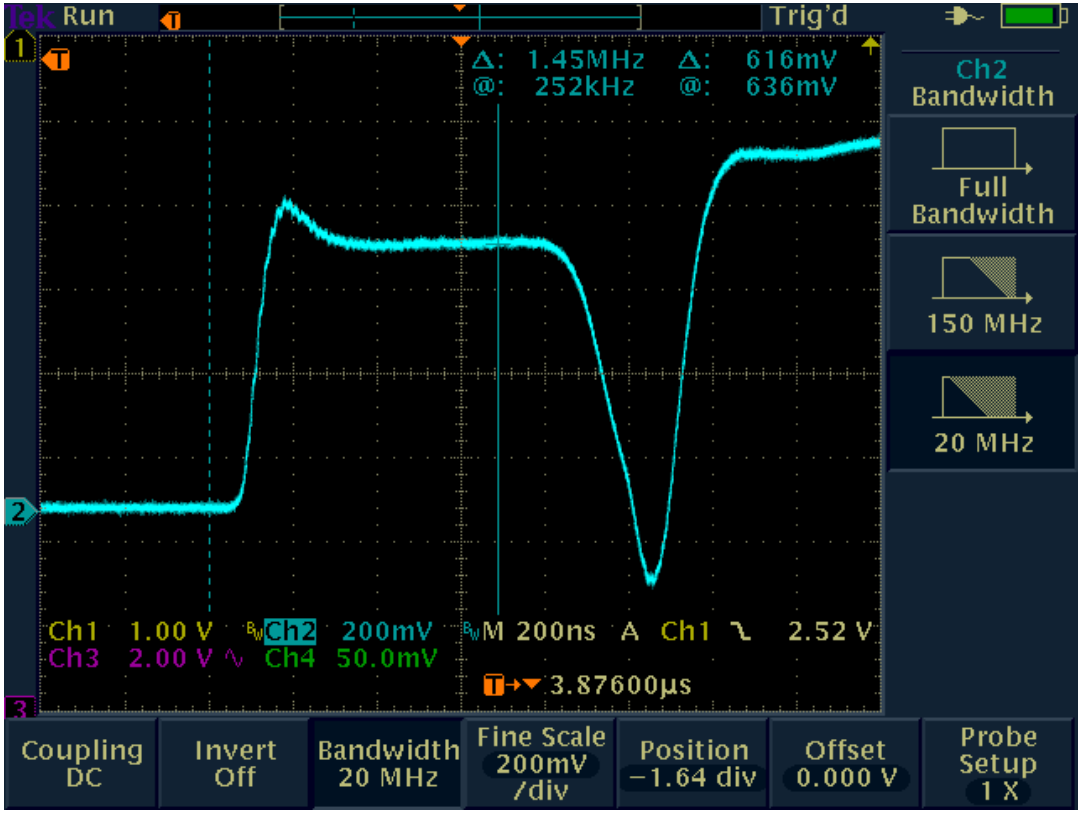






Pulse testing In R4

- After tests on R4 Kicker test bay
- Can we produce a bigger pulse?



Pulse testing In R4

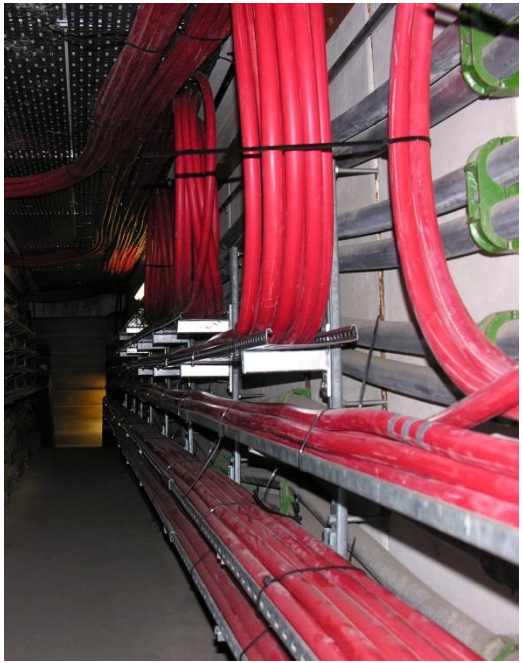
- After tests on R4 Kicker test bay
- Can we produce a bigger pulse?
- 5000A - 1 micro second Pulse
- Two possible solutions!!

