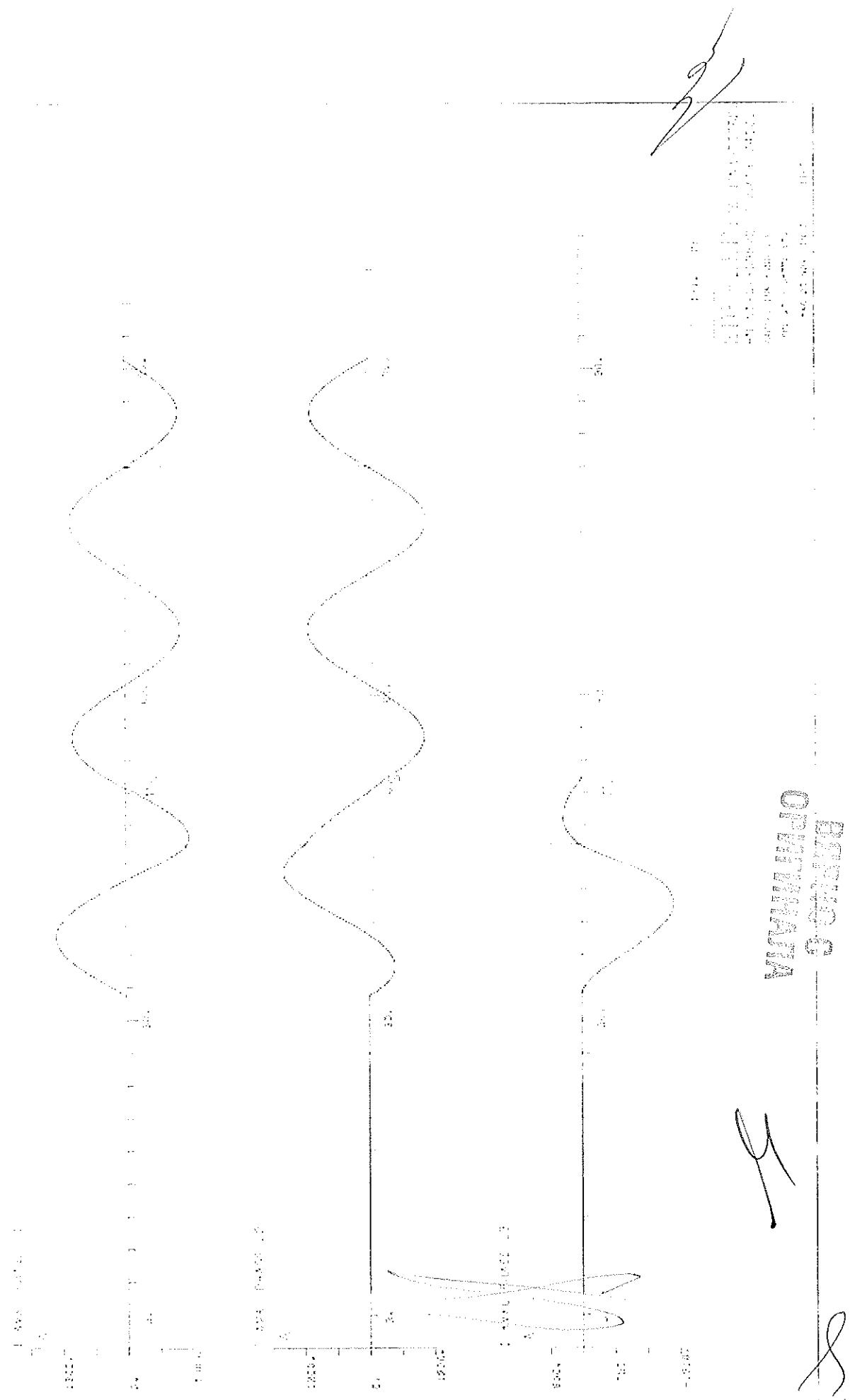
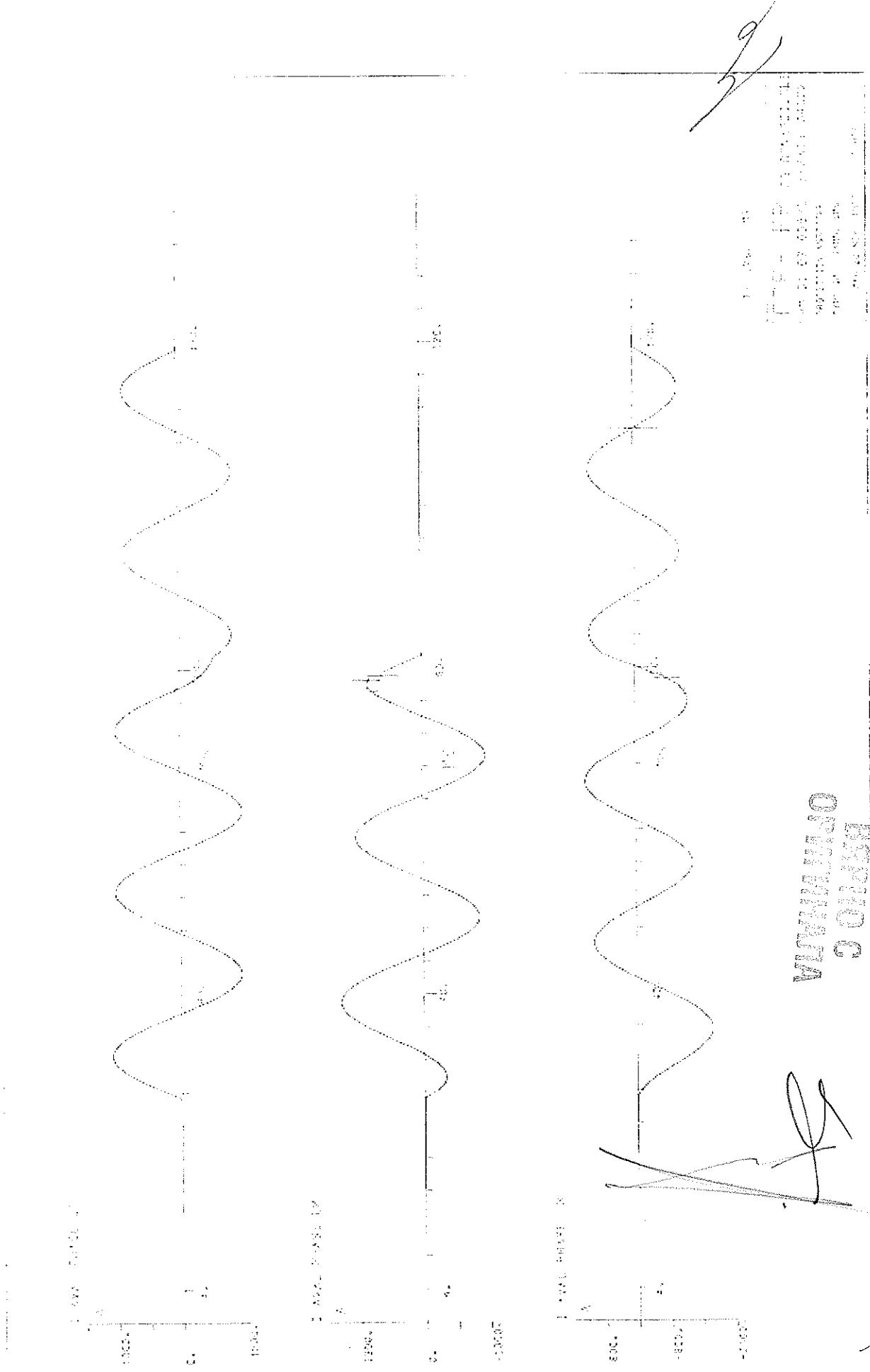


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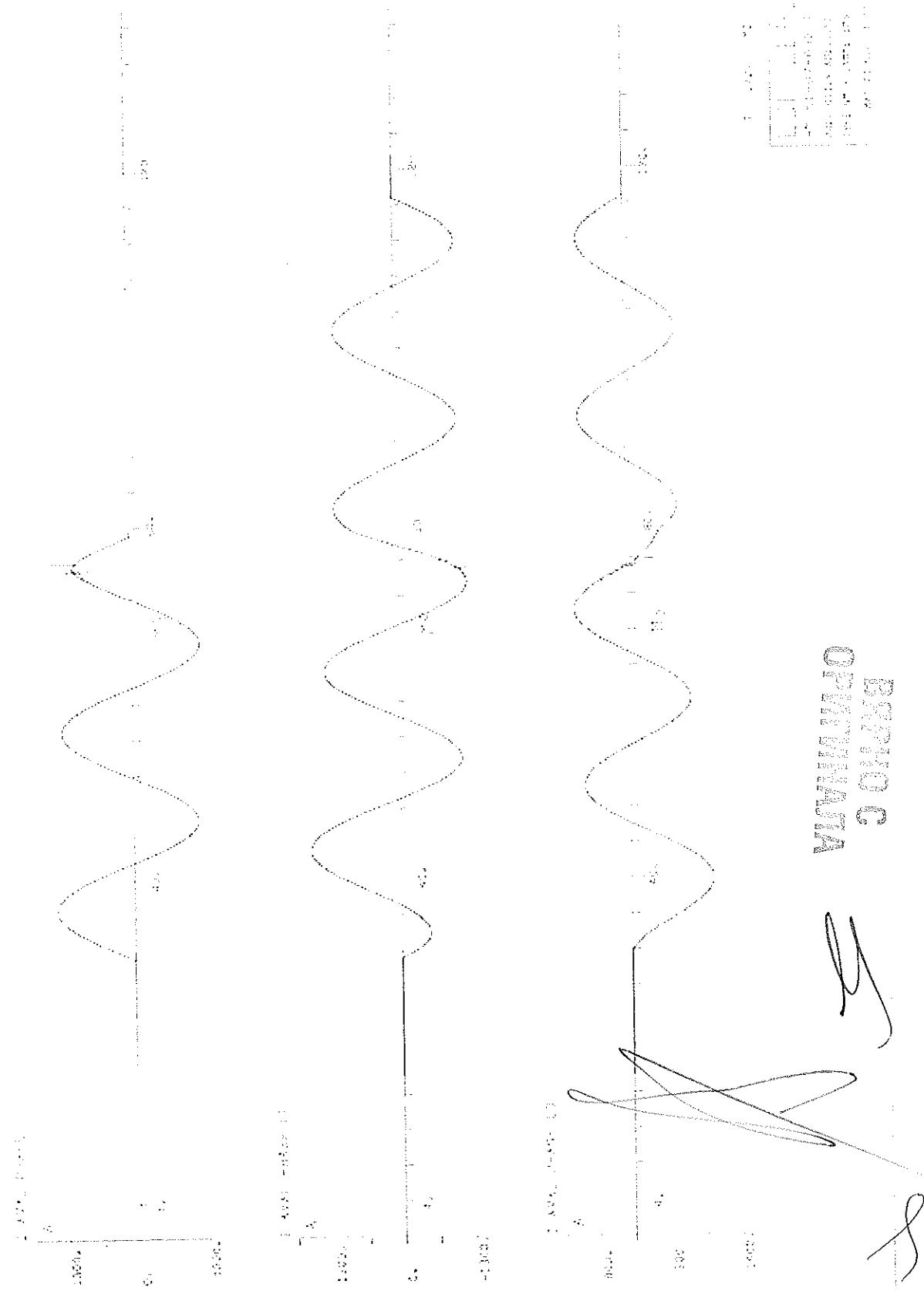


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2. *Athyrium filix-femina*
3. *Thlaspi arvense*
4. *Agrostis capillaris*
5. *Agrostis capillaris*
6. *Agrostis capillaris*

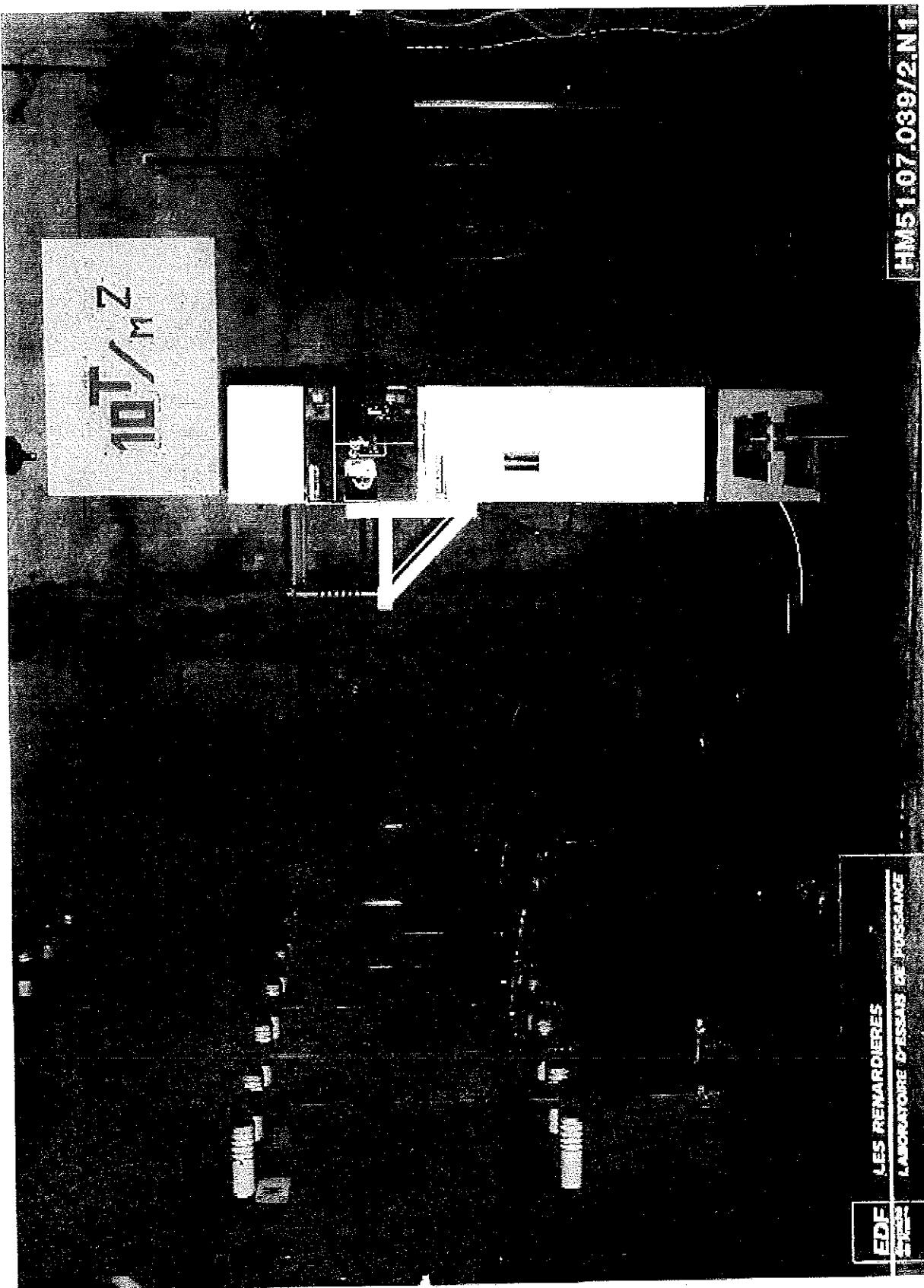
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故人不以爲子也。子之不孝，則無子矣。故曰：「子不孝，無子也。」

