5/11 394 mV = 154 mJ

6/11/82 – 6/10/87 30 hrs

6/10 – 5 pm = 330 mV ≈ 130 mJ

6/11/87 360 mV – 140 mJ

6/14 122 mJ J6

3:30 – 1:00 = 8½ hrs.

6/15 1:45 – 9:30 = 8 hrs J6

124 mJ

6/16 2:30 – 11:15 = 8½ hrs J6

115 mJ

6/18 1:00 pm – 2:45 = 1½ hr. J6

376 mV – 134 mJ

6/23 11:15 PM / AM = 2 hrs. JG

404 mV = 156 mJ

6/26 334 mV = 129 mJ

10:00 PM – 3:00 AM = 5 hrs.

6/27 4:35 PM – 9:15 PM J6

354 mV = 137 mJ

6/28 1:45 PM – 7:30 PM J6

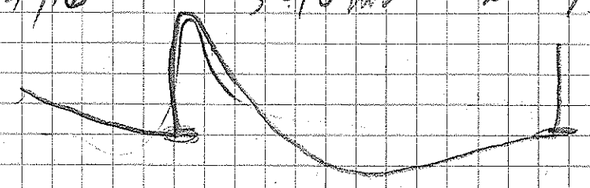
360 mV =

7/2 370 mV AN.

7/2 – 7/9 ran ~ 8 HRS each day A.N.

7/9 354 mV = 137 mJ A.N.

7/16 340 mV ~ 130 mJ



7/20 328 mV – 127 mJ TR

11:00 – 11:05 5 min

7/22 3.2 x .1 = 320 mV = 123.5 mJ SW

7/12 – 7/22 = 30 hrs SW

7/24 340 mV running SW

310 mV = 115 mJ afternoon EW

7/25 9:30 – 10:15 300 mV 115 mJ TR

1:00 – 3:00 320 mV

3:30 320 mV SW

7/27	10:15	320 mV	TR	
7/28	3pm	320 mV	EM	
7/29	3:15 pm	350 mV	EM	
7/30	12:30 pm	350 mV	EM	
7/31	9:00 am		TR	
8/4 - 8/5	345 mV =	133 mJ	10 hrs	EM
8/13	345 mV =	133 mJ	2 hrs	EM
8/14			7 hrs	EM
8/15	382 mV =	148 mJ	7 hrs	EM
8/16	338 mV =		8 hrs	EM
8/18	336 mV =	130 mJ		A.N.
8/19	ran ~ 8 HRS.			
8/20	ran ~ 8 HRS			
8/21	6 HRS →	128 mJ		A.N.
8/22				
8/23	6 8 HRS	8 HRS/day		
8/24				
8/25 - 9/29				
8/31	130.5 mJ		A.N.	
9/7/87	320 mV =	125 mJ		EM
9/9/87	340 mV =	130 mJ		EM
9/12/87	342 mV =	130 mJ		JG
9/13/87	340 mV =	130 mJ		EM

9/15/87	350 mV / 6 hours	EM
9/17/87	318 mV = 125 mJ / 7h	CC
9/18/87	330 mV =	CC
9/19/87	315 mV	CC
10/5/87	310 mV = 120 mJ	EM
10/5/87	319 mV	JG
	start 11:00 AM	
10/6/87	315 mV	
	at 7:45 pm	EM
10/7/87	310 mV 2:30 pm +	EM
10/12/87	331 mV on 11:45 AM	JG
10/13/87	330 mV	EM
10/16/87	330 mV	CC
10/24/87 (½ hour)	320 mV	TR
10/27	334 mV	A.N.
10/28	315 mV	TR & A.N.
10/31	328 mV	A.N.

11/04/87 320 mV C.C.

11/5/87 334 mV = 128.95 mj A.N.
2600 mbar

11/5/87 330 mV 4pm EM

11/6/87 350mV 7pm EM

11/7/87 350mV 3pm EM
Pressure: 2560 mbar
(lost 40 mbar in 2 days)

11/10/87 348mV 9pm EM

11/15/87 345 mV 2:30 EM

11/18/87 360mV 9:30 am EM

11/22 360mV 8pm EW

11/24 350 mV 2:00-5:00 pm Jg

11/25 372 mV 11:30-530 JG

11/29 320 mV 5:30 pm -

12/5 315 mV 3:15 - 5:10pm EM

12/10 282 mV JG

12/10 FILL

12/16
NEW FILL AFTER CLEANING WINDOW & SANDING OFF CONTAMINATION ON O-RING SURFACE.
Cause leak occurred there.

12/17 380 mV A.N. ran 6 HRS

12/18 354 mV A.N.
ran 8 Hrs

12/19 ran 10 hrs

12/20 354 mV ran 12

12/21 354 mV ran 12 hrs
There still is a slow leak.

12/22 338 mV ran 5 HRS A.N.

12/23 352 mV ran 10 HRS A.N

12/24 ran 10 HRS A.N

12/28 384 mV in morning
= 148 mj. RAN 8 HRS A.N

12/29/87 382 mV. ran 10HRS A.N

12/30/87 388 mV.

