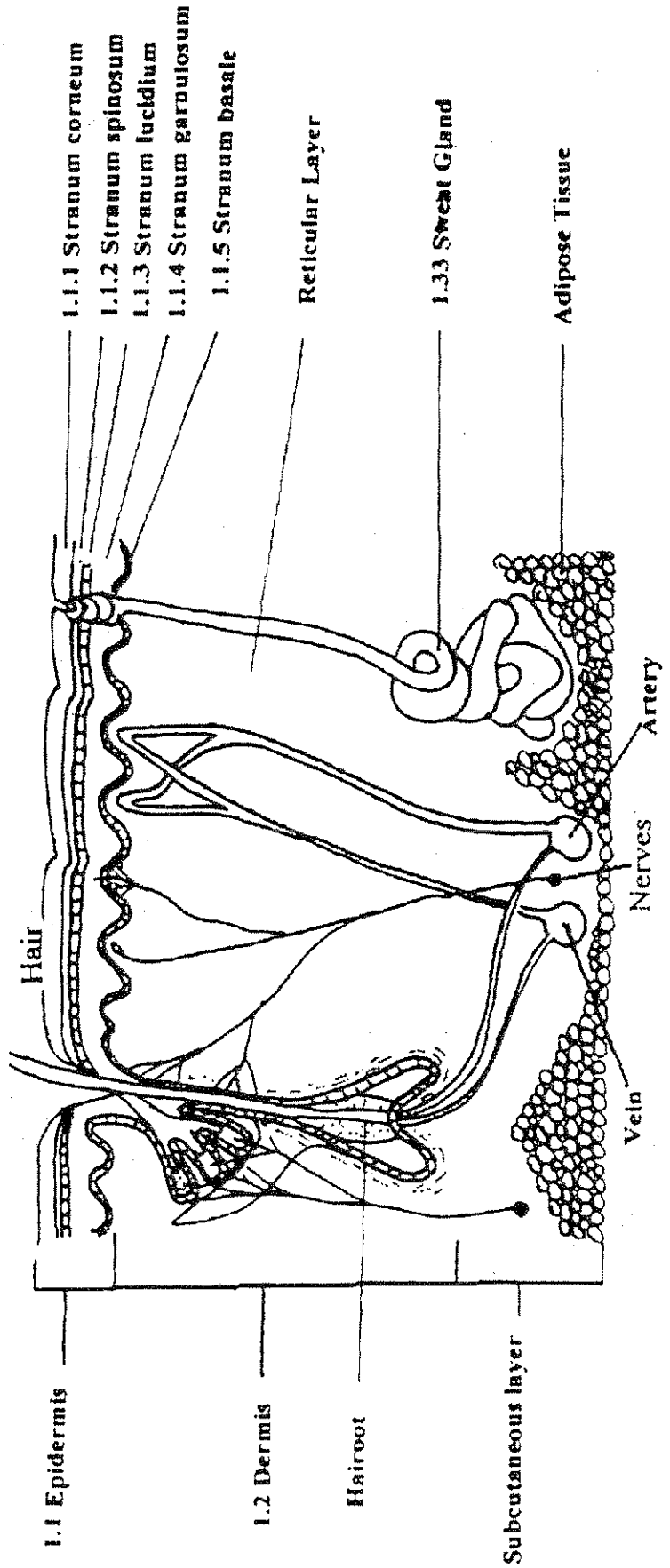

1.1.1 Stranum corneum
1.1.2 Stranum spinosum
1.1.3 Stranum lucidium
1.1.4 Stranum granulosum
1.1.5 Stranum basale
Reticular Layer
1.33 Sweat Gland
Adipose Tissue
Hair
Artery
Nerves
Vein
1.1 Epidermis
1.2 Dermis
Hairroot
Subcutaneous layer

FIGURE 1

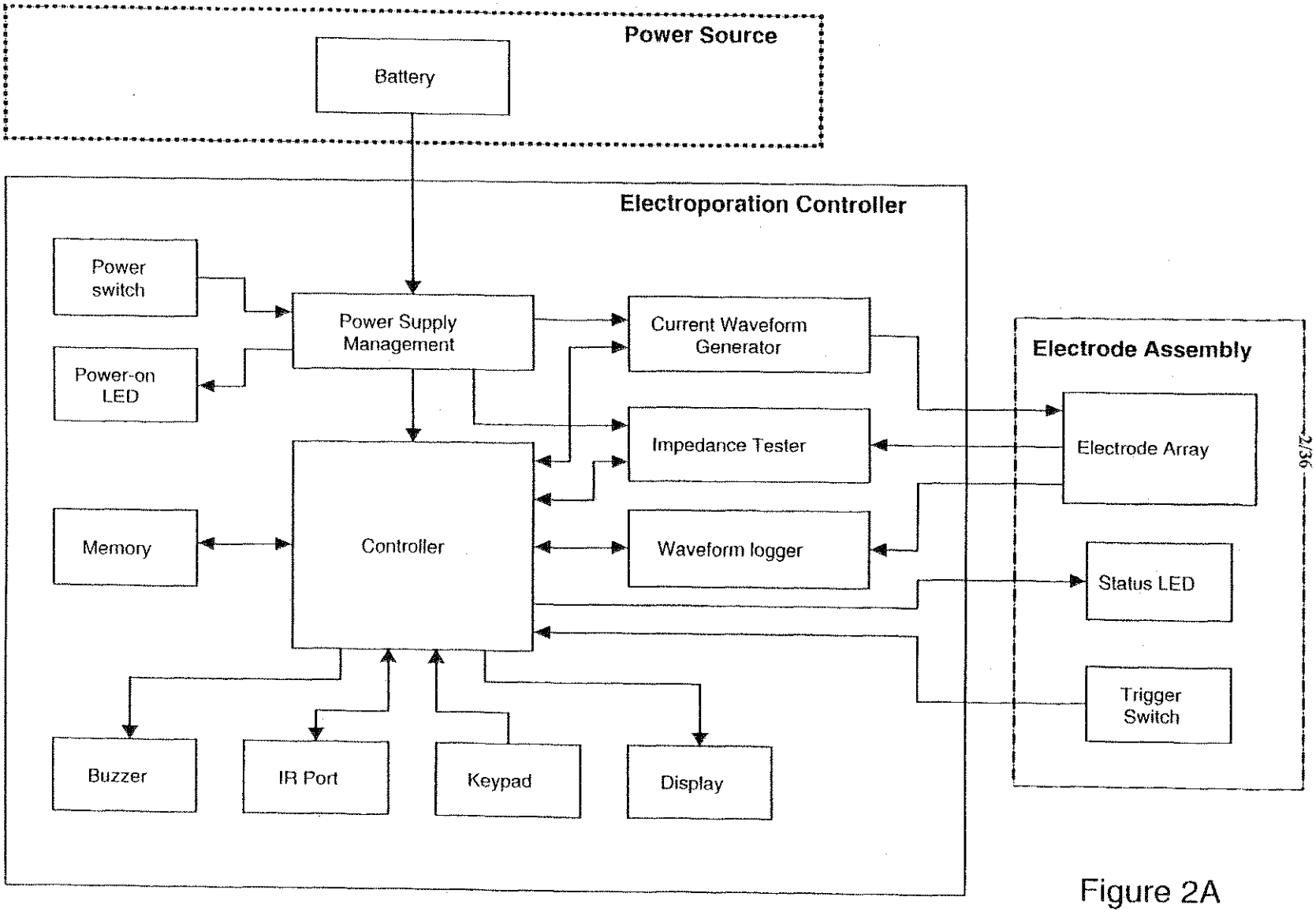

Power Source
Battery
Electroporation Controller
Power switch
Power-on LED
Power Supply Management
Current Waveform Generator
Impedance Tester
Memory
Controller
Waveform logger
Buzzer
IR Port
Keypad
Display
Electrode Assembly
Electrode Array
Status LED
Trigger Switch

Figure 2A

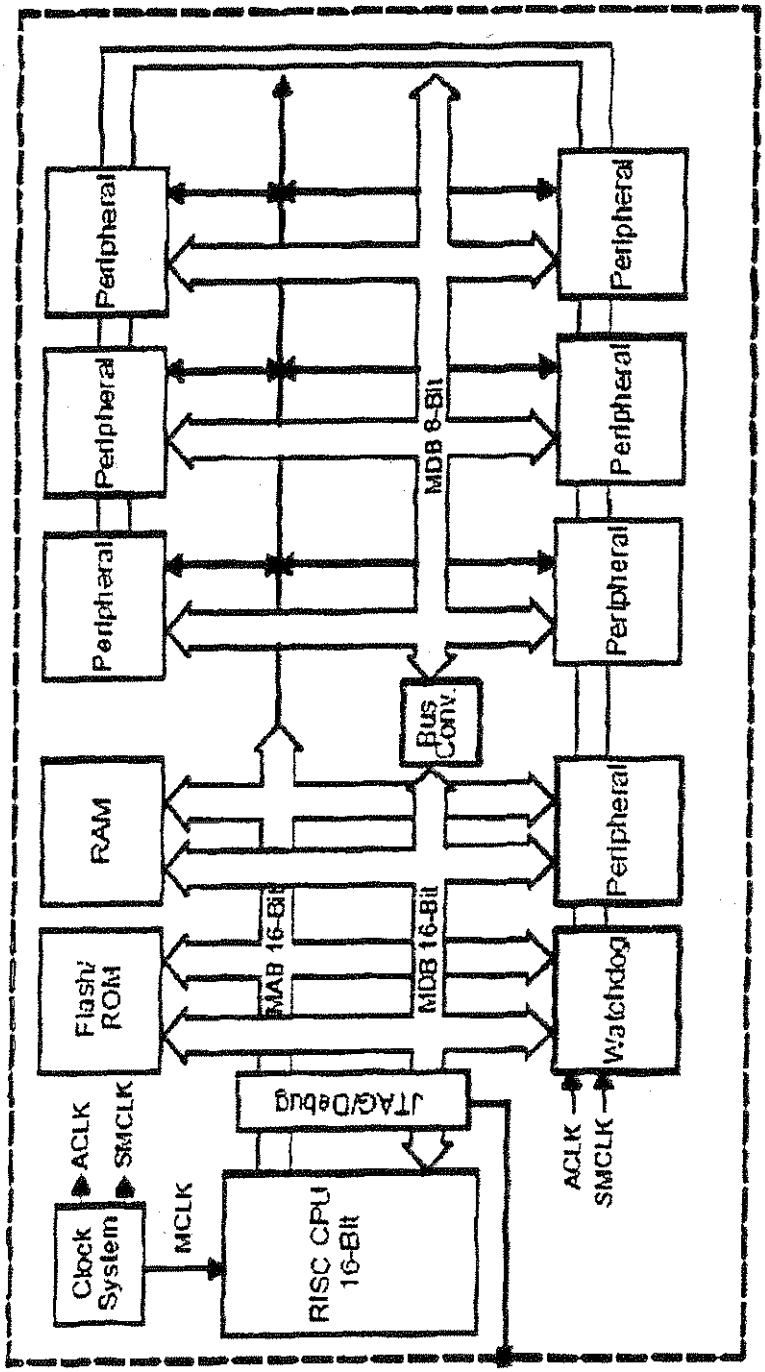

Peripheral
Peripheral
Peripheral
Peripheral
Peripheral
Peripheral
Peripheral
Peripheral
MDB 8-Bit
Bus Conv.
RAM
Flash/ ROM
MAB 16-Bit
MDB 16-Bit
Peripheral
Watchdog
JTAG/Debug
RISC CPU 16-Bit
Clock System
ACLK
SMCLK
MCLK
ACLK
SMCLK

Figure 2B

2.1

Filename:	00032210_06_06_28_15_26_43.csv					
Animal Number:	32210					
Pulse In Sequence:	1		2			
Prewait (s):	4		1			
Pulse Width (ms):	52		52			
Pulse Current (A):	0.1		0.1			
Electrode 1:	POS		OFF			
Electrode 2:	NEG		POS			
Electrode 3:	NEG		NEG			
Voltage (V)	Current (A)	Voltage (V)	Current (A)		Z1 (Ohms)	Z2 (Ohms)
4.54	0	3.37	0			
4.49	0	3.42	0			
4.59	0	3.42	0			
154.08	0.1	143.53	0.1		1540.6459	1435.1565
157.6	0.1	172.35	0.1		1575.8424	1723.3277
159.84	0.1	192.23	0.09		1598.2402	2135.6516
161.06	0.1	197.36	0.1		1610.439	1973.4027
161.65	0.09	197.7	0.1		1795.9116	1976.8023
160.82	0.1	197.51	0.09		1608.0392	2194.3117
159.99	0.09	197.61	0.09		1777.4692	2195.4227
159.01	0.1	197.36	0.1		1589.941	1973.4027
157.69	0.1	197.61	0.09		1576.7423	2195.4227
156.86	0.1	196.09	0.1		1568.4432	1960.7039
156.23	0.1	194.43	0.1		1562.1438	1944.1056
155.01	0.09	191.45	0.1		1722.142	1914.3086
154.57	0.1	187.35	0.1		1545.5454	1873.3127