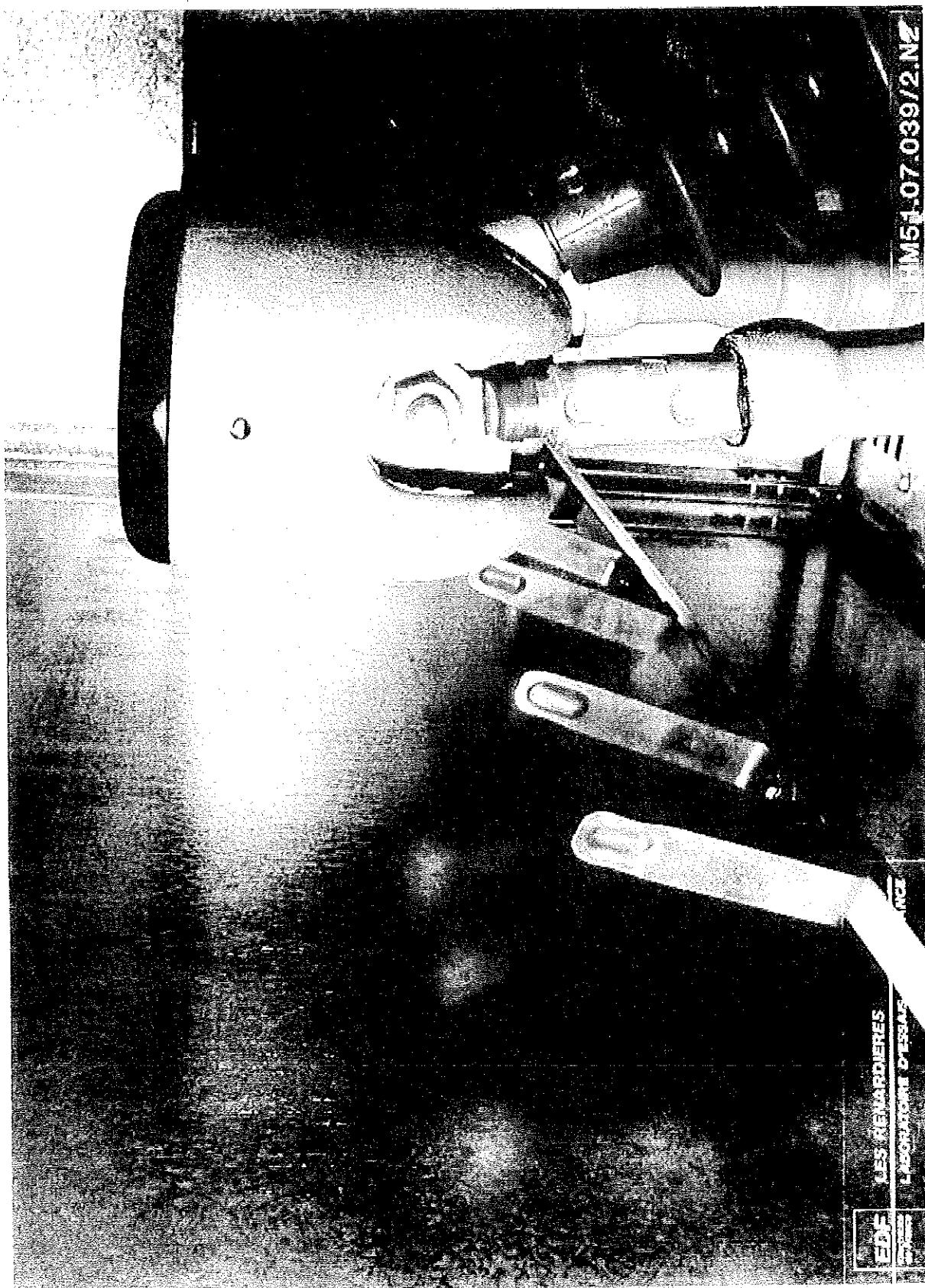
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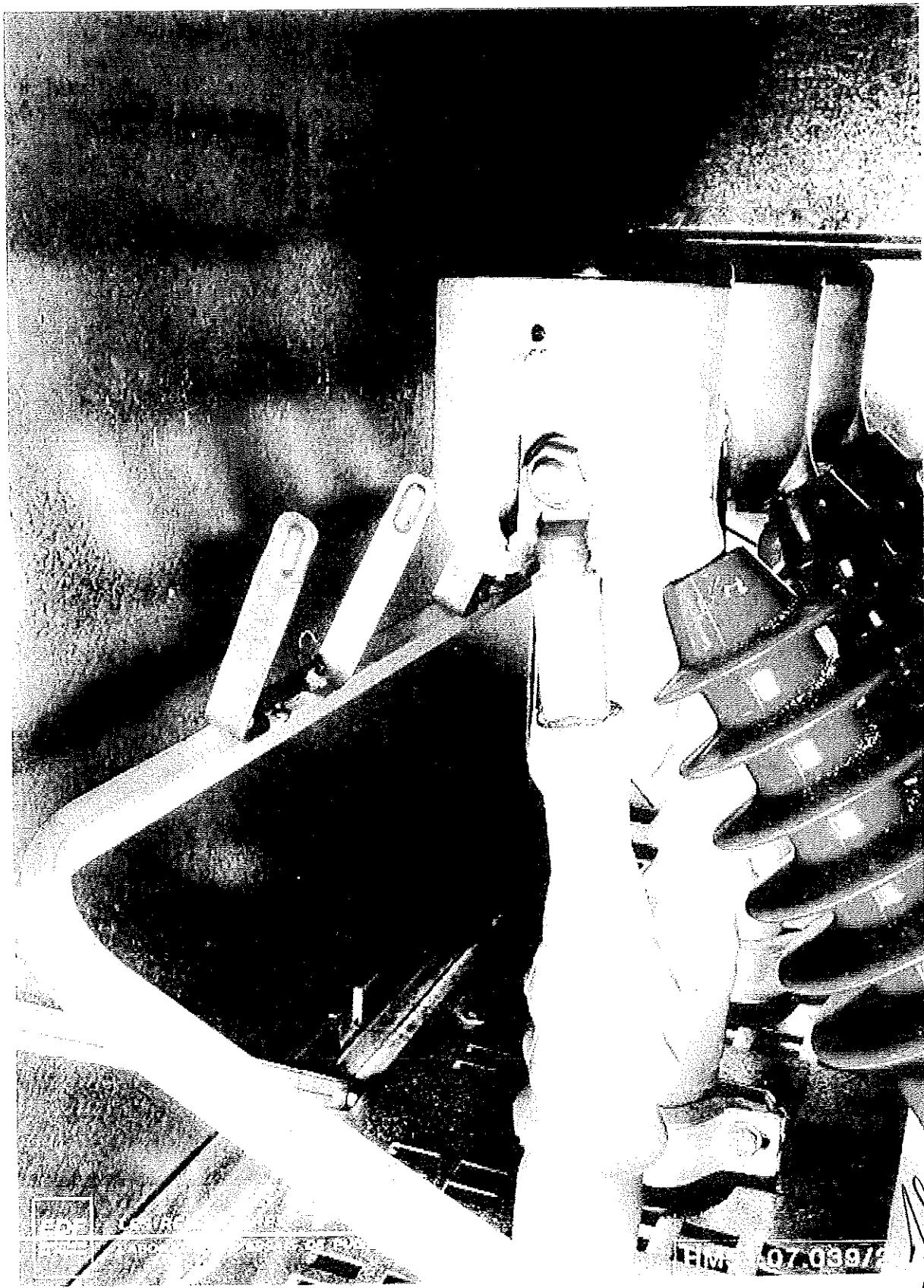


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LES RÉPARATIONS
DU GOUVERNEMENT FEDÉRAL
DU CANADA



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AB3665b

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BP n° 1
77250 Moret sur Loing

TEST REPORT No. AB 3665 b

Apparatus : *High-voltage switch*

Designation : *SM6 inside cubicle SM6 type QM*

Rated voltage 24 kV-Rated normal current 200 A-Rated frequency 50/60 Hz

Manufacturer : *MERLIN GERIN - Grenoble - FRANCE*

Object : *Single capacitor bank current switching tests rated at :*

135 A - 24 kV

Short-circuit making tests rated at :

31.5 kA peak - 24 kV

Tested for : *MERLIN GERIN*

Date(s) of tests : *13 - 14 - 15 - 18 / 04 / 1994*

These tests were carried out in accordance with : **Customer request based on NFC standard 64.130 (1992) § 6.101.12**

The performance of the apparatus tested and the results obtained are shown in the tables, oscillograms and photographs enclosed.

The responsibility for conformity of any apparatus having the same designation with that tested rests with the Manufacturer.

The documents forming part of this report are :

Ratings of the apparatus	page(s) 2 to 4
Record of proving tests	page(s) 5
Conditions of proving tests	page(s) 6 to 11
Test result tables	page(s) 12 to 31
Oscillograms	page(s) 32 to 81
Photographs	page(s) none

The test report comprises 81 page(s)

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Grenoble 22 / 02 / 1995

Technical Manager

Testing Station Manager

Ph. MAUDUIT

J.C. OKERMAN

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No. AB 3665 b

page 2

RATINGS OF THE METAL-ENCLOSED SWITCHGEAR ACCORDING TO IEC 298

Manufacturer	: MERLIN GERIN
Designation	: Cubicle SM6 type QM
Number of phases	: 3
Voltage	kV: 24
Power frequency withstand voltages (1 min)	
- to earth and between phases	kV: 50
- across the isolation distance	kV: 60
Lightning impulse withstand voltages	
- to earth and between phases	kV: 125
- across the isolation distance	kV: 145
Frequency	Hz: 50/60
Normal current	A: 200
Peak withstand current	kA: 31.5
Short-time withstand currents	
- main circuit	kA: 12.5
- earthing switch	kA: 12.5
- earth bar	kA: 12.5
Duration of short-circuit	s: 1
Arcing withstand due to an internal fault	kA: /
- duration	s: /
- type of accessibility	: /
Degree of protection	: IP2XC
Dimensions	: /
Weight	: /
Drawing(s) No.	: 3729262 A

The metal-enclosed switchgear, is equipped with : 1 switch SM6

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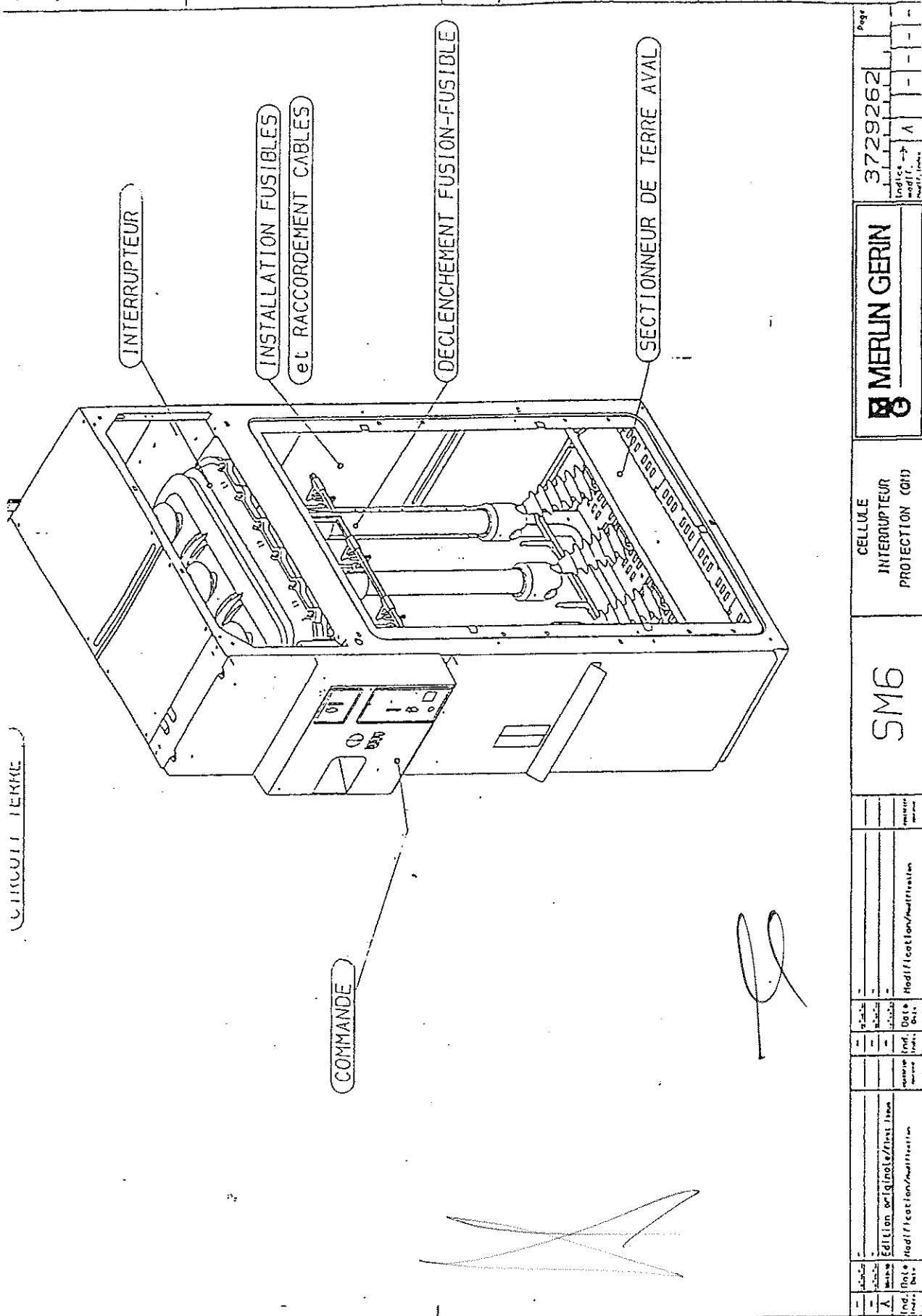
No. AB 3665 b

page 3

RATINGS OF THE HV SWITCH ACCORDING TO IEC 265

Manufacturer	: MERLIN GERIN
Designation	: SM6
Number of poles	: 3
Type of switch	: with increased operating frequency
Class	: indoor
Voltage	kV: 24
Power frequency withstand voltage (1 min)	kV: 50
Lighting impulse withstand voltage	kV: 125
Frequency	Hz: 50/60
Normal current	A : 200
Breaking capacities	
Mainly active load	A : 200
No-load transformer	A : /
Closed-loop	A : 200
Cable-charging	A : 25
Line-charging	A : /
Earth-fault	A : 75
Cable-charging under earth-fault conditions	A : 44
Making capacity	kA: 31.5
Peak withstand current	kA peak : 31.5
Short-time withstand current	kA R.M.S. : 12.5
- duration	s : 1
Mechanical endurance	Operating cycles : 1000
Interrupting medium	: gas SF6
Absolute pressure required at 20 °C	bar : 1.4
Operating temperatures	minimum °C : - 25 maximum °C : + 55
Degree of protection	: IP2XC
Drawing(s) No.	: /

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CELLULE INTERRUPTEUR PROTECTION (G1)	3729262	Page
Indice → A	-	-
Indice → B	-	-
Indice → C	-	-
Indice → D	-	-
Indice → E	-	-
Indice → F	-	-
Indice → G	-	-
Indice → H	-	-
Indice → I	-	-
Indice → J	-	-
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Indice → X	-	-
Indice → Y	-	-
Indice → Z	-	-

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page 5

[Signature]

RECORD OF PROVING TESTS

Apparatus No. :

test type and test-duty	Page
- Calibration of the supply circuit A : 1.29 kA - 24 kV	8
- Calibration of the supply circuit B : 6.98 kA - 24 kV	10
- No-load operations before tests	12
- Single-capacitor bank switching current tests	
Test-duty No.4 : 10 CO at 133/138 A - 24.8/25.3 kV	13 to 16
Test-duty No.2 : 10 CO at 145/148 A - 26.5/27.0 kV	17 to 20
Test-duty No.1 : 10 CO at 46.0/49.0 A - 24.4/24.9 kV	21 to 24
Test-duty No.3 : 10 CO at 46.0/47.7 A - 24.2/24.7 kV	25 to 28
- 2 making tests at short-circuit making current at: 31.5 kA peak - 24.6/24.7 kV	29
- No-load operations after tests	30
- Measurement of the resistance of the main circuit before and after tests	31

[Handwritten notes]

Manufacturer Representative(s) : Mr MESTRALLET

MERLIN GERIN/DMT

[Signature]

[Signature]

Test Manager

: M.PALLOT

SEGP VOLTA

[Signature]

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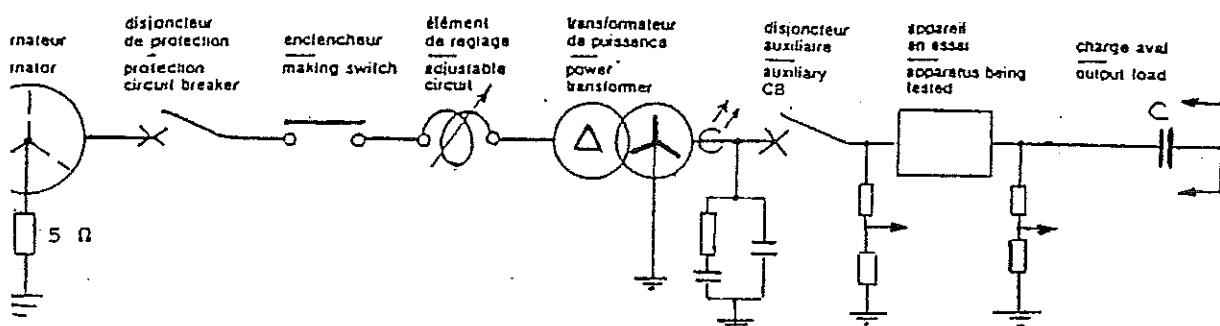
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page 6

TEST CIRCUIT FOR SINGLE CAPACITOR BANK CURRENT SWITCHING TESTS



Note : - The measuring devices of the voltage on load side were note suited:
- The voltage drop does not exceed 10 % 100 ms after arc extinction.