1/2/88 changed air filter EM

5:30pm 392 mV = 150 mJ EM

after BS:
150 mV to molectron ≅ 60 mJ
210 mV to PDA ≅ 80 mJ EM

ran 3 1/2 hrs.

1/4/88 380 mV ran for 4hrs EM

1/5/88 390 mV ran for 5hrs EM

1/6/88	396 mV (Press = 2450 mbar) run 9:15 AM - 4:00 PM		
1/7/88	406 mV (Press = 2425 mbar) run 10:00 AM -		
1/8/88	395 mV		EM
1/10/88	406 mV (2475 mbar)	3:30 PM -	JG
1/11/88	390 mV	2:20 pm	EM
1/13/88	414 mV (2500 mbar)	9:30 AM -	JG
1/14/88	410 mV	11:00 cm	EM
1/16/88	392 mV	1:30 AM - 3:00 AM	JG
1/19/88	366 mV	2pm	EM
1/22/88	370 mV	2pm -	JG
1/23/88	386 mV	12:00 pm -	JG
1/24/88	350 mV		JG
1/25/88	346 mV		EM
1/26/88	350 mV		JG
1/26/88	335 mV		JG
1/27/88	345 mV		CC
1/28/88	335 mV 340 mV	5 h 2 h 2 h 30	CC CC
1/30/88	380 mV	10:30 am	CC
1/31/88	402 mV P: 2600	Run 7:00 pm -	JG
2/1/88	385 mV		
2/1/88	380 mV		CC
2/3/88	380 mV		JG
	Same as every		EM
2/4/88	ex current power	366 mV	EM
2/5/88	9 hours		JG
2/6/88	400 mV		EM
2/7/88	400 mV / 2 h		CC
2/8/88	425 mV P = 2475 mBar		JG 6 hrs
2/9/88	410 mV		8 hrs EM
2/10/88	410 mV	10 hrs	CC
2/11/88	420 mV	2 hours	EM
2/13/88	400 mV	2 h	CC
	P = 2450 mbar		
2/14/88	405 mV / 30 mn P = 2410 mbar		CC
2/20/88	386 mV		EM
2/24/88	372 mV		EM
2/27/88	320 mV		JG
	P had fallen to 2350 mbar Sat I refilled → 440 mV		JG
2/29	360 mV		EM
3/1	360 mV		JG

3/2 300 mV JG

3/5 310 mV JG

3/7 310 mV JG

3/8 New Fill 465 mV after firing 2 Hz for a few minutes.
400 mV a few minutes later

3/9 340 mV Still steady EM

3/11 330 mV EM

3/13 385 mV EM

3/15 350-380 mV EM
30 mV fluctuations

3/16 ~~350-380~~ 350-380 mV JG

~~3/17~~ 3/17 360-380 mV - mostly 370 JG

~~3/18~~ 3/18 360-390 mV - mostly 375 JG

3/20 380 mV EM

3/23 360 mV A.N. ran 6 Hrs

3/26 368 mV A.N

3/27 375 mV CC

4/1 350 mV CC

4/2 ran 8 hrs A.N.

4/4 348 mV A.N.

4/11 325 mV CC

4/20 470 mV CC
2 h

4/21 425 mV CC 2h

4/25 425 mV 1h CC

4/26 425 mV 2

4/27 450 mV 3

5/16 445 mV 1h EM

5/17 440 mV + 3h CC
435 mV

5/18 455 mV 4h CC
455
454

5/19 440 mV 6h CC

5/20 440 mV 8h CC
450

5/23 420 mV 9h
450 mV 9h

5/24 445 mV 6h

5/25

5/26	450 mV	CC
5/28	424 mV	JG
5/29	430 mV	"
5/30	410 mV	JG

(NOTE: When I switched the power supply on, it was at 20 kV. - could this have damaged it?)

- No signs of trouble in operation

6/1/88	395 mV	6 hrs	"
6/3/88		6 hrs	"
6/4/88		8 hrs	"
6/5/88	400 mV	6 hrs	"
6/6/88	378 mV	3 hours	JG
6/8/88	380 mV	4 h	CC
6/10/88	395 mV	10 hrs	"
6/16/88	350	1 h	"
6/14/88	342		
6/16/88	375	3 h	CC
7/6/88	375	4 h Andé?	
6/28/88	370	2 h	"

6/29/88	370 mV 370 mV	2 h 4 h	CC
6/30/88	374 mV		JG
7/2/88	370 mV	~8 hours	JG.
7/3/88	380 mV	10 hours	JG
7/4/88	380 mV		JG
7/10/88	365 mV		"
7/13/88	385 mV		CC
7/14/88	385 mV	14 h	CC
7/15/88	375 mV	14 h	CC
7/18/88	390 mV	15 h	"
	364 mV		JG
7/19/88	320 mV		
7/20/88	360 mV		CC
7/21/88	13 hours		JG
7/22/88	350 mV		
7/25/88	330 mV	16 h	CC
7/26/88	315 mV	13 h	
7/28/88	335 mV		"
7/29/88	325 mV		JG.
7/30/88	320 mV		JG
8/2	340 mV		JG