2.2

2.3

2.4

2.5

FIGURE 2C

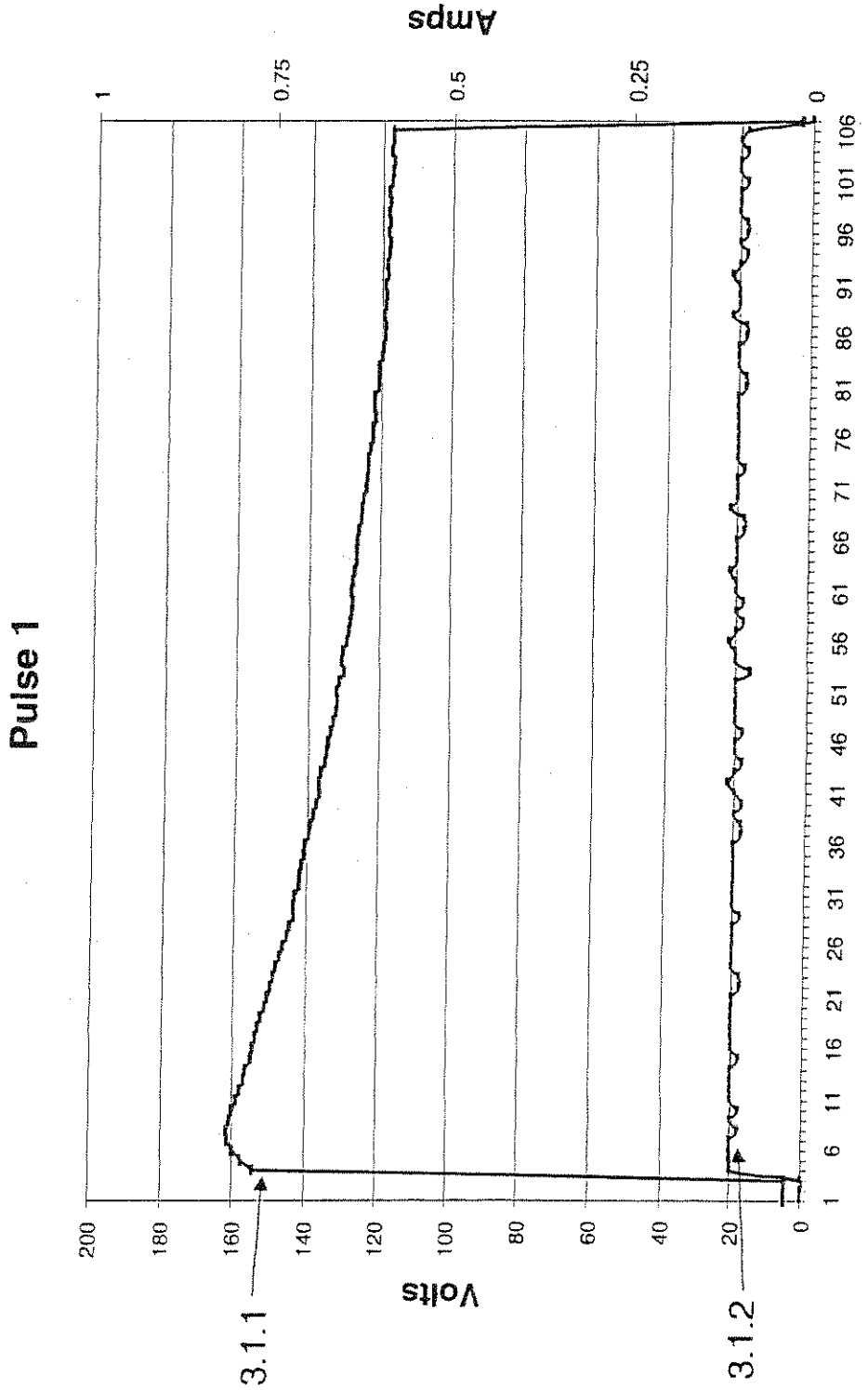

Pulse 1
Amps
Volts
3.1.1
3.1.2
1
0.75
0.5
0.25
0
200
180
160
140
120
100
80
60
40
20
0
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71 76 81 86 91 96 101 106

FIGURE 3.1

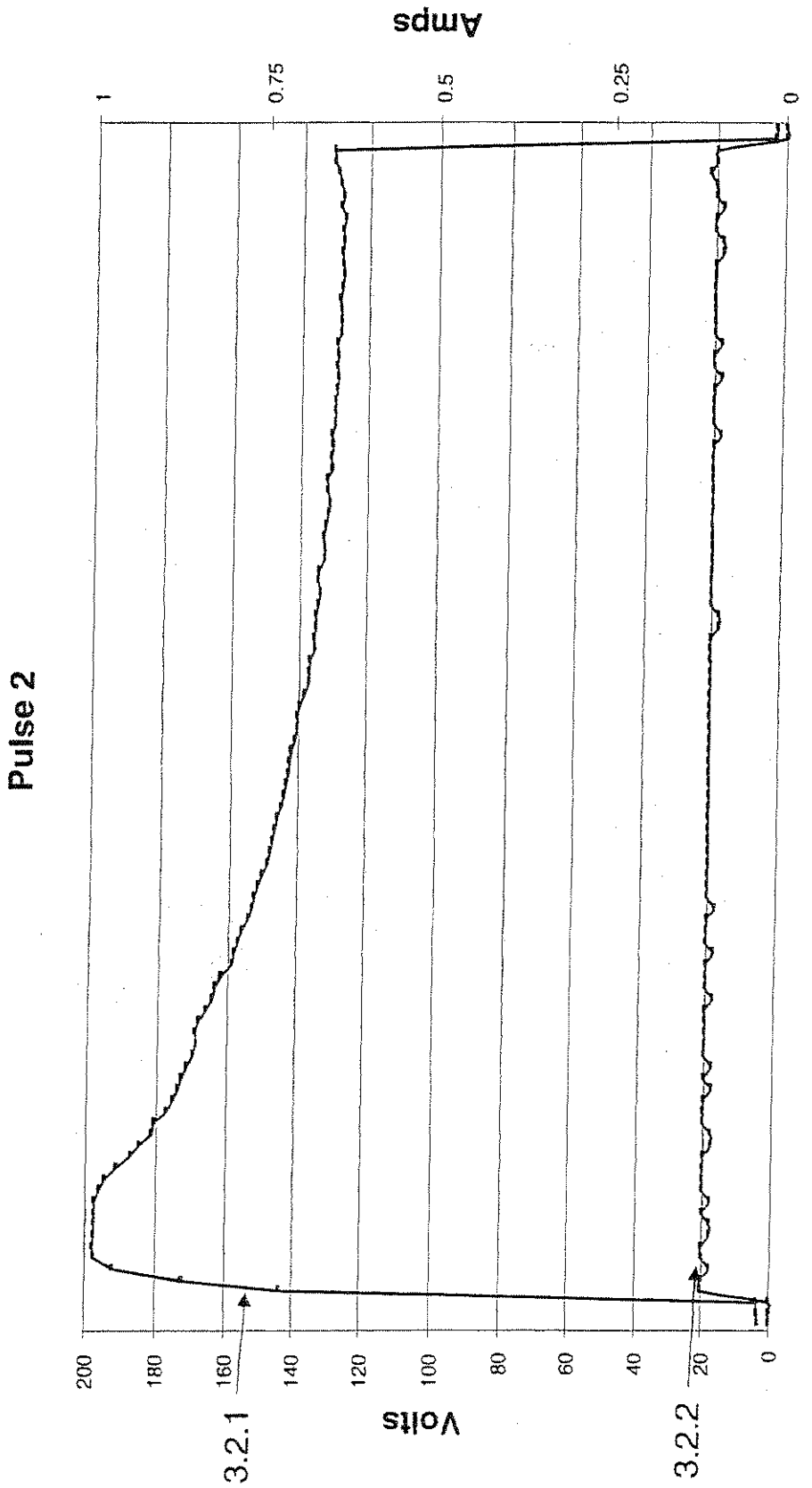

Pulse 2
Amps
1
0.75
0.5
0.25
0
Volts
200
180
160
140
120
100
80
60
40
20
0
3.2.1
3.2.2

FIGURE 3.2

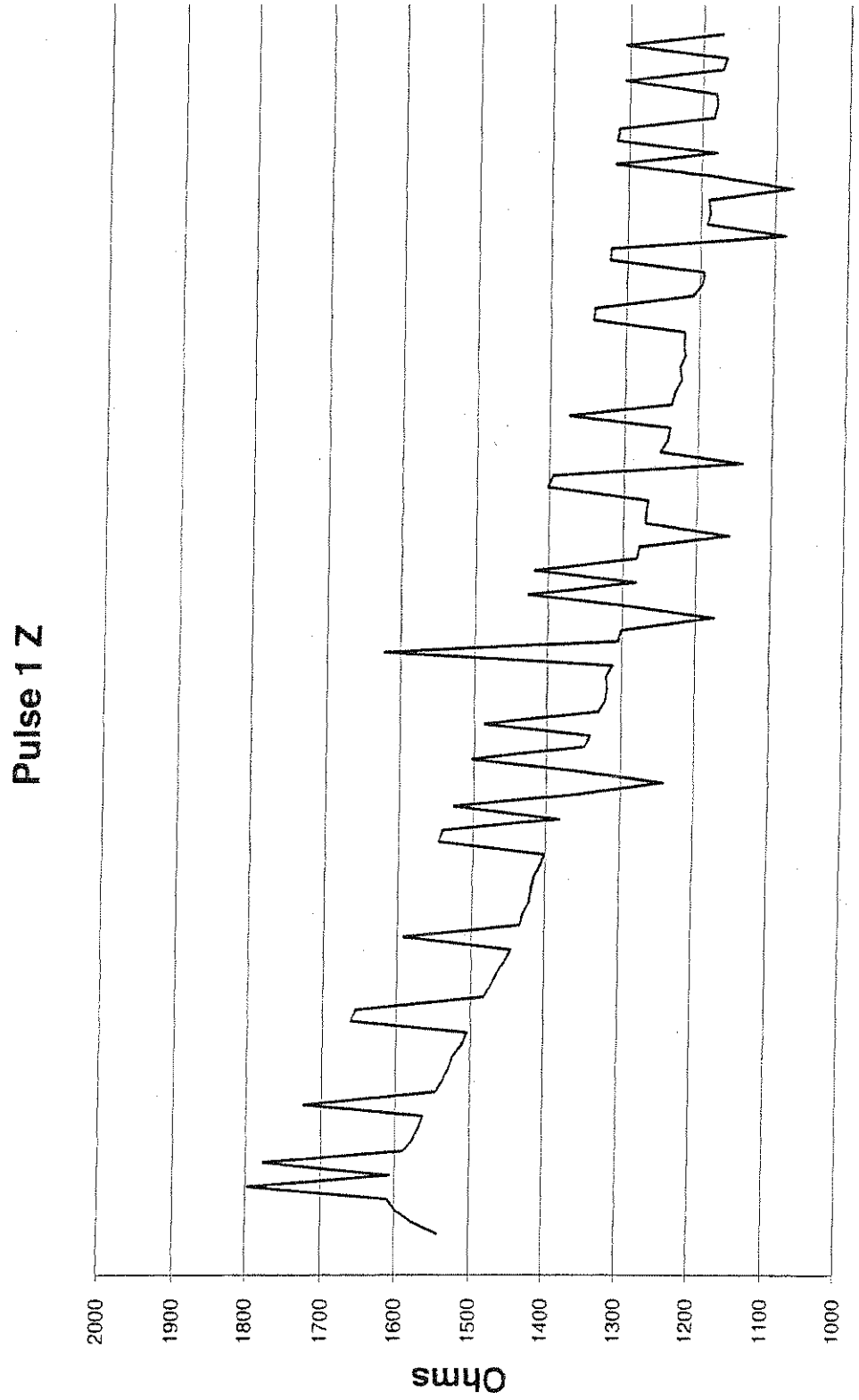

Pulse 1 Z
Ohms
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000

FIGURE 3.3


Pulse 2 Z
Ohms
2400
2300
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000

FIGURE 3.4

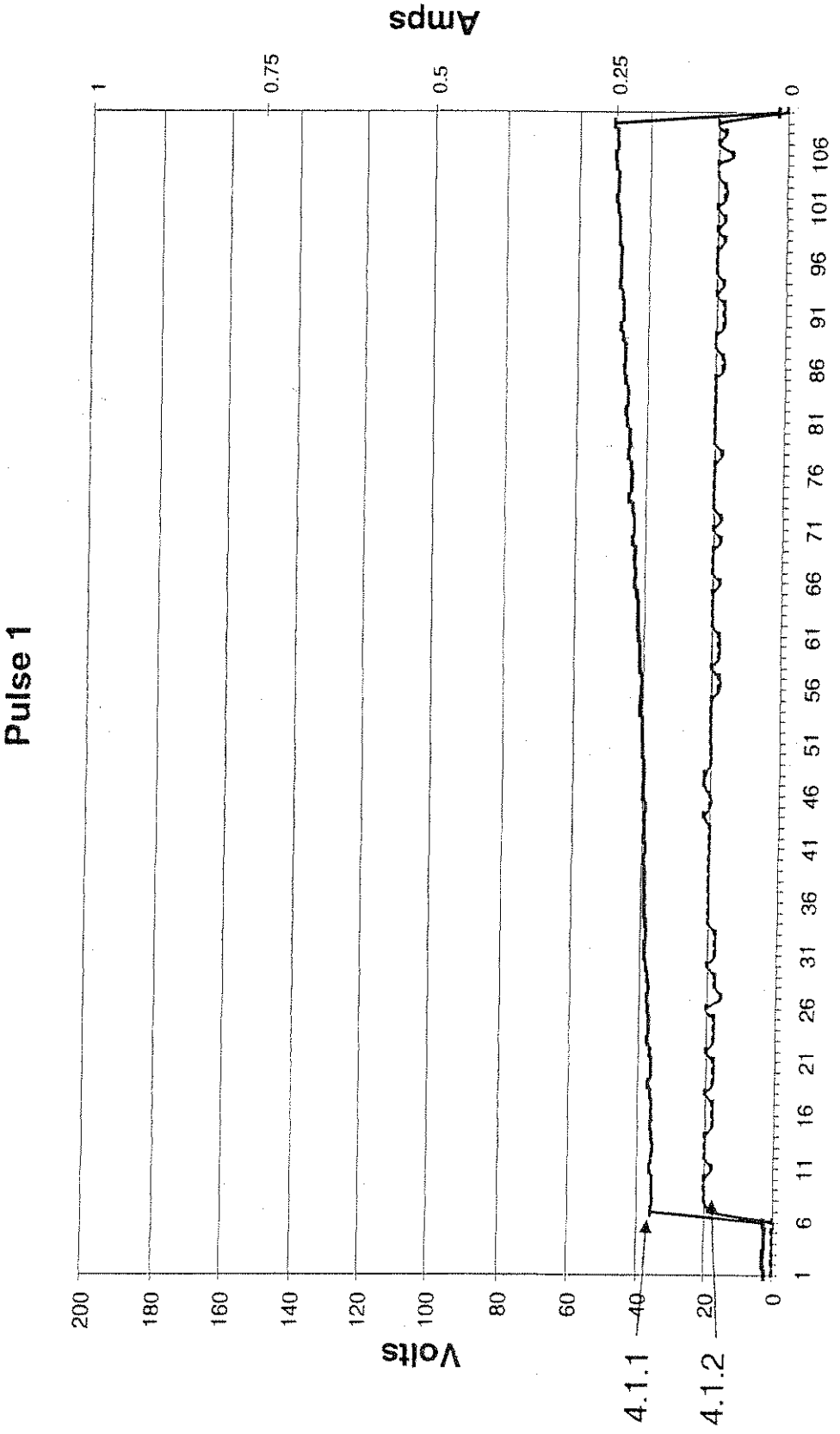

Pulse 1
Amps
Volts
4.1.1
4.1.2
200
180
160
140
120
100
80
60
40
20
0
1
0.75
0.5
0.25
0
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71 76 81 86 91 96 101 106