CONDITIONS OF PROVING TESTS

- Supply by the upper switch connections
- The fuses are replaced by rigid connections
- Pressure of the interrupting medium : 0.4 bar gauge
- Control devices supply : 85 % of the rated voltage : 187 Vac
- The time of supply of the opening coil is changed by 1 ms after each test
- The duration between two successive operations is 3 to 5 minutes
- The metallic enclosure is connected to earth point by cable 50 mm². The fault current is recorded on the oscillograms

Test-duties No.1 and 2

The short-circuit current reaches 10 % of the rated short-time withstand current of the switch

Test-duties No.3 and 4

The short-circuit current reaches 56 % of the rated short-time withstand current of the switch

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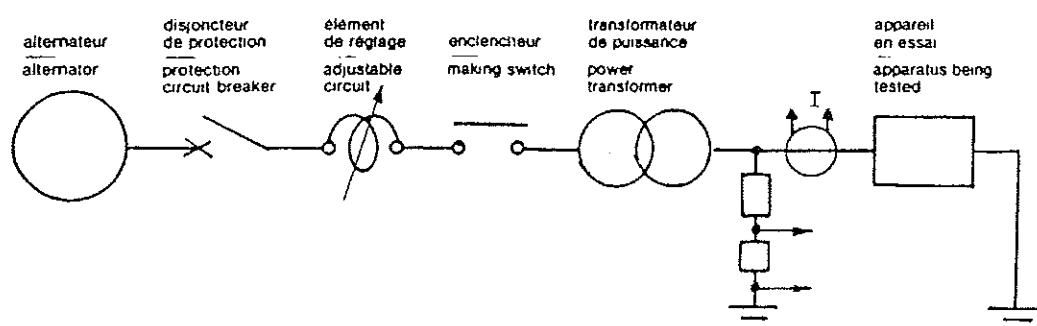
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page 7

TEST CIRCUIT FOR THE SHORT-CIRCUIT MAKING TESTS



CONDITIONS OF PROVING TESTS

- Supply by the upper switch connections
- The short-circuit is on lower switch connections
- Pressure of the interrupting medium : 0.4 bar gauge
- Control devices supply : 85 % of the rated voltage : 187 Vac



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No. AB 3665 b

page 8

CALIBRATION OF THE SUPPLY CIRCUIT A

Oscillogram	No.	B 3665.94.04.13.014		
Circuit : 100 %		phase 1	phase 2	phase 3
Frequency	Hz	50		
Measure of the R.M.S. current	Time	ms	20	20
	Value	kA	1.29	1.30
	Average	kA	1.29	
Aperiodic component	Value	%	75	70
Peak current	kA	3.45	3.50	2.00
Power factor		0.05		

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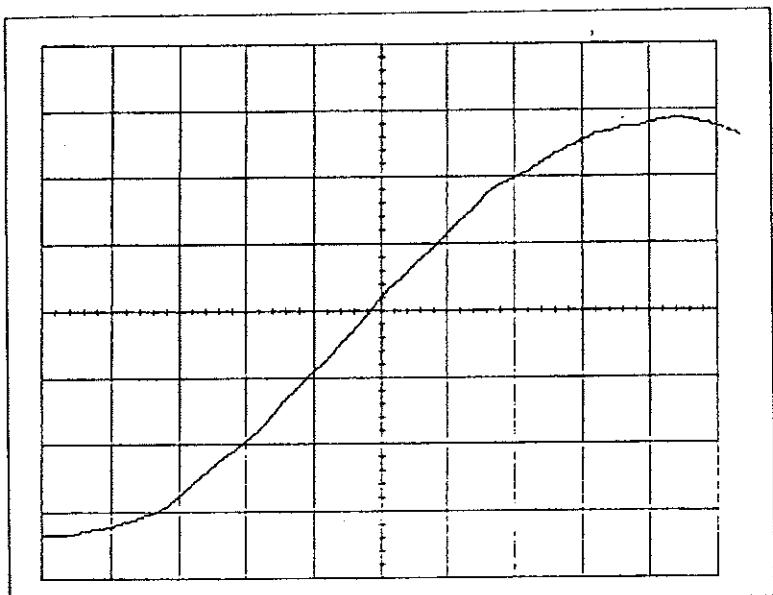
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No. AB 3665 b

page 9

PROSPECTIVE TRV OF THE SUPPLY CIRCUIT A

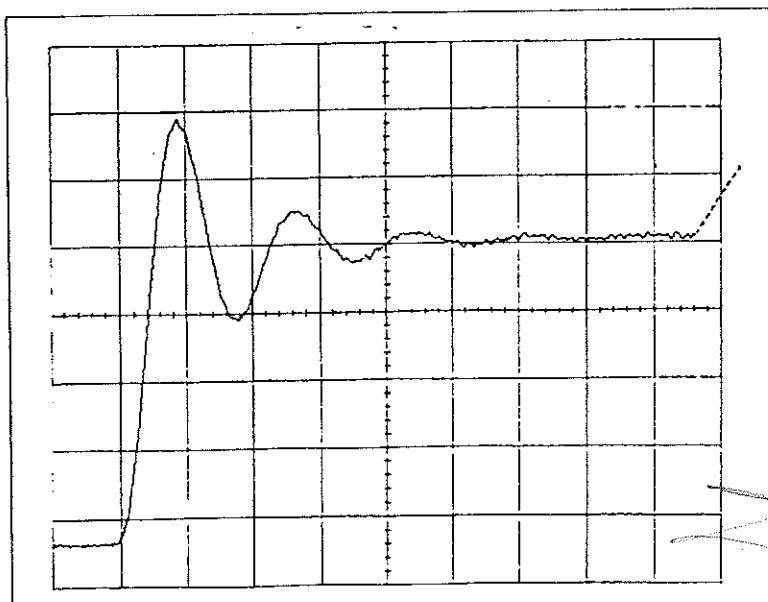


Circuit : 1.29 kA - 24 kV

$$t_3 = 78 \mu\text{s}$$

$$t_d = 9 \mu\text{s}$$

$$k = 1.42$$



$$k = 1.42$$

Time base : 0.1 ms /unit

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No. AB 3665 b

page 10

CALIBRATION OF THE SUPPLY CIRCUIT B

Oscillogram	No.	B 3665.94.04.13.015		
Circuit : 50 %		phase 1	phase 2	phase 3
Frequency	Hz	50		
Measure of the R.M.S. value	Time	ms	10	10
	Value	kA	3.59	3.48
	Average	kA	3.49	
Aperiodic component	Value	%	93	66
Peak current	kA	9.78	8.50	6.15
Power factor		0.03		

Circuit : 100 %		phase 1	phase 2	phase 3
Frequency	Hz	50		
Measure of the R.M.S. value	Time	ms	10	10
	Value	kA	7.18	6.96
	Average	kA	6.98	
Aperiodic component	Value	%	93	66
Peak current	kA	19.6	17.2	12.3
Power factor		0.03		

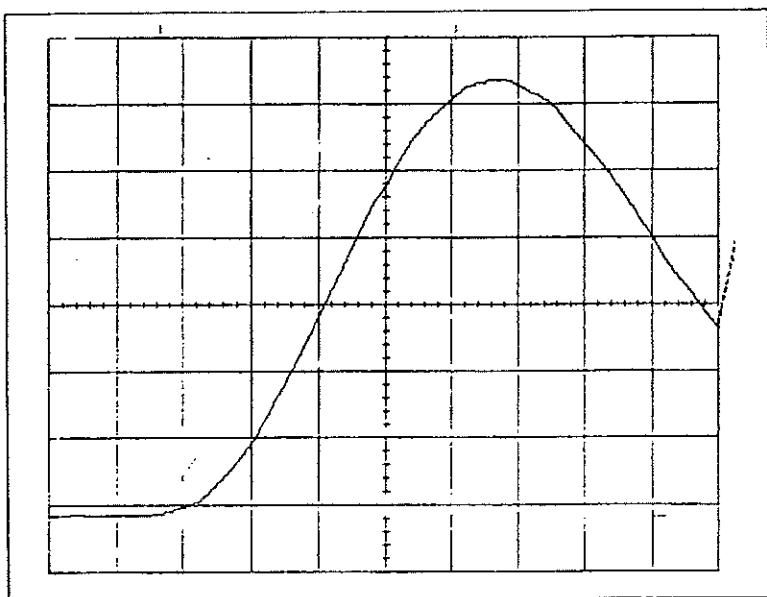
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PROSPECTIVE TRV OF THE SUPPLY CIRCUIT B

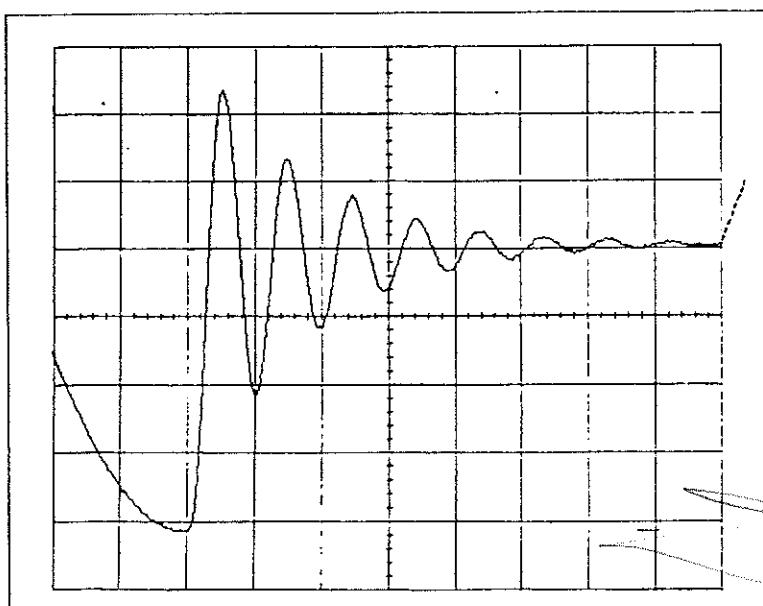


Circuit : 6.98 kA - 24 kV

$$t_3 = 88 \mu s$$

$$t_d = 15 \mu\text{s}$$

$$k = 1.55$$



$$k = 1.55$$

Time base : 0.2 ms /unit

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page 12

RESULTS OF THE NO-LOAD OPERATIONS BEFORE TESTS

RATINGS

Motor supply voltage : 220 Vac
Pressure of the interrupting medium : 0.4 bar gauge
Supply voltage of the opening coil : 220 Vac
Supply voltage of the closing coil : 220 Vac

Oscillogram No. B 3665.94.04.13			011	012	013	
Operating sequence			C - O	C - O	C - O	
Motor supply voltage		Vac	242	220	187	
Pressure of the interrupting medium	gauge	bar	0.4	0.4	0.4	
	absolute	bar	1.4	1.4	1.4	
Supply voltage of the coil	opening	Vac	242	220	187	
	closing	Vac	242	220	187	
Time	opening	ms	20.5	19	25	
	closing	ms	60	59	67.5	

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No. AB 3665 b

page 13

RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 4

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 10 - 11

Apparatus condition before tests : Having performed the single capacitor bank tests of test report No. AB 3665 a

Oscillogram No. B 3665.94.04.14		062			t	063			t	064		
Operating sequence		C-O				C-O				C-O		
Applied voltage		kV	23.9			24.2			24.1			
Peak current		A	410	740	880	800	450	930	920	720	460	
Closing time		ms	45.0			48.0			54.0			
Broken current	per phase	A	131	131	138	131	138	138	134	138	134	
	average	A	133			136			135			
Aperiodic component		%	< 20			< 20			< 20			
Recovery voltage	per phase	kV	14.5	14.1	14.3	14.3	14.5	14.7	14.3	14.3	14.5	
	average	kV	14.3			14.5			14.4			
	phase to phase	kV	24.8			25.1			24.9			
Time	opening	ms	25			25			25			
	arcng	ms	7			10			11			
	break	ms	32.0			35.0			36.0			
Remarks												

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No. AB 3665 b

page 14

RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 4

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 10 - 11

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.14		065			t	066			t	067			
Operating sequence		C-O				C-O				C-O			
Applied voltage		kV	24.2				24.1				24.2		
Peak current	A	580	860	820	860	400	870	740	930	760			
Closing time	ms		51.0				48.0				42.0		
Broken current	per phase	A	134	138	134	134	138	138	134	134	138		
	average	A		135			137			135			
Aperiodic component	%		< 20				< 20			< 20			
Recovery voltage	per phase	kV	14.5	14.7	14.3	14.3	14.5	14.5	14.3	14.5	14.5		
	average	kV		14.5			14.4			14.4			
	phase to phase	kV		25.1			24.9			24.9			
Time	opening	ms		25			25			25			
	arcng	ms		10.5			10			7.5			
	break	ms		35.5			35.0			32.5			
Remarks													

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No. AB 3665 b

page 15

RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 4

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 10 - 11

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.14		068			t	069			t	070		
Operating sequence		C-O				C-O				C-O		
Applied voltage		kV			24.2	24.2				23.9		
Peak current		A	560	880	880	950	880	740	680	870	810	
Closing time		ms	40.0			44.0				42.5		
Broken current	per phase	A	134	138	138	134	134	138	138	138	138	
	average	A	137			135				138		
Aperiodic component		%	< 20			< 20				< 20		
Recovery voltage	per phase	kV	14.7	14.5	14.3	14.5	14.5	14.5	14.5	14.7	14.3	
	average	kV	14.5			14.5				14.5		
	phase to phase	kV	25.1			25.1				25.1		
Time	opening	ms	25			25				25		
	arcing	ms	6.5			8.5				8		
	break	ms	31.5			33.5				33.0		
Remarks												

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No. AB 3665 b

page 16

RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 4

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 10 - 11

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.14		071	t		t	
Operating sequence		C-O		C-O		C-O
Applied voltage	kV	24.0				
Peak current	A	500	860	910		
Closing time	ms	45.0				
Broken current	per phase	A	134	134	138	
current	average	A	135			
	Aperiodic component	%	< 20			
Recovery voltage	per phase	kV	14.7	14.5	14.3	
	average	kV		14.6		
	phase to phase	kV		25.3		
Time	opening	ms	25			
	arcng	ms	7			
	break	ms	32.0			
Remarks						