8/3/1988	390 mV	[illegible]
8/4	400 mV	JG
8/5	400 mV	JG
8/6	400 mV	JG
8/7	410 mV	JG
8/9	410 mV	
8/9	410 mV	CC
8/15	375 mV	JG
8/16	390 mV 6h	CC
	375 mV 2h	
8/17	375 mV 6h	CC
8/18	360 mV	CC
8/20	370 mV 350 mV /2h	
8/23	360 mV	CC
8/24	310 mV	A.N
8/28	320 mV 6h	CC
	320 mV	
9/01	320 mV /5h	CC

	320 mV / 3h	CC
09/02/88	315 mV/	
9/11/88	322 mV	A.N
	run everyday 9 Hrs	
9/14/88	305 mV	A.N
	9 Hrs/day	
9/21/	290 mV	A.N
9/25	278 mV	A.N.
9/26	390 mV - New Fill Later: ~~from~~ N ~~[illegible]~~ 340 mV	A.N
9/27	345 mV	A.N
10/3	325 mV	A.N
	(pressure has drifted up to 2900 mb) from 2600	
10/9	320 mV 15×10³ shots	A.N.

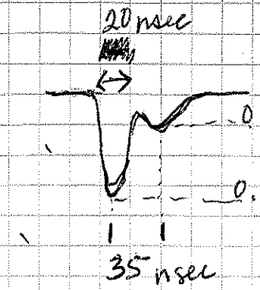
Pressure went up to 3000 mbr.
the laser head interlock tripped off.
Apparently I had the neon tank open & there is a leak in the ~~[illegible]~~ valve Solenoid Valve.

10/11 After New Fill + 1 day (running) 300 mV

10/24 32[illegible] mV A.N.

11/6/88	340 mV		EMC
11/30/88	315 mV		EMC
12/5/88	300 mV		EMC
12/8/88	430 mV, 4 hrs		E^3
~~12~~ 12/9/88	415 mV		E^3
12/10/88	405 mV	2hrs	EMC
12/12/88	415 mV	@ 1/hr + Bob Ligon's time (6 hrs)	E^3
12/13/88	416 mV	5 hrs	BJL
12/15/88	408 mV	7 hrs	BJL
12/16/88	408 mV	10 hrs.	BJL
12/17/88	415 mV	9 hrs	BJL
12/20	390 mV	7 hrs	BJL
12/22	390 mV		EMC
12/27	388 mV	3 hrs	EMC
12/28	375 mV	3 hrs	EMC
12/29	375 mV	2 hrs	EMC

Examiner pulse



w/ P ~ 2400 mbar and a Neon, Kr, Xe w/ Hydrogen fill and 360 mV ? output.

EMC.

1/2/89	360 mV	1 hr	EMC
1/3/89	370 mV		EMC
	D_2 = 2500 mbar		
1/3/89 evening	340 mV		EMC
	P ~ 2450 mbar		
	new fill: initially 450 mV		
	at end ? evening (1 hr cals)	390 mV	EMC
1/4/89	390 mV 2600 mbar	5 hrs	EMC
1/5/89	395 mV 2550 mbar	5 hrs	EMC
1/6/89	395 mV	6 hrs	EMC

1/9/89 Pr = 2500 mbar
400 mV 6 hrs EM

1/11/89 370 mV at 20.4 kV EM
405 mV at 21 kV EM

1/12/89 395 mV at 21 kV EM

1/13/89 405 at 21 kV EM

1/15 400 mV at 21 kV EM
5 hrs
P = 2650 mbar when starting run
P = 2550 mbar before leaving

1/16 370 mV at 20.5 kV
P = 2600 mbar
410 mV at 21.1 kV
6 hrs
EM

1/18 21 kV, 390 mV
Pressure 2600 mbar

1/20 21 kV 410 mV EM
Pressure 2550 5 hrs

1/23 21 kV 390 mV EM
Pr = 2500 5 hrs

1/24 21 kV 390 mV EM
Pr. 2500 mbar 4 hrs

1/28 21 kV 360 mV
Pressure: 2500 mbar.
new fill:
initially 480 mV
420 mV after 10 min

1/29 20.4 kV Pr: 2600 mbar
410 mV

2/2/89 20.5 kV 410 mV

2/3 Pr 2530 mbar
20.4kV 390mV

2/7 21 KV 410mV
Pr = ~~2545~~ 2500 mbar EMH
7hrs

3/11/89 Pr. 2300 mbar
Power = 335mV
(at 20.4kV)
ran for 4hrs. EMH

3/15/89 new fill
initially: 455mV at 20.4kV
later 425mV at 20.5kV.
ran for 5hrs. EMH

3/17/89 350mV at 20.4kV
~2hrs
EMH

3/21 at 20.5kV 390 mV EMH

3/24/89 at 20.4kV 3hrs.
EMH

3/27/89 at 20.4kV 395mV EMH
Pr. 2500mbar

4/7/89 Pr = 2400 mbar
at 20.4kV 375mV
3hrs EMH

4/10 Pr ~ 2350 354 mV.
AN

⇒ add Neon buffer to 2600 mbar.
+ still power reads 354 mV - No
Change.
ran for 8hrs EMH.