FIGURE 4.1

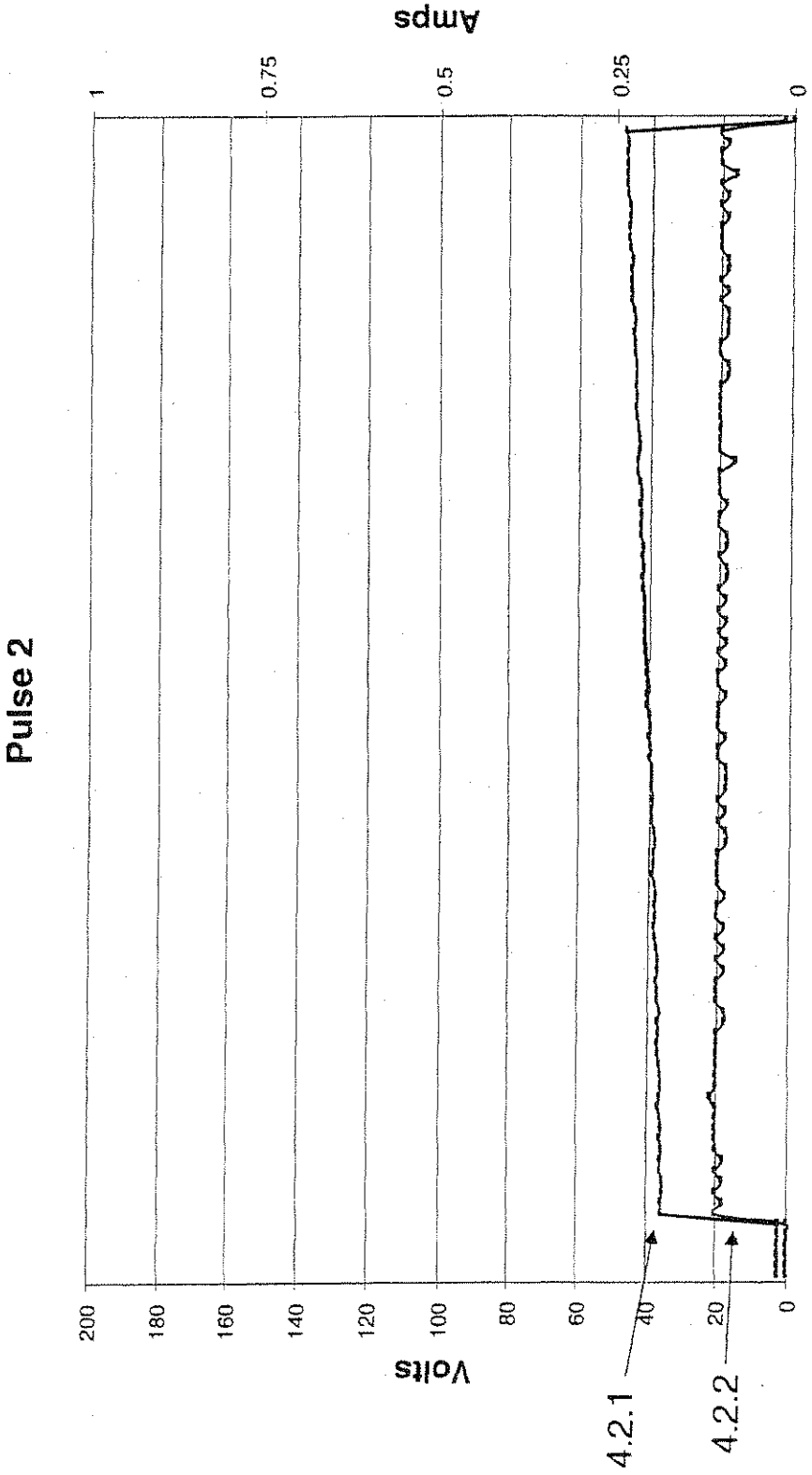

Pulse 2
Amps
1
0.75
0.5
0.25
0
Volts
200
180
160
140
120
100
80
60
40
20
0
4.2.1
4.2.2

FIGURE 4.2

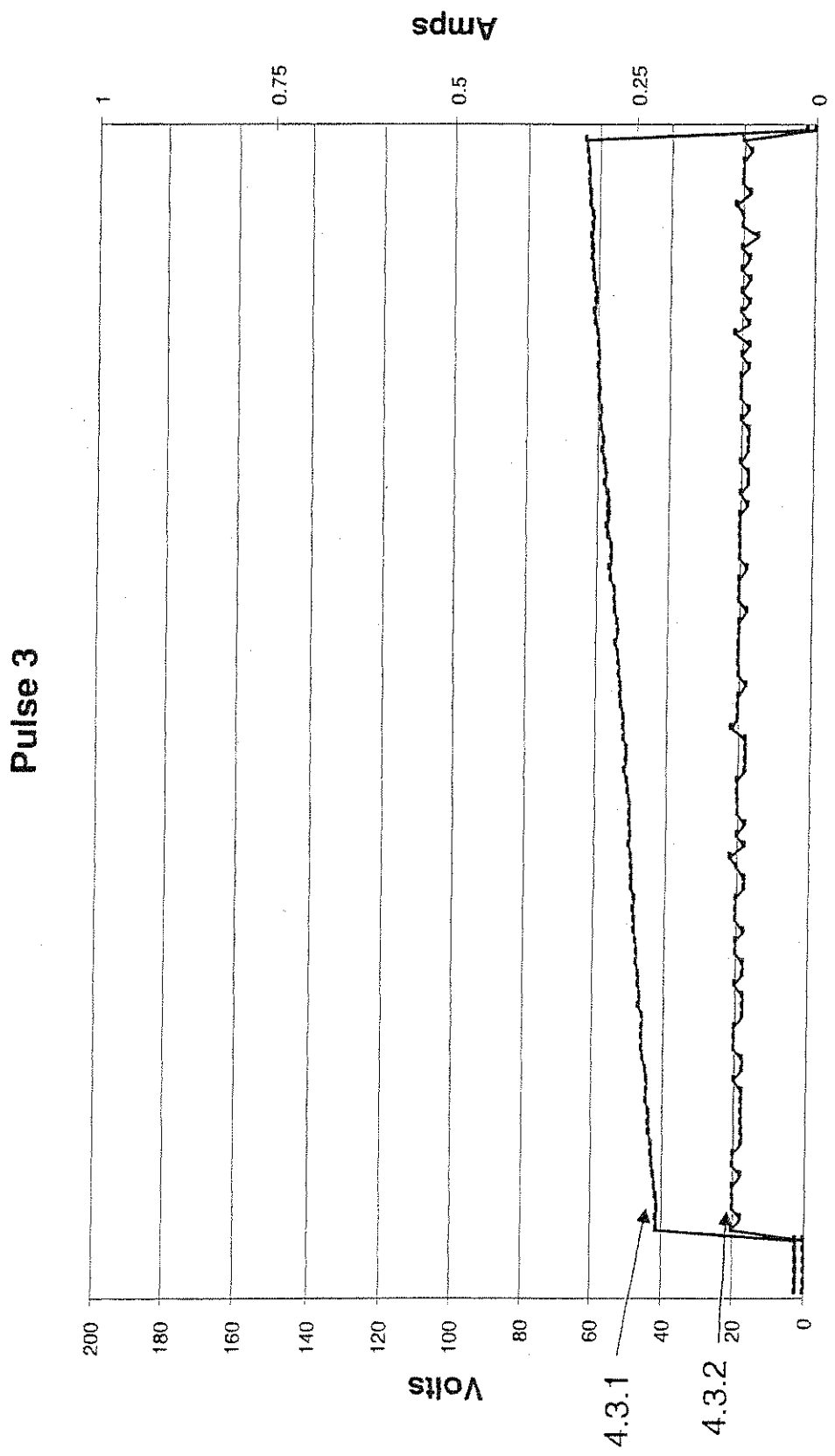

Pulse 3
Amps
1
0.75
0.5
0.25
0
Volts
200
180
160
140
120
100
80
60
40
20
0
4.3.1
4.3.2

