Case No
6373

Large Exhibits

Schlumberger

SIMULTANEOUS
COMPENSATED NEUTRON-FORMATION DENSITY

COMPANY BEARD OIL COMPANY

WELL HANLAD #1

FIELD WILDCAT

COUNTY EDDY STATE NEW MEXICO

Location: C-SW-SW

Other Services: DLL

Sec. 17 Twp. 17-S Rge. 24-E

Permanent Datum: G.L. Elev. 3822
Log Measured From: K.B. 10 Ft. Above Perm. Datum
Drilling Measured From: K.B.

Elev.: K.B. 3832
D.F.
G.L. 3822

Date	7-29-78		
Run No.	ONE		
Depth-Driller	7270		
Depth-Logger	7211		
Btm. Log Interval	7210		
Top Log Interval	2200		
Casing-Driller	8 5/8@ 1200	@	@
Casing-Logger	1200		
Bit Size	7 7/8		
Type Fluid in Hole	SALT GEL & MYLO-JEL		
Dens. Visc.	9.6 / 52		
pH / Fluid Loss	8.0 / 8.2		
Source of Sample	PIT		
Rm @ Meas. Temp.	.088 @ 98 °	@ °	@ °
Rmf @ Meas. Temp.	.076 @ 98 °	@ °	@ °
Rmc @ Meas. Temp.		@ °	@ °
Source: Rmf / Rmc			
Rm @ BHT	.068 @ 129 °	@ °	@ °
Time Since Circ.	1000		
Max. Rec. Temp.	129		
Equip. Location	1590		
Recorded By	[illegible]		
Witnessed By	[illegible]		

The well name, location and borehole reference data were furnished by the customer.

RUN NO. ONE
Date 7-29-78
Type Log DLL

CASING RECORD: 8 5/8 @ 1200 — 7 7/8 @ 7270

BOREHOLE RECORD: Bit 7 7/8 — From 1200 — To 7270

Run	Tool Type	Serial No.	Position	Material	Source	Density	Hole Corr.	Mud Type	Mud Density	Mud Viscosity	Fluid Loss	R_m @ Meas. Temp.	R_mf @ Meas. Temp.	R_mc @ Meas. Temp.	Source R_mf / R_mc	R_m @ BHT	Time Since Circ.	Max. Rec. Temp.	Equip. Location	Recorded By	Witnessed By
ONE	DLL	17	17-S	24-E				SALT GEL & MYLO-JEL	9.6	52	8.0	.088 @ 98	.076 @ 98			.068 @ 129	1000	129	1590	[illegible]	[illegible]