(before: Power is 320mV)

4/11/89 New ~~[illegible]~~ fill
initially 460mV
settled in at 380mV

4/12/89 380 mV

4/15/89 380 mV Ellen

[illegible]

6/8 380 mV Felix
run for 5 hrs

6/9 ~~380 mV~~
run for 6 hrs Felix

~~6/10~~ 290 mV ↔ $\frac{290}{2.59}$(mJ) = 112 mJ

6/13 run for Felix

7/15 280 MV Felix

9/23 at 20.5 kV ~245 mV
need more Xe.

new fill 440mV initially.

after 1/2 hour 390mV

9/24-9/25 - laser head interlock engaging after 15 min at ~2 Hz.
resets itself after [illegible] time (1 min).
Changed air filter. no help.
✓ water flow 1l/10sec - 6 l/min > 4 l/min recommended.

3hrs later power at 360mV
Still tripping into lock after 15 min.
(HV must be on but laser firing to trip into lock)

need to: check fan motor, and then call.

- trip point on [illegible] circulation fan motor protection relay was set to 2.1 amps (changed from 1.8 amps)

- 380mV at 20.5 kV ran for 4 hrs.

10/7 -350 mV @ 20.5 kV → 135 mJ

10/18 -304 MV @ 20.5 kV → 118 mJ

11/6 452 mV (new fill)

11/7 456 mV Press down to 2550 mbar

11/10 Press steady @ 2250 mbar
410 mV

11/20 ~~400~~ 390 mV

11/21 386 mV

11/22 385 mV

11/25 385 mV

11/27 380 mV

11/30 370 mV

12/4 360 mV

12/5 360 mV

12/6 350 mV

12/7 350 mV

12/9 350 mV

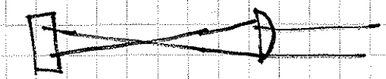
12/10 330 mV

12/11 315 mV

* 5/2/90 Set up excimer in Delaware
Maintenance (see maintenance sec.)
1 fill : ~~[illegible]~~ mJ
182 ± 5

Tuned rear mirror : 195 ± 10 mJ

→ I wasn't as centered as I'd thought on the element. Focus slightly with 6" cylindrical lens



pyroelectric

spot size on element
~ 1 × 3 cm
→ << 100 MW/cm²

~140 mJ/pulse
Mode off mirrors is nice and filled in rectangle.

5/16/90 : 148 mJ (500 mV pyroelectric)

5/17/90 : 530 mV pyroelectric → ~ 157 mJ
Late evening 400 mV = 118 mJ

7/13/90 Cleaned windows
Passivate over night

7/14 Calibrate pyro:
5.00 Hz Thermal meter

Excimer → ◇ → [] Thermal Disk
↑
focus to ~ square aspect □

5.00 Hz → 550 mW = 110 mJ

Pyro meter (unfocused excimer beam)

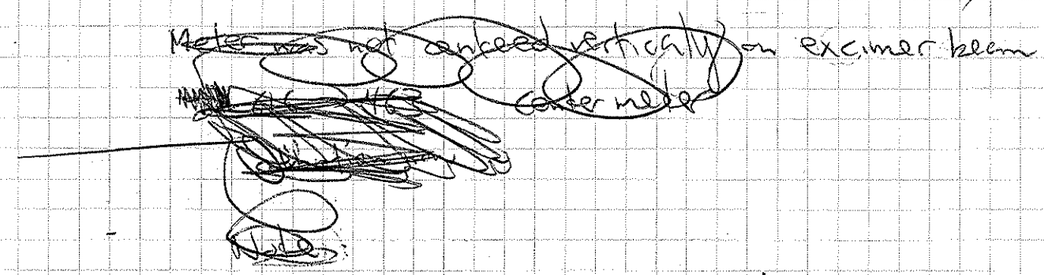
~440 mV ⌐¬ 440 mV
↑ note baseline ≠ ground

440 mV = 110 mJ

4 mV/mJ

Track Rear mirror: 616 mV
= 155 mJ

(Previous calibration: 3.4 mV/mJ)

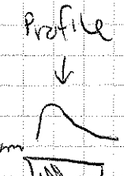


7/18 532 mV = 156 mJ

7/19 472 mV = 139 mJ

7/20 468 mV

7/22 Bad "mode" most of energy on one side of beam
Energy down to 255 mV
New Fill 448 mV



7/31 402 mV

8/1 362 mV output window foggy

8/1 clean windows, fill
516 mV

8/3 442 mV

8/4 500 mV

8/10 440 mV
after ~ ½ hour down to 340 mV
≈ 80 mJ

refill 550 mV = 125 mJ
after ~ 1 hour down to 358 mV
= 90 mJ
after ~ ½ hour down to
90 mJ again


refill
618 mV = 155 mJ

8/13 630 mV = 158 mJ

8/14 600 mV = 150 mJ

8/16 520 mV = 130

8/17 500 mV = 125 mJ

8/20 500 mV = 125 mJ

8/21 550 mV ≈ 140 mJ

8/25 600 mV ≈ 125 mJ

8/26 550 mV 140 mJ

8/30 530 mV 132 mJ

9/3 500 mV 125 mJ

9/4 530 mV 132 mJ

9/5 510 mV 128 mJ

2/4/91 Only ~ 330 mV. Gave laser new fill (pure Ne, probably, a mistake!)