FIGURE 4.3

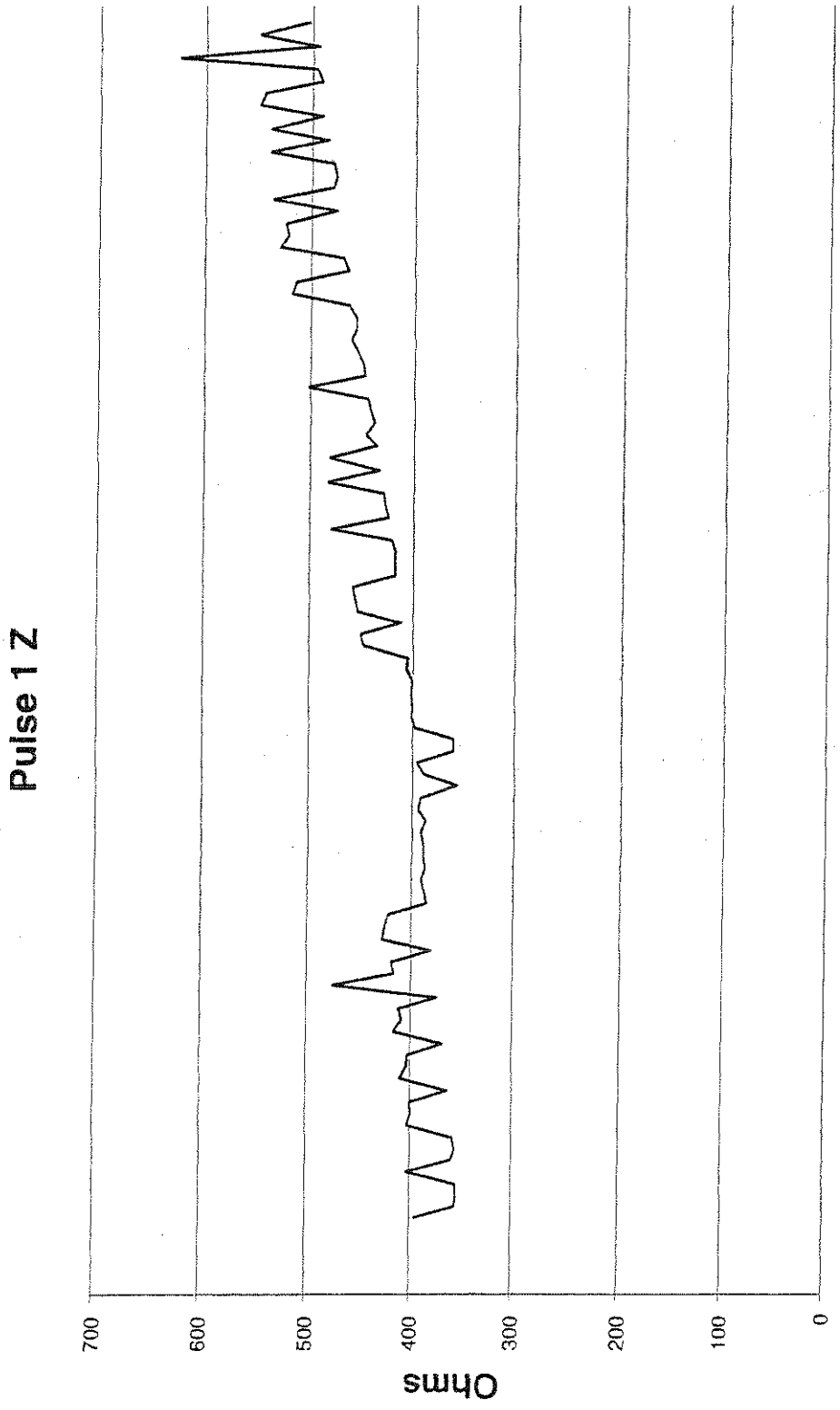


FIGURE 4.4

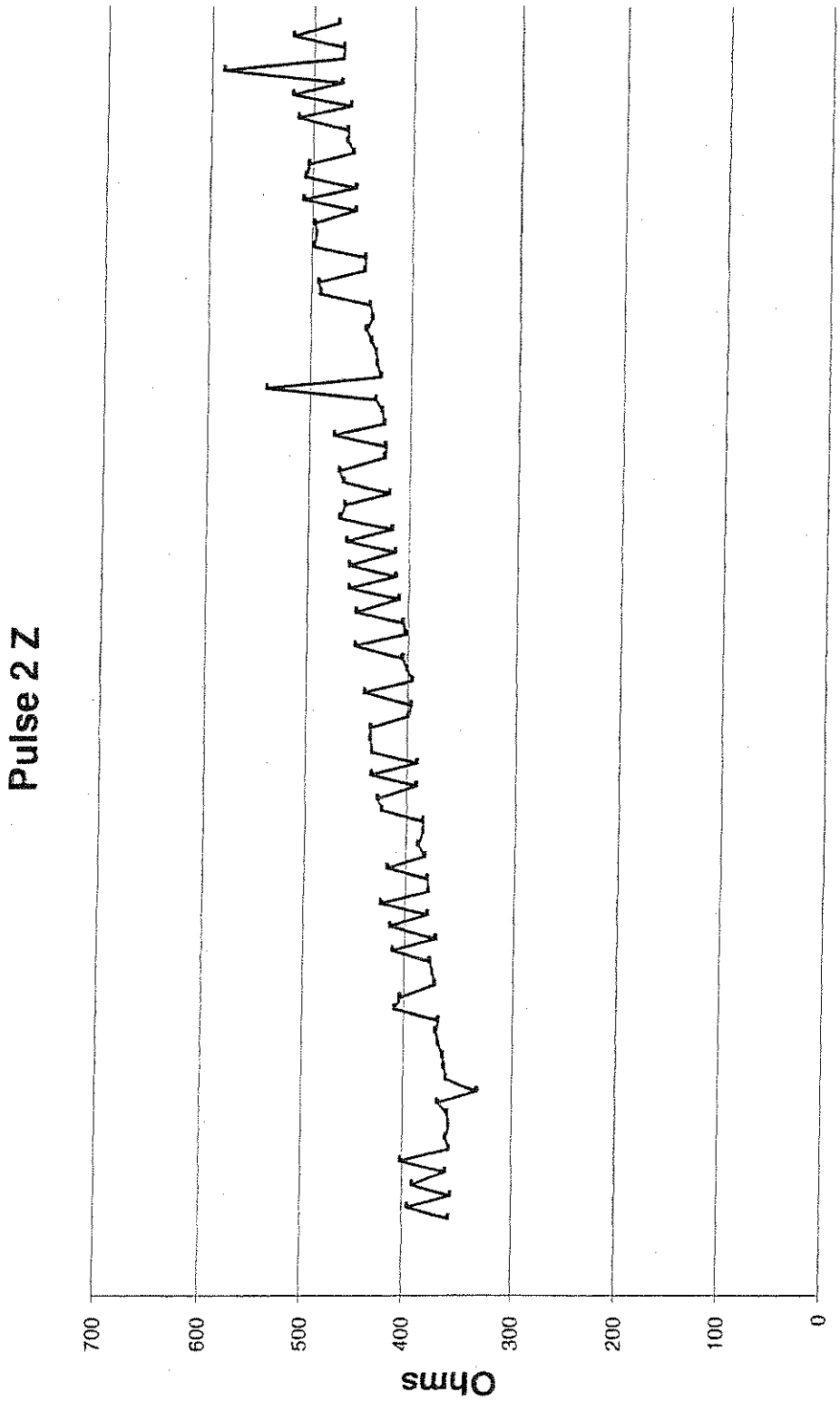


FIGURE 4.5

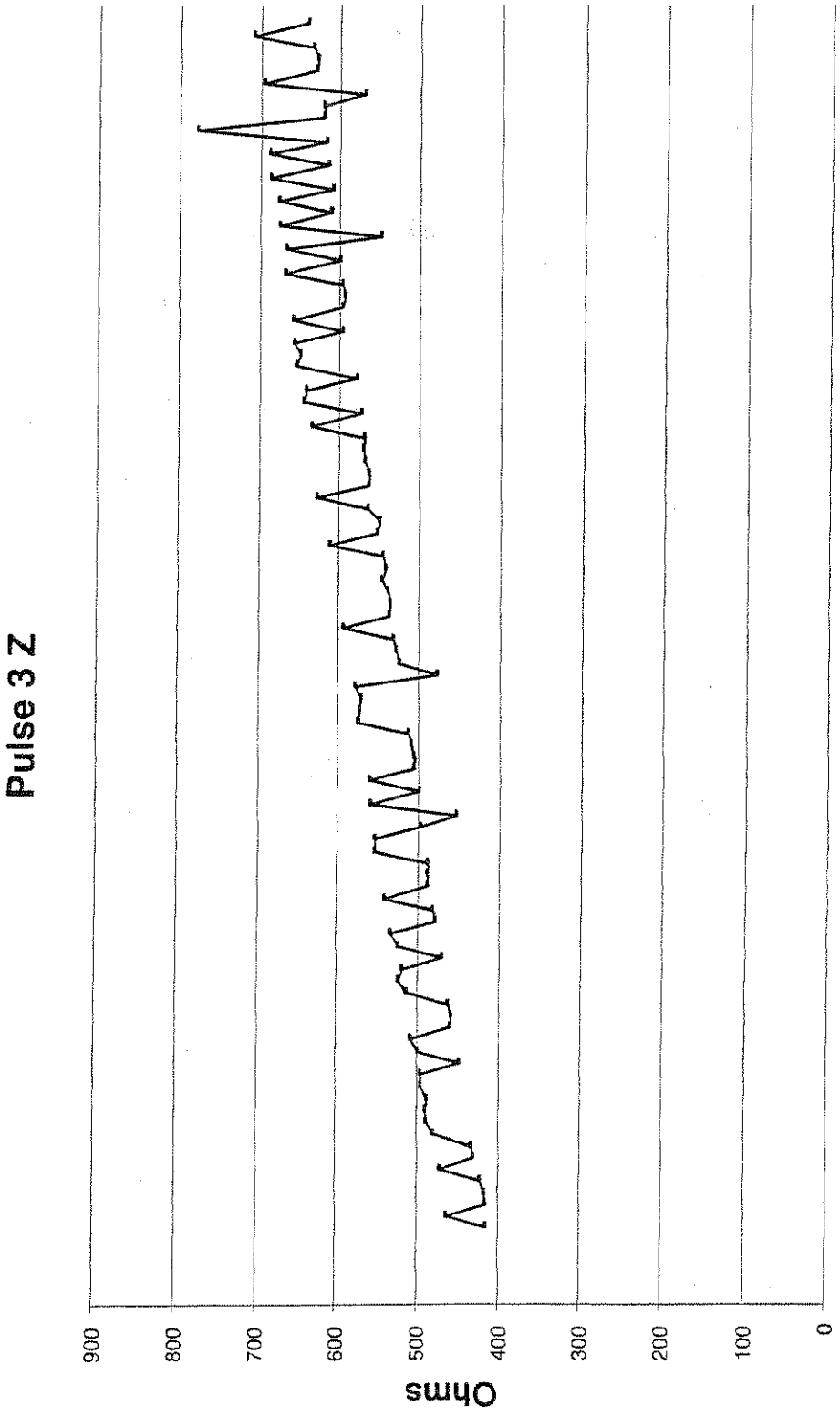


FIGURE 4.6

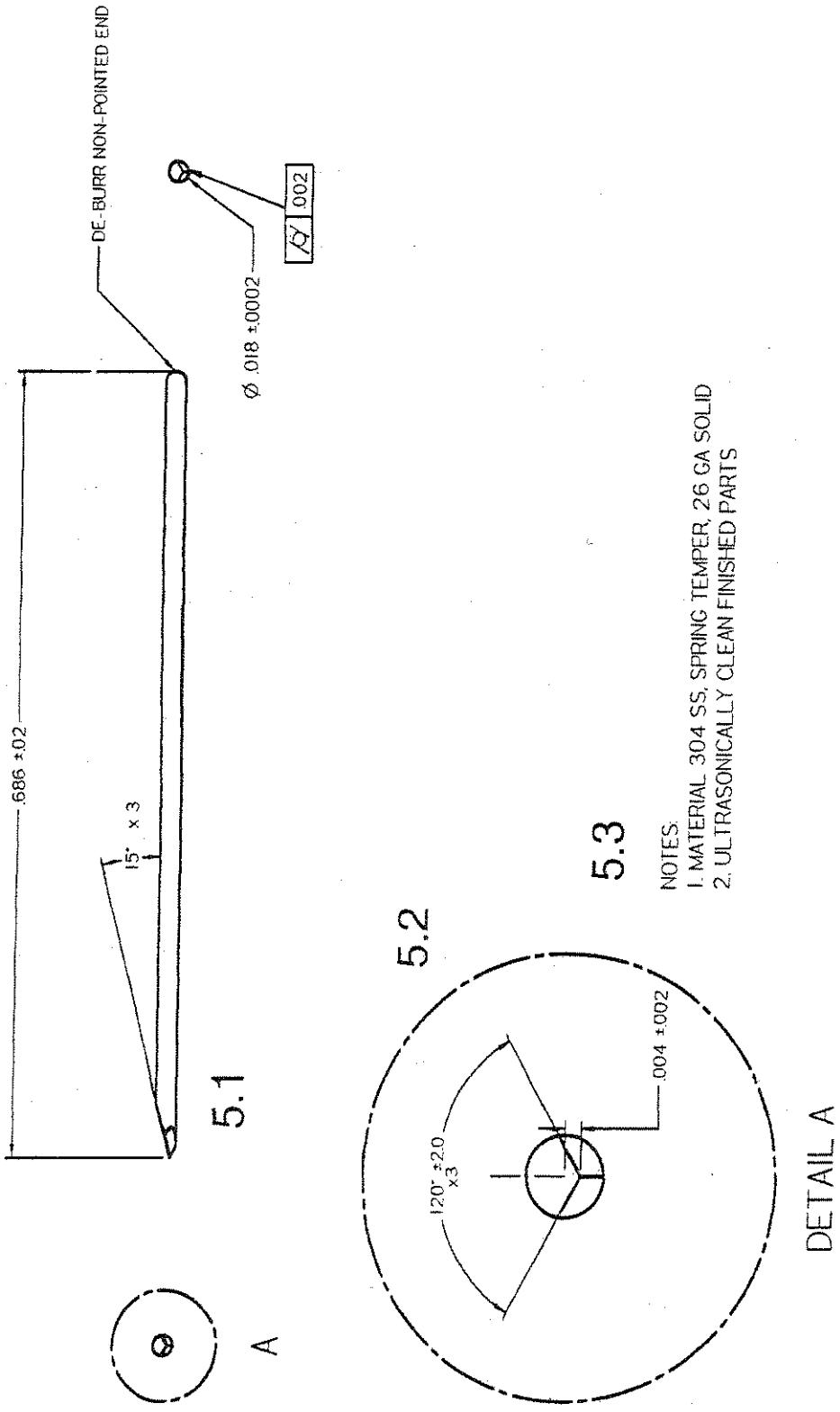

DE-BURR NON-POINTED END
.686 ±.02
15° x 3
Ø .018 ±.0002
Ⓜ Y .002
5.1
A
5.2
120° ±2.0 x3
.004 ±.002
5.3
DETAIL A
NOTES:
1. MATERIAL 304 SS, SPRING TEMPER, 26 GA SOLID
2. ULTRASONICALLY CLEAN FINISHED PARTS

