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		Recorded by	4/3/03

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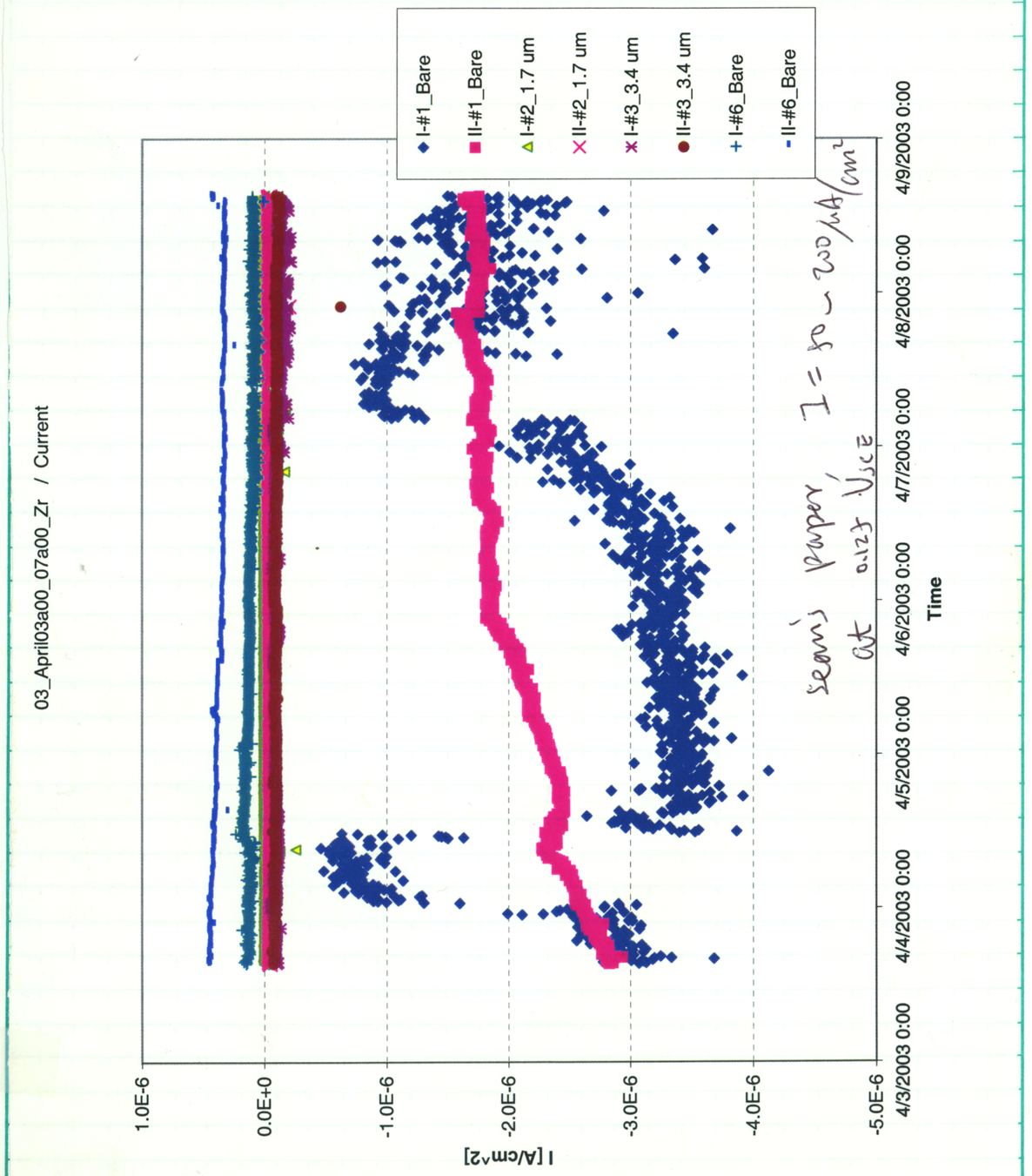

Sean's paper, I = 50 ~ 200 μA/cm²
at 0.125 V_SCE

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4/23/03

14:29. Water level in cell I + II too low, just touch the edge of the Bare electrodes.
water added so 1/4" of the bare electrodes submerged.

4/28/03 Noticed, program stopped. Stopped at ~~4/22/2003, 8:38~~ 4/22/2003, 8:33 5/7/03 J.Y.

8:38 Restarted, File name 03_April28a.

5/9/03 15:40 connected I-Pt2 with I-Pt1
II-Pt2 with ~~II-Pt1~~ #4 J.Y. 5/9/03
~~Pt1~~
to raise the E.

16:22 removed I-Pt1, just I-Pt2 coupled with #1, 2, 3 electrodes.
removed II-Pt1, just II-Pt2 coupled with #1, 2, 3 electrodes.

5/12/03 8:52. E_{I-Pt2} = 71.2 mV ; E_{II-Pt2} = 194.79 mV. good?
E_{I-Pt1} = 241 mV ; E_{II-Pt1} = 264. mV.
connect I-Pt1 with I-Pt2
II-Pt1 with II-Pt2.

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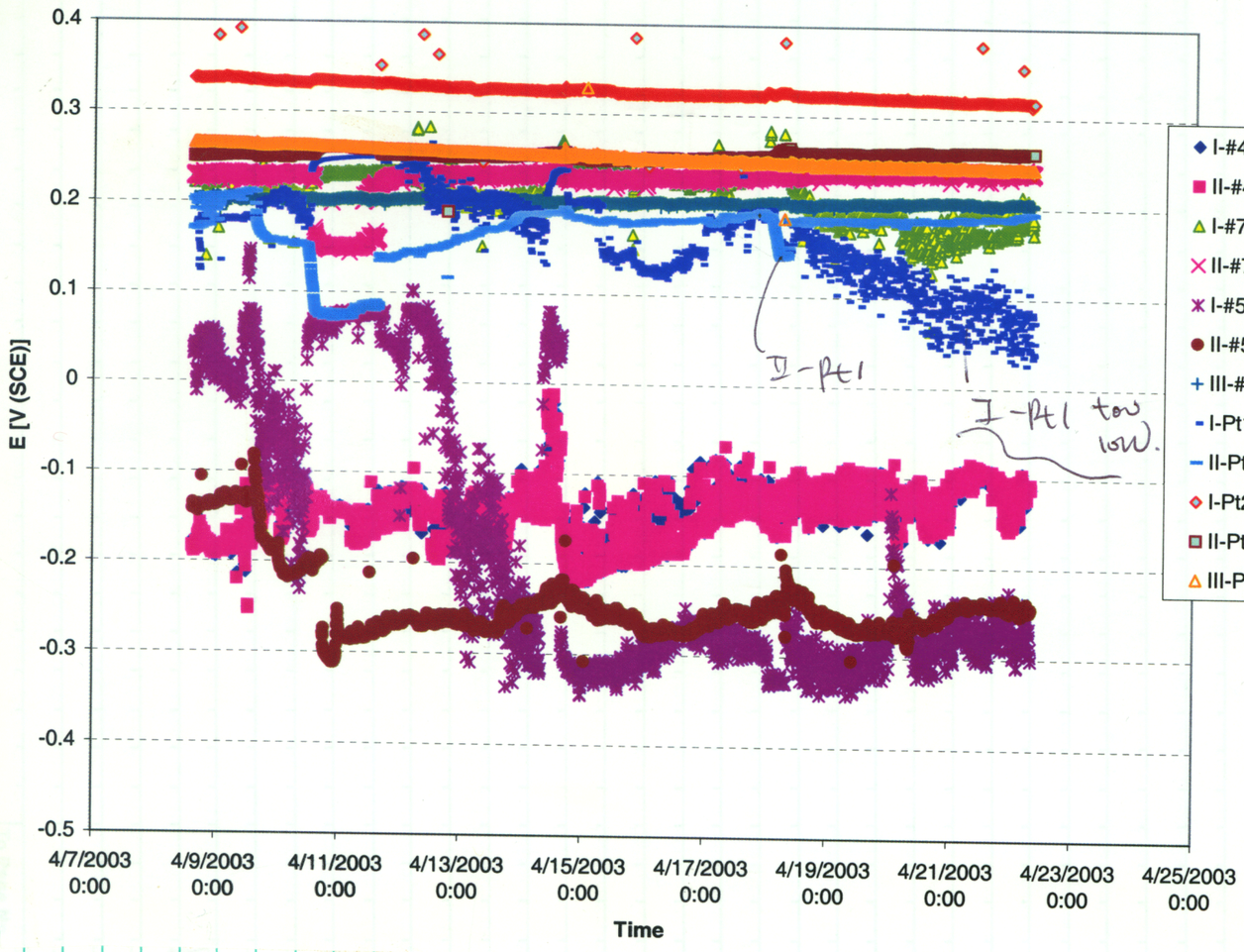
File: Zr_03_April08a00_a03 / Tab: Potential