Apparatus condition after tests : No deterioration was noted

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page 17

RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 2

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 8 - 9

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.15		078			t	079			t	080			
Operating sequence		C-O				C-O				C-O			
Applied voltage		kV	23.7				23.9				24.1		
Peak current		A	530	730	530	600	660	320	430	730	540		
Closing time		ms	42.0				43.5				46.5		
Broken current	per phase	A	148	145	145	148	145	148	148	148	148		
	average	A	146				147				148		
Aperiodic component		%	< 20				< 20				< 20		
Recovery voltage	per phase	kV	15.2	15.2	15.6	15.2	15.6	15.6	15.6	15.6	15.6		
	average	kV	15.3				15.5				15.6		
	phase to phase	kV	26.5				26.8				27.0		
Time	opening	ms	25				25				25		
	arching	ms	6.5				9				8.5		
	break	ms	31.5				34.0				33.5		
Remarks													

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 2

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 8 - 9

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.15		081			t	082			t	083		
Operating sequence		C-0				C-0				C-0		
Applied voltage		kV	23.9			24.1			23.8			
Peak current		A	480	440	730	300	550	720	560	730	410	
Closing time		ms	41.5			41.0			48.0			
Broken current	per phase	A	148	148	148	148	145	141	152	145	145	
	average	A	148			145			147			
Aperiodic component		%	< 20			< 20			< 20			
Recovery voltage	per phase	kV	15.6	15.6	15.0	15.2	15.6	15.2	15.6	15.6	15.6	
	average	kV	15.4			15.3			15.6			
	phase to phase	kV	26.7			26.5			27.0			
Time	opening	ms	25			25			25			
	arcing	ms	13.5			9			6			
	break	ms	38.5			34.0			31.0			
Remarks												

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 2

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 8 - 9

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.15		084			t	085			t	086			
Operating sequence		C-O				C-O				C-O			
Applied voltage		kV	23.9				23.9				23.9		
Peak current		A	440	720	570	750	330	570	620	410	720		
Closing time		ms	45.0			52.0			53.5				
Broken current	per phase	A	152	148	148	145	145	145	148	141	148		
	average	A	149			145			146				
Aperiodic component		%	< 20			< 20			< 20				
Recovery voltage	per phase	kV	15.6	15.6	15.6	15.2	15.6	15.6	15.6	15.6	15.6		
	average	kV	15.6			15.5			15.6				
	phase to phase	kV	27.0			26.8			27.0				
Time	opening	ms	25			25			25				
	arcing	ms	13			9			11				
	break	ms	38.0			34.0			36.0				
Remarks													

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 2

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 8 - 9

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.15		087	t	t	
Operating sequence		C-O		C-O	C-O
Applied voltage	kV	24.0			
Peak current	A	160	320	540	
Closing time	ms	52.0			
Broken current	per phase	A	148	148	148
	average	A	148		
Aperiodic component	%	< 20			
Recovery voltage	per phase	kV	15.2	15.6	15.2
	average	kV		15.3	
	phase to phase	kV		26.5	
Time	opening	ms	25		
	arcing	ms		9.5	
	break	ms		34.5	
Remarks					

Apparatus condition after tests : No deterioration was noted

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 1

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 8 - 9

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.18		091			t	092			t	093		
Operating sequence		C-O				C-O				C-O		
Applied voltage	kV	24.0				24.1				24.1		
Peak current	A	320	380	250		150	300	350		200	340	330
Closing time	ms	48.5				40.5				40.0		
Broken current	per phase	A	47.7	46.0	46.0	46.0	46.0	46.0	49.5	49.5	49.5	
	average	A	46.6			46.0				49.0		
Aperiodic component		%	< 20			< 20				< 20		
Recovery voltage	per phase	kV	14.1	14.5	13.8	14.3	14.3	14.3	14.5	14.5	14.5	14.1
	average	kV	14.1			14.3				14.4		
	phase to phase	kV	24.4			24.8				24.9		
Time	opening	ms	25			25				25		
	arcng	ms	12.5			7.5				7		
	break	ms	37.5			32.5				32.0		
Remarks												

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 1

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 8 - 9

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.18		094			t	095			t	096		
Operating sequence		C-O				C-O				C-O		
Applied voltage		kV			23.9	23.9				23.9		
Peak current		A	350	190	260	290	190	330	330	340	160	
Closing time		ms	48.0			49.5				43.5		
Broken current	per phase	A	47.7	49.5	46.0	49.5	46.0	47.7	49.5	46.0	47.7	
	average	A	47.7			47.7				47.7		
Aperiodic component		%	< 20			< 20				< 20		
Recovery voltage	per phase	kV	14.3	14.1	14.1	14.3	14.5	14.1	14.3	14.3	14.1	
	average	kV	14.2			14.3				14.2		
	phase to phase	kV	24.6			24.8				24.6		
Time	opening	ms	25			25				25		
	arching	ms	13			6.5				7.5		
	break	ms	38.0			31.5				32.5		
Remarks												

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 1

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 8 - 9

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.18		097			t	098			t	099		
Operating sequence		C-0				C-0				C-0		
Applied voltage	kV	23.8				23.9				24.2		
Peak current	A	170	310	350		310	350	210	280	210	340	
Closing time	ms	41.5				46.0				50.5		
Broken current	per phase	A	49.5	47.5	47.7	49.5	47.7	47.7	49.5	49.5	47.7	
	average	A	48.3			48.3				48.9		
Aperiodic component		%	< 20			< 20				< 20		
Recovery voltage	per phase	kV	14.1	14.1	14.1	14.1	14.3	14.1	14.3	14.5	14.1	
	average	kV	14.1			14.1				14.3		
	phase to phase	kV	24.4			24.4				24.8		
Time	opening	ms	25			25				25		
	arcng	ms	9.5			11				9.0		
	break	ms	34.5			36.0				34.0		
Remarks												

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 1

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 8 - 9

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.18			100	t		t	
Operating sequence			C-O		C-O		C-O
Applied voltage		kV	23.9				
Peak current		A	340	150	280		
Closing time		ms	49.0				
Broken current	per phase	A	49.5	47.7	47.7		
	average	A		48.3			
Aperiodic component		%	< 20				
Recovery voltage	per phase	kV	14.3	14.5	14.1		
	average	kV		14.3			
	phase to phase	kV		24.8			
Time	opening	ms	25				
	arcing	ms		14.5			
	break	ms		39.5			
Remarks							

Apparatus condition after tests : No deterioration was noted

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 3

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 10 - 11

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.18		101			t	102			t	103		
Operating sequence		C-O				C-O				C-O		
Applied voltage	kv		24.1				24.1				24.0	
Peak current	A	220	500	500	540	360	500	460	540	310		
Closing time	ms		43.5				49.0				49.0	
Broken current	per phase	A	47.7	46.0	47.7	47.7	47.7	47.7	46.0	47.7	47.7	
	average	A		47.1			47.7				47.1	
Aperiodic component	%		< 20				< 20				< 20	
Recovery voltage	per phase	kV	14.3	14.1	14.0	14.1	14.1	13.8	14.1	14.1	13.8	
	average	kV		14.1			14.0				14.0	
	phase to phase	kV		24.4			24.2				24.2	
Time	opening	ms		25			25				25	
	arcing	ms		6			12				5	
	break	ms		31.0			37.0				30.0	
Remarks												

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 3

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 10 - 11

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.18		104			t	105			t	106		
Operating sequence		C-O				C-O				C-O		
Applied voltage		kV			24.0	24.1				23.9		
Peak current		A	240	490	520	300	470	520	150	500	520	
Closing time		ms	39.5			43.5				41.0		
Broken current	per phase	A	46.0	46.0	46.0	47.7	46.0	46.0	46.0	47.7	47.7	
	average	A	46.0			46.6				47.1		
Aperiodic component		%	< 20			< 20				< 20		
Recovery voltage	per phase	kV	14.1	14.1	13.8	14.1	14.1	13.8	14.3	14.1	13.8	
	average	kV	14.0			14.0				14.1		
	phase to phase	kV	24.2			24.2				24.4		
Time	opening	ms	25			25				25		
	arcng	ms	7			6				9.5		
	break	ms	32.0			31.0				34.5		
Remarks												

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 3

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 10 - 11

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.18		107	t	108	t	109
Operating sequence		C-0		C-0		C-0
Applied voltage	kV	23.8		24.1		24.2
Peak current	A	240	400	200	400	520
Closing time	ms	46.0		42.5		41.5
Broken current	per phase	A	46.0	46.0	46.0	47.7
	average	A		46.0		46.6
Aperiodic component	%	< 20		< 20		< 20
Recovery voltage	per phase	kV	14.1	14.3	14.0	14.3
	average	kV		14.1		14.2
	phase to phase	kV		24.4		24.6
Time	opening	ms	25		25	
	arcng	ms		6.5		6
	break	ms		31.5		31.0
Remarks						

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RESULTS OF THE MAKING AND BREAKING TESTS

Test-duty : Test-duty No. 3

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 - 10 - 11

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.18		110	t		t	
Operating sequence		C-0		C-0		C-0
Applied voltage	kV	24.2				
Peak current	A	220	470	470		
Closing time	ms	49.5				
Broken current	per phase	A	47.7	46.0	46.0	
	average	A	46.6			
Aperiodic component	%		< 20			
Recovery voltage	per phase	kV	14.5	14.5	14.0	
	average	kV		14.3		
	phase to phase	kV		24.7		
Time	opening	ms	25			
	arcing	ms		10.7		
	break	ms		35.7		
Remarks						

Apparatus condition after tests : No deterioration was noted

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RESULTS OF THE SHORT-CIRCUIT MAKING TESTS

Apparatus in test : Switch SM6 inside cubicle SM6 type QM

Operating conditions of the apparatus : See page 7

Test conditions : See page 7

Apparatus condition before tests : Having performed the previous tests

Oscillogram No. B 3665.94.04.18		117	t	118	t	
Operating sequence		c		c		c
Applied voltage	kV	24.6		24.7		
Peak current	I1	kA	18.9		31.5	
	I2	kA	30.8		19.4	
	I3	kA	31.5		28.7	
Making current	I1	kA	12.8		12.9	
	I2	kA	13.0		12.8	
	I3	kA	12.7		12.7	
	average	kA	12.8		12.8	
Time	pre-arcing	ms	/	/		
	closing	ms	41.0		38	
	current	ms	150		150	
Fuse						
Remarks						

Apparatus condition after tests : No deterioration was noted.

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RESULTS OF THE NO-LOAD OPERATIONS AFTER TESTS

RATINGS

Motor supply voltage : 220 Vac
Pressure of the interrupting medium : 0.4 bar gauge
Supply voltage of the opening coil : 220 Vac
Supply voltage of the closing coil : 220 Vac

Oscillogram No. B 3665.94.04.18		119	120	121	
Operating sequence		C - 0	C - 0	C - 0	C - 0
Motor supply voltage	Vac	242	220	187	
Pressure of the interrupting medium	gauge	bar	0.4	0.4	0.4
	absolute	bar	1.4	1.4	1.4
Supply voltage of the coil	opening	Vac	242	220	187
	closing	Vac	242	220	187
Time	opening	ms	24	28.5	25
	closing	ms	39	47	41

142Y

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MEASUREMENT OF THE RESISTANCE OF THE MAIN CIRCUIT

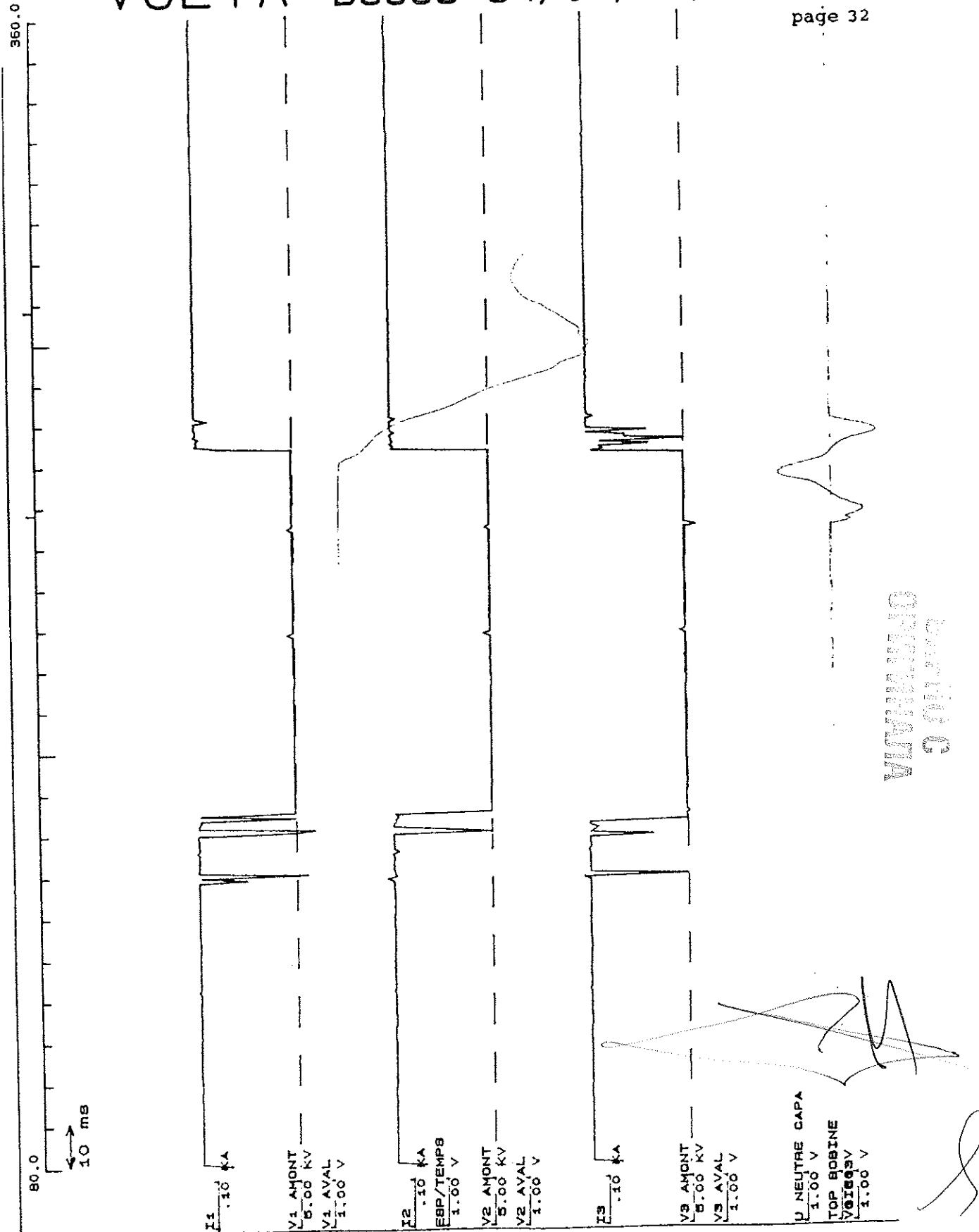
Measurement of the voltage drop under 100 Adc

Voltage drop (mV)	Pole 1	Pole 2	Pole 3
Before tests	6.50	7.16	6.64
After tests	5.85	6.24	6.60
Ratio after / before	0.82	0.87	0.99