Now ~ 514 mV. But meter has been damaged with Nd:YAG laser. So what is the calibration now??

Use 6" lens to focus to square spot on 210 meter. (Can't do often or for long; can hear slight ablation!)

5 Hz ⇒ ~ 680 mW

So $P = 5 \frac{136}{680}$

136 mJ. But lose ~ 10% on lens (or a little more).

Thus $P \simeq 1.1 \times 136 = 150$ mJ $\quad \frac{136}{1496}$

Pyroelectric, carefully centered: 470 mV
repeat: 475 mV.

Thus, $\boxed{475\ mV = 150\ mJ}$

(down from ~ 600 originally!)

New calibration: $3\overline{)950}^{317}$

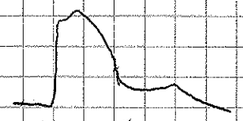
$\boxed{3.17\ mV = 1\ mJ}$

Note that centering of height on aperture plate is crucial!

Alignment into pulsed amp. looks OK.
Ext. trigger also looks OK.

Firing delay: ≈ 1.3 μsec

Shape:



jitter ≈ 1 ns rms
(never shifts by 7 or 8 nsec on scope)

(For this, trigger scope on ext. firing line coming in to excimer supply)

After a few minutes, timing stability got worse, then improved again.

Still, temporal overlap with 5 nsec pulse should be easy!

P-P timing jitter is 8 nsec max.

So, work 6-7 ns into pulse when synchronizing with Nd:YAG laser.

After 1 hr at 5-10 Hz,

P ≈ 440 mV. Still OK, but suggests gas liner were contaminated as I feared. Will see how it holds out.

$-E^3$

(Note -- P_i ≈ 2590 mbar -- watch for leak rate)

2/7 460 mV; P = ~~2570~~ 2570 mbar
ran ½ hr @ 4 Hz

2/8 About 3 hrs @ 5 Hz
500-520 mV ! P = 2570 mbar

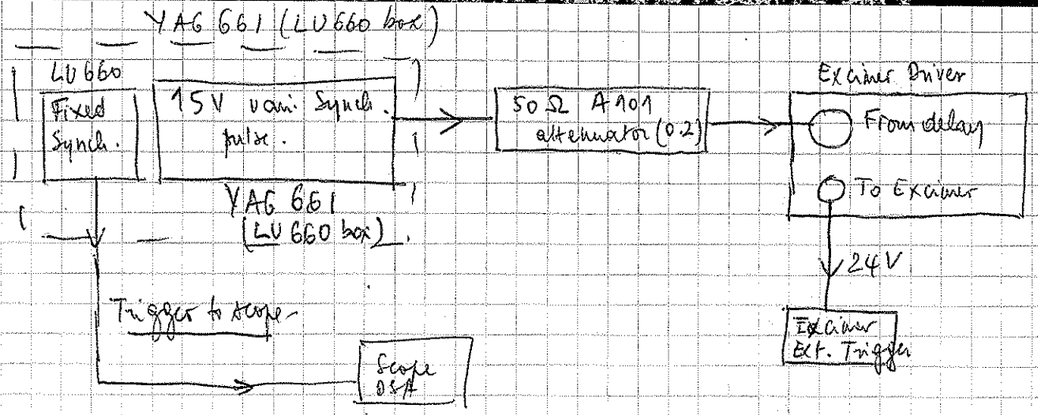
02/18/91 At 20.5 kV, 5 Hz rep rate
Joulemeter reads: 460 mV ≡ 145 mJ
P = 2480 mbar

Run for about 1 hour -

02/19/91 At 20.5 kV, 5 Hz rep rate
480 mV ≡ 150 mJ P = 2480 mbar

Run for ~ 3 hours

Tried and succeeded in triggering the excimer from excimer driver pulse generated at the LU660 (Var. synch. output).



By varying the VAR sync. screw and observing both the pulses from the YAG 661 (any 204nm after tripling scheme + 306 nm doubled light were chosen) & the Excimer pumped P.D.A, the two pulses were successfully synchronised to ± 4ns.

The pulse widths were measured to be:

YAG (Tripling scheme) ≃ (9 ± 1) ns

Excimer pumped PDA (ewing) ≃ (12 ± 2) ns.

02/20/91 At 20.5kV, 455mV ≃ 140mJ P = 2480 mbar.

03/26/91 At 20.5kV; 250mV = 77mJ P = 2300 mbar

laser needs new refill

3/29/91 New fill, tried 50% Ne, 50% He

A little leak on HCl (about 95 mbar)

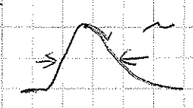
filled to exactly 2600 mbar.

342 mV = 105 mJ

So we did lose pwr compared w/ using more Neon.

Need to look at mixture, too.

Approx. Shape:



- 3/30/91

. 340mV = 108mJ

Pressure: ~ 2595 mbar

04/01/91

340mV

Pressure 2550 mbar

04/05/91

330 mV

Pressure 2500 mbar

Run for about 3 hours.

04/06/91

330mV

pressure 2500 mbar

run for ~ 1 hour

04/10/91

330mV

Pressure 2480 mbar.