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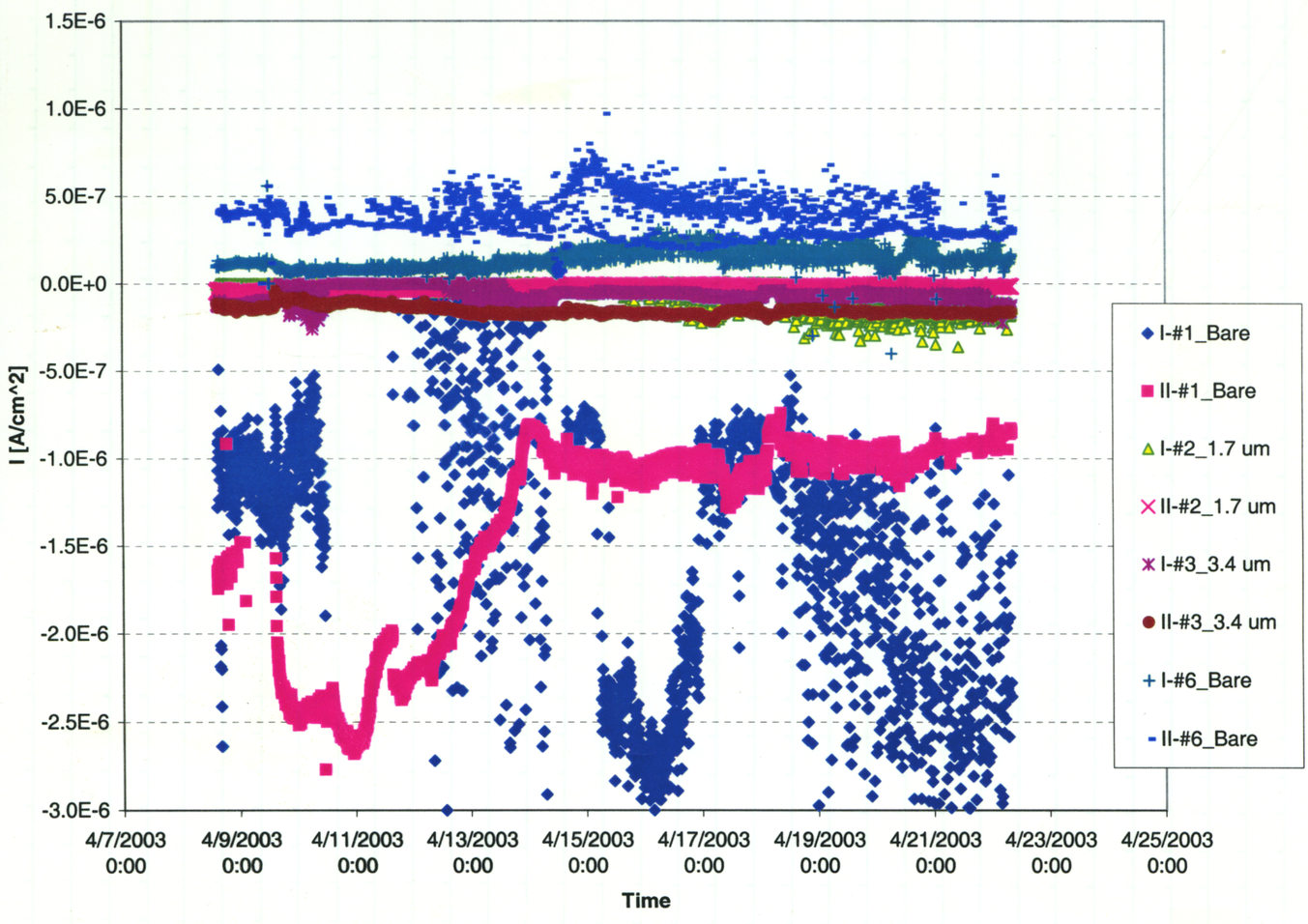
Zr_03_April08a00_a03 / Current



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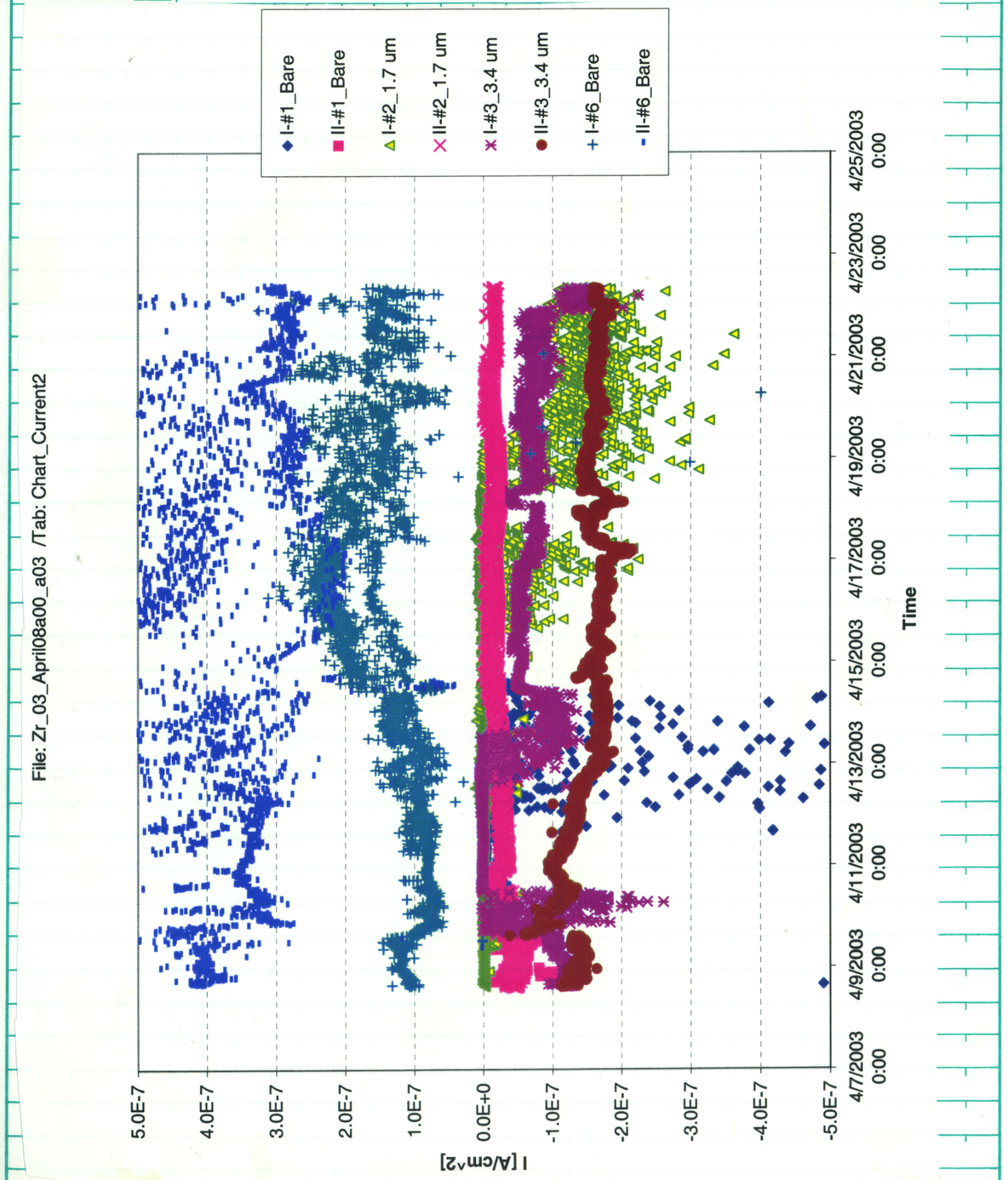