FIGURE 5

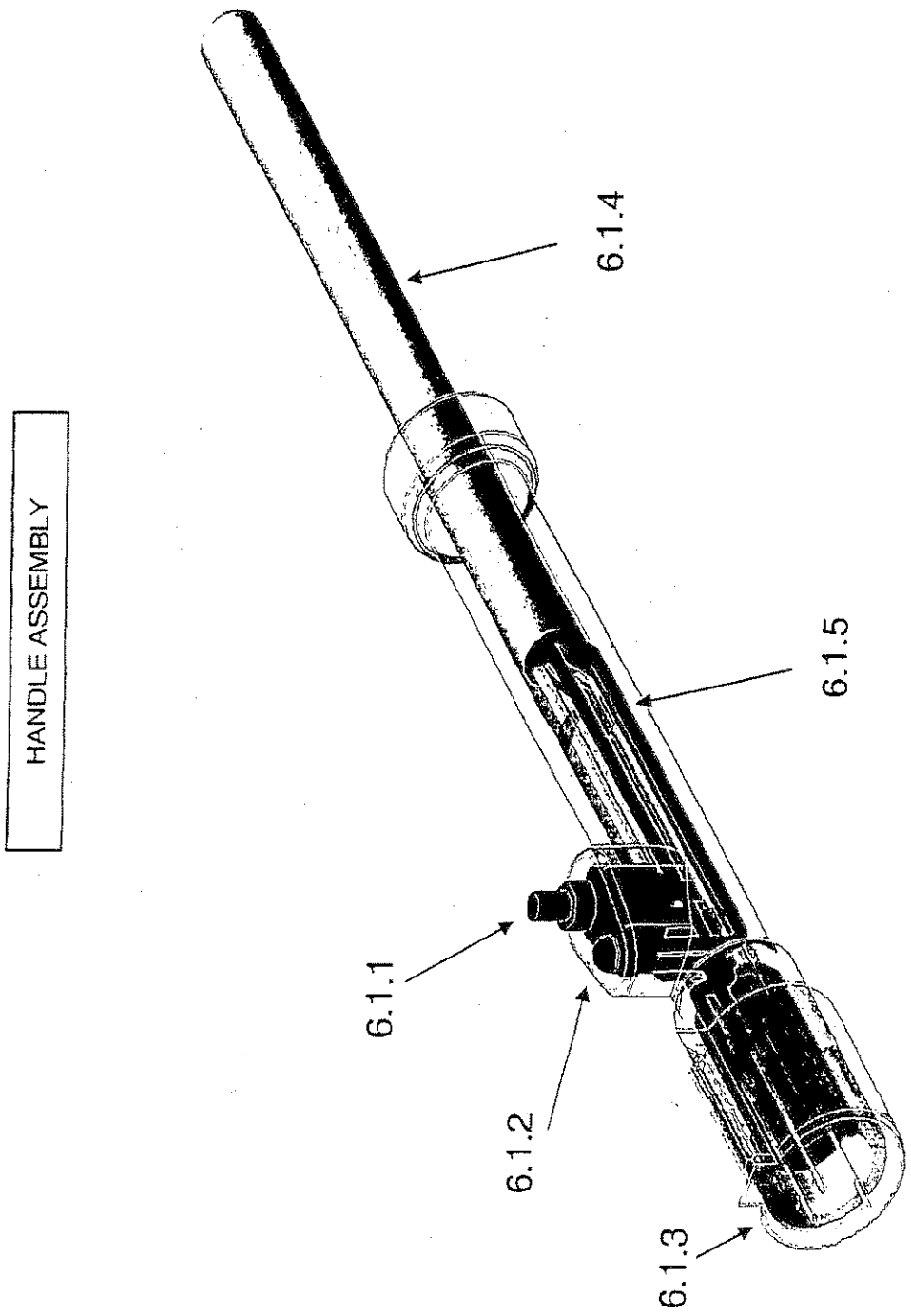


FIGURE 6.1

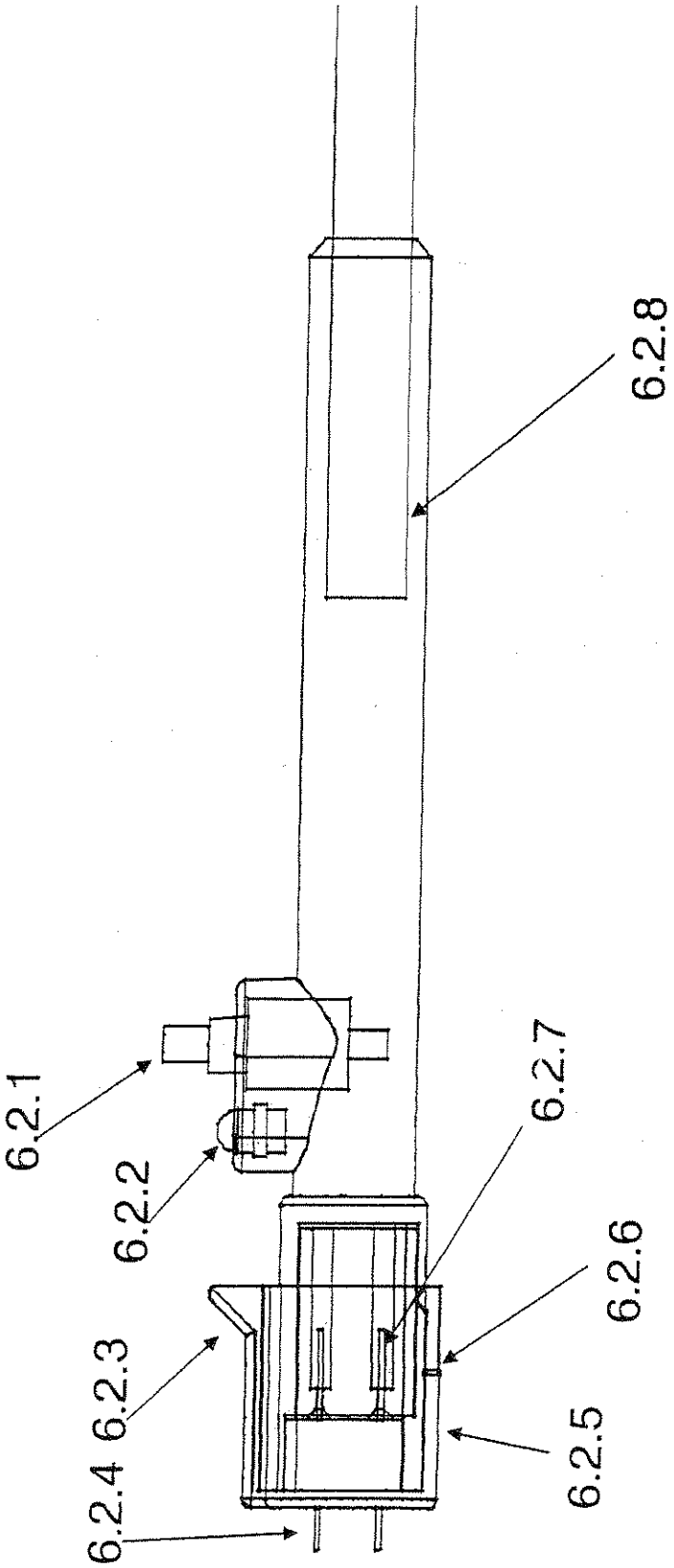


FIGURE 6.2

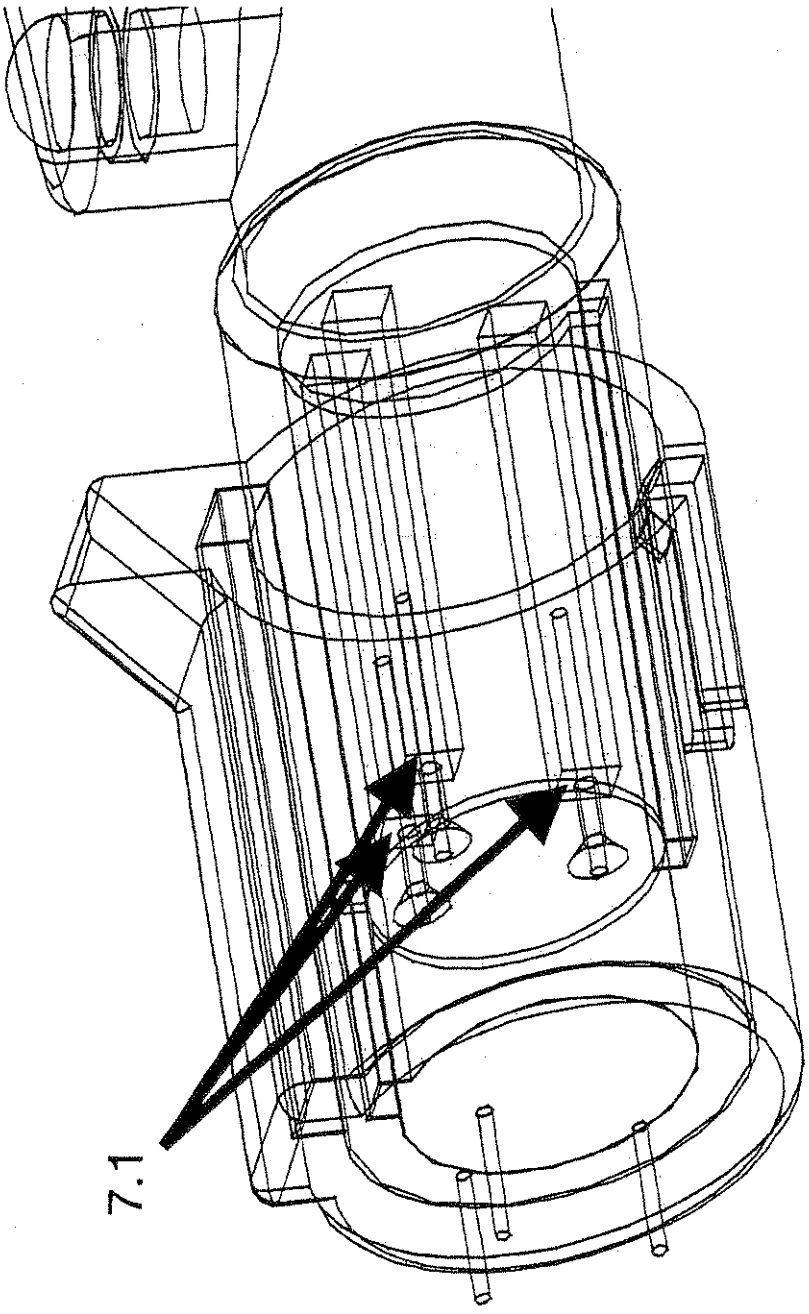


FIGURE 7

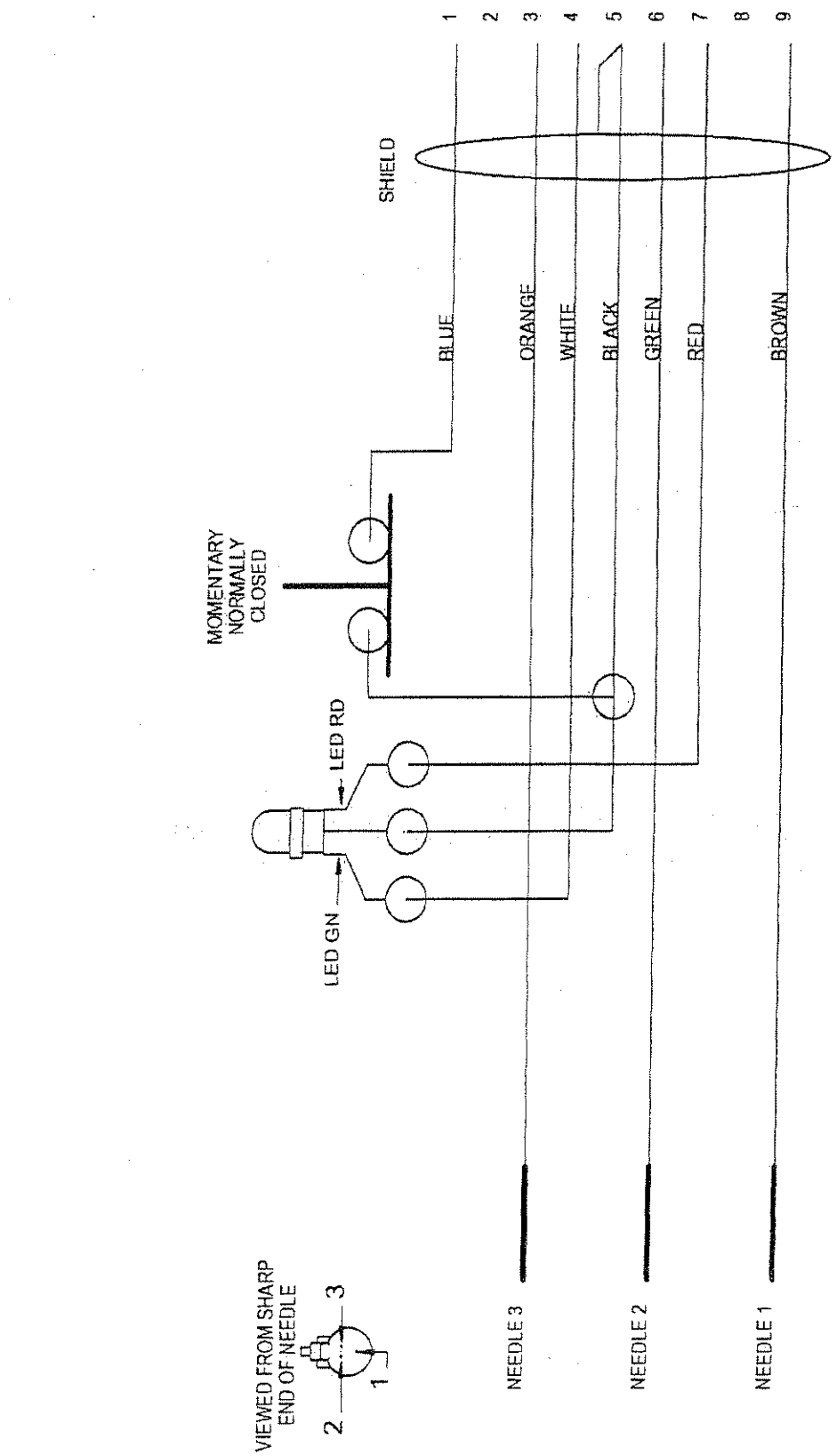

VIEWED FROM SHARP END OF NEEDLE
1
2
3
NEEDLE 3
NEEDLE 2
NEEDLE 1
LED GN
LED RD
MOMENTARY NORMALLY CLOSED
SHIELD
BLUE
ORANGE
WHITE
BLACK
GREEN
RED
BROWN
1
2
3
4
5
6
7
8
9

FIGURE 8

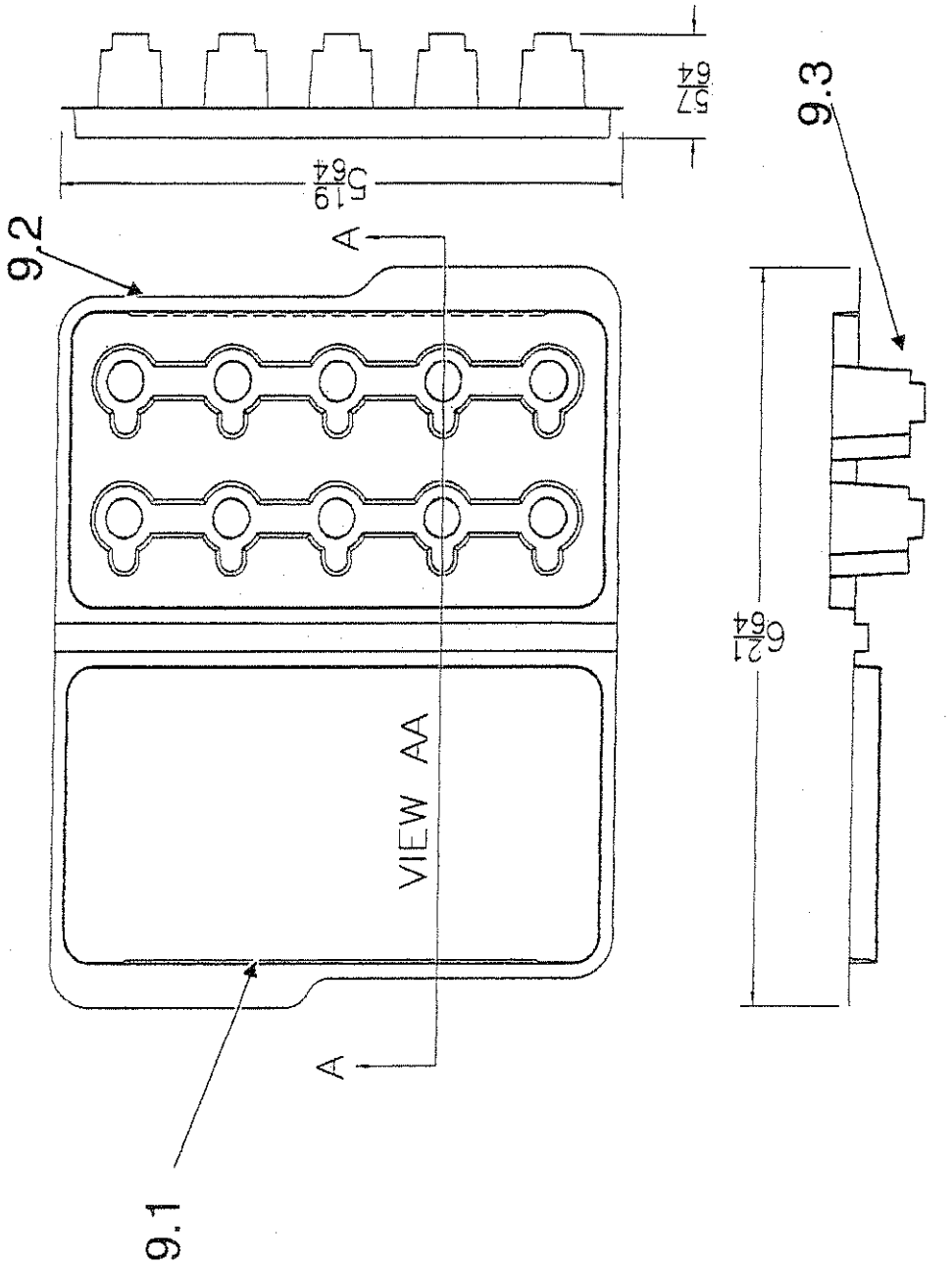


FIGURE 9

Dose (µg)	Volume (µL)	Current	Lag	Handle	Pulse	Score	SE mean
50	**50**	**0.2A**	**4**	**MA**	**20ms**	**5.00**	**0.00**
100	100	0.2A	80	LA	20ms	5.00	0.00
100	100	0.2A	4	LA	20ms	4.33	0.24
200	100	0.1A	4	LA	52ms	4.17	0.17
100	100	0.1A	4	LA	20ms	4.00	0.00
200	100	0.4A	80	LA	52ms	3.67	0.33
100	50	0.2A	4	LA	52ms	3.33	0.33
50	50	0.2A	4	MA	52ms	3.00	0.00
100	100	0.1A	80	LA	52ms	2.83	0.17
200	100	0.4A	80	LA	20ms	2.83	0.17
50	50	0.2A	80	MA	20ms	2.67	0.17
100	200	0.1A	80	LA	20ms	2.33	0.33
200	100	0.6A	80	LA	52ms	2.17	0.17
100	50	0.1A	80	MA	52ms	2.00	0.00
50	50	0.6A	80	MA	52ms	2.00	0.00
50	50	0.2A	80	MA	20ms	2.00	0.00
100	200	0.2A	80	LA	20ms	2.00	0.00
100	100	0.1A	4	LA	20ms	2.00	0.00
200	100	0.1A	4	LA	20ms	2.00	0.00
200	100	0.2A	4	LA	52ms	2.00	0.00