Satisfactory results : Variations of the voltage drops below 20 %

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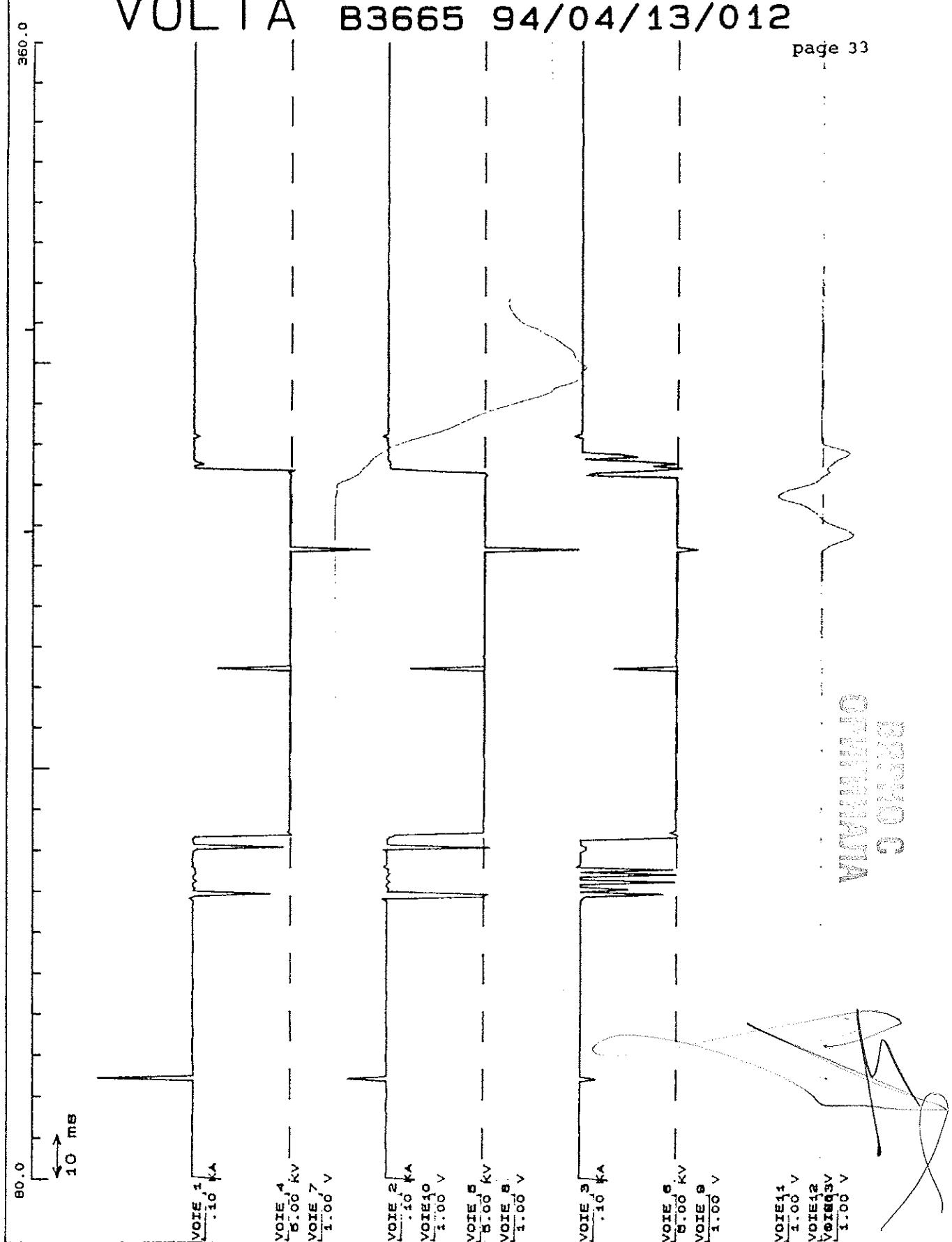


1426

VOLTA

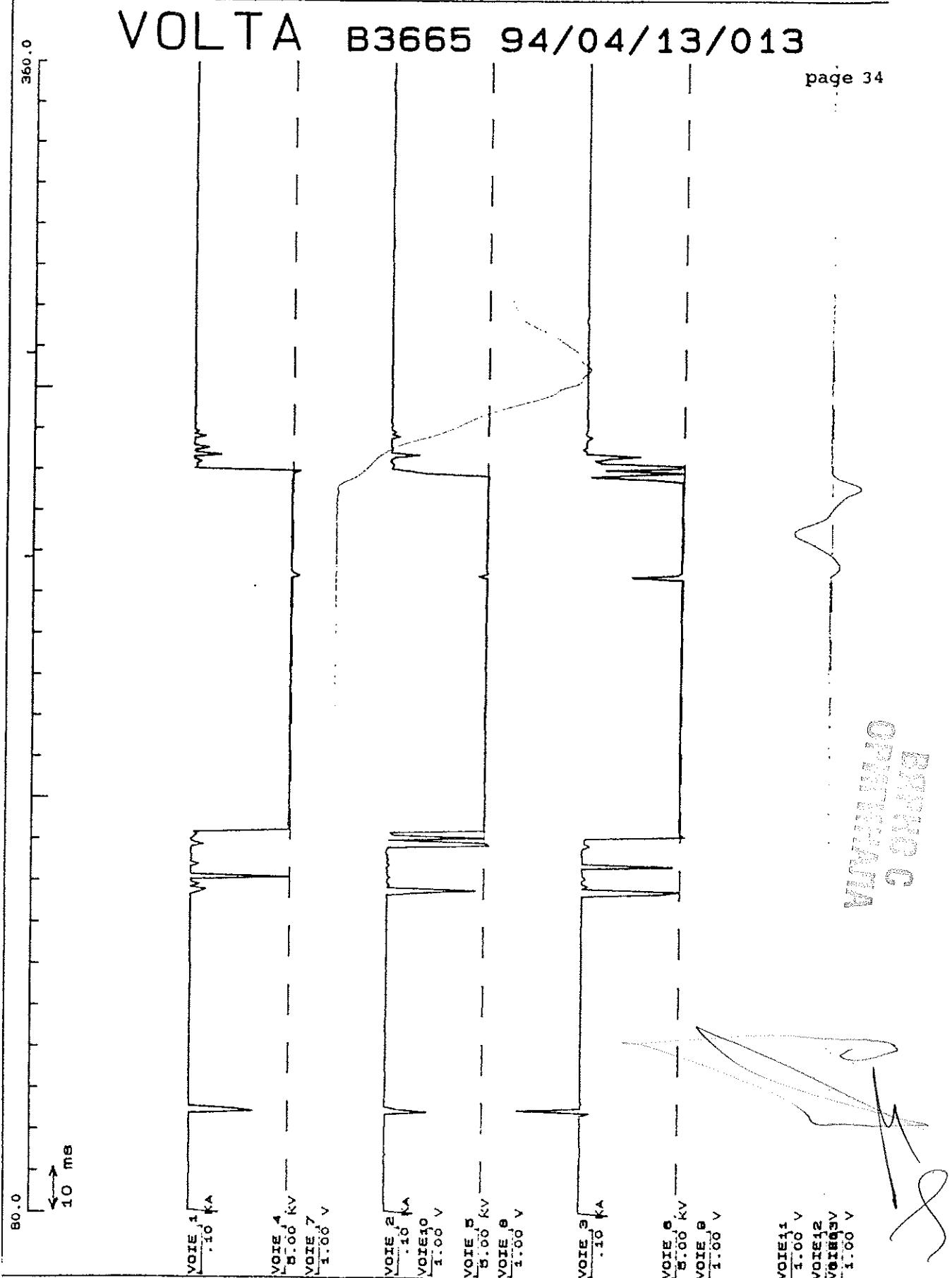
B3665 94/04/13/012

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VOLTA B3665 94/04/13/013

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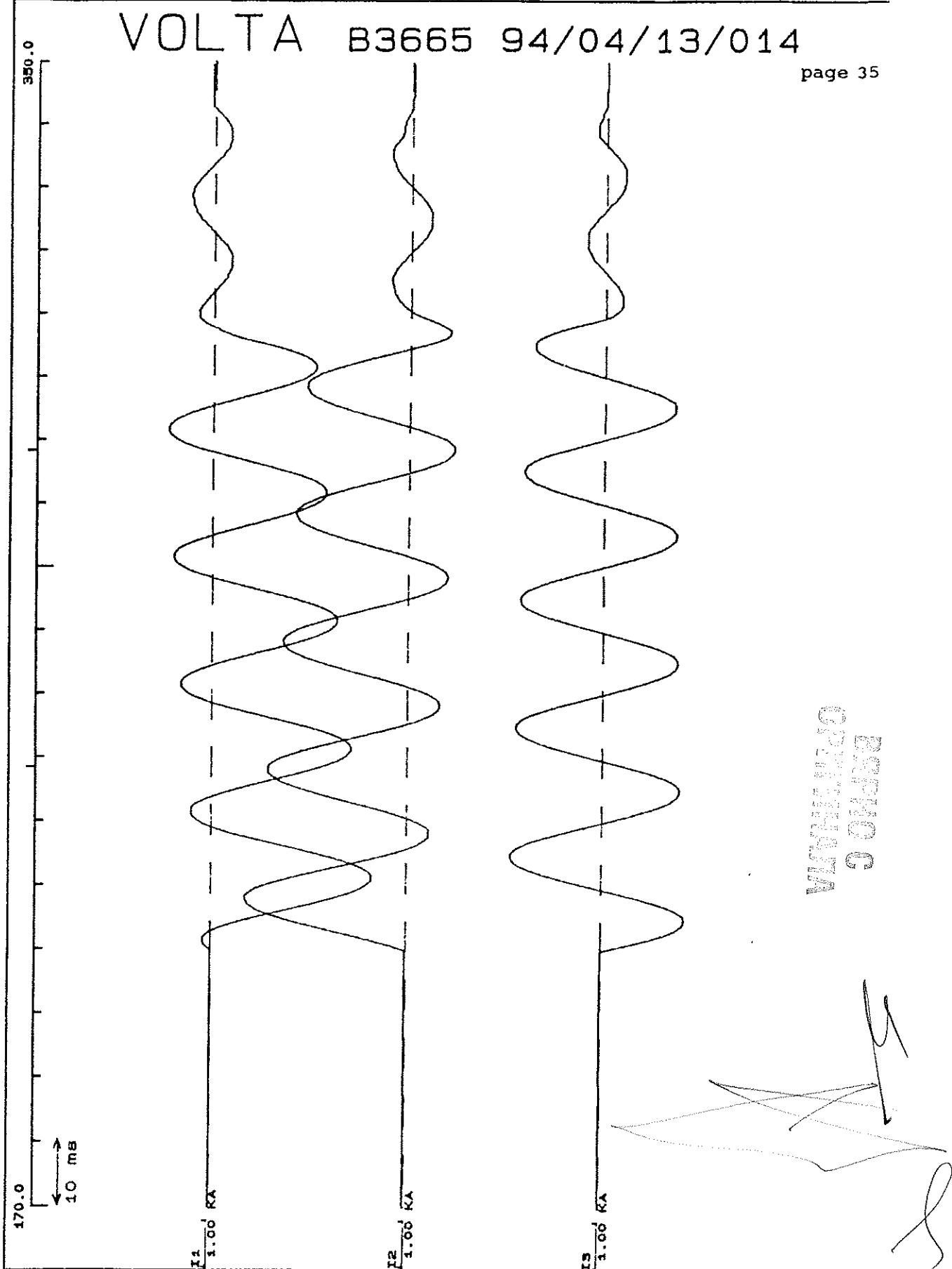


1428

2

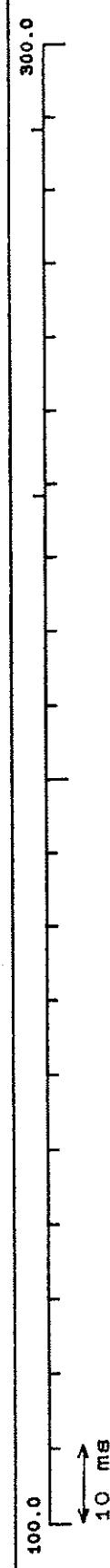
VOLTA B3665 94/04/13/014

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VOLTA B3665 94/04/13/015

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VOIE 4
2.00 KV

VOIE 4
20.00 KV
VOIE 7
1.00 V

VOIE 2
2.00 KA

VOIE 10
1.00 V

VOIE 3
2.00 KA

VOIE 5
20.00 KV
VOIE 8
1.00 V

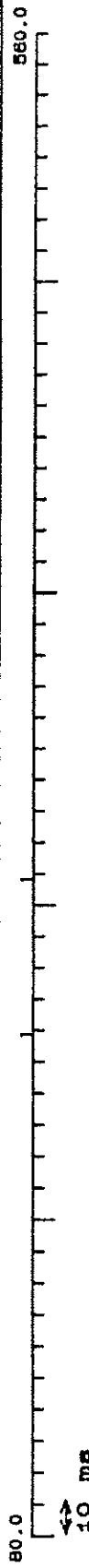
VOIE 11
1.00 V
VOIE 12
1.00 V
VOIE 13
1.00 V

VOIE 14
1.00 V
VOIE 15
1.00 V
VOIE 16
1.00 V

1430

VOLTA B3665 94/04/14/062

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E1 200A/V
- .20 KA

V1 AMONT
50.00 KV
V3 AVAL 200A/V
1.00 V

E2 200A/V
- .20 KA
ESP/TEMPS
1.00 V

V2 AMONT
50.00 KV
V2 AVAL 200A/V
1.00 V

E3 200A/V
- .20 KA

V3 AMONT
50.00 KV
V3 AVAL 200A/V
1.00 V

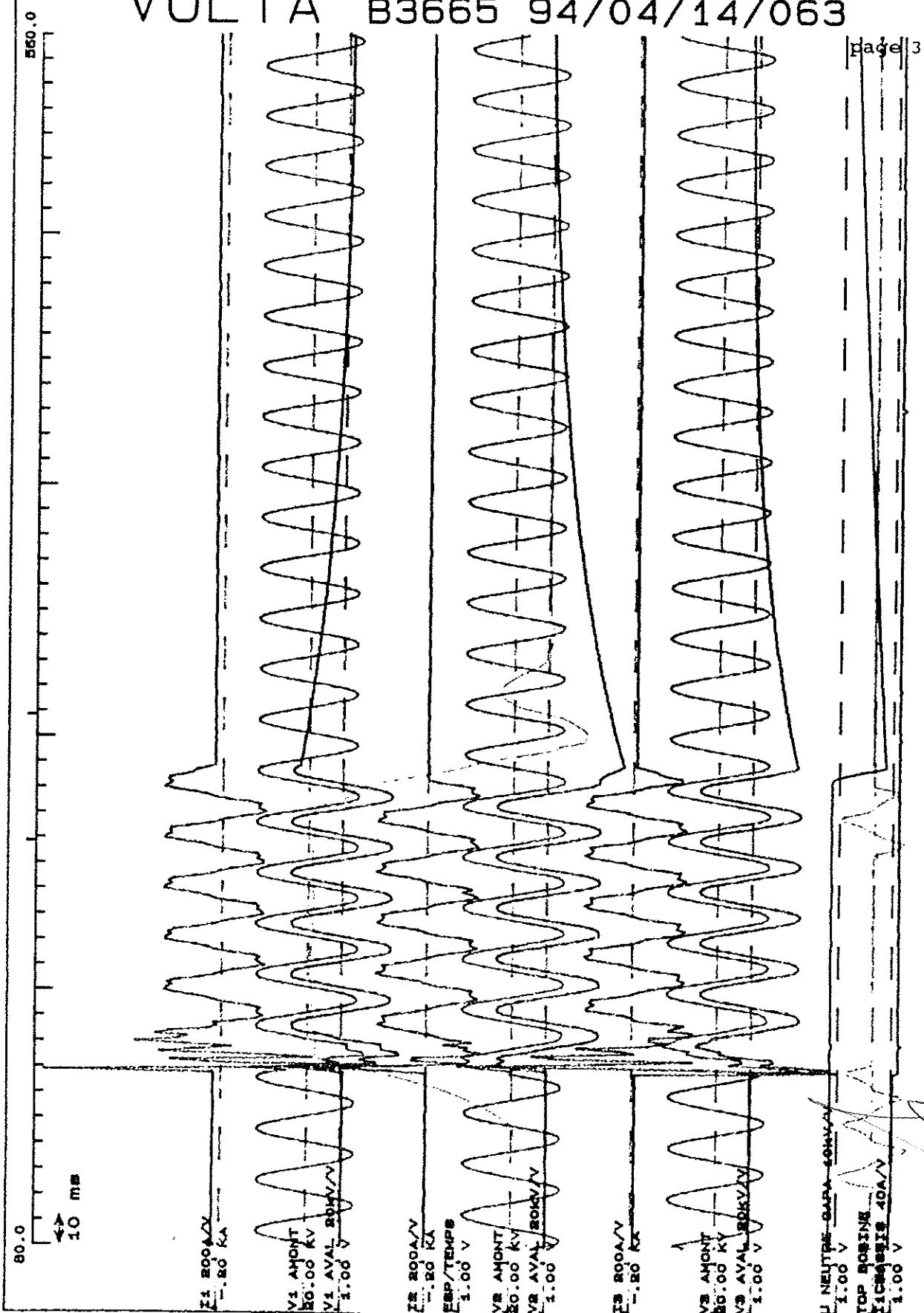
V1 NEUTRE 200A/V
1.00 V
TOP 200A/V
FICHEURIE 40A/V
1.00 V