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5/

6/2/03. 17:00 uncouple the electrodes.

By passed 1k Resistors (#12) for #3 connector.

By-passed 10k Resistors (#8) for #2 connector.

By-passed ~~10k~~ 1k J.Y. 6/2/03 Resistors (#17) for #~~2~~ 1 J.Y. 6/2/03 connector

T (Thermometer (SN 498-182)) = 92°C.

Controller Temperatures:

I	II	III	
91.6	93.5	92.7	
91.7	93.5	92.8	→ set point

Cell II, Bare coupons barely touch liquid level.

17:07 Data point # 5885 obtained! (showing time 4:53 p.m.)

17:27 last data point, power off.!

Results see pages 65-67 and 74.

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6-3-03 Restarted computer with Data File ~~06-June03~~ 03_June03 @ 8:17 A.m

data see pages 75-76

* Note. Major power shutdown last night beyond UPS capability. All Temp Controllers And Keithleys shut down But were back on this Morning

6/6?

6/3/03

8:59. Heaters shut down. Data points 7 cycles 8:56 A.m

12:53 T = 58 °C

16:48 T = 40 °C

data see Pages 75-76

6/6/03 6/6/03, 14:29 p.m. new file: 03_June06.txt started.

16:01 All connections to the cells disconnected.

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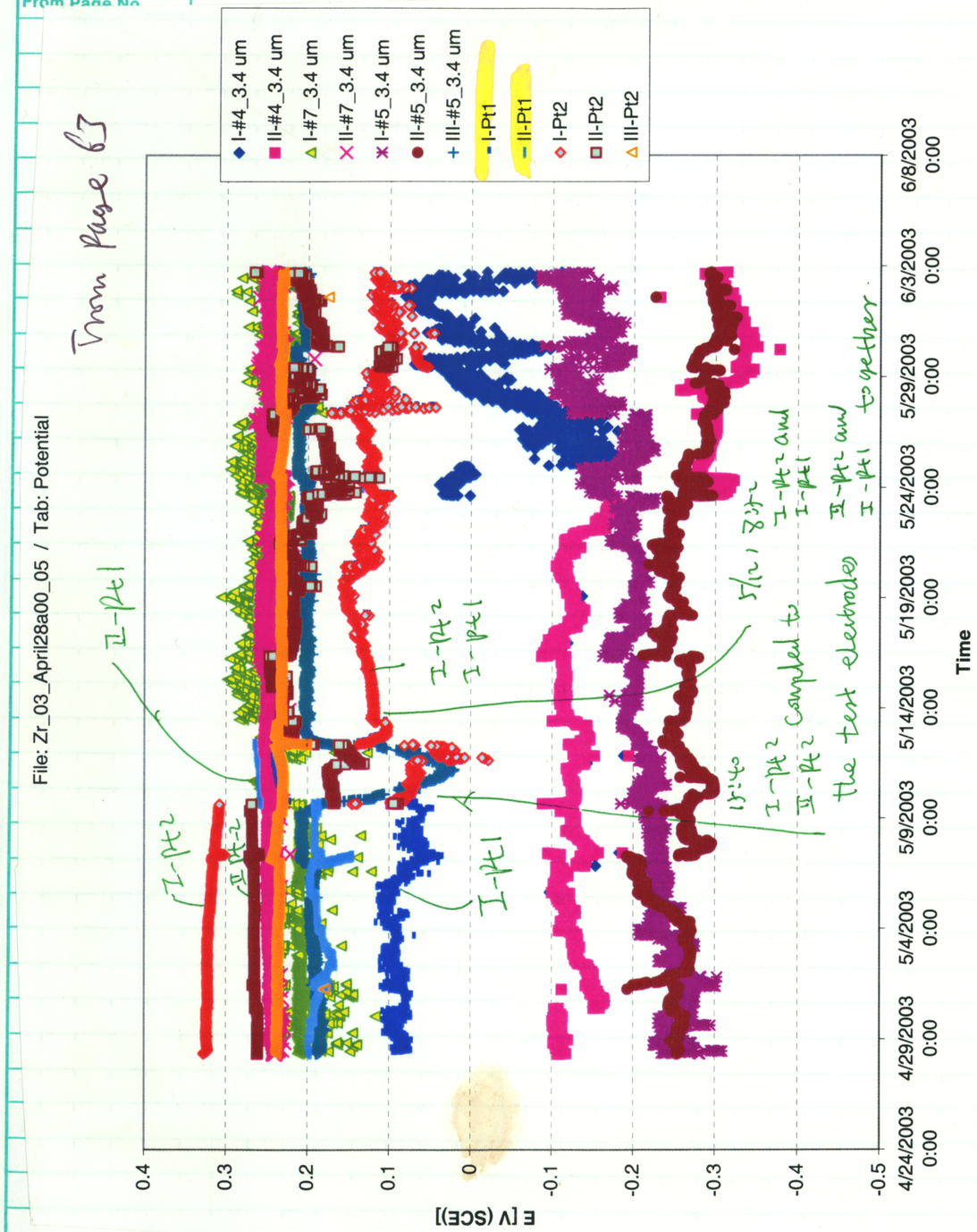