FIGURE 10

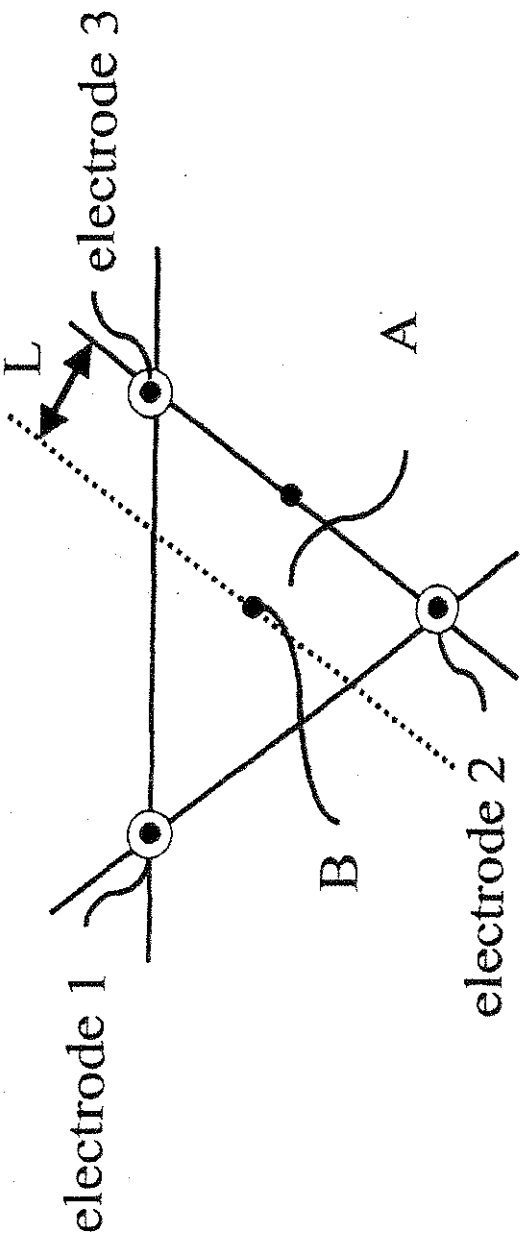


Figure 11

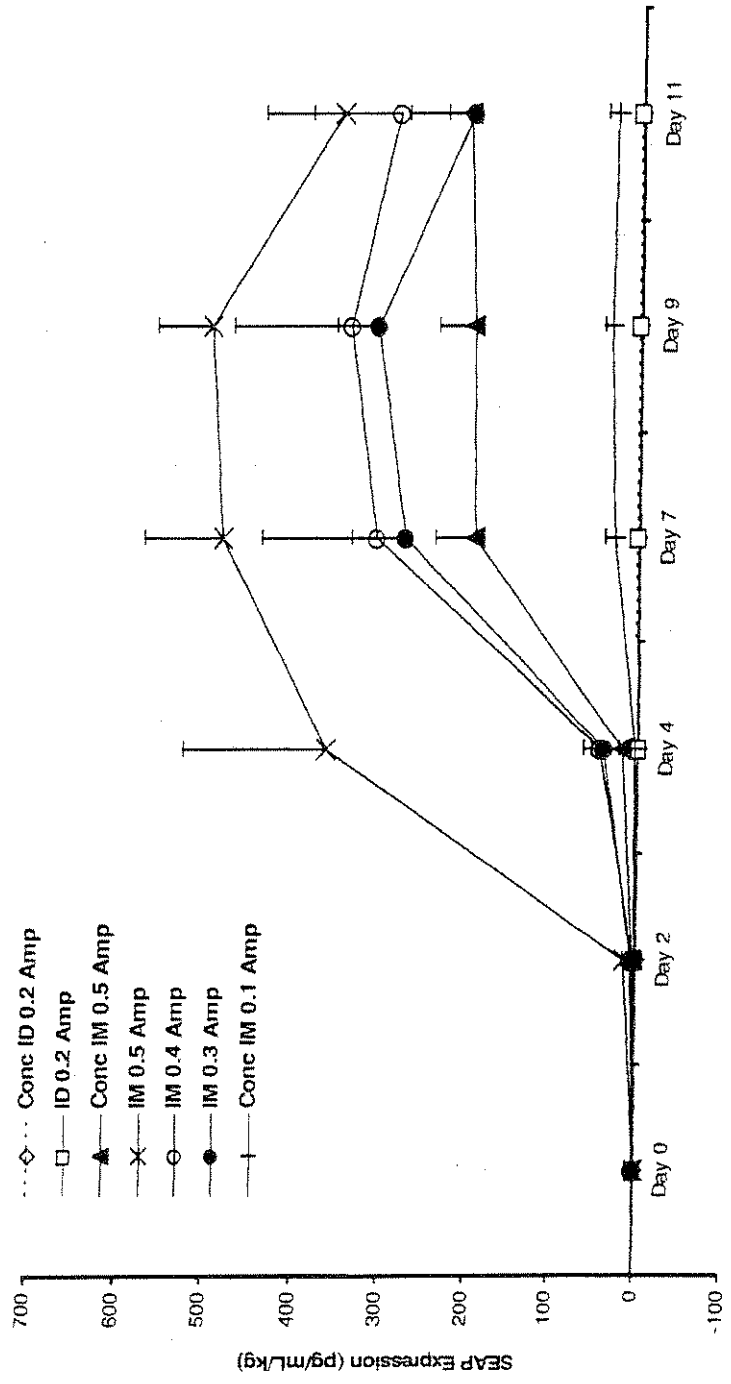

Conc ID 0.2 Amp
ID 0.2 Amp
Conc IM 0.5 Amp
IM 0.5 Amp
IM 0.4 Amp
IM 0.3 Amp
Conc IM 0.1 Amp
SEAP Expression (pg/mL/kg)
700
600
500
400
300
200
100
0
-100
Day 0
Day 2
Day 4
Day 7
Day 9
Day 11

Figure 12

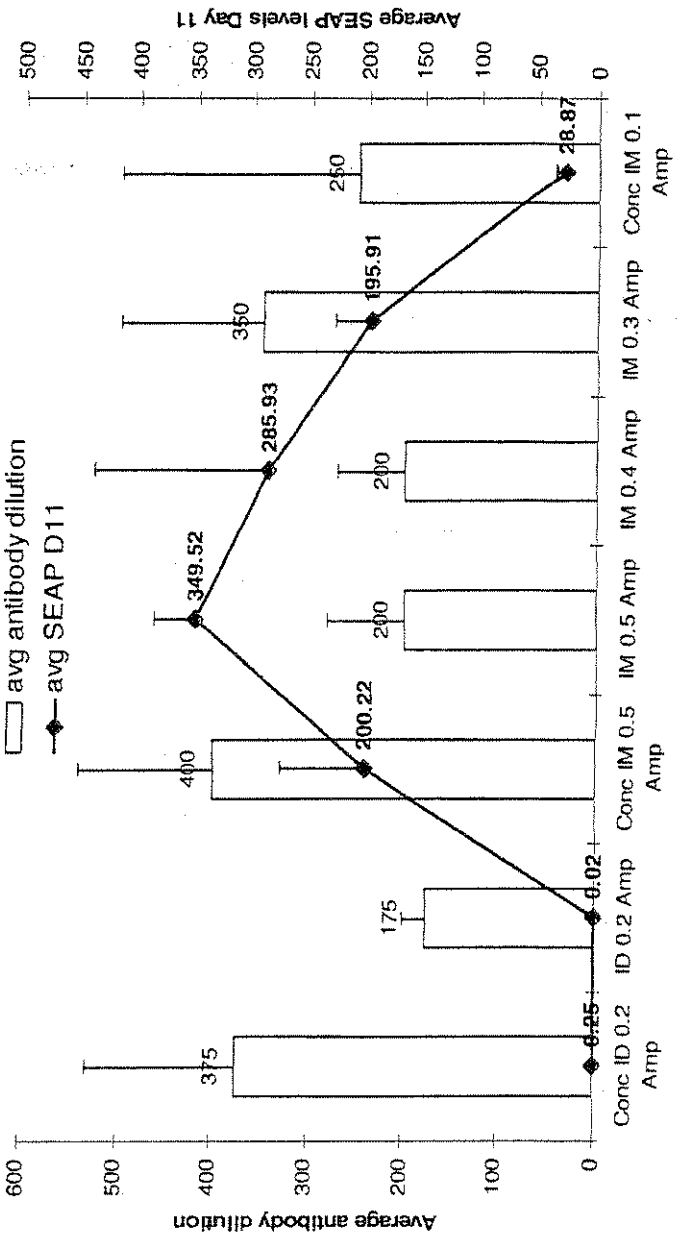

avg antibody dilution
avg SEAP D11
Average antibody dilution
Average SEAP levels Day 11
600
500
400
300
200
100
0
500
450
400
350
300
250
200
150
100
50
0
375
175
400
200
200
350
250
0.25
0.02
200.22
349.52
285.93
195.91
28.87
Conc ID 0.2 Amp
ID 0.2 Amp
Conc IM 0.5 Amp
IM 0.5 Amp
IM 0.4 Amp
IM 0.3 Amp
Conc IM 0.1 Amp

Figure 13

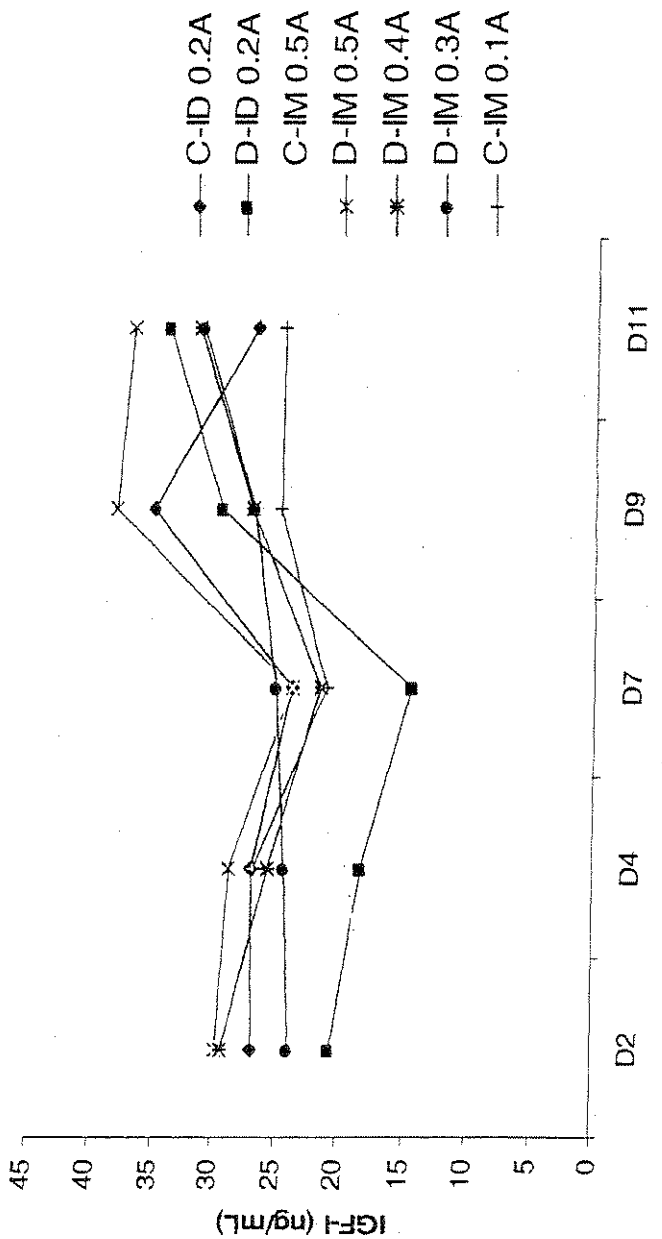
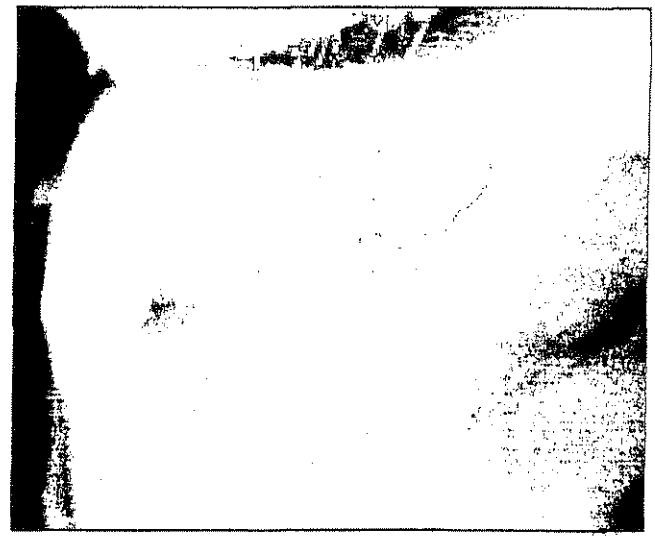
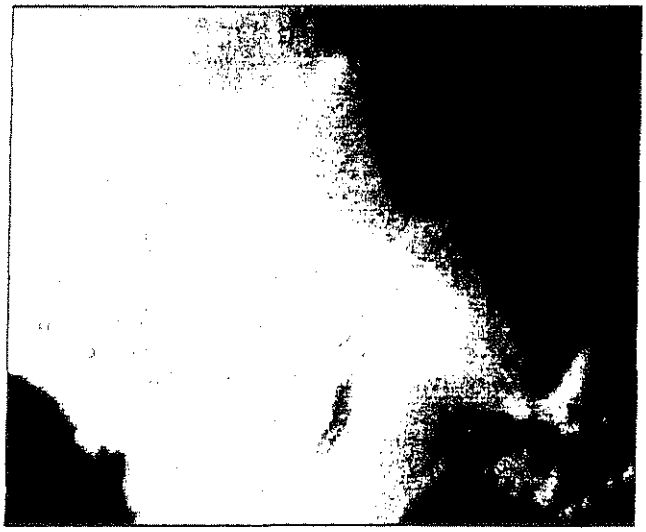

C-ID 0.2A
D-ID 0.2A
C-IM 0.5A
D-IM 0.5A
D-IM 0.4A
D-IM 0.3A
C-IM 0.1A
IGF-I (ng/mL)
0
5
10
15
20
25
30
35
40
45
D2
D4
D7
D9
D11

Figure 14



50µg/50µL, skin EP



100µg/100µL, IM EP

Figure 15

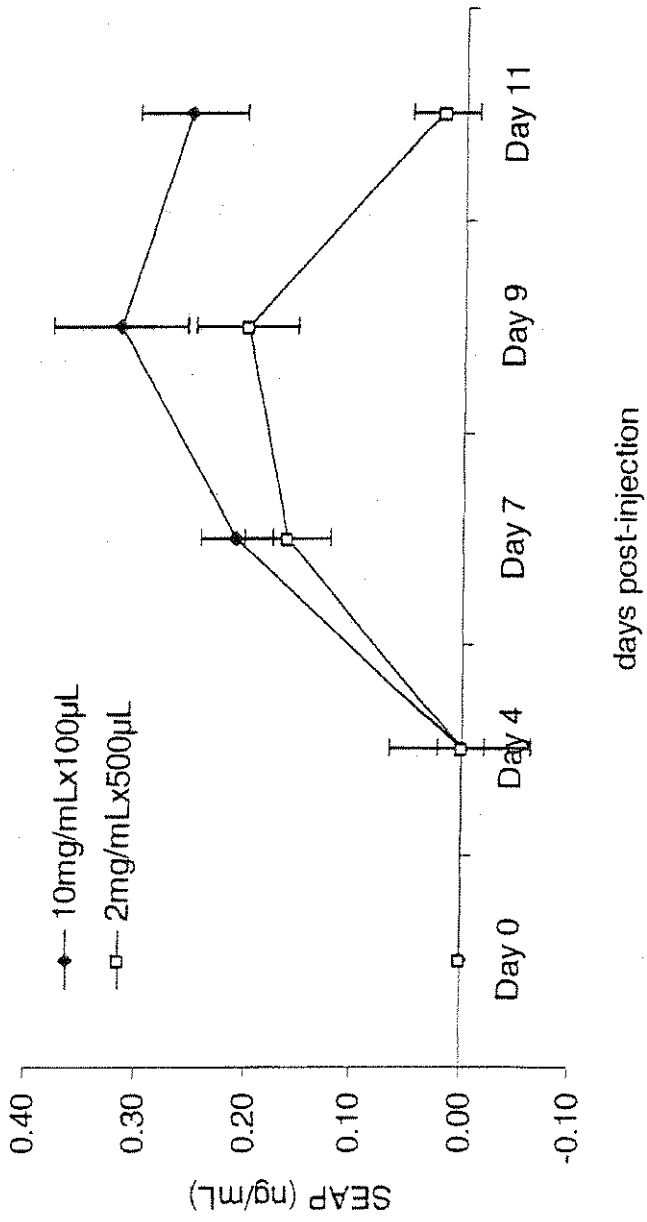
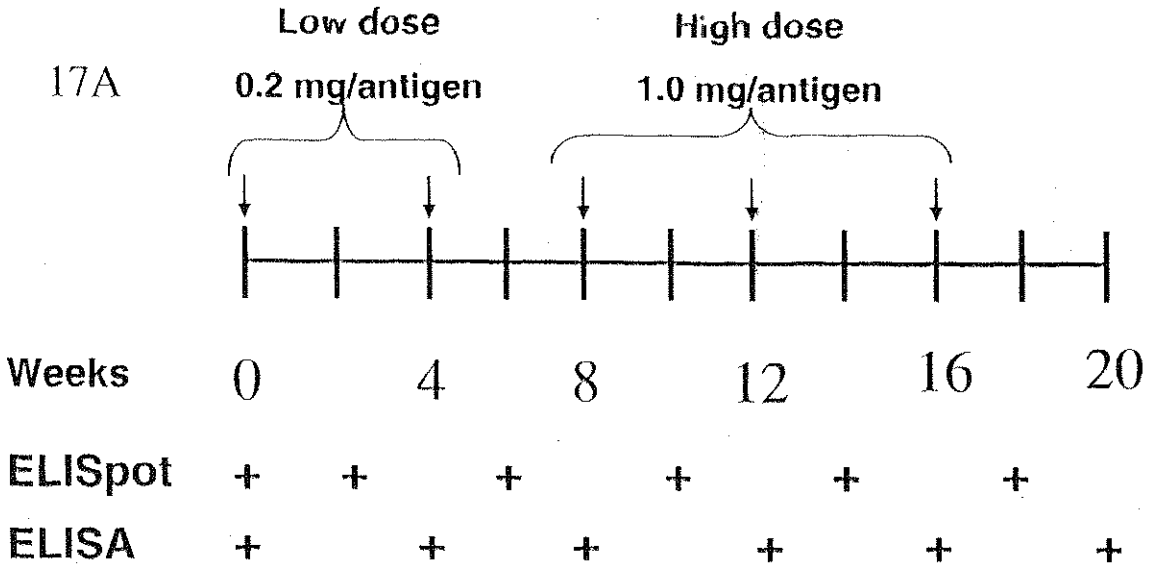