04/11/91

328mV

Pressure 2460 mbar.

After about 15 minutes of operation, energy dropped to 300mV!

Oops. Take that back, it is due to misalignment of joulemeter.

04/12/91: 324 mV

Pressure 2430 mbar.

04/13/91
322 mV : 101 mJ
pressure 2400 mbar.

04/15/91
322 mV
pressure 2400 mbar.

04/16/91 (Aïd el Fitr !!)
318 mV
pressure 2400 mbar.

05/22/91
310 mV
pressure 2100 mbar
laser needs another filling. Will do it asap.

05/29/91
260 mV = 82 mJ
pressure 2000 mbar
New fill definitely required.
Purged line twice with He
New fill:
Xe (New bottle installed) : 1250 mbar
Ne (~~...~~ 1250 mbar
HCl = 100 mbar

No lasing! There must be s.t wrong with the mix (see E8)

Too much Xe. When the note mentions (3/29/91 previous page) 50% Ne & 50% Xe I think it means 50% Ne & 50% He. What a shame. I've to somehow save the Xe in the Excimer.
~~Cannot~~. For these atoms/molecules,

the mean free path is ~ 6-11 μm. So we are in the viscous flow regime. Will therefore try to get one more go with this awfully expensive fill.

New fill (kept 100 mbar of Xe)

100 mbar of Xe
80 mbar of HCl
2420 mbar of Ne
Total 2600 mbar.

15:36	energy : 576 mV	180 mJ	Pressure 2600 mbar
06/01/91	energy 560 mV	176 mJ	— " —
06/02/91	Energy 540 mV	170 mJ	Pressure 2600 mbar.
4 June 91 :	530 mV (168 mJ)		pressure 2600
05 June 91	508 mV		pressure 2600
15 June 91	528 mV		pressure 2540
16 June 91	525 mV		pressure 2540
17 June 91	532 mV		pressure 2520

8/2/91 336 mV (106 mJ) pressure 2400 mbar
[calib: 3.17 mV/mJ]
~ 3 hrs operation @ ~ 3 Hz rep rate

14 August 91 at 20.5 kV signal : ~~...~~ 246 mV pressure 2350 mbar
= ~~77~~ mJ < 100 mJ
77 mJ

The Excimer needs a refill.
Not enough Ne for next fill?
Ne. on order (see Stubragar)

New fill:

100 mbar of Xe ✓

80 mbar of HCl ✓

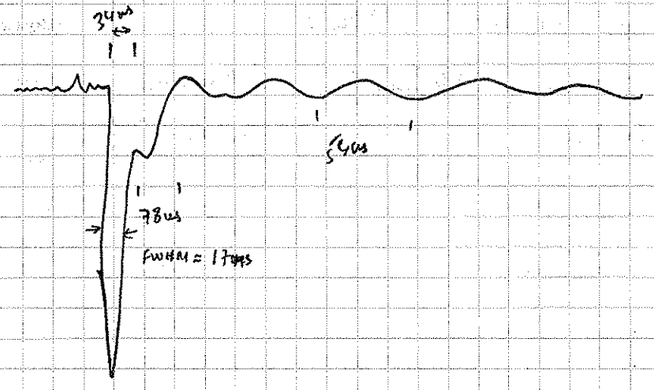
2420 mbar of Neon ✓

2600 mbar total

ORDER A NEW BOTTLE OF Ne. (see Shibagaki Spectra Gases)

Energy: 570 mV / 3.17 = 179.8 mJ

8/20



1-2 ns photodiode into 50Ω

(scattering off a desk paper)

↳ too large a value for the pulse width – am I seeing fluorescence effects of the scattering material?

8/27 367 mV, about 3 hrs at 10 Hz since last fill, plus whatever was used for Sukhagata's runs! (and a few hrs at 1 Hz)

P = 2580 mbar

8/28, 8/29 5 hrs, mostly at 5 Hz

8/31 125 mJ 5 hrs, ~5 Hz

09/01 366 mV i.e 115 mJ pressure = 2510 mbar

The Neon bottle is still not here!

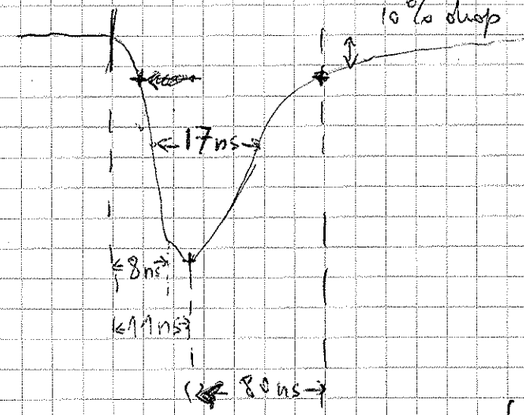
Ran for ~5 hours at ~2 Hz mostly.

09/11/91 160 mV i.e 50 mJ!!

Desperately need a refill. See Ne order tomorrow.