REMARKS

LOGGING DATA

Run	Tool Type	Top	Bottom
ONE	DLL	4600	7270

CALIPER DRAW IN INCHES — 6 to 16

GAMMA RAY API UNITS — 0 to 100 to 200

BULK DENSITY GRAM/CC — 2.0 to 3.0

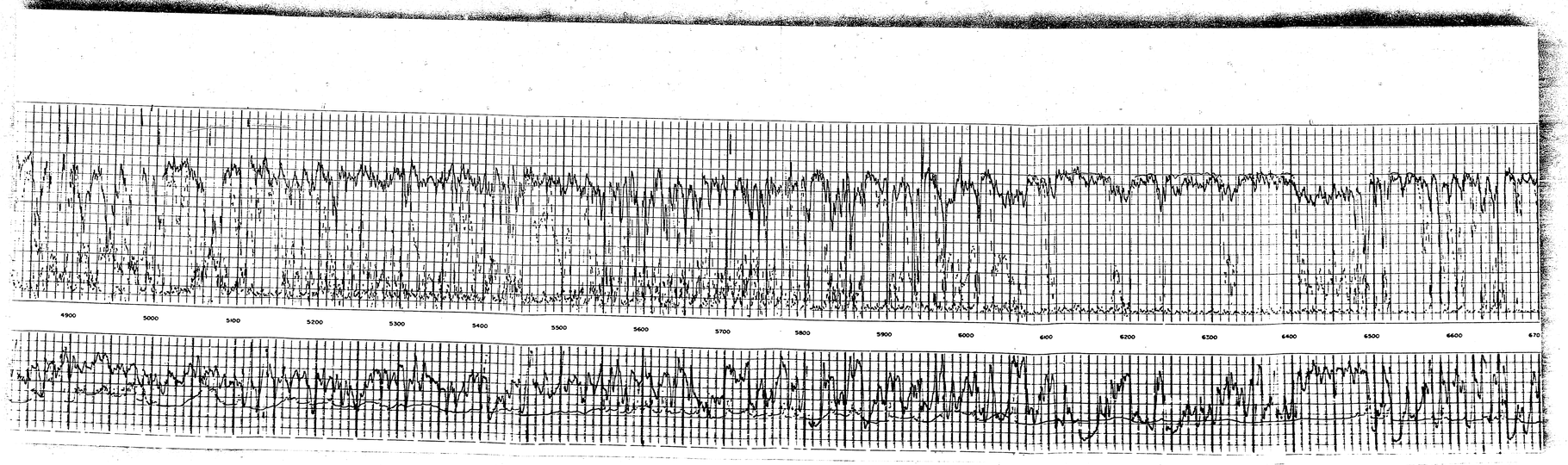
CORRECTION GRAM/CC — -.30 to +.30

Use NO scale when correction curve is presented in Track 2

CNL POROSITY — % — 30 to 0 to -10

4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.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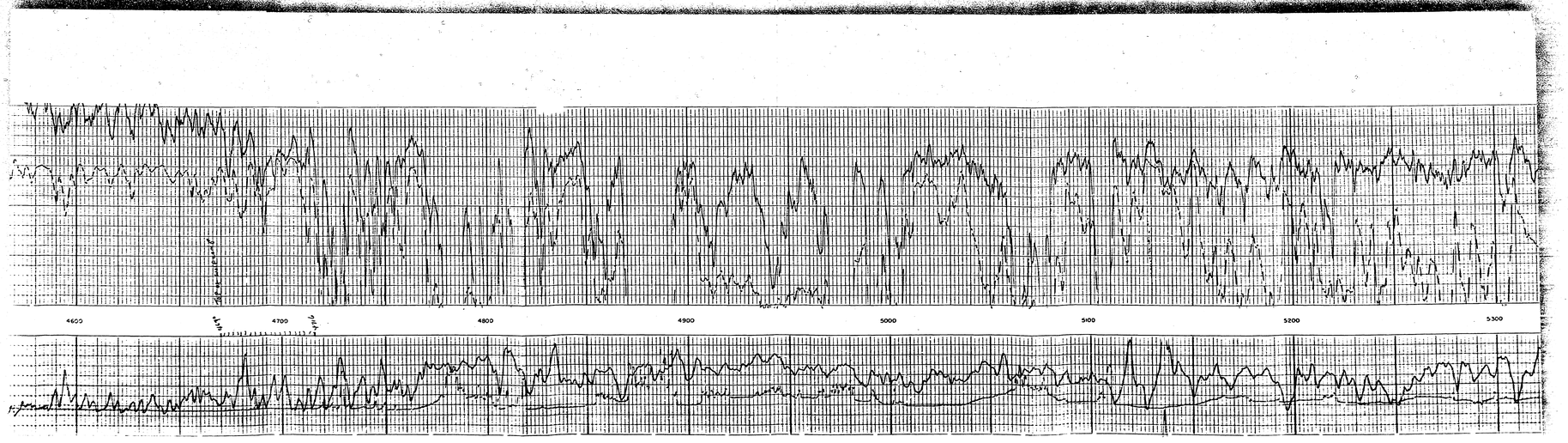
6400
6500
6600
670

8-07-78 03:34:46
6100
6200
6300
6400
6500
6600
6700
6800
6900
7000
7100
7200
7300
CAL
CALIPER
CALIPER
OIL POROSITY—%
BULK DENSITY GRAMS/CC
CORRECTION GRAMS/CC
GAMMA RAY API UNITS
CALIPER DIAM. IN INCHES
DETAIL LOG
5" = 100'
POROSITY INDEX (%) LIME WATER
COMPENSATED FORMATION DENSITY POROSITY
COMPENSATED NEUTRON POROSITY
CALIPER DIAM. IN INCHES
GAMMA RAY API UNITS
4200
4300
CORR
DIF