WILHELMUS
9 04 14 062

1431

VOLTA B3665 94/04/14/063

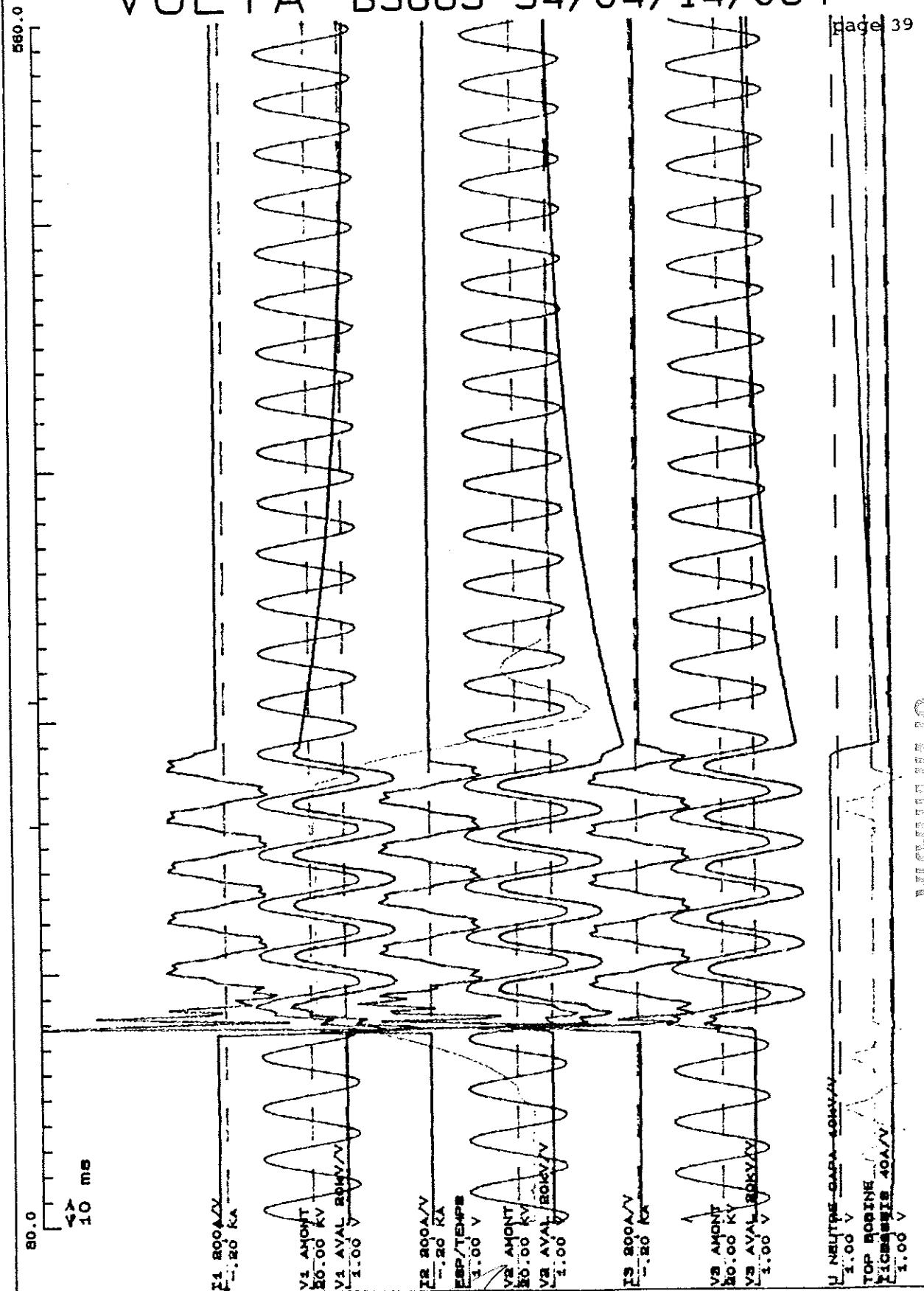
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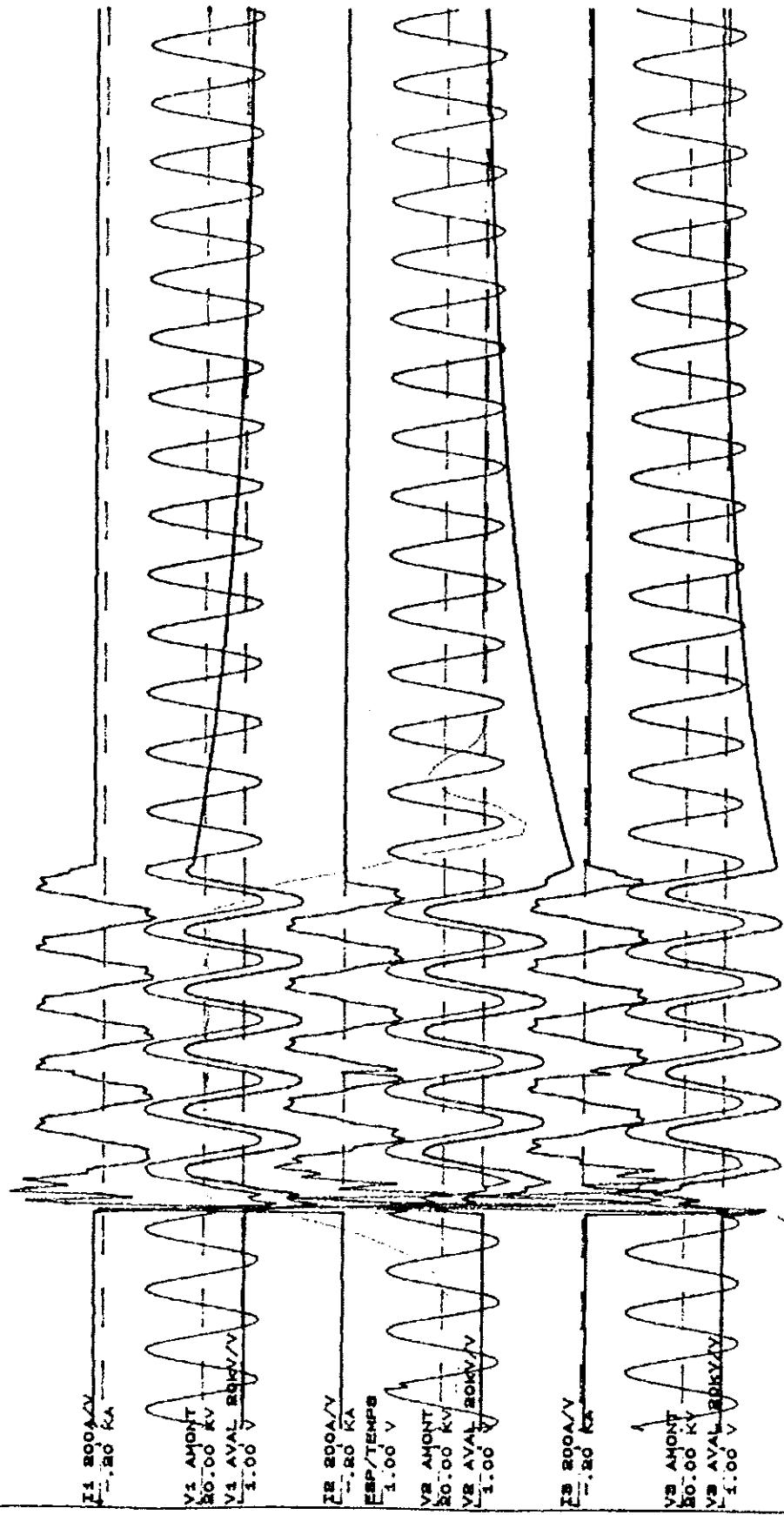
VOLTA B3665 94/04/14/064