09/13/91 New fill (70% Ne, 30% He) 110 mJ, pr = 2600 mbar

Pulse looks like



So, FWHM ≃ 17 ns

, slow decay (100%–10%) ~ 80 ns

, Shape single pulse with a touch of a shoulder at the peak

02/06/92 New fill (70% Ne, 30% He) i.e

100 mbar Xe
80 mbar HCl
720 mbar He
1700 mbar Ne
2600 mbar = Total

New fill gives: 486 mV / 3.17 = 150 mJ

06/09/92

4/27 PUMPED OUT GASES. ADDED 1) 100 MB XE, 3) 2,420 NEON, AN. + L.M
2) 80 MB ~~HCL~~ HCL TOTAL = 2600
1 HCL HALOGEN MIX
ORDER: XE, HCL, NEON (BUFFER)

* SHOULD HAVE CLEANED EXIMER WINDOW, + FLUSHED GAS LINES. ANY AIR INSIDE CAUSES CORROSION WHEN MIXED WITH HCL.

1 XE NOBLE
2 HCL HALOGEN MIX
3 NEON BUFFER

proper order:
1) HALOGEN
2) NOBLE
3) Buffer

5/30 NEW FILL — A.N. E.M

125 FILLS BEFORE CHANGING HALOGEN FILTERS.
VACUUMPUMPOIL SHOULD BE CHANGED ~ 1/YEAR

7/15 CLEANED WINDOW + MIRROR (TINOXIDE WORKS WELL)

7/16 - NEW FILL 179.9 mj AT 20.5 KV + 2.09 V/J (NOTE: MAX = 22 KV)

~~7/18~~

8/14 cleaned windows, new fill
164 mJ at 20.5 KV, 2.59 V/J
Calibration. E3
Windows were very dirty, but cleaned up easily with MeOH alone.
Mylar gasket missing from front window!

10/15 cleaned windows + new fill
154 mj at 20.5 kV
mylar gasket back in place.

11/6 REALIGNED CAVITY BY BACK REFLECTING HE-NE BEAM ONTO ITSELF FROM EXIT WINDOW AND MIRROR. CAVITY LINE BEING. FIRST, IT CENTERED THE HE-NE BEAM THROUGH EXIT + BACK APERTURE (TWO DEFINING THE CAVITY AXIS), AT THE SAME TIME FLUSHING THE SYSTEM WITH HE TO PREVENT MOISTURE FROM ENTERING. THEN I PASSIVATED THE SYSTEM W. 200 MB XECL + 800 MB HE OVERNIGHT. THE NEXT DAY THE POWER WAS 193 mj FOR 1ST 30 SHOTS => IT DROPPED SLOWLY DOWN.
ANDRE

11/11 I PASSIVATED THE CAVITY OVERNIGHT. THEN GAVE A NEW FILL.
486 mV = 188 mj
5 minutes later at 2 Hz dropped: 414 mV = 160 mj
10 " " " " " 406 mV = 156 mj

11/18 NEW FILL
1st few shots 176 mj
=> settled down to ~145 mj

11/20 NEW FILL
SAME TYPE OF BEHAVIOR!
1st shots ~198 mj => dropped to 148 mj after 10 minutes at 10 Hz.

1/2/86 New fill P = 169 mJ
after ___ P =

1/7 new fill 440 mV after = 170 mj AN
ran ~ 6 Hrs 5 Hz

1/8 power dropped to ~100 mj for no apparent reason. So I refilled it
=> back to 424 mV = 164 mj

1/15 new fill before 130 mj
after 178 mj.

2/27 new fill before 120
after ~170 mj A.N.

3/5/87 new fill before E ≈ 100 mJ
after E ≈ 181 mJ
let run for 5 min at 10 Hz
E ≈ 153 mJ

4/21 new fill before 127 mj A.N.
after 156 mj
460 mV
=> dropped ~100 mj

4/23 143 mj after a few hours of running 2 HRS A.N.
=> 137 mj after ~3 more HRS.

4/24 => 143 after ~6 HRS
ran total of 10 HRS

4/25 146 mj AN

6/18 before 115 mJ JG
after 154 mJ

10/10

6/24
PUT IN NEW tank of HCL, MIRROR AND WINDOW were cracked + Replaced the MgF₂ window with a CaF₂ window (8290 TS5400), but kept the Bad window IN place to see if it really leaks. pa... the laser with HCL FOR 4 hours => ... got out ~ 160 mJ at FIRST (after realignment)

6/25
426 mV = 164 mJ after first few shots –

7/23
412 mV = 159 mJ JG

7/24 has dropped to 115 mJ
refilled : 400 mV EM

7/25 dropped to 300 mV JG
refilled 4[illegible] mV

7/26 330 mV 3pm GM
350 9:30 pm EM

8/18/87 New FILL 390 mV after fill

9/30/87 New fill. Not enough Xe for 100 mb (~90 mb) Power = 330 mV = 125 mJ
JG.

10/1/87 New fill + clean windows
Pump = 350 mV

10/2/87 325 mV / 2.5 hours

10/21/87 There was a leak at the ~~[illegible]~~ mirror & window, with ~~[illegible]~~ corrosion due to HCL on both. We cleaned them, put in new O-rings + ~~got [illegible]~~ realigned the laser using a He–Ne laser. ~~[illegible]~~ We got powers of ~310 mV throughout the week. (There still may be a slight leak though). P=3500 10/27 The lower powers ~~[illegible]~~ are understandable due to air getting in during alignment

12/10/87 cleaned windows, passivated.
12/11/87 found leak. Windows not tightened sufficiently. Tightened them. Filled. laser – 432 mV. for the first few shots (167 mJ)

11/03/87
New Ne bottle 600 psi
After fill : 30 psi on the line
300 mV!