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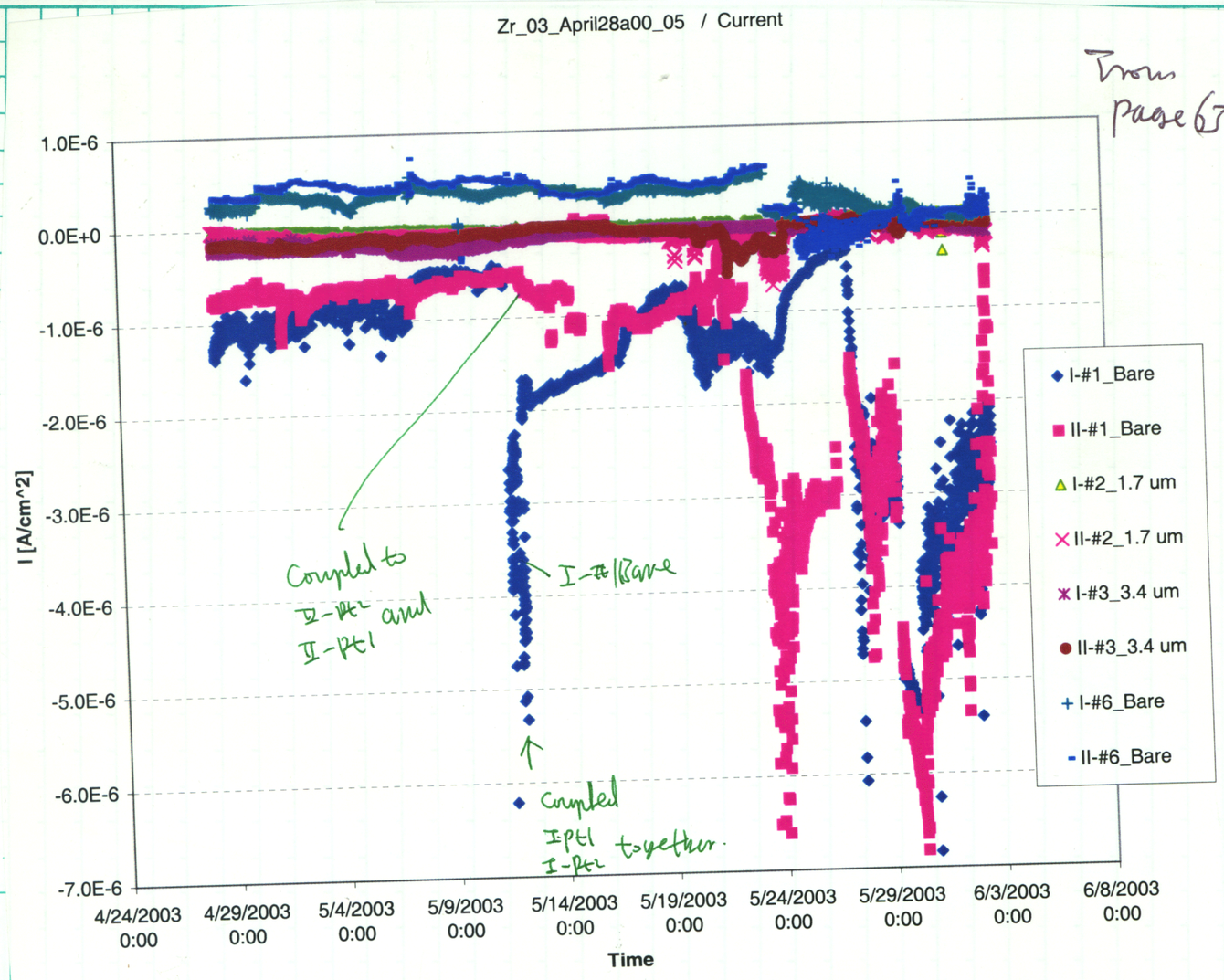

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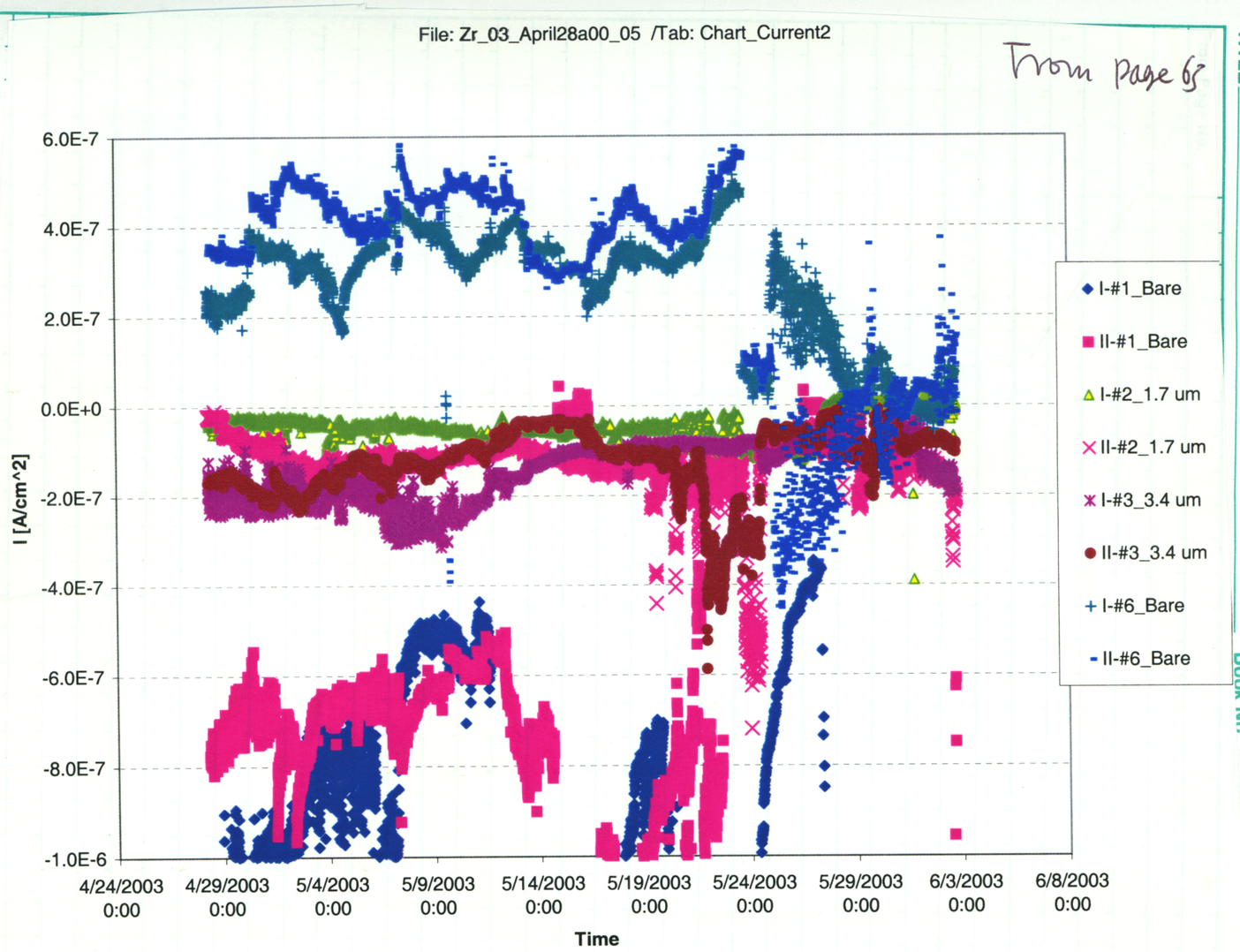

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6/10/03

1:43 p.m. Cell #III opened

Max immersion depth = 57.2 mm

lowest depth mark 36.4 mm.