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VOLTA B3665 94/04/14/065

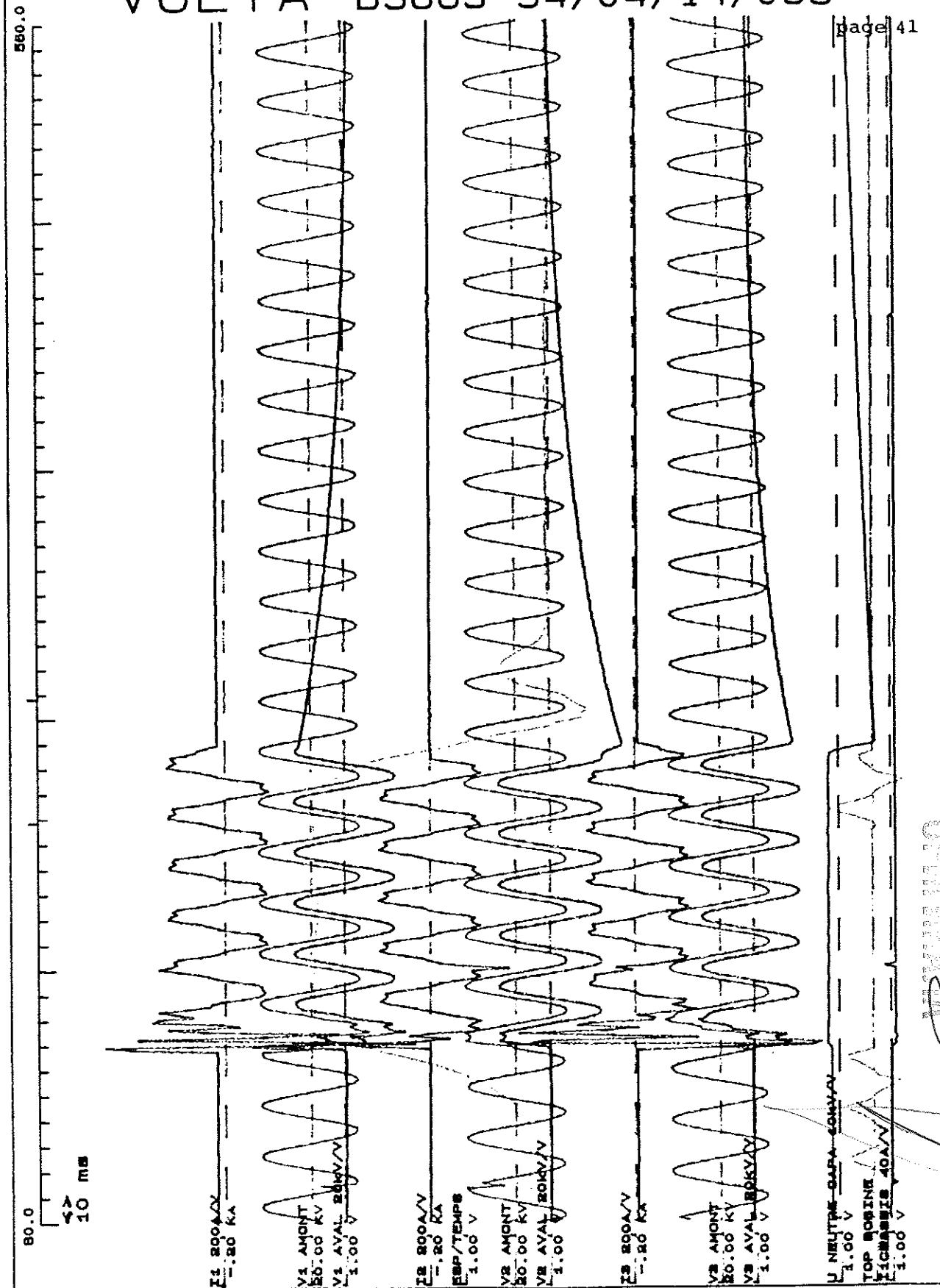
page 40



1434

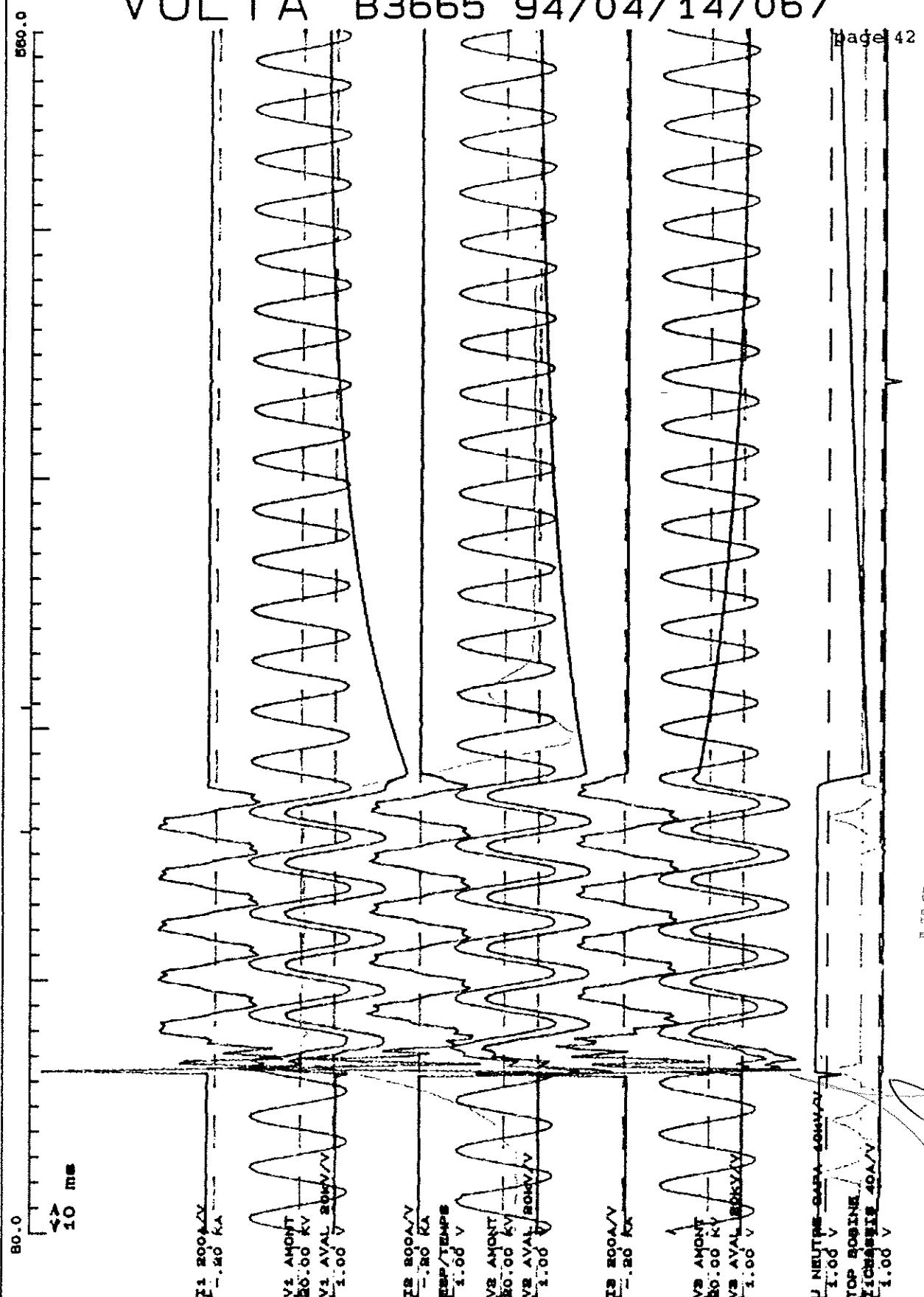
VOLTA B3665 94/04/14/066

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VOLTA B3665 94/04/14/067

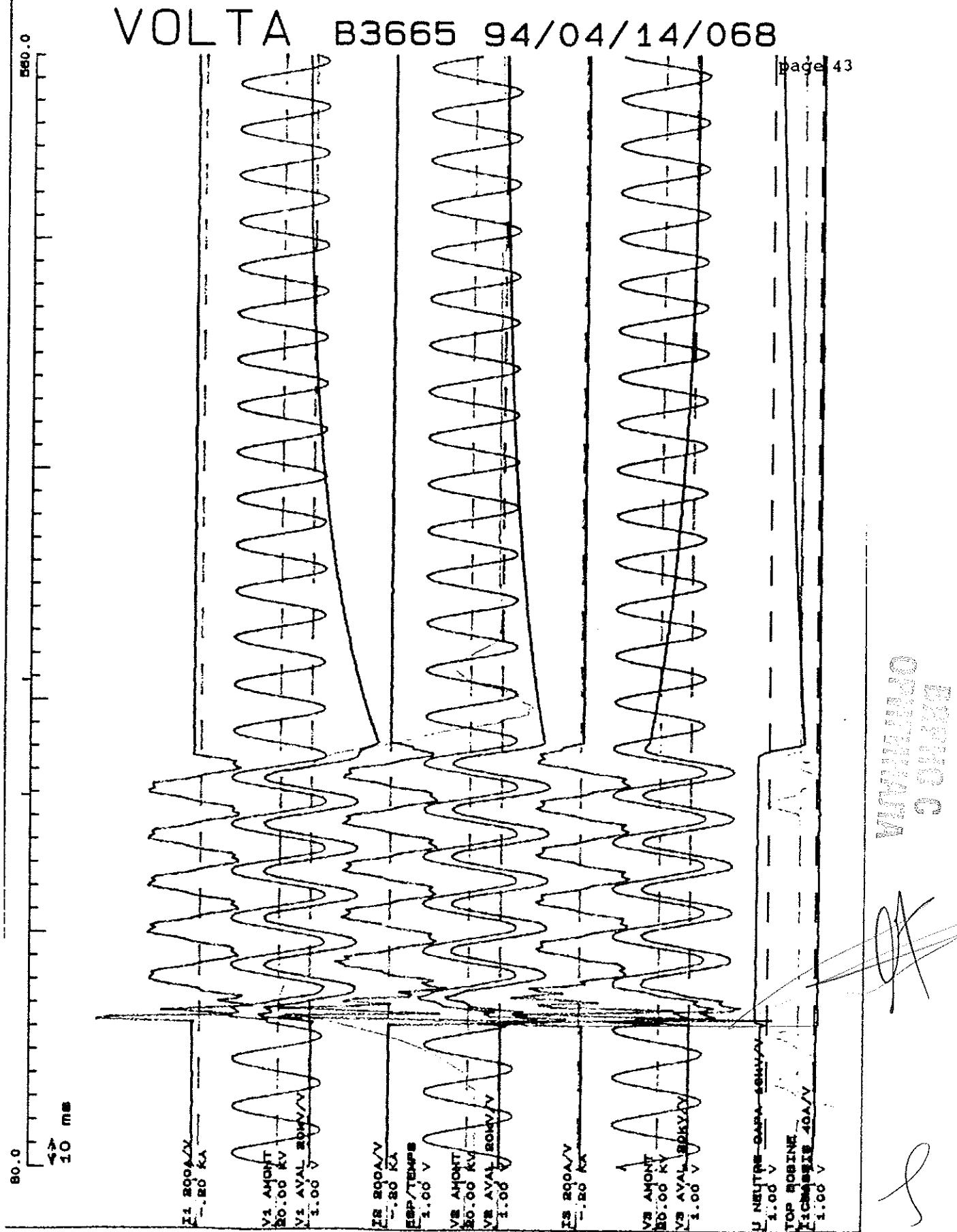
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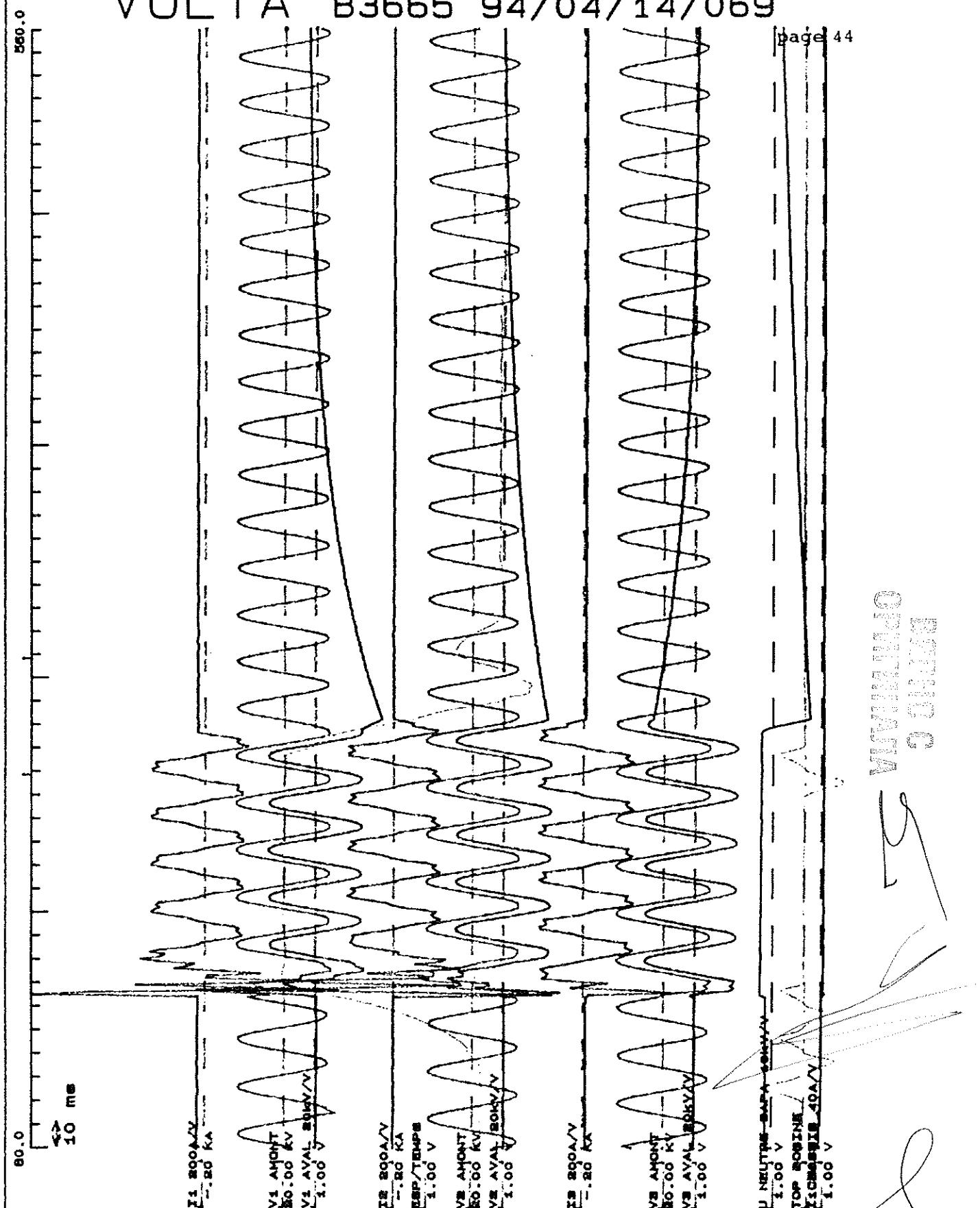
VOLTA B3665 94/04/14/068

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VOLTA B3665 94/04/14/069

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VOLTA B3665 94/04/14/070

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80.0
E2 2000 V
-1.20 KA
1.0 ms

E2 2000 V
-1.20 KA
1.00 V
VS AMONT
20.00 KV
VS AVANT
20.00 KV

E2 2000 V
-1.20 KA
1.00 V
VS AMONT
20.00 KV
VS AVANT
20.00 KV

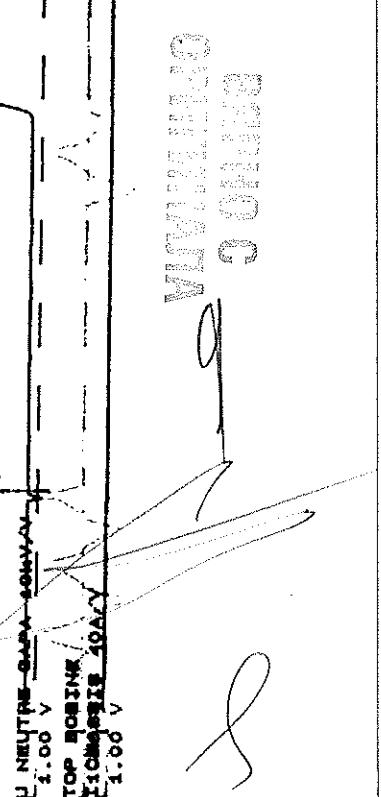
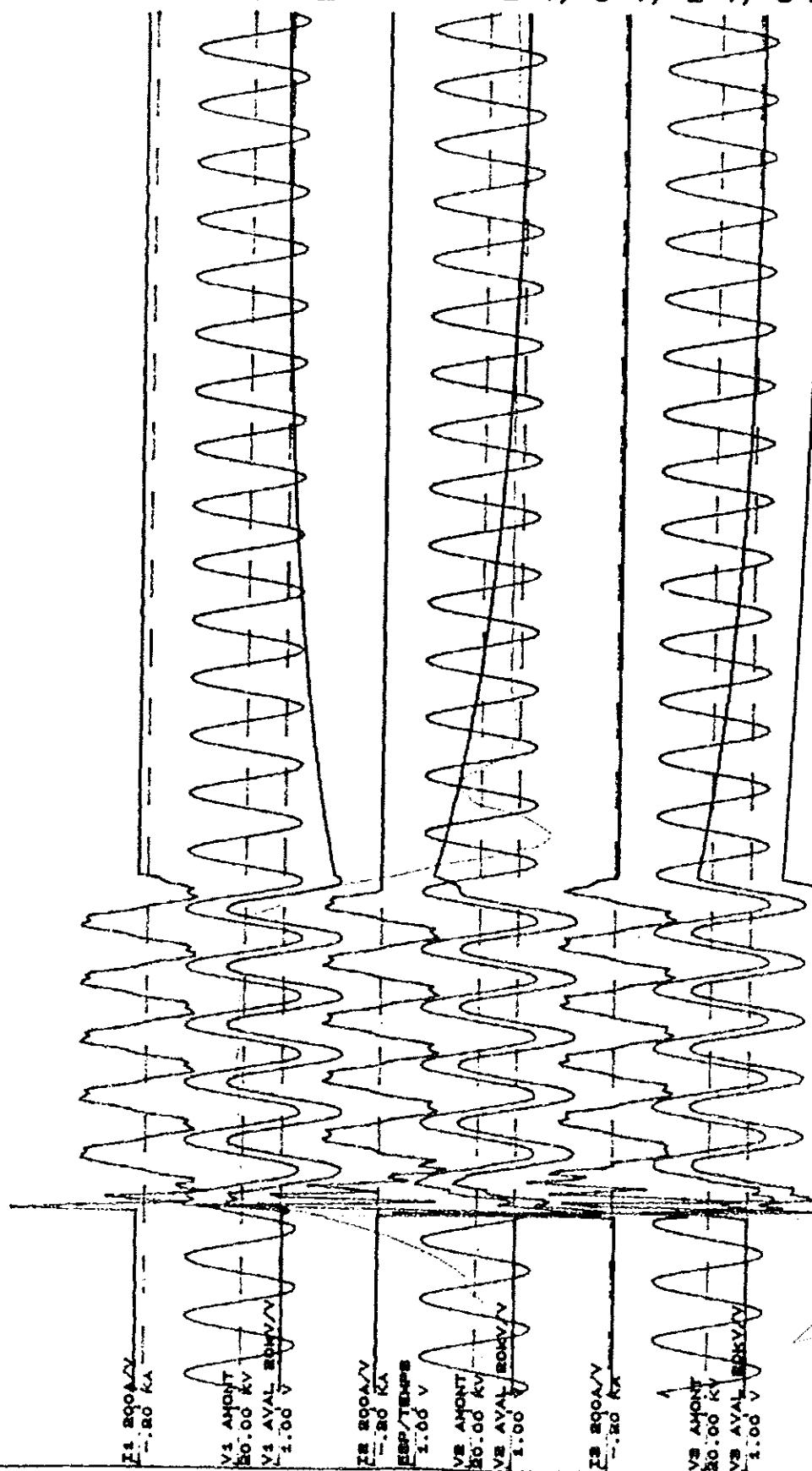
E2 2000 V
-1.20 KA
1.00 V
VS AMONT
20.00 KV
VS AVANT
20.00 KV

E2 2000 V
-1.20 KA
1.00 V
TOP BONING
VICHAMETIE MOAIV
1.00 V

1439

VOLTA B3665 94/04/14/071

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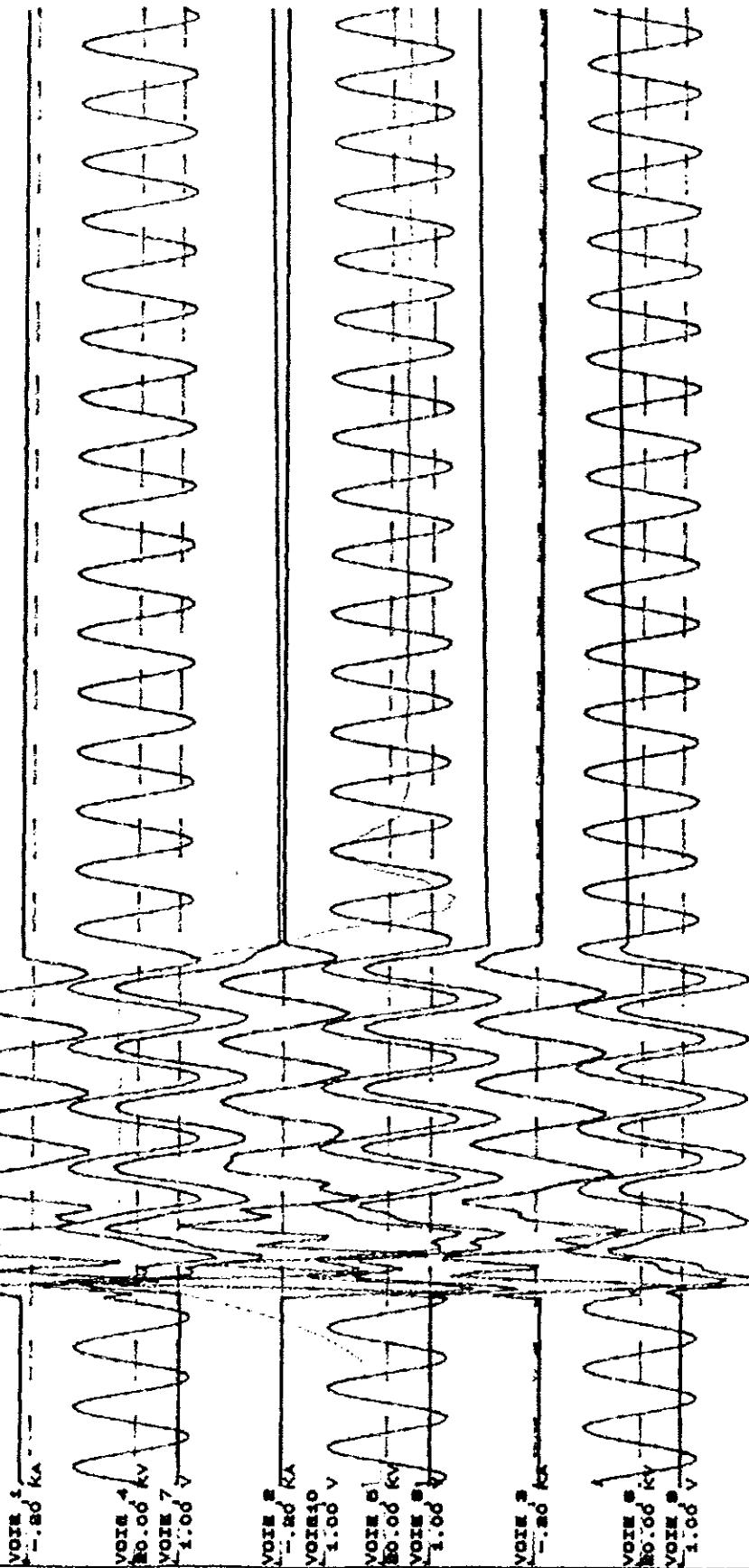