Pulse testing In R4

- Solution 1
- Cable PFN (Pulse forming Network)
- RG220
- Coaxial Cable
- 50 Ohms Impedance
- Graphite layer
- 37kV Pulse rating

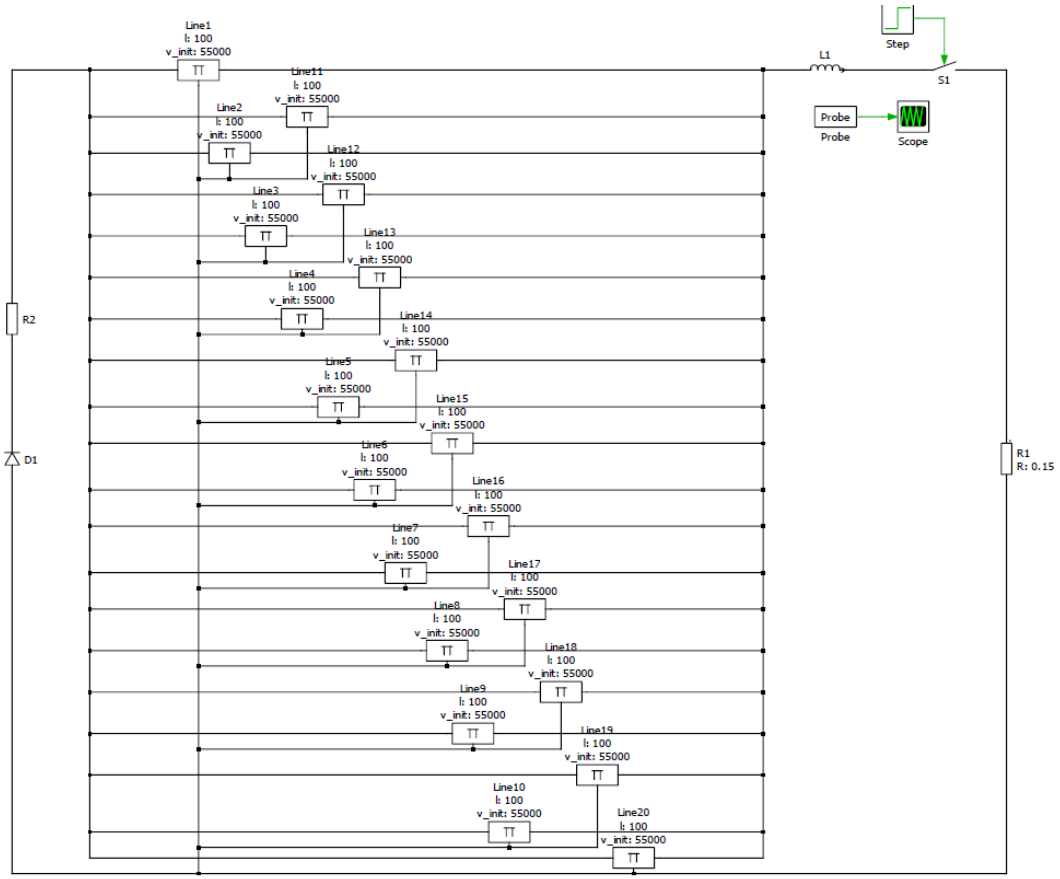
Pulse testing In R4

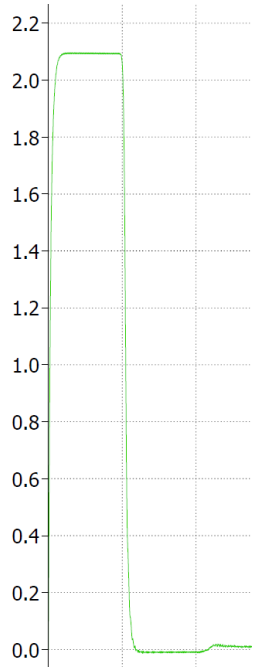
- Solution 1
- Build system - 100 meter lengths
- 20 stages to match load impedance
- Total of 2000 meters of large diameter cable



Pulse testing In R4

- Solution 1





Pulse testing In R4

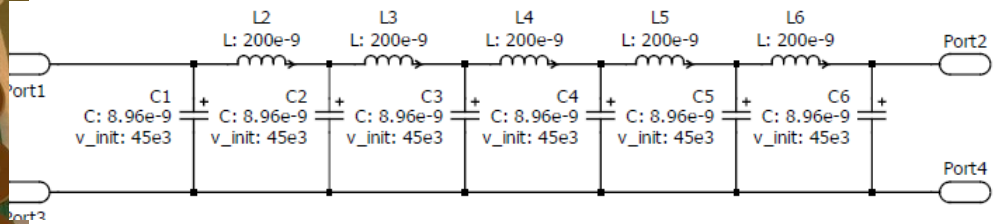
- Solution 1
- Cable Storage ?
- Safety?
- Size?