When took out: 47.2 mm. depth.

No apparent corrosion.

wt: 69.28721g

pH = 4.947

See pg #26

See page 27

Restarting Test · New solution 0.1 m NaCl

Start pH: 5.965

11.697g NaCl Lot # 030152

End pH: 5.48

+ DI water To 2000mls

Specimen End wt: 69.28608g

2:37 p.m. Cell II Opened

#6 Bare electrode. Apparent depth of immersion 0.237 cm.

#1 Bare electrode Apparent depth of immersion 0.163 cm.

upp. joint to lead corroded!

pH: 4.932 see also page 27

The surface of I-#1; I-#6, II-#1 and II-#6 specimens were examined. see pages 85 ~ 89.

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Recorded by L-Yang

From Page No.

New Type III Specimens Made @ SWRI Machine shop

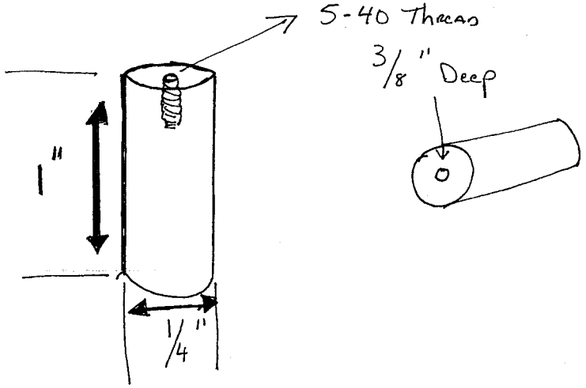
See pg #3-11 for Material - Zinc Rod.

Drawing Sent To Machine shop

Zirconium Rod - Specimens Project/change #20.06002.01.081

Total = 6 Cylinder

#1223217, #243687 Rod supplied.



6pcs Made From Supplied Rod #1223217, #243687

Walter L. Smithson 6/23/03

SwRI 24 QA

For: Licai Yang

X 2483

Thanks Brian

X 6627 Lab 5448

6pcs OK

Calipers 30-6C-8

Thd Gage

SwRI 24 QA JUN 23 2003

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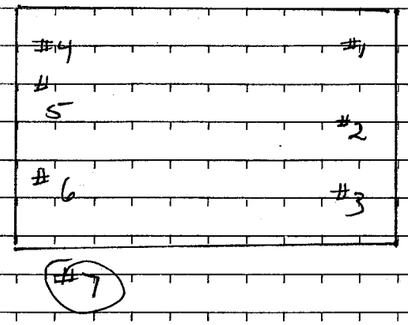
New Cell Specimen Configurement

Cell #2

Connection Color Wire
#1 = white
#2 = Red
#3 = Blue
#4 = Green
#5 = Black
#6 = Brown
#7 = Rod (Brass Rod)



Specimen #1 Type III Base
Start wt: 4.79941g End wt: 4.76861g Specimen New
Specimen #2 Type I 1.7mm
Start wt: 28.00863g End wt: 28.01380g
Specimen #3 Type I 3.4mm
Start wt: 29.43789g End wt: 29.43919g
Specimen #4 Type II
Start wt: 63.44178g End wt: 63.44563g
Specimen #5 Type II
Start wt: 69.42486g End wt: 69.42962g
Specimen #6 Type III Base Specimen New
Start wt: 4.67159 End wt: 4.66957g
Specimen #7 Type II
Start wt: 63.80363 End wt: 63.79980g

All specimens weights Taken with Sartorious Genius SN# 128090599
Cal 5/15/03 Due 11/15/03

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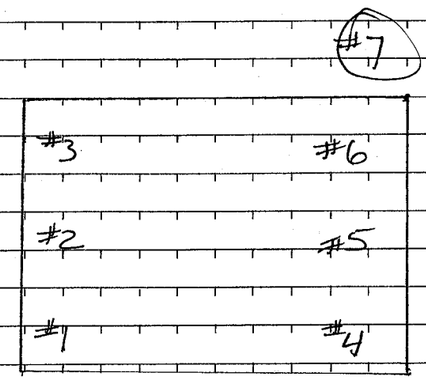
New Cell Configurement

Cell #1

Connection Color Wire
#1 = Brown
#2 = Black
#3 = Green
#4 = Blue
#5 = Red
#6 = White
#7 = Rod (Brass Rod)



Specimen #1 Type III Base
Start wt: 4.81699g End wt: 4.57850g Specimen New
Specimen #2 Type I 1.7mm
Start wt: 27.97631g End wt: 27.88149g
Specimen #3 Type I 3.4mm
Start wt: 29.28801g End wt: 29.29351g
Specimen #4 Type II
Start wt: 69.47483g End wt: 69.47203g
Specimen #5 Type II
Start wt: 69.53810g End wt 69.54376g Specimen New
Specimen #6 Type III Base
Start wt: 4.77415g End wt: 4.78418g Specimen New
Specimen #7 Type II
Start wt: 69.79215 End wt: 69.79185g

All Specimen wts Taken with Santorious Genius SN# 128090885
Cal 5/15/03 Due 11/15/03

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New solutions for Cell #1 And Cell #2

Cell #1

0.1 M NaCl
11.684g NaCl Lot # 030198
+ DI water To 2000mls

pH Start = 5.791 Fisher Accumet 950 meter SN# 3340 Cal 8/7/02 Exp 8/7/03
pH End = 1.73 pH probe # 13-620 296 SN# 2291257P6

Cell #2

0.1 M NaCl
11.690g NaCl Lot # 030198
+ DI Water To 2000mls

pH Start = 5.677 Fisher Accumet 950 meter SN# 3340 Cal 8/7/02 Due 8/7/03
pH End = 5.63 pH probe # 13-620-296 SN# 2291257P6

Cell # 3 No Solution Change See Pg # 68

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6/27/03
17:00 Wire connections made. (see Page 15).

Resistors are the same as June 10/2003.

6/30/03
11:54 I-1 Return connected to Reference electrode.
14:44 I-2 and I-3 Returns connected to Reference Electrode

All had been Heated before connected to Reference electrode.
9:00 program Restarted 03_July02a.
7/2/03 Complete the electrodes as shown in Pages 15 + 45.
9:50 Connector 10k, # 12 to # I-3 Return. also to II-Pt1
Connector 10k, # 8 to # I-2 Return. also to II-#4 & I-#4
Connector 1k # 17 to # I-1 Return. also to I-Pt1

10:00 Connections done.

However I-3 Ch. 1 (II-#1 Bare) = -100 mV
S.C. II-Pt2 too high.
Reconnected II-Pt2 2.y. II-Pt1 2.y. 10/30/03
II-Pt1 10/30/03
to I-3 Return, dropped to -68 mV.
must be due to bad connection! good.

10:30 II-#7 -3.4 pH : -78 mV SCE, Lead rod in liquid.
pulled lead rod out. ep = 166 mV SCE Good!

11:34 I-#1 positive current! ep = +261 mV SCE
if decoupled from I-Pt1, ep = +291 mV!