0.40
0.30
0.20
0.10
0.00
-0.10
SEAP (ng/mL)
Day 0
Day 4
Day 7
Day 9
Day 11
days post-injection
10mg/mLx100µL
2mg/mLx500µL

Figure 16

17A



17B

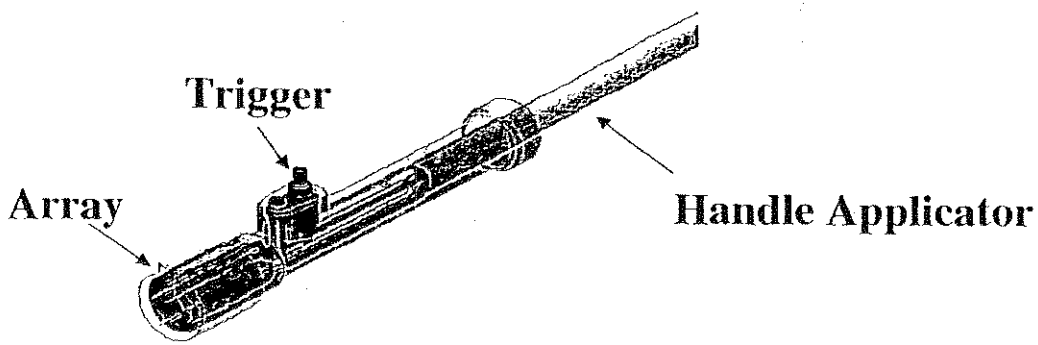


Figure 17

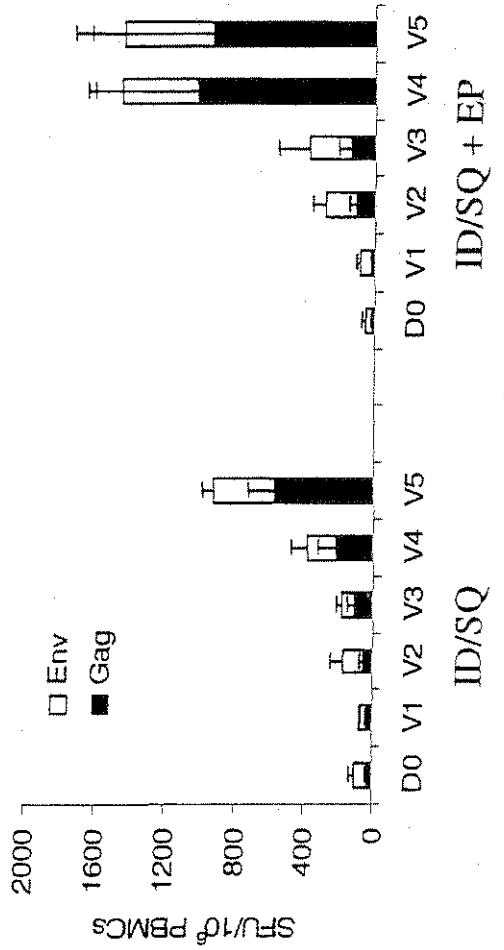


Figure 18

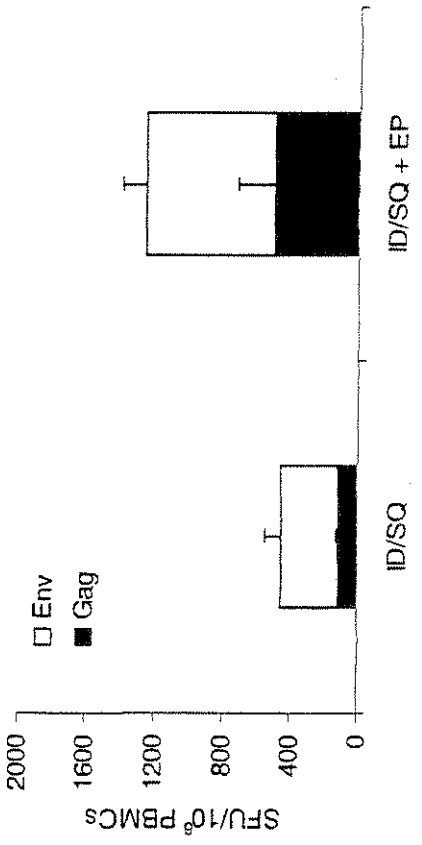


Figure 19

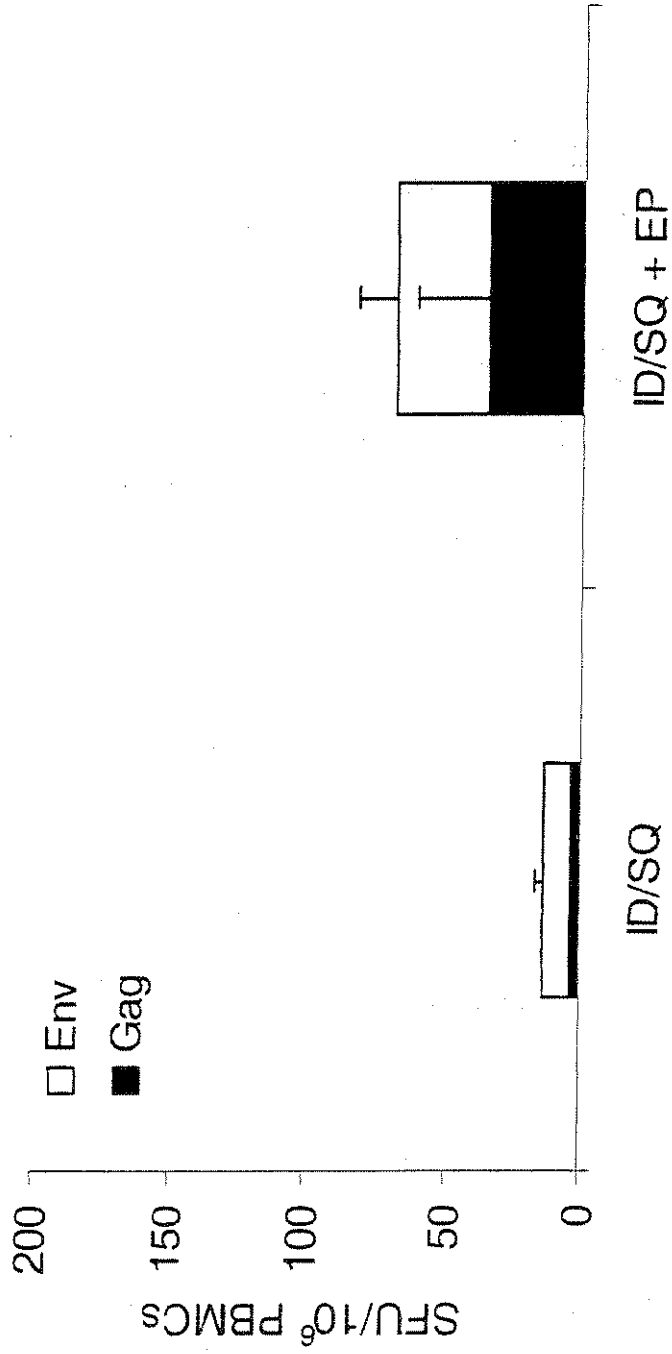
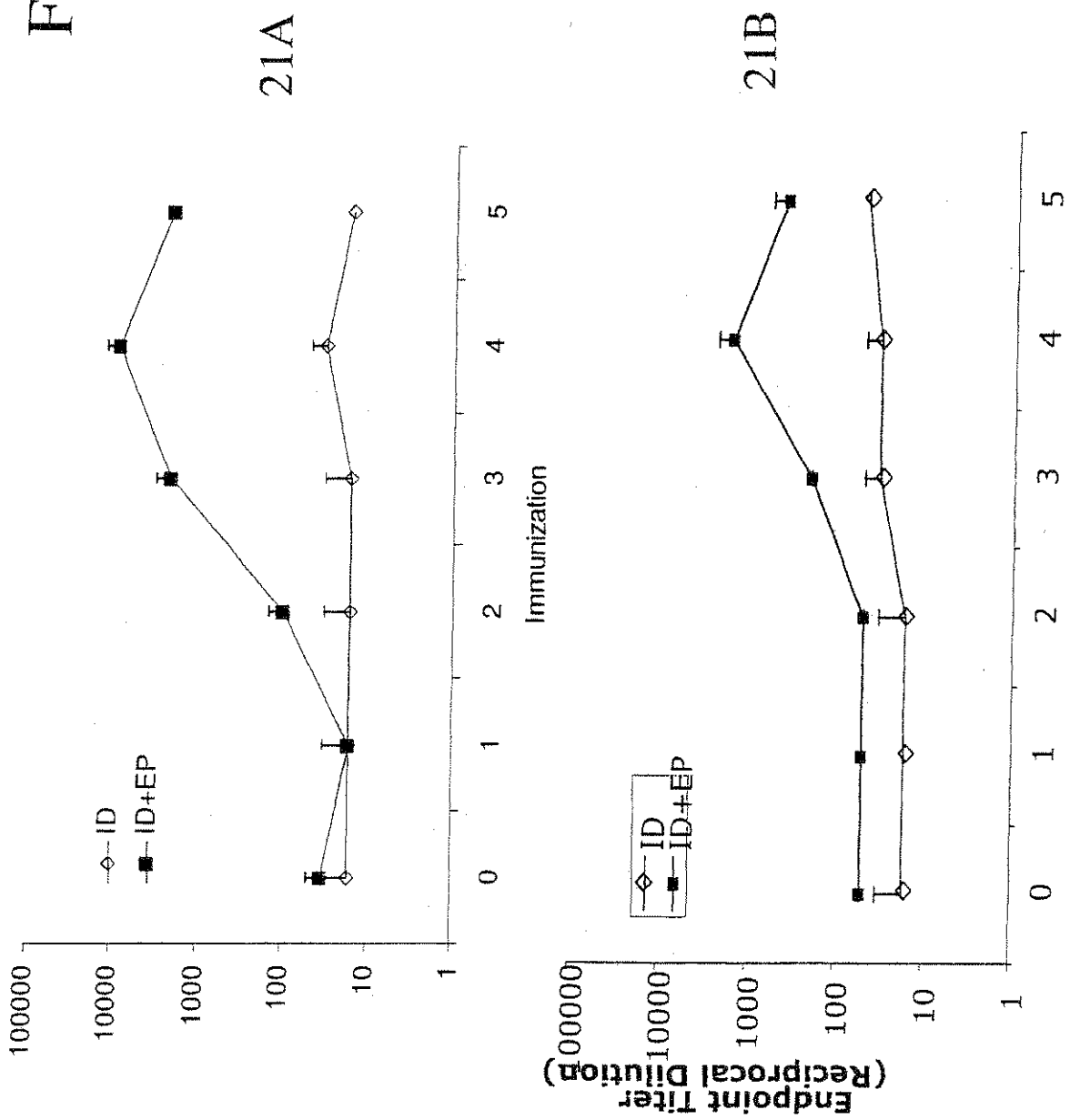


Figure 20

Figure 21


21A
21B
ID
ID+EP
Immunization
Endpoint Titer
(Reciprocal Dilution)
100000
10000
1000
100
10
1
0
1
2
3
4
5