Pulse testing In R4

- Solution 2

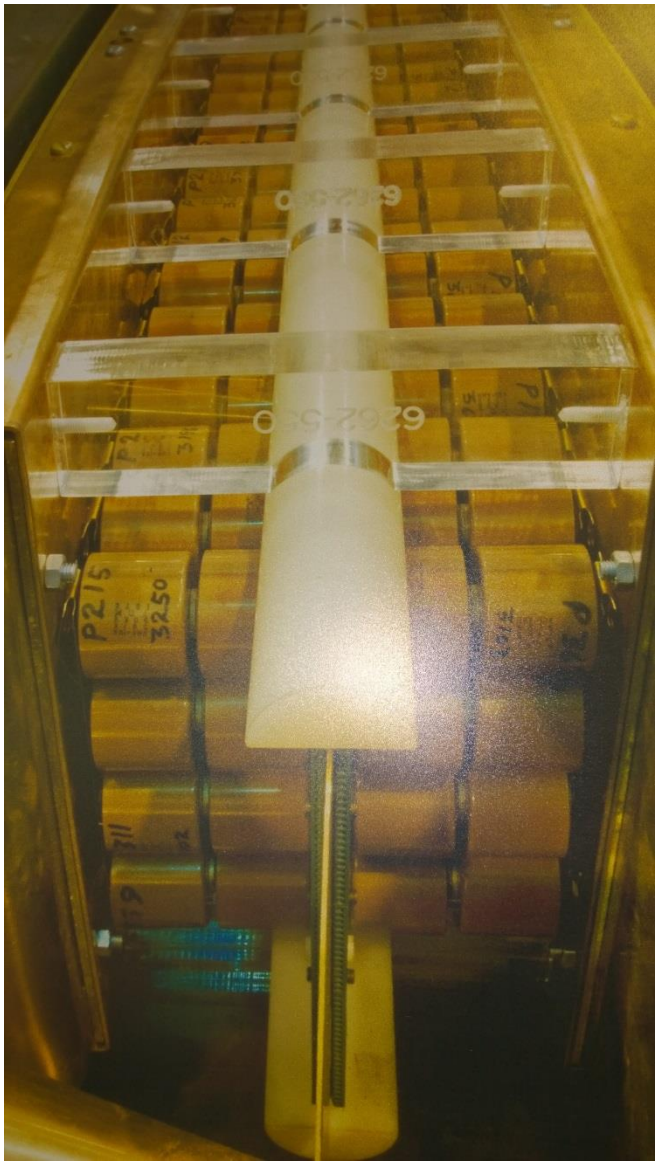
Pulse testing In R4

- Solution 2
- Modify existing ISIS Kicker PFN
- Compact design
- Available components
- Easier testing and safety