11/04/87 New Fill

12/17 NEW FILL A.N (380mV after several shots)

1/29/88 Filled using 100% Ne instead of 70%

Energy : 150 mV ~

refilled : Energy : 177 mV

Let sit for a few hours to see if that helps:
Before (5:35) P is a little below 2600 mB
After (11:00) P unchanged

filled for 3rd time, but with Ne-70

Energy : 450 mV first few shots

1/30/88 385 mV after 10 min warmup at 2 Hz. GM.

(initially 434 mV)

11:00 385 mV

2/27/88 440 mV first few shots JG

3/8/88 ~600 mV first few shots

465 mV after a minute or so.

3/9/88 340 mV mix and steady still GM

Passivation

4/13/88 550 mV first shots

1) Cl 100 mBar 460 mV after 5 min at
2) HCl 80 mBar 2 Hz
3) Ne 2420 ~ steady 450 mV CC

6/14/88 500 mV 1st shots
370 steady

6/16/88 Only 300 mV → passivation
+ new fill
545 mV first shots
5 min later, 2 Hz, 420 mV CC

7/28/88 Passivation
480 mV 1st shots
330 mV steady / 10 min 2 Hz
2nd fill
510 mV 1st shots
390 mV steady

7/28 380 mV 9:45 a.m. GM
335 mV 11:00 a.m. GM

J6

7/29 350 mV

~~dropped~~

8/22 Fill ~400 mV => dropped A.N
after several hrs to ~250 mV !!
Pressure before fill was ~ 2200 mb
though the power was ~360 mV.

8/23 Filled again.

4/26 New tank of 50L Xenon put in
+ excimer laser passivated over night -
New regulator put in as well (matheson).
High pressure-400 psi, low pressure 10 psi
390 mV after few minutes

5/10 Measured p = 3000 mb. The Neon
tank was open to ~60 psi, + it apparently
ruptured inside the excimer. New
solenoid must be ordered. - New
- fill to 2600 mbar. Excimer now
- behaving normal.

(10) 12/6
PUT NEW TANK OF HCL (w/ H_2 added) in place of HCL tank
that had NO H_2 in it. ALSO I cleaned the front window
of the excimer. I also changed the leaky solenoid
valve connected to the argon line.
THE TANK OF HCL-He MIX contains 1% H_2. SINCE
the FILL requires 80mb HCL mix, the ~~fraction~~ amount
fraction of H_2 in the eximer tank is

$$\frac{.8\,mb}{2600\,mb}$$

12/7 New fill power 163 mJ or 426 mV
w/ HCl/He mix.
Higher power than normal so far, although fluctuations
about 40 mV/426 mV ~ 10%

1/3/89 new fill:
Pressure was 2400 mBar, power was
340 mV.
initially 450 mV after fill
after 1 hr. 390 mV at 20.5 kV

1/29/83 new fill
initially: 480 mV at 20.4 kV

3/15/89 new fill
initially 455 mV at 20.4 kV

4/11/89 new fill
initially 460 mV at 20.4 kV
later 380 mV

6/8 New fill
380 mV = 147 mJ

6/16 New fill
380 mV = 147 mJ

6/29 New tank of Neon (UHP) 380 mV after fill - possibly some air contamination in Neon regulator when changing tanks.

7/19 New fill 400 mV

9/23 at 20.5 kV 243 mV
~~new~~ fill: need more Ne.
440 mV initially

10/23 at 20 New fill: 450 mV initially
= 173 mJ

11/4 390 mV =
ran for ~ 3 minutes, then laser tripped off. Pressure in head = pinned at max > 4 atm. What happened. Pumped out to 2600. Don't know what happened.
Pumped out the rest of the way (what was in there?

Xe & HCl tanks closed off securely. Ne tank open (40 PSI) That must have done it. I must check whether solenoid ~~is broken~~ valves are leaking.

Leave He line ~~filled~~ pressurized ① 30 PSIG, (Close valve to primary stage. Pressure ~ 100 PSIG primary) Excimer ~~fill~~ = 200 mbar. 3000 mbar ≈ 45 PSIA = 30 PSIG. Thus there is no danger of overpressuring in event of a leak.

After 3 hours, no change: I conclude that there's no problem.

11/5 Return after ~ 24 hours. He regulator primary is drained, press in excimer from 2000 to (2100) mbar. Definite leak (closer to 2050, but definitely in the solenoid valve. up.

11/6 Spoke to A tech service: Easy to replace stem ~~&~~ & gasket for solenoid valve. (~45$) No risk to excimer due to overpressure.

jmg

Filled. 452 mV

12/12 New fill

March 19 '90

New fill of oil for Vacuum pump
changed Halogen filter

March 28 '90

Replaced the stems of Solenoid valves of buffer and noble gases.