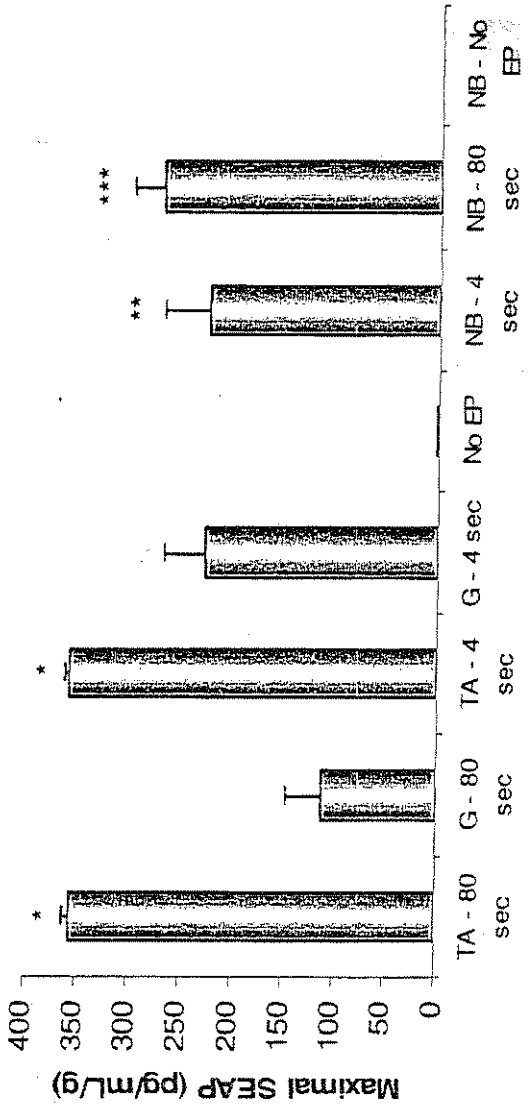


Figure 22

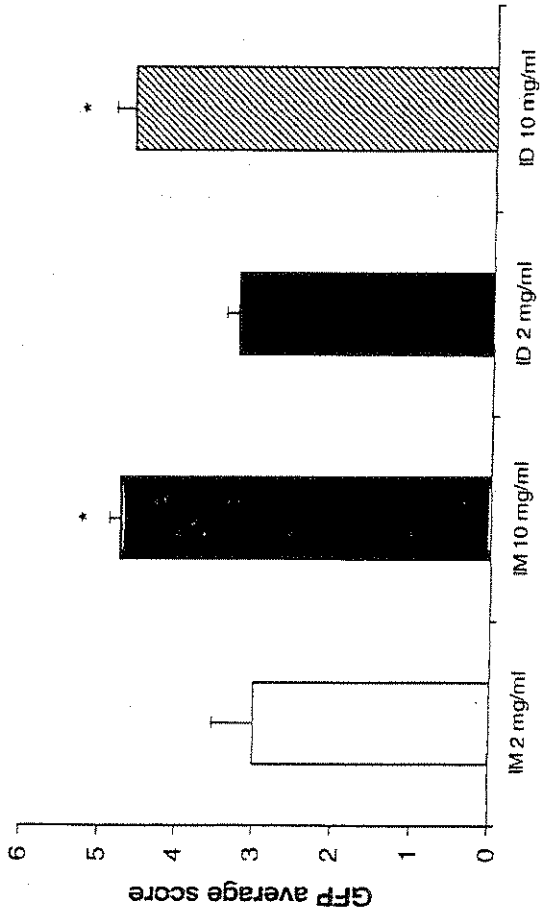


Figure 23

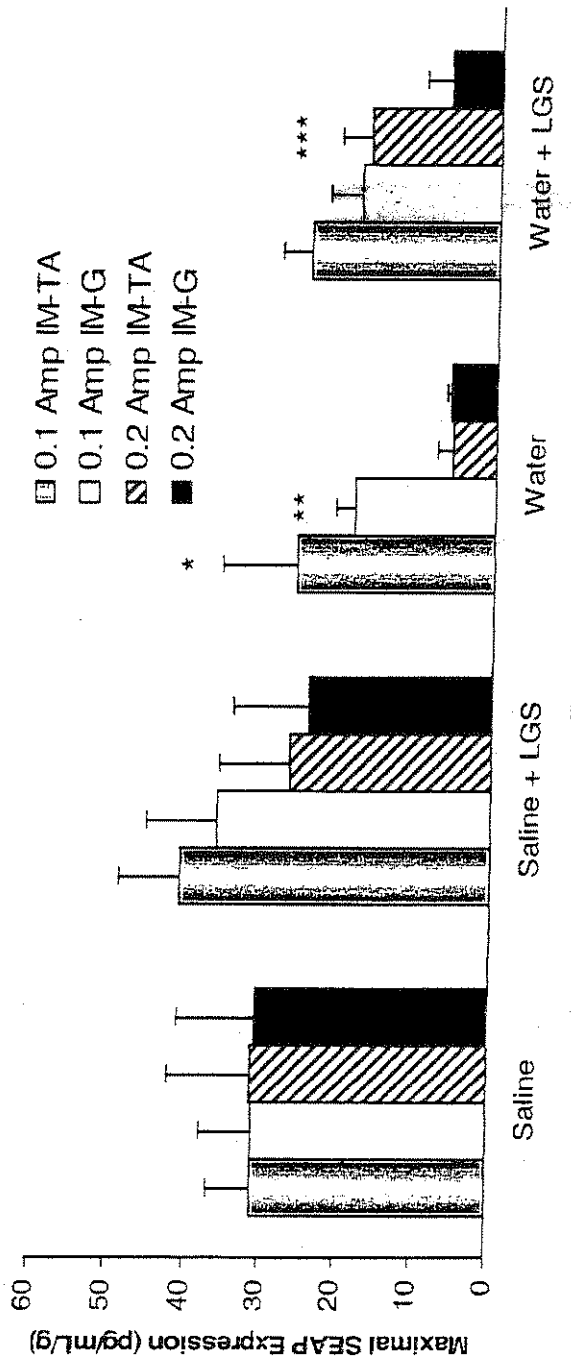


Figure 24

Figure 25

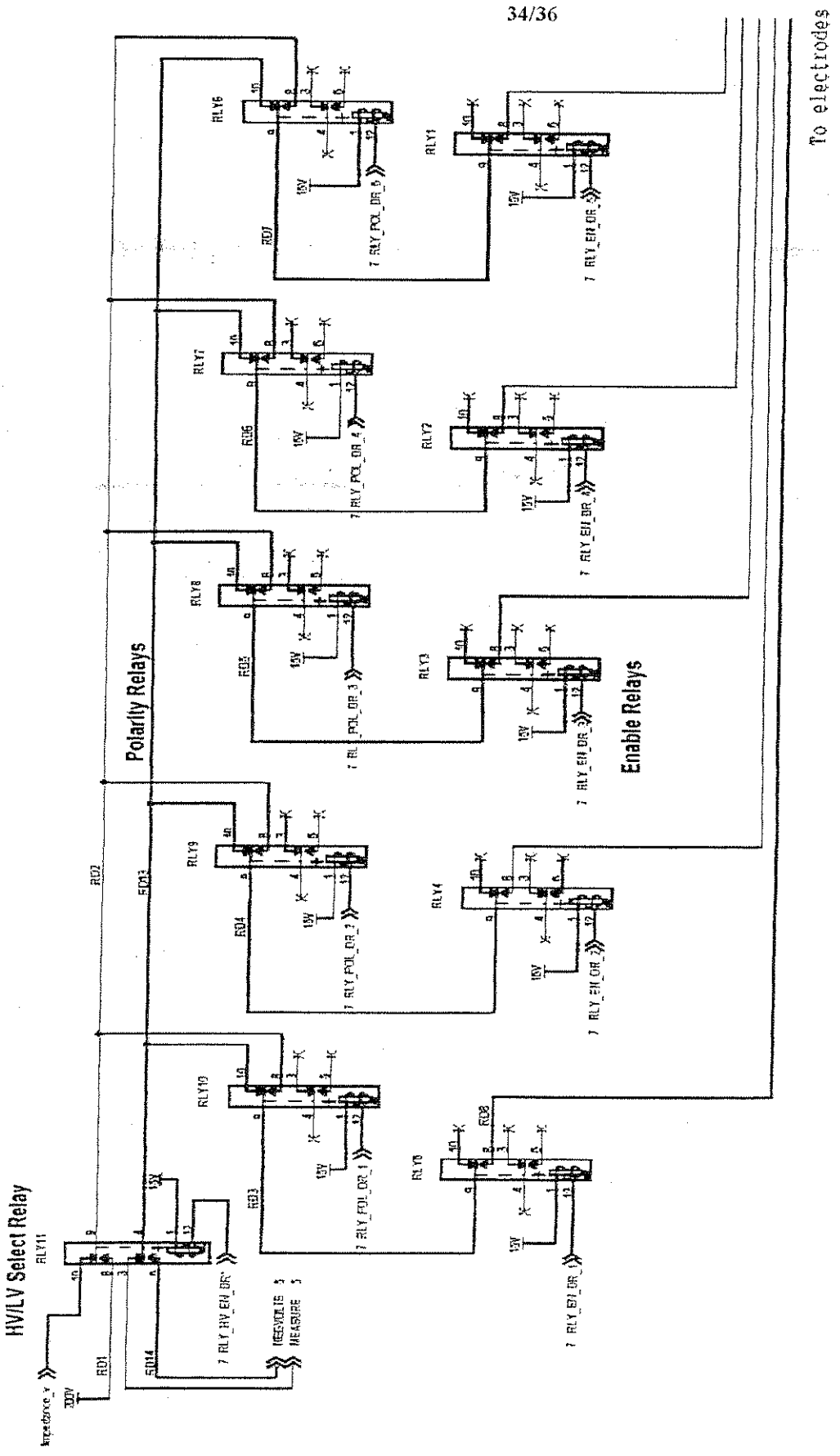

HV/LV Select Relay
Polarity Relays
Enable Relays
To electrodes

Figure 26

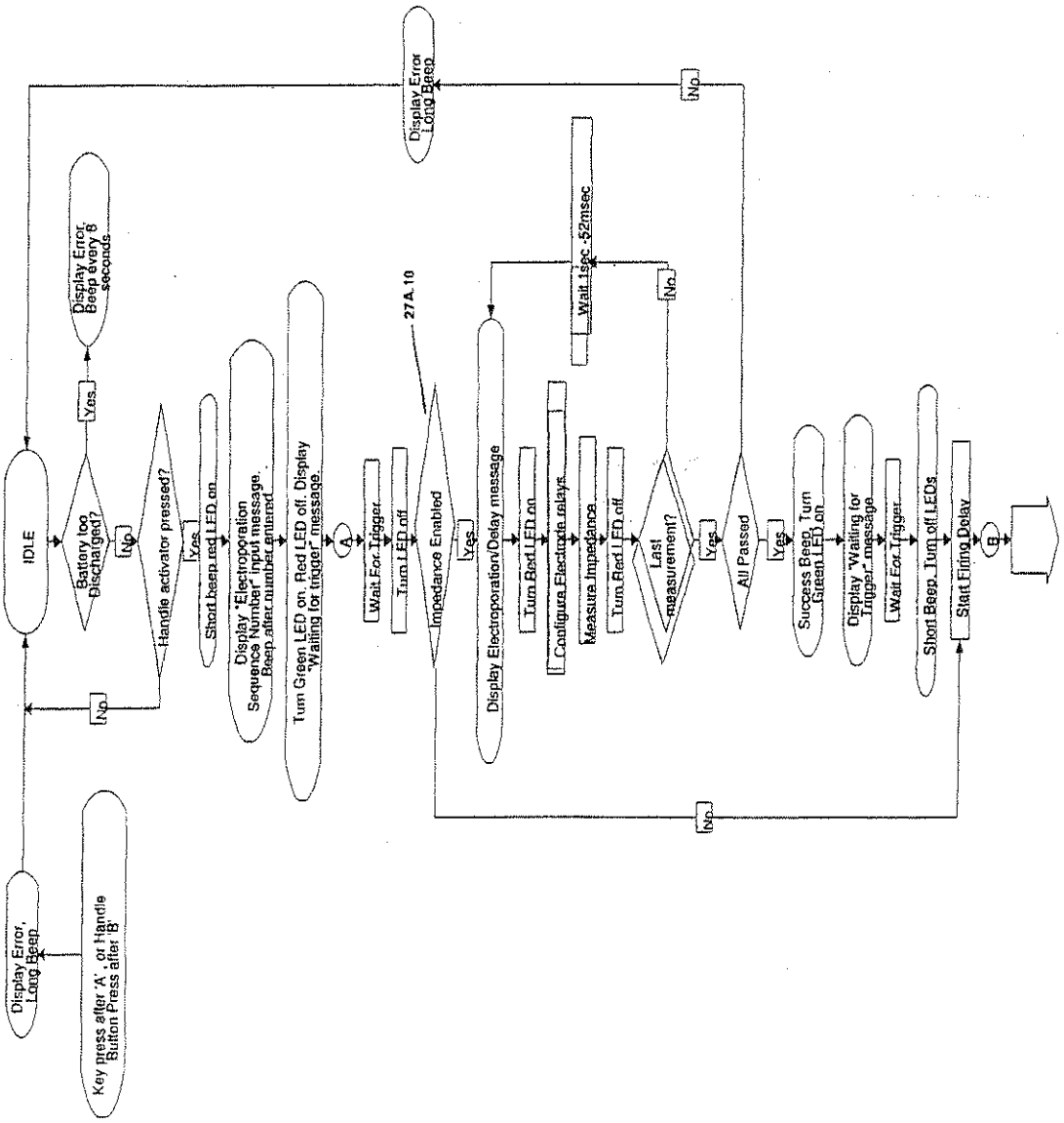

IDLE
Battery too Discharged?
Yes
No
Display Error, Beep every 8 seconds
Handle activator pressed?
Yes
No
Short beep, red LED on
Display "Electroporation Sequence Number" input message. Beep after number entered
Turn Green LED on. Red LED off. Display "Waiting for trigger" message.
A
Wait For Trigger
Turn LED off
27A.10
Impedance Enabled
Yes
No
Display Error Long Beep
Display Electroporation/Delay message
Turn Red LED on
Configure Electrode relays
Measure Impedance
Turn Red LED off
Wait 1sec -52msec
Last measurement?
Yes
No
All Passed
Yes
No
Success Beep, Turn Green LED on
Display "Waiting for Trigger" message
Wait For Trigger
Short Beep, Turn off LEDs
Start Firing Delay
B
Display Error, Long Beep
Key press after 'A', or Handle Button Press after 'B'

FIGURE 27A

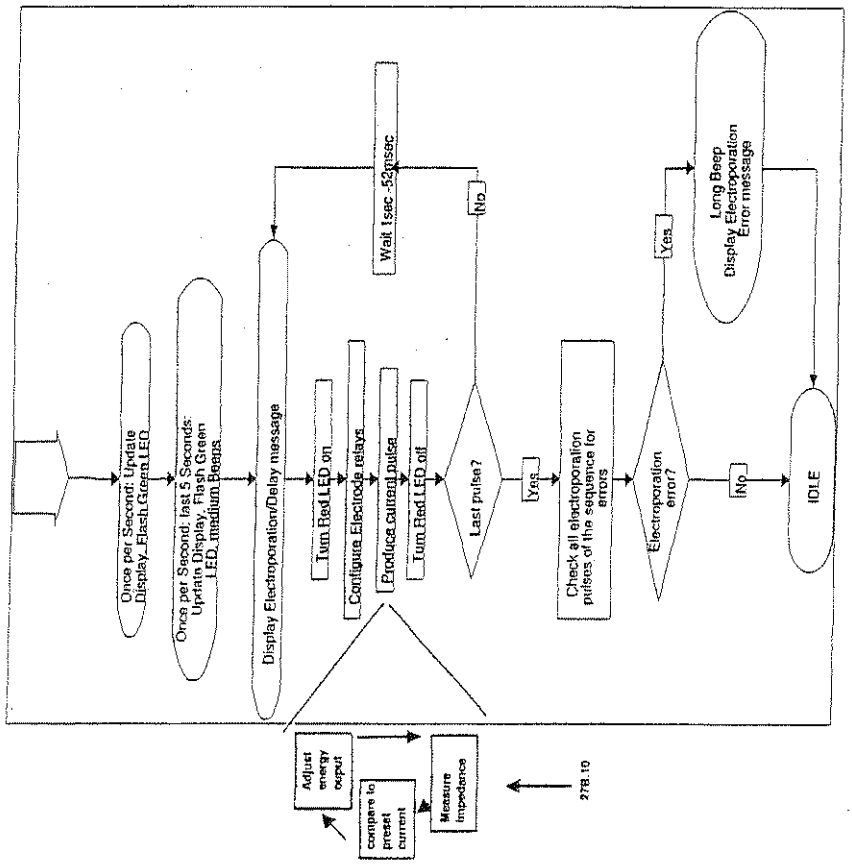

Once per Second: Update Display, Flash Green LED
Once per Second: last 5 Seconds: Update Display, Flash Green LED, medium Beeps
Display Electroporation/Delay message
Turn Red LED on
Configure Electrode relays
Produce current pulse
Turn Red LED off
Wait 1sec -52msec
Last pulse?
No
Yes
Check all electroporation pulses of the sequence for errors
Electroporation error?
Yes
Long Beep
Display Electroporation Error message
No
IDLE
Adjust energy ouput
compare to preset current
Measure impedance
278.10

FIGURE 27B