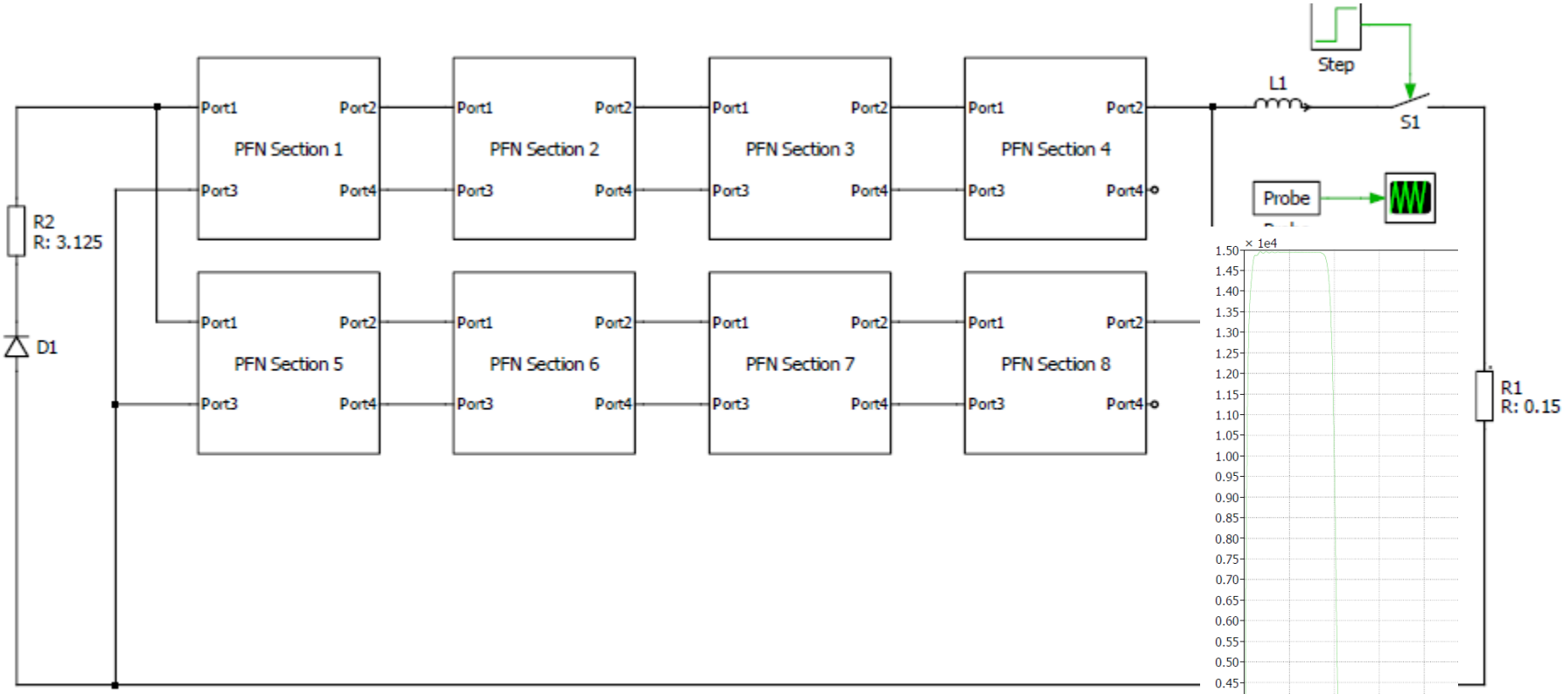


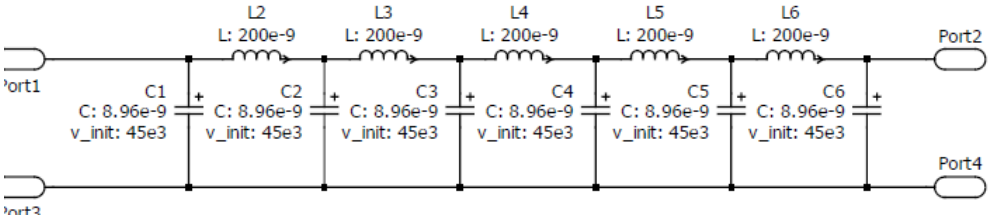
Pulse testing In R4

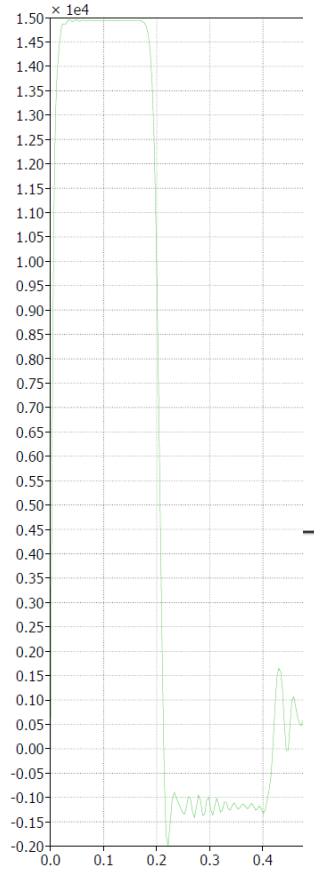
- Solution 2
- 4.48nF per stage
- 200nH Inductance
- 23 Stages
- ISIS Kicker PFN E=103J