DETAIL LOG
5" = 100'
POROSITY INDEX (%) LIME MATRIX
COMPENSATED FORMATION DENSITY POROSITY
COMPENSATED NEUTRON POROSITY
CALIPER DIAM. IN INCHES
GAMMA RAY API UNITS
CORRECTION DRAIN/DC
CALIPER DIAM. IN INCHES
4200
4300
4400
4500
4600
4700
4800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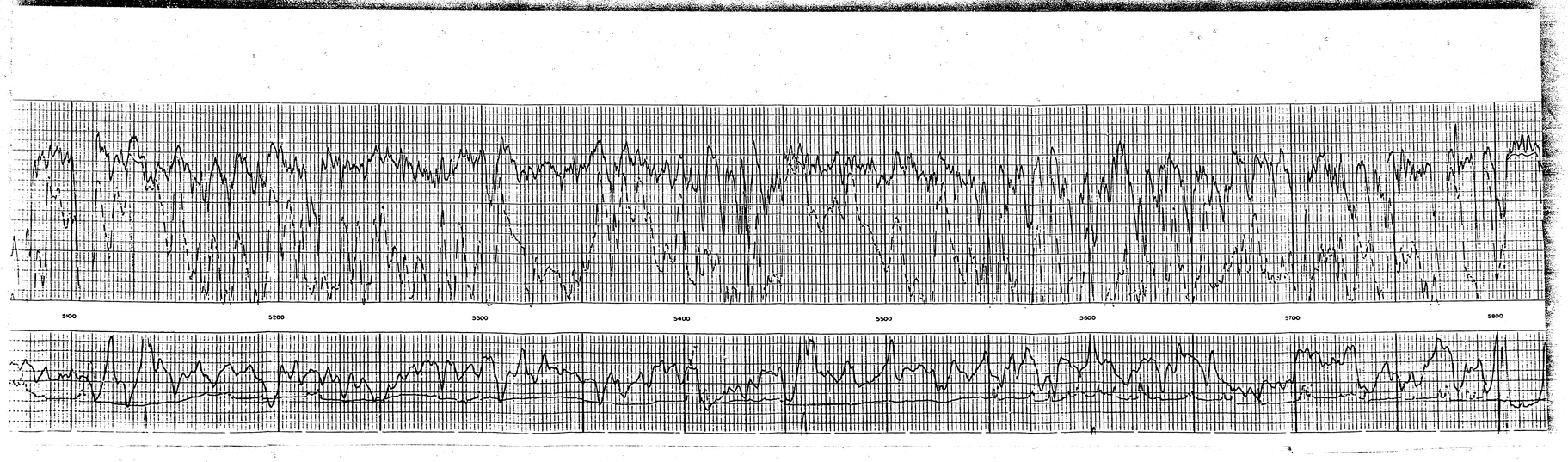