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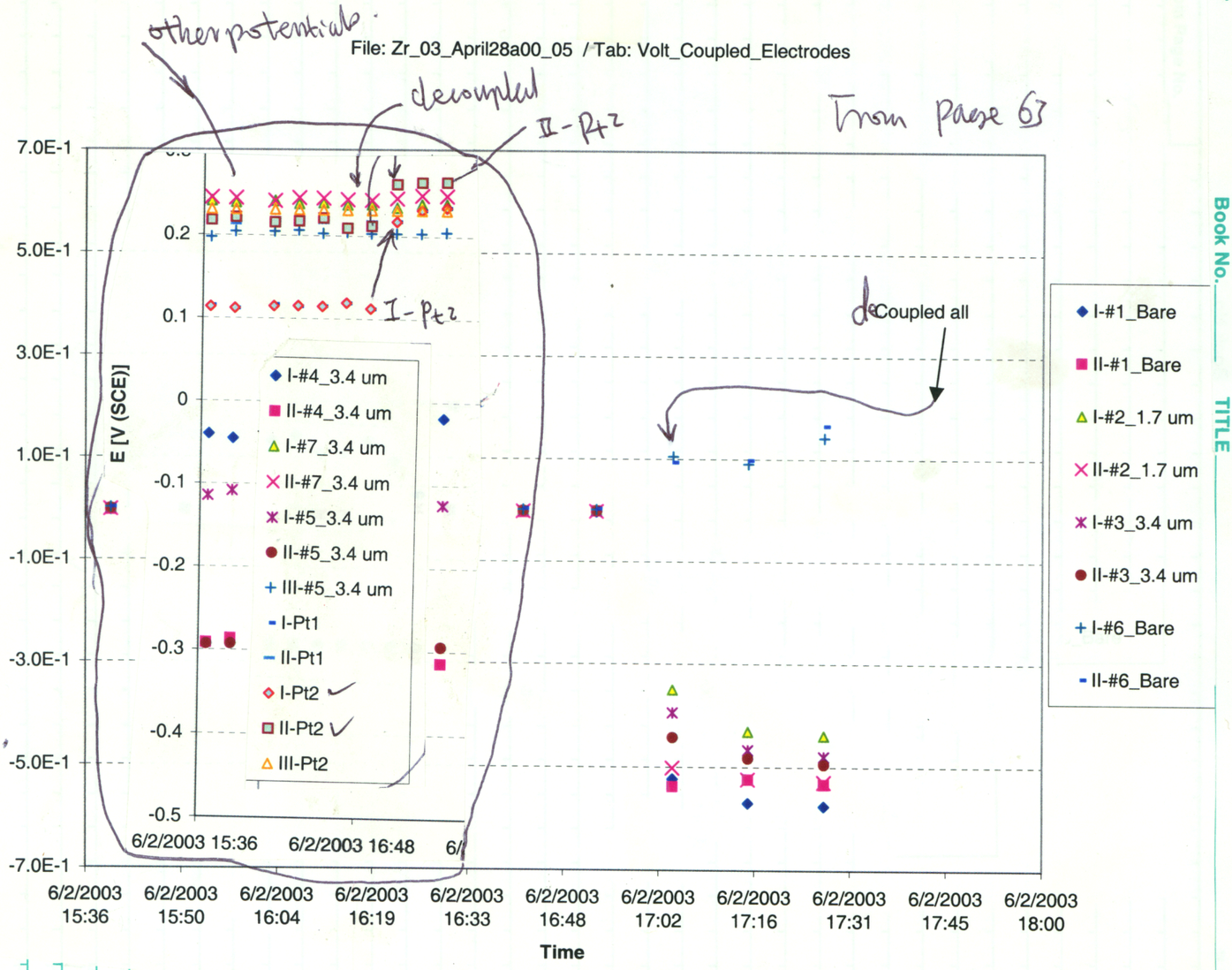

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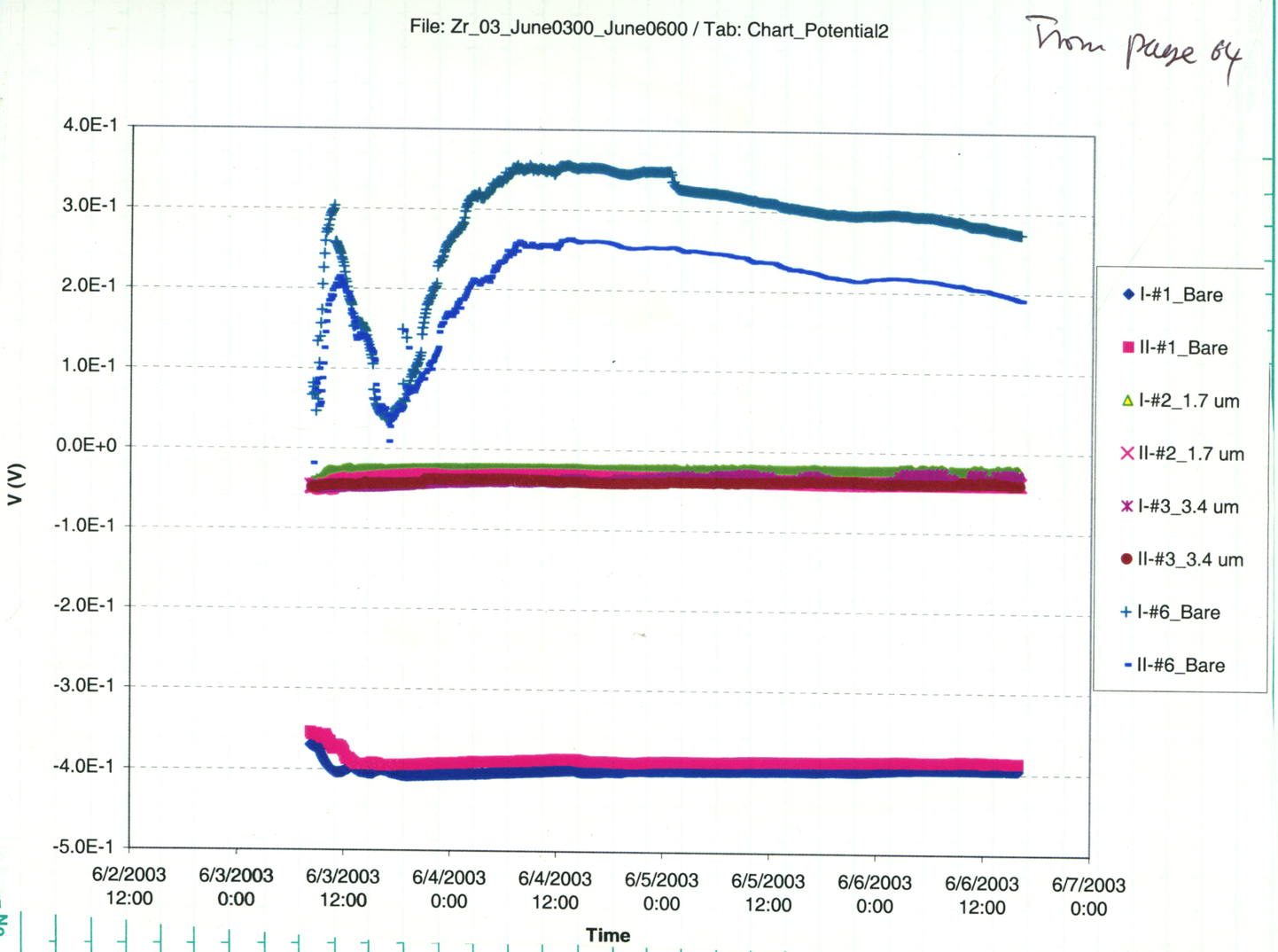