Pulse testing In R4

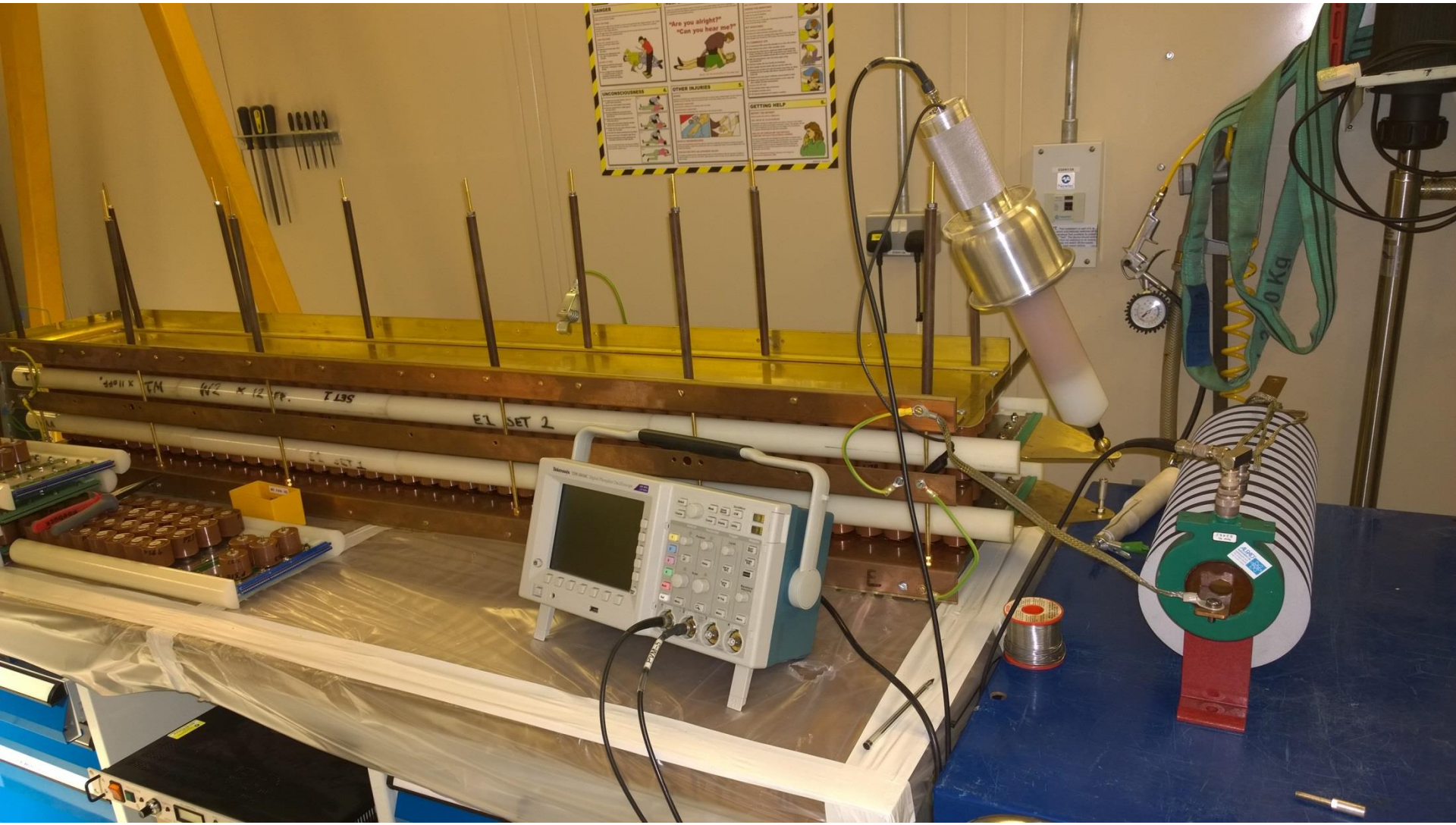






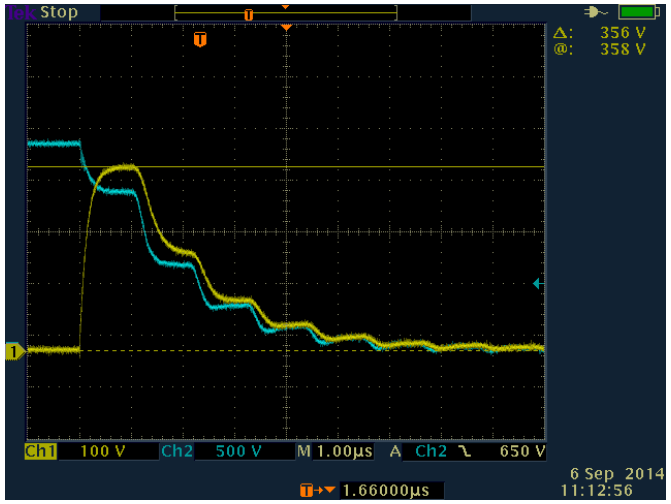
Pulse testing In R4

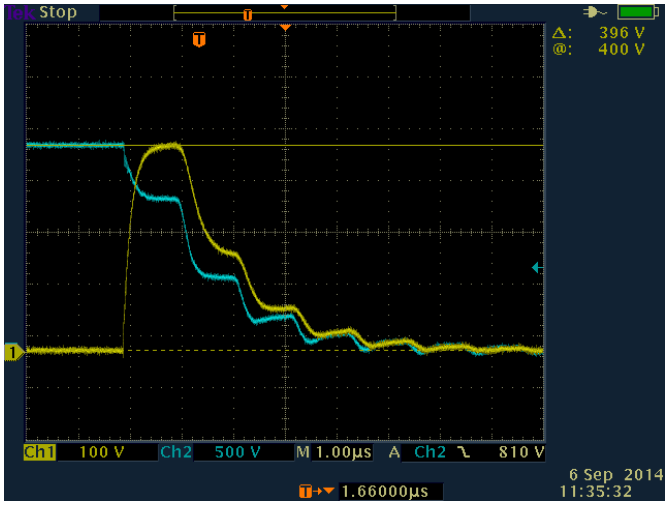
Pulse testing In R4

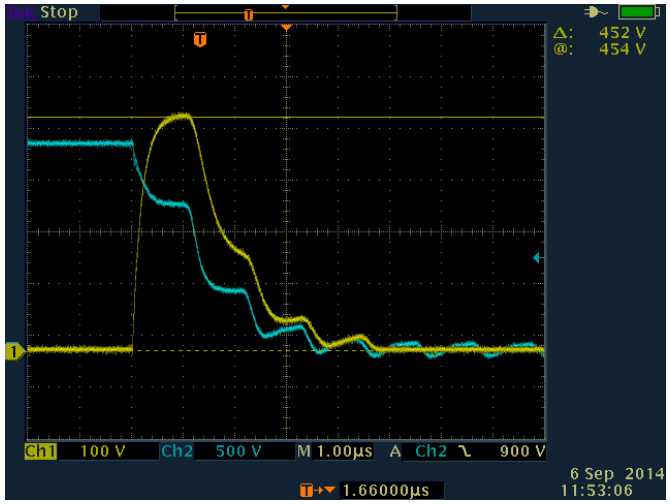


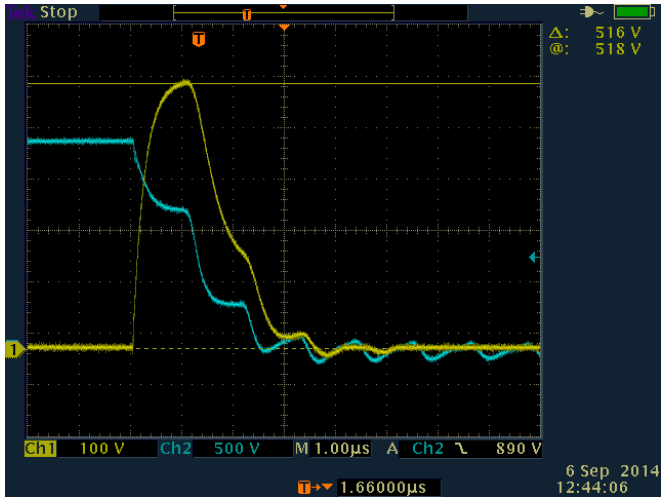
Pulse testing In R4

sets	V	A	Scope	
1	500	71.6	0	3.5
1	1000	142	1	3.5
1	2000	284	2	3.5
2	500	88	3	3.5
2	1000	175	4	3.5
2	2000	356	5	3.5
1	500	81.2	6	3
1	1000	161	7	3
1	2000	312	8	3
2	500	97.6	9	3
2	1000	198	10	3
2	2000	396	11	3
1	500	86	12	2.5
1	1000	177	13	2.5
1	2000	348	14	2.5
2	500	112	15	2.5
2	1000	224	16	2.5
2	2000	452	17	2.5
1	500	96.4	18	2
1	1000	187	19	2
1	2000	384	20	2
2	500	129	21	2
2	1000	256	22	2
2	2000	516	23	2
2	2000	606	24	1.5
2	2000	700	25	1
2	2000	868	26	0.5
1	2000	572	27	0.5
1	2000	488	28	1
1	2000	430	29	1.5