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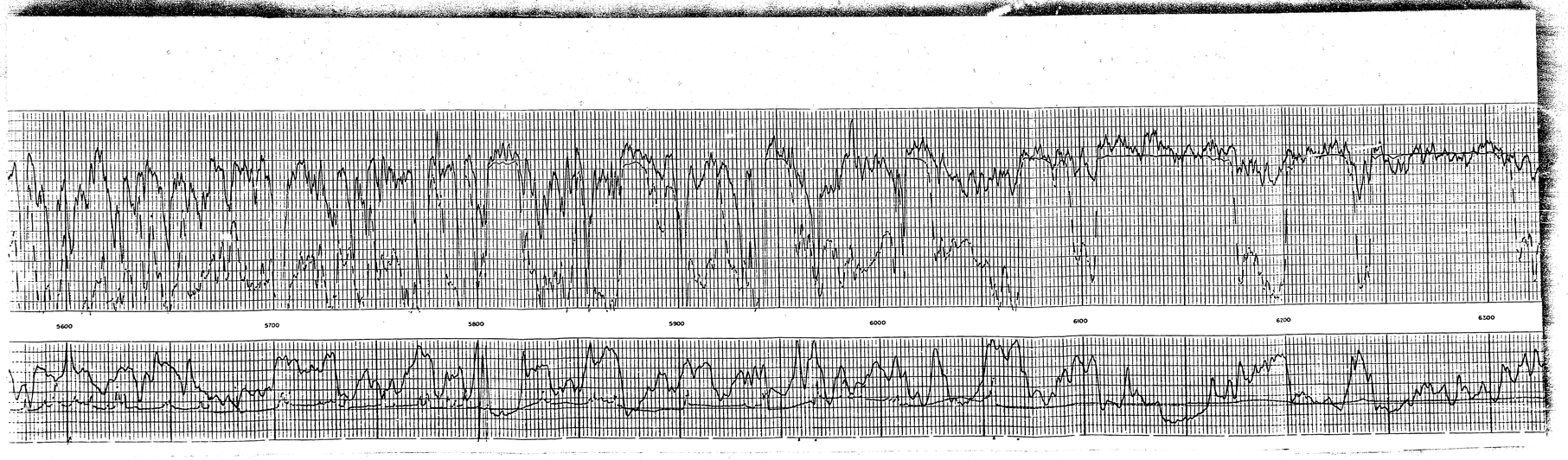
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5700
5800
5900
6000
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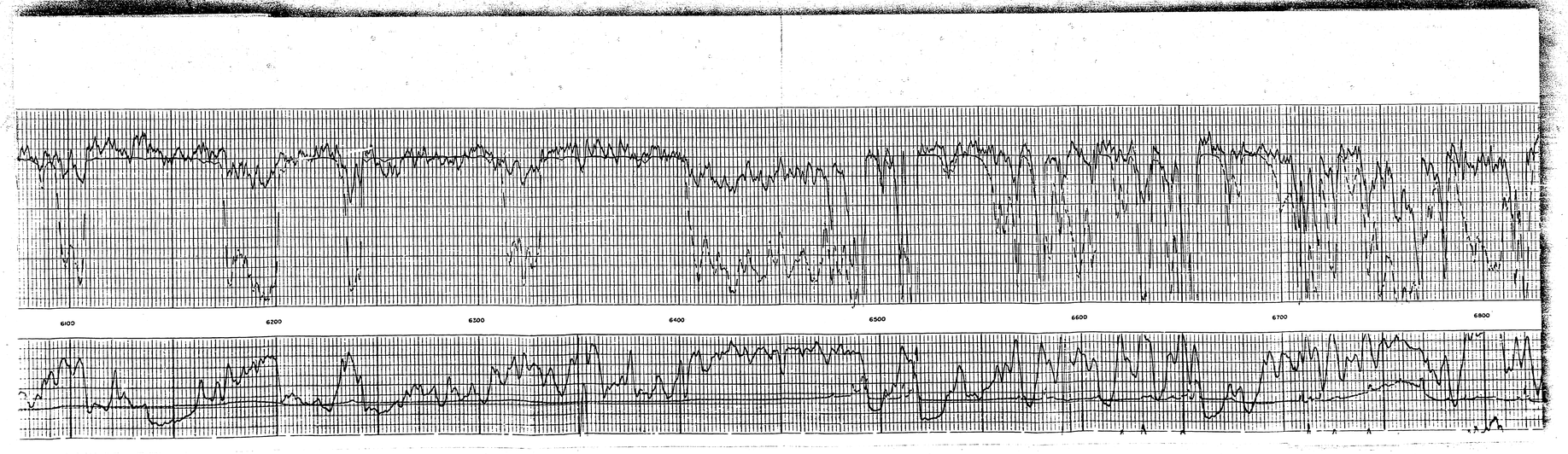
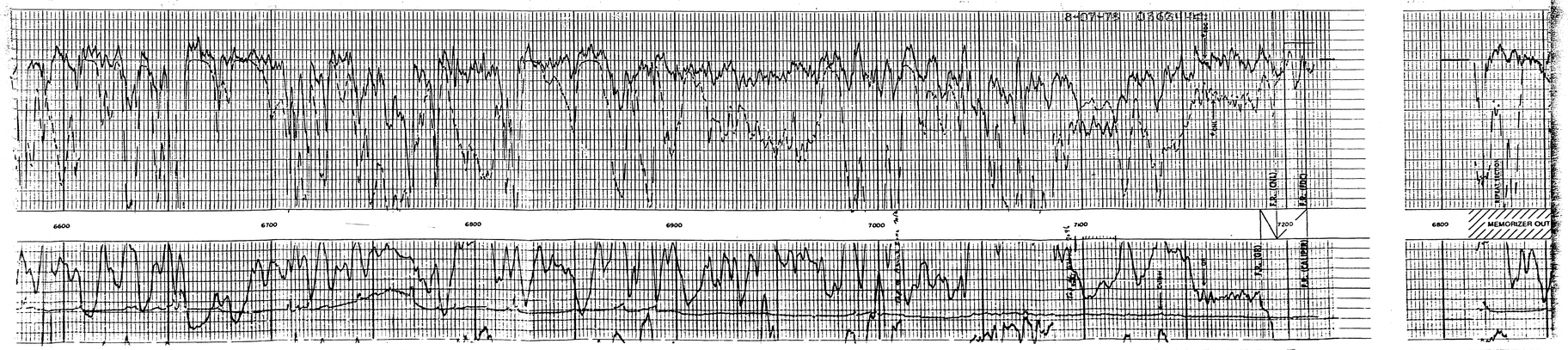
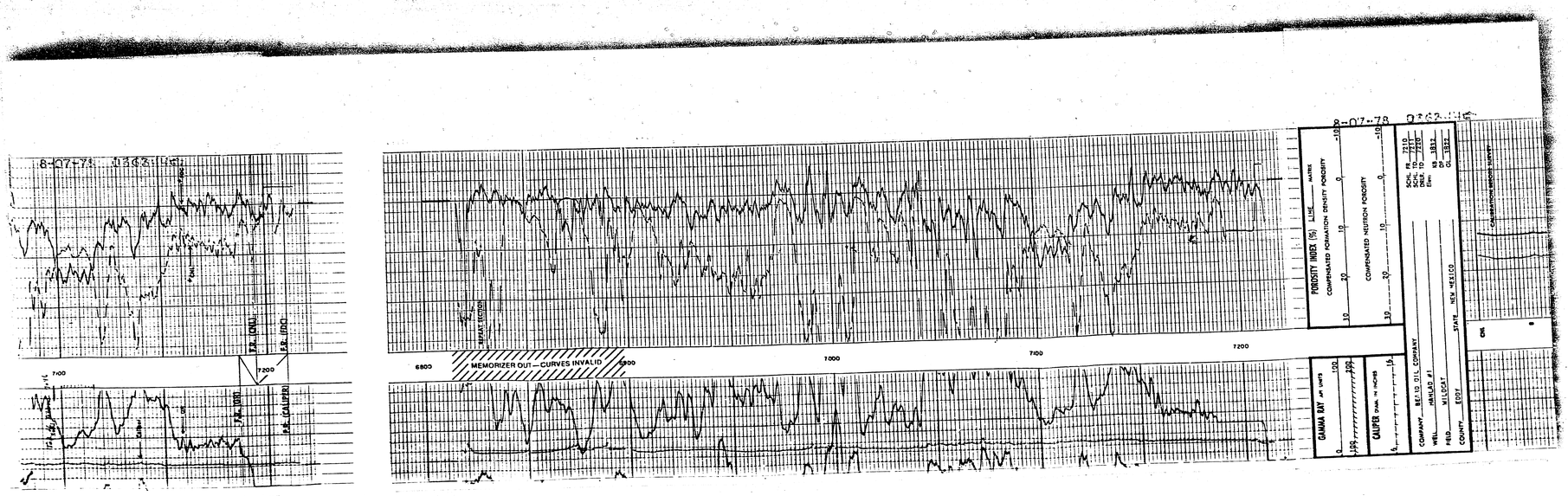
6200
6300

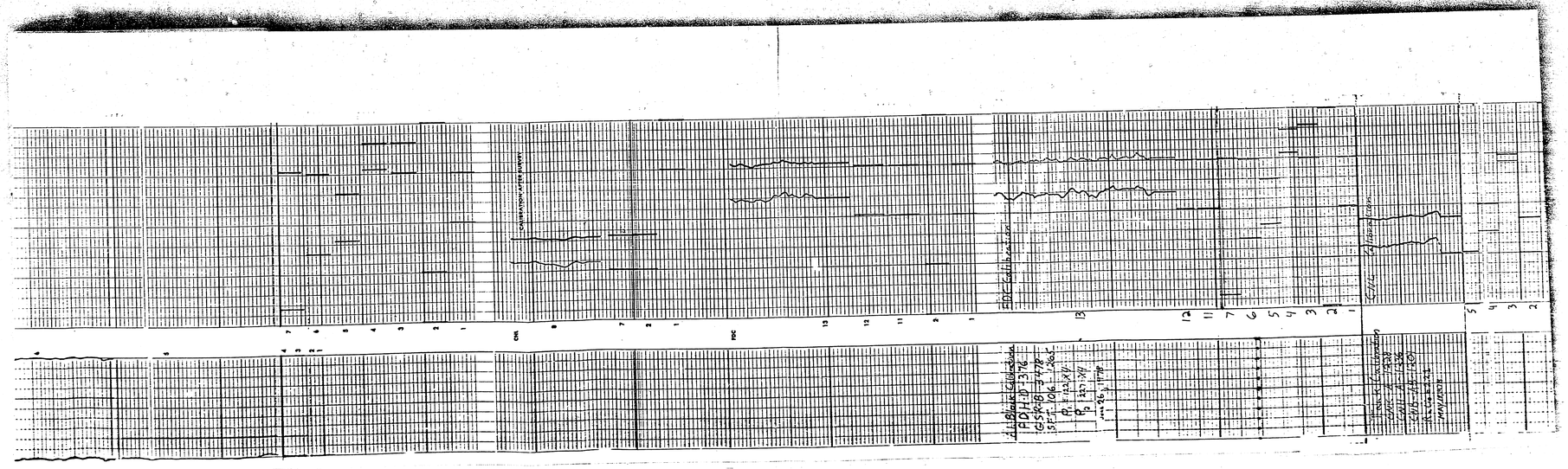