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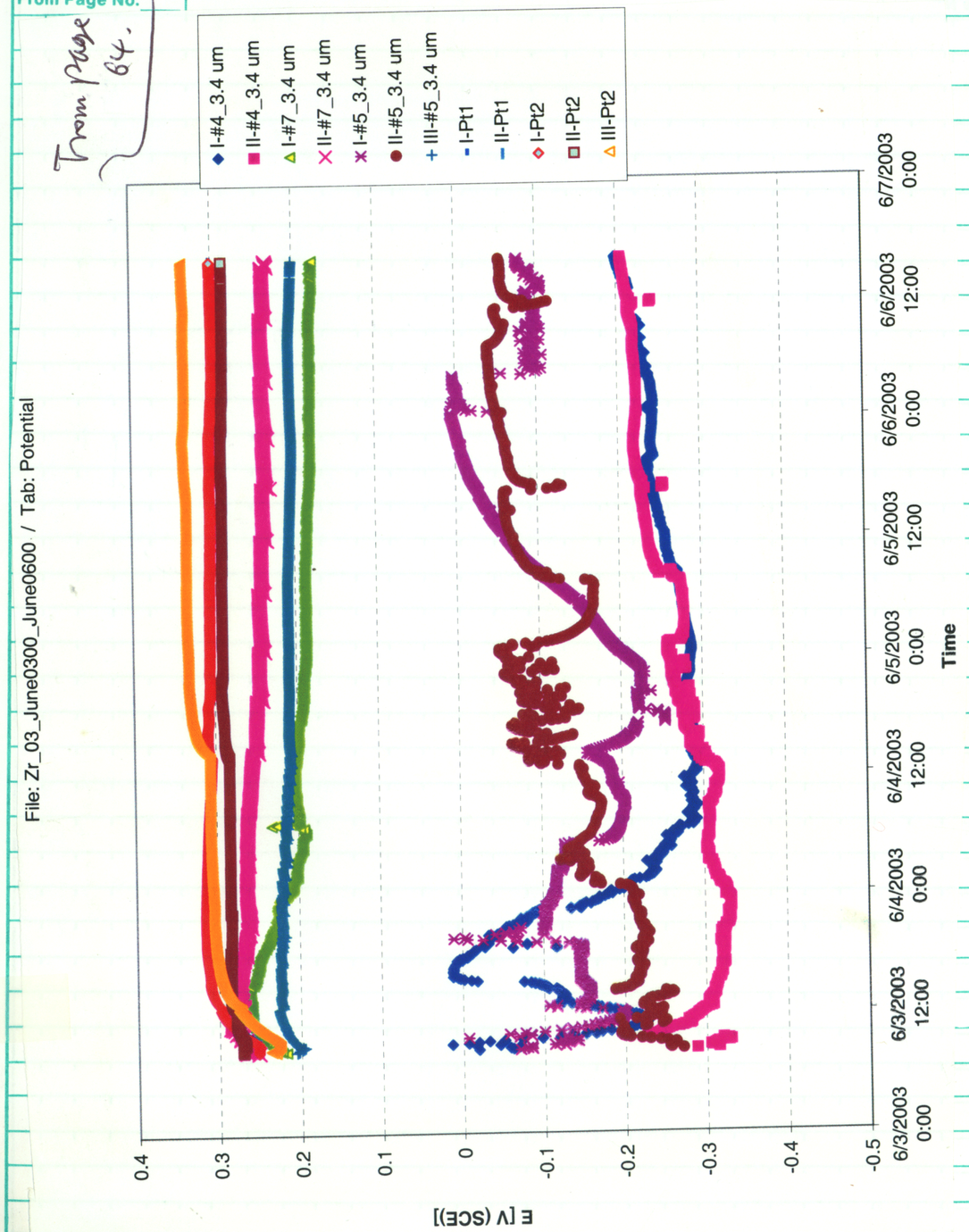

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7/2/03
11:34 II-#4 = -57 mVSCE, = -257 mV after decoupled with II-#6 + I-#6 + II-#4

I-#4 = -86 mVSCE = -87 mVSCE after decoupled with I-#6 + II-#6 + I-#4

I-#4 = -45 mV after decoupled with II-#4

Connector to I-#4 not good, re connected to I-#4

I-#4 = -~~69.1~~ 69.1 mVSCE; I-#4 = +55 mVSCE after disconned II-#4 alone

II-#4 = -67 mVSCE; II-#4 = -60 mVSCE after disconnected II I-#4 alone

affecting each other

When shared same Return of II-2 connector.

7/2/03
1:00pm Spikes Both Cells #1 And #2

Cell #1 Spikes with 2.708g $FeCl_3 \cdot 6H_2O$ Lot# 005437 = 5 mM
withdrew 100mls of Test solution Added $FeCl_3$ then F.W. = 270.3
Returned to Test cell once $FeCl_3$ was Soluable d=1.82

cell #2 Spikes with 1080µl of 5 mM. 31.5%
Hydrogen Peroxide 30% Lot# 010839, F.W. = 34.01
Used Eppendorf pipeton sn# 360050 d=1.18 for 50% H_2O_2
1.080 * 1.080 / (2L * 34.01) = 5 mM d = 1.08 measured.

Cycle #41 Computer Time was 12:47pm 36 BM 7/2/03

7/3/03 Resistor #17 (1kΩ) on I-1 changed to 10Ω (#23)
10:05 Resistor #12 (10kΩ) on I-3 changed to 100Ω (#11)

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7/7/03

15:32 Noticed II-Pt1 potential was not stable 0.1 – 0.2 V.

II-#1 Bare current was low after the Resistor changed from 1000 Ω to 100 Ω?

II-Pt1 = 219.6 mV$_{SCE}$, = 210 mV$_{SCE}$? after decoupled. 1.5 min after decoupled.

II-#1 Bare = 219.6 mV$_{SCE}$; = 108 mV$_{SCE}$

2.9. 7/7/03

II-#2 Bare = -1.7 μm ; = 115 mV$_{SCE}$, 1.5 min after decoupled

II-#3 3.4 μm = ; = 156 mV$_{SCE}$, 1.5 min after decoupled.

15:40 II-Pt1 = 209 mV after decoupled, = 206 mV when coupled!

why?

15:59 II-Pt1 = 195 mV when decoupled. = 193 mV when coupled!

16:00 disconnect II-#6 from connector I-2 Ch. 10 to prevent interference

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7/13/03 7:38: Computer was down, last night there were power off.

Program restarted. File: 03 July 13a

results see page 91–94

7/14/03 17:05. Circulating cooling water bursted. Twice!

Reference electrode and condenser left without circulating water overnight!

7/15/03 8:47 Reference Temperatures without cooling: Cell I 66°C Cell II 62°C Cell III 60°C

7/17/03 10:25. Return of I-1 and commons of #1, #2 and #3 found disconnected from I-Pt-1

— connected!