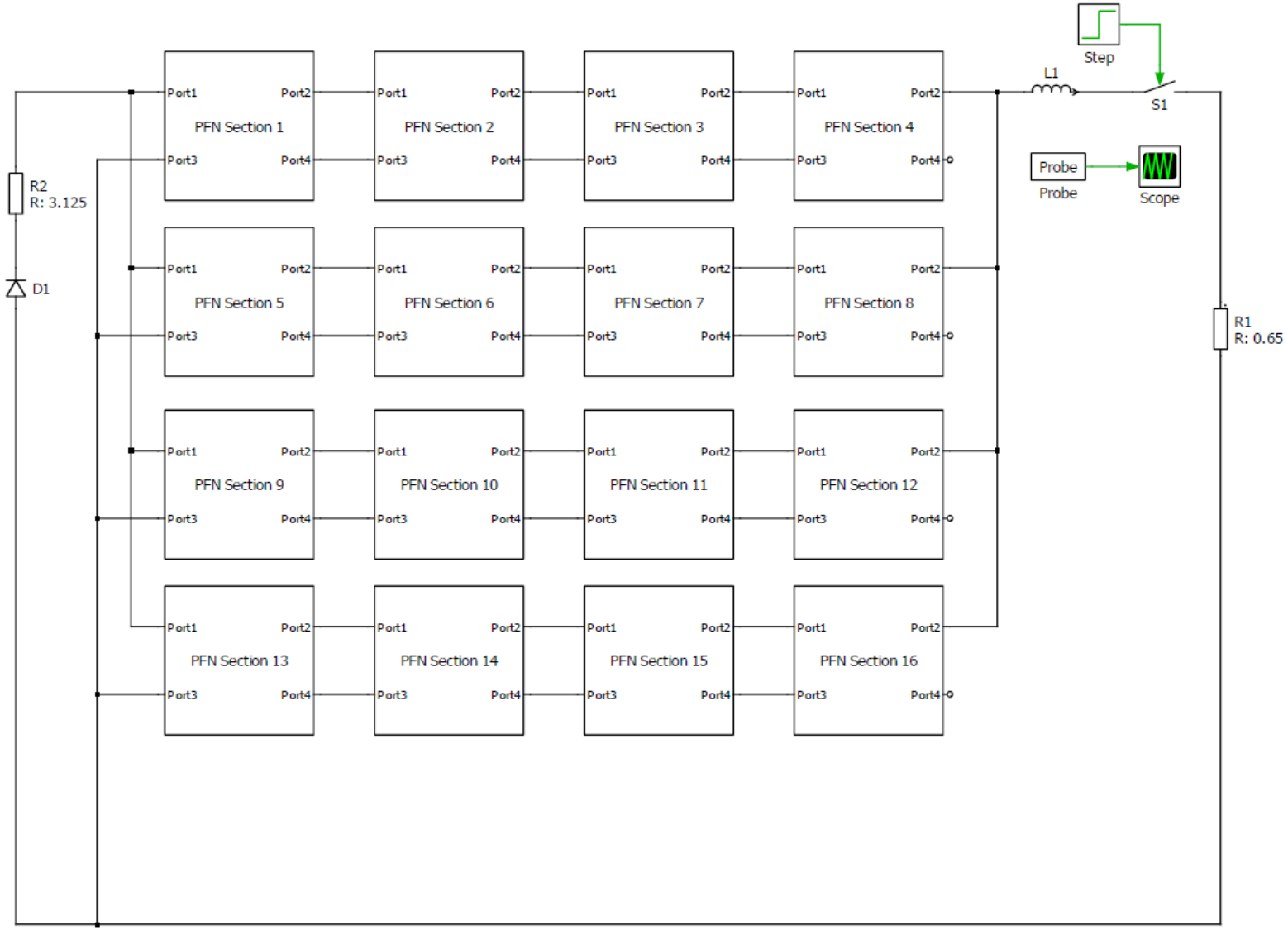




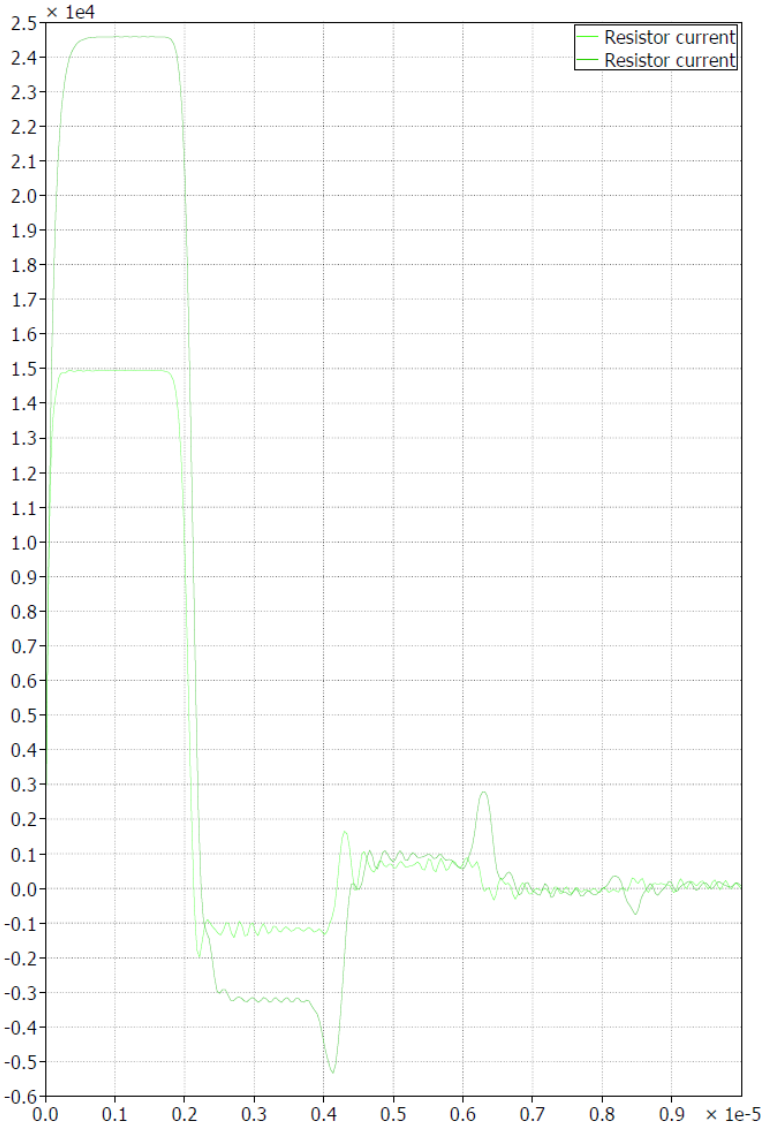




Pulse testing In R4

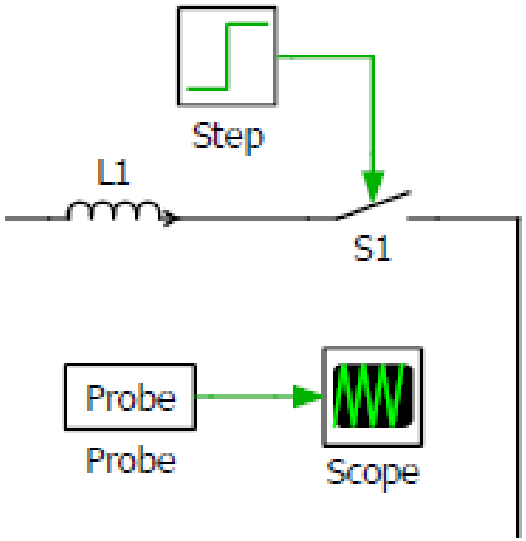


Pulse testing In R4



Pulse testing In R4

- Future work
- What switch to use?