VOLTA

B3665 94/04/15/078

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500.0



Q
G
S
D
E
F
H
I
J
K
L
M
N
O
P
R
T
U
V
W
X
Y
Z

0.0
100 ms

1441

VOLTA

B3665 94/04/15/079

page 48

500.0

400.0

300.0

200.0

100.0

0.0

40 ms

VOLTA
4 KV
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00

VOLTA
4 KV
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00

VOLTA
4 KV
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00

VOLTA
4 KV
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00

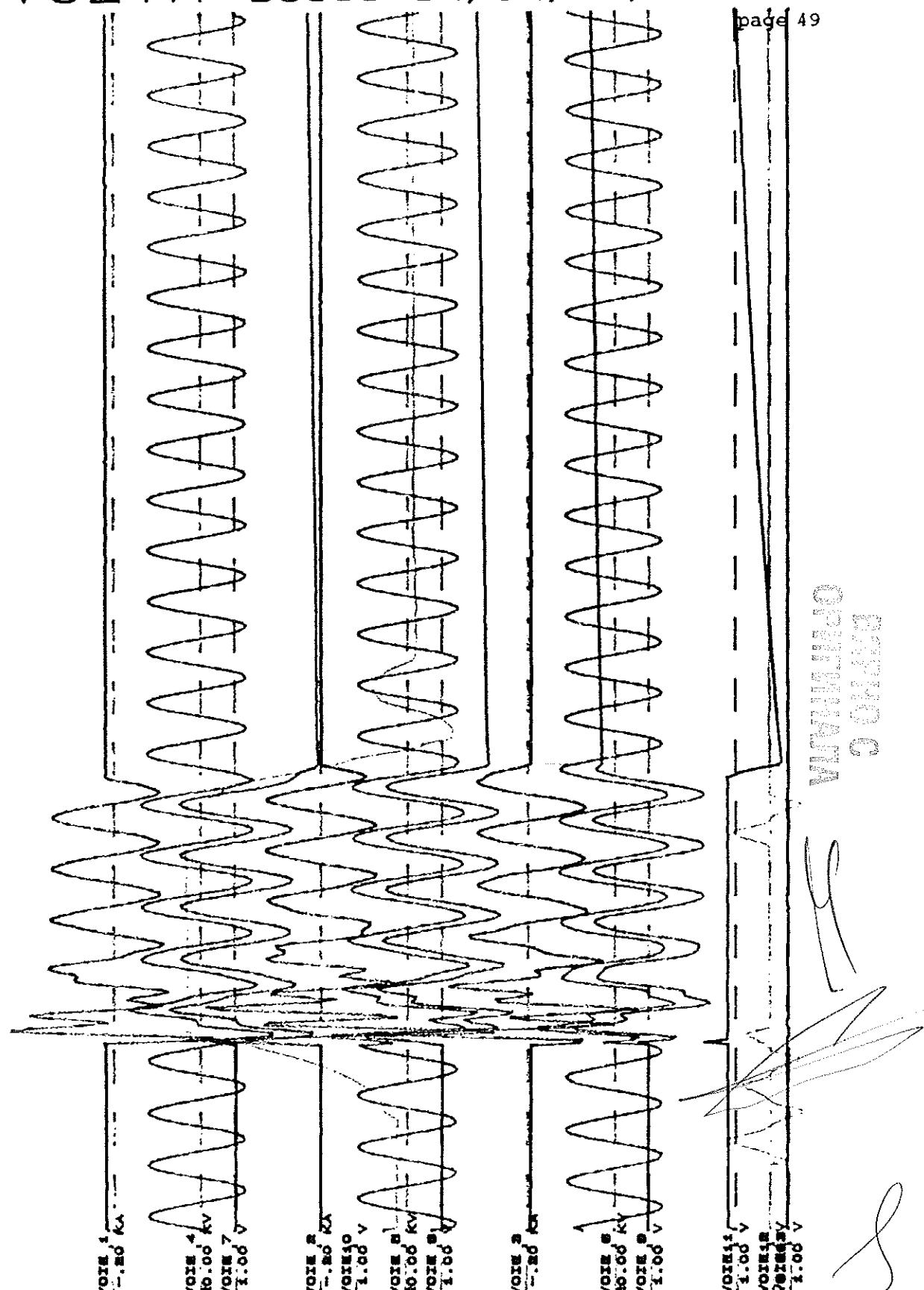
1442

VOLTA B3665 94/04/15/080

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RECORDED
BY
G.P.
MAY 1984

550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0



1443

VOLTA B3665 94/04/15/081

page 50

550.0

40 ms
80.0

VOLTE 4
-1.00 KV

VOLTE 4
-0.66 KV
VOLTE 7
1.00 V

VOLTE 2
-1.00 KV

VOLTE 10
1.00 V
VOLTE 5
-0.66 KV
VOLTE 8
1.00 V

VOLTE 2
-1.00 KV

VOLTE 4
-0.66 KV
VOLTE 8
1.00 V

VOLTE 4
-1.00 V
VOLTE 13
1.00 V

RECORDED
BY
S. S.

1444

VOLTA B3665 94/04/15/082

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500.0
400.0
300.0
200.0
100.0
0.0

> 20 ms

NOTE 1

NOTE 2
NOTE 3
NOTE 4
NOTE 5
NOTE 6

NOTE 7
NOTE 8
NOTE 9
NOTE 10
NOTE 11
NOTE 12
NOTE 13
NOTE 14

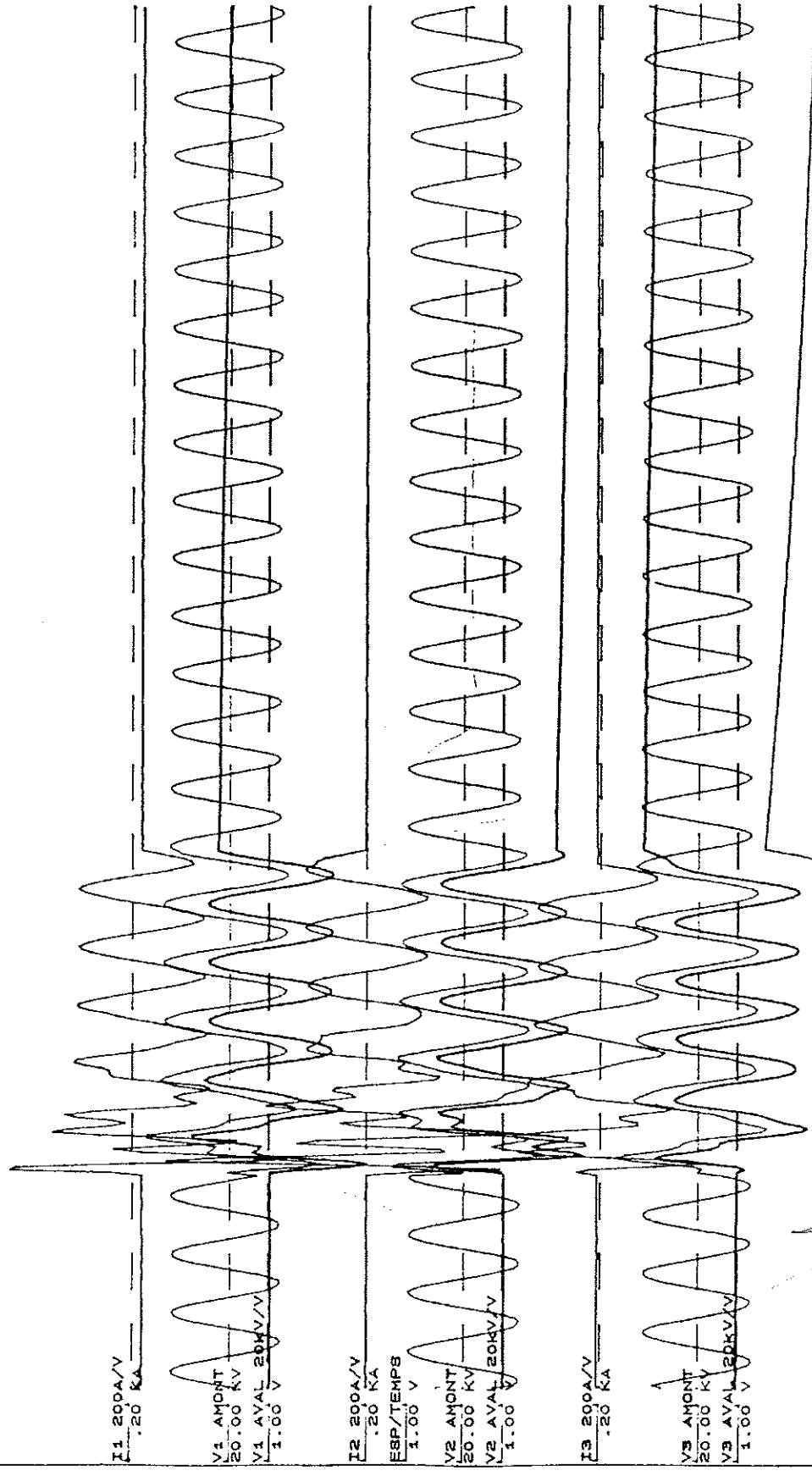
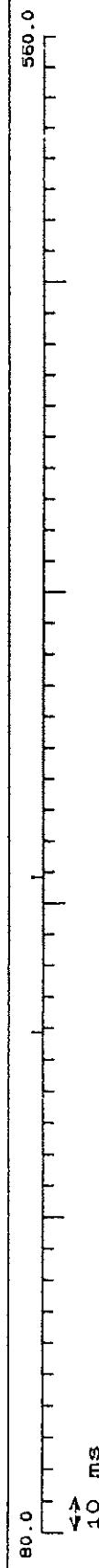
NOTE 15
NOTE 16
NOTE 17
NOTE 18
NOTE 19
NOTE 20

NOTE 21
NOTE 22
NOTE 23
NOTE 24
NOTE 25
NOTE 26

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VOLTA B3665 94/04/15/083

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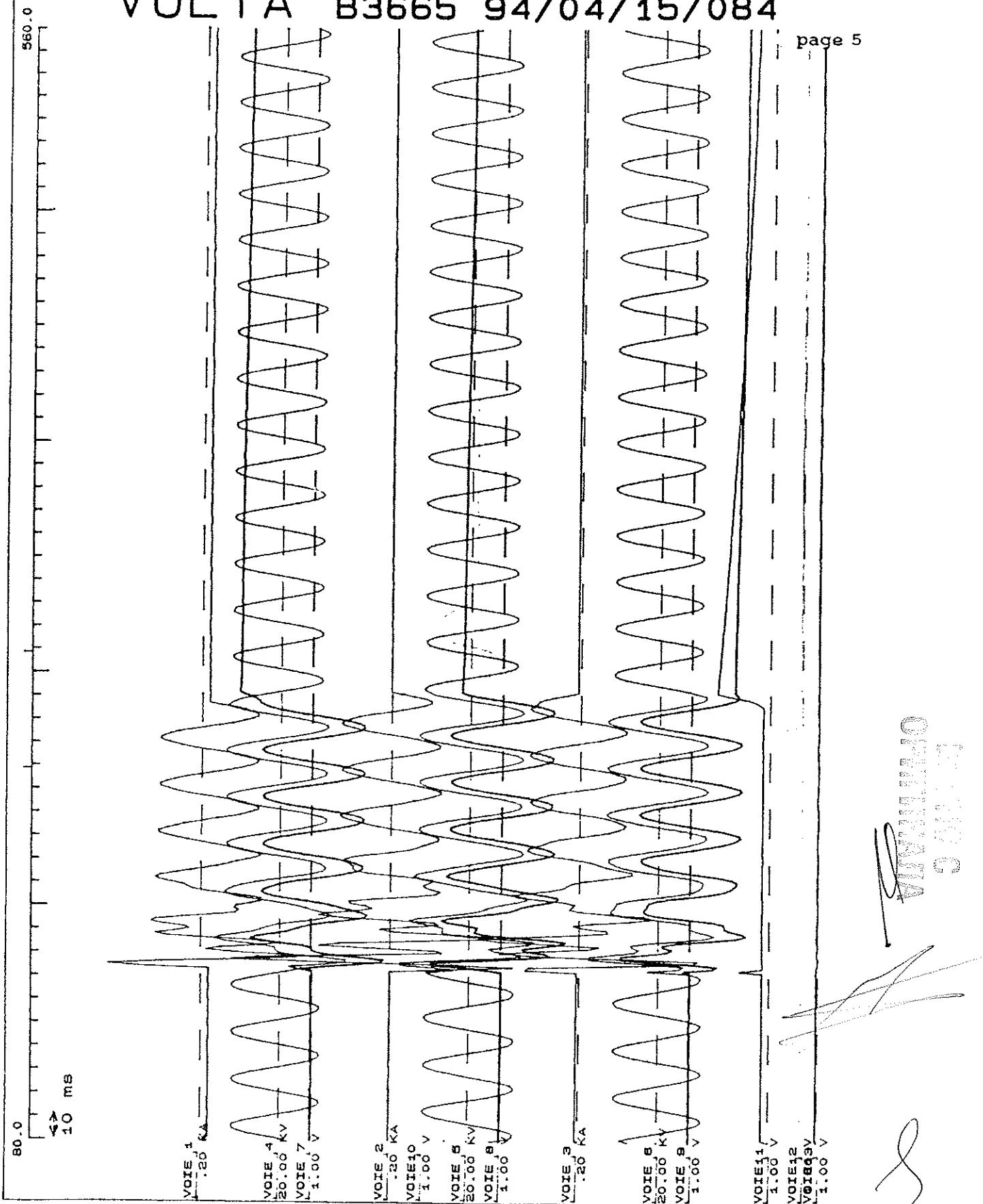


U NEUTRE GRAPHE 40444444
TOP BOBBINE
F1GBASSIS 40A/V
1.00 V

1446

VOLTA B3665 94/04/15/084

page 5



1447

VOLTA B3665 94/04/15/085

page 5.