Cell I, depth of immersion of Bare electrode: 1/4"

Cell II, depth of " " " " " 1/2"

J.Y. 7/17/03

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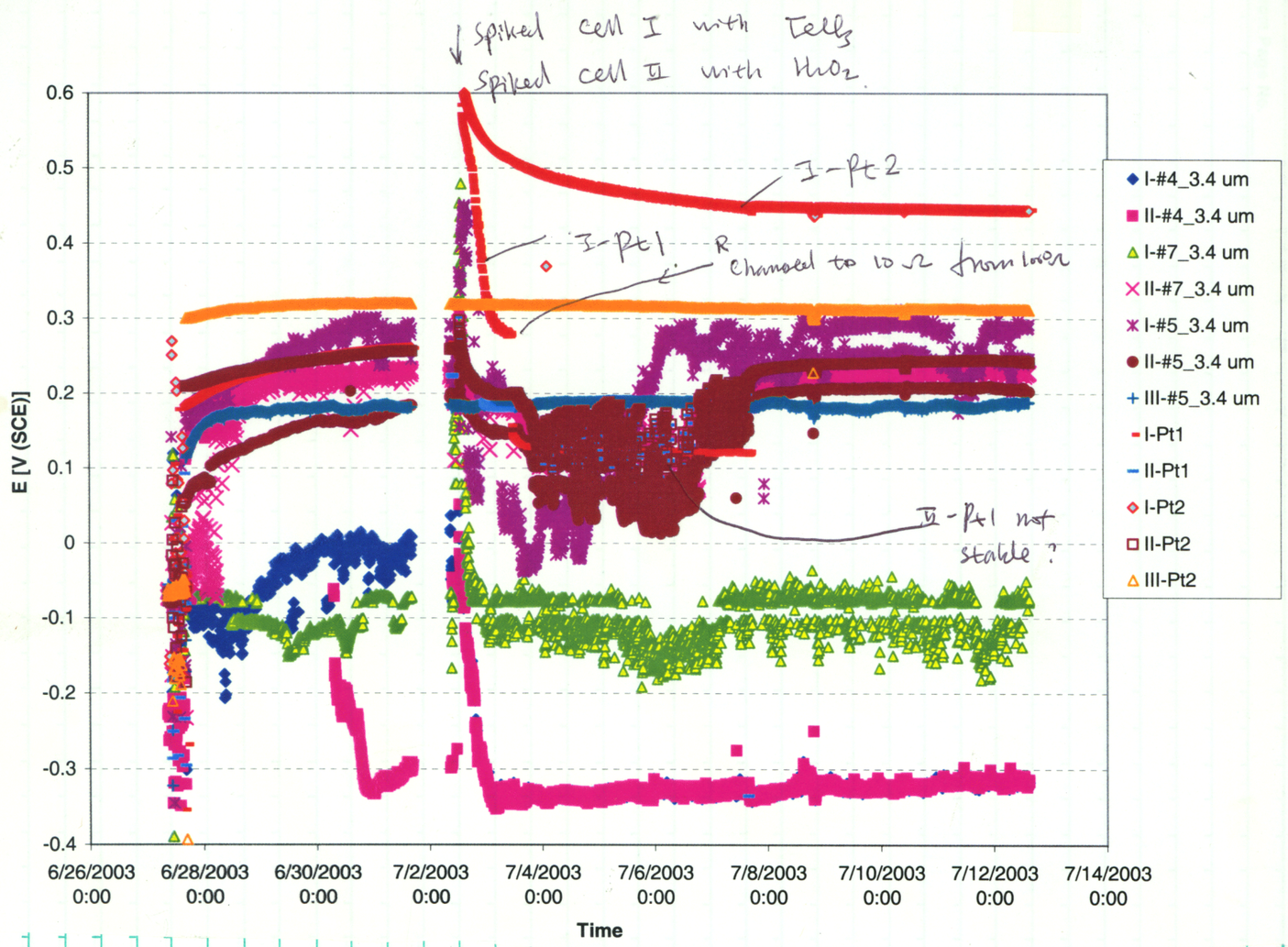
File: Zr_03_June0604_July02a02 / Tab: Potential



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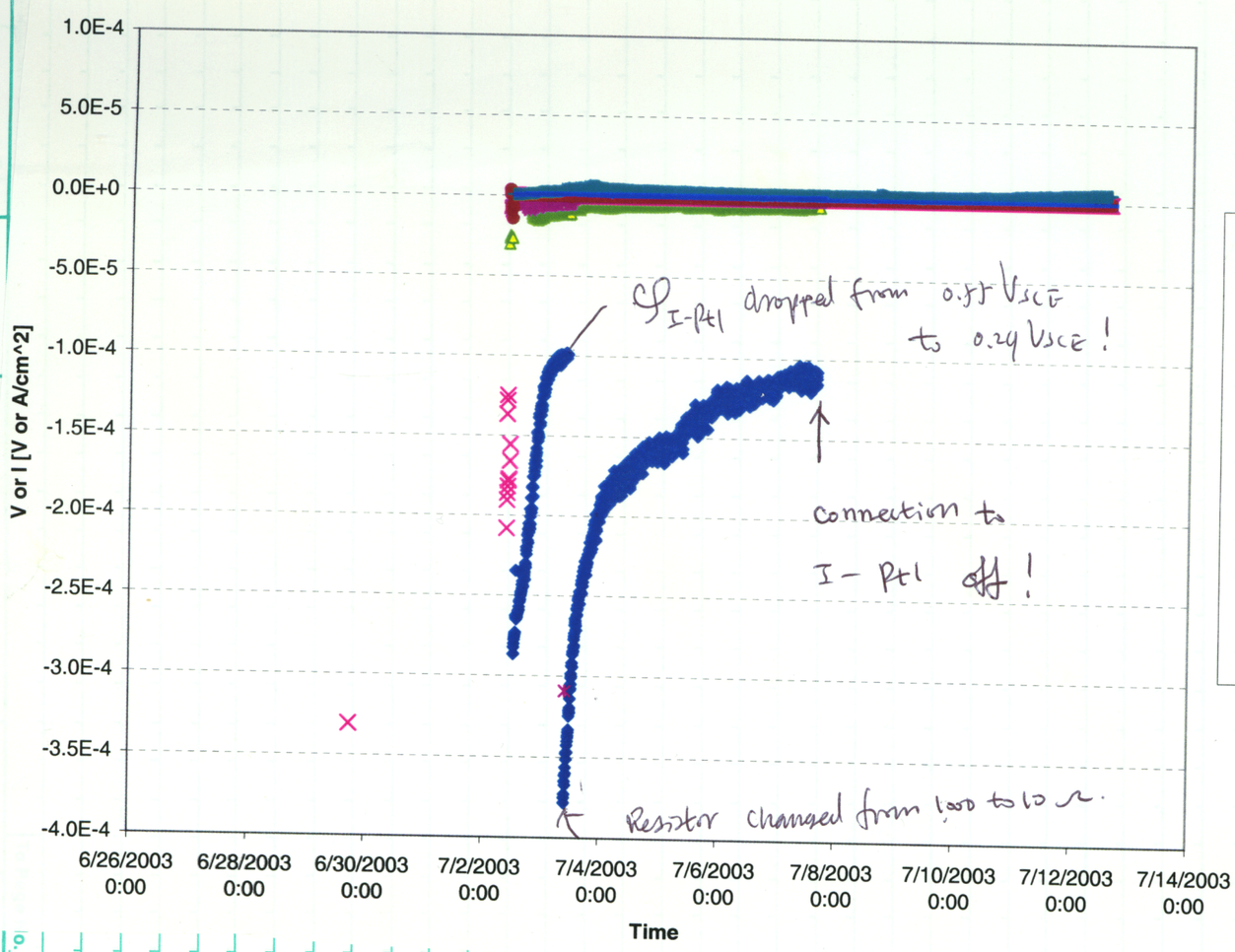
File: Zr_03_June0604_July02a02 /Tab: Chart_Current



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