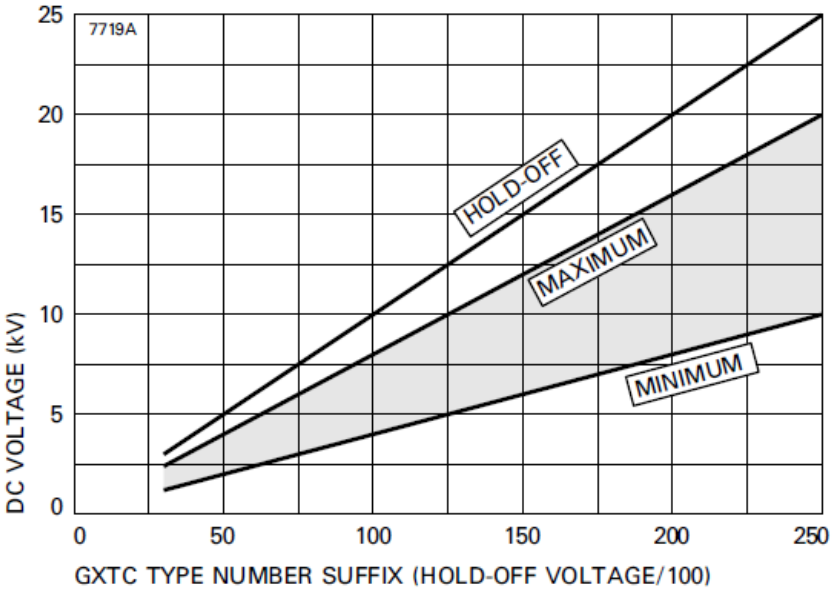


Pulse testing In R4

- Future work
- What switch to use?

GXTC Series
3-electrode Spark Gaps

OPERATING VOLTAGE RANGE

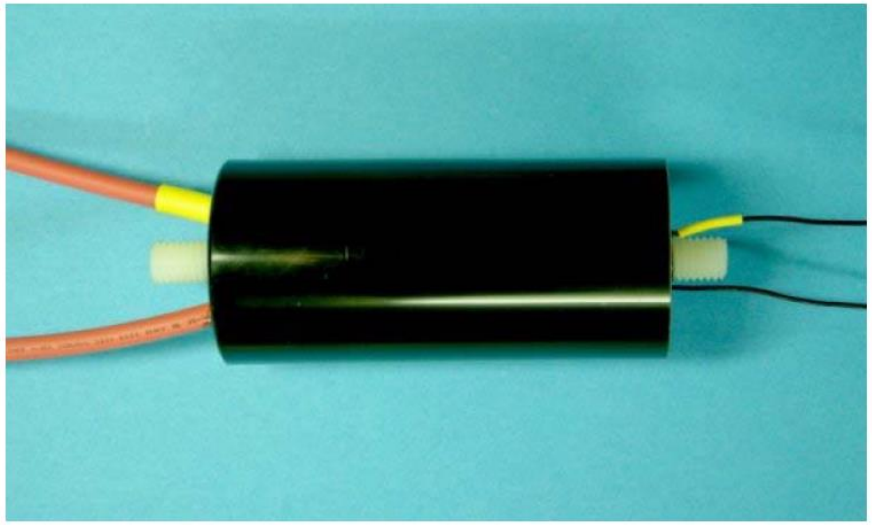


Pulse testing In R4

- Future work
- What switch to use?

JR200, JR201
Trigger Transformers for Spark Gaps

	Typical	Max	
Input voltage (peak) (see notes 1 and 2)	–	550	V
Input energy (see note 2)	70	150	mJ
Secondary open circuit voltage (peak) (see note 3)	–	40	kV
Rate of rise of output voltage (see notes 4 and 5)	25	<30	kV/µs
Pulse repetition rate	5	100	pps
Output current (peak) (see note 3)	1.0	–	A
Voltage transformation ratio	62:1 min		

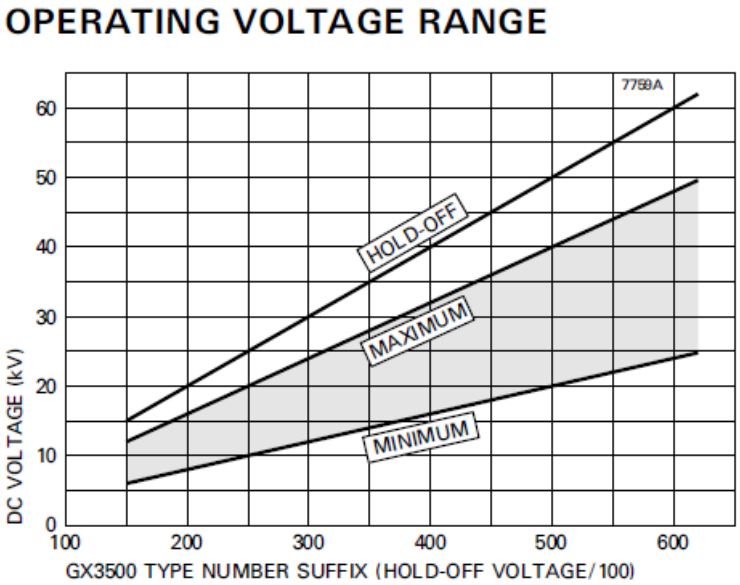


Pulse testing In R4

- Future work
- Housing Multiple PFN's

Pulse testing In R4

- Future work
- Multiple output switches
- Type of switch
- Multiple triggers
- Timing
- Load distance from PFN



Pulse testing In R4

- Thank you for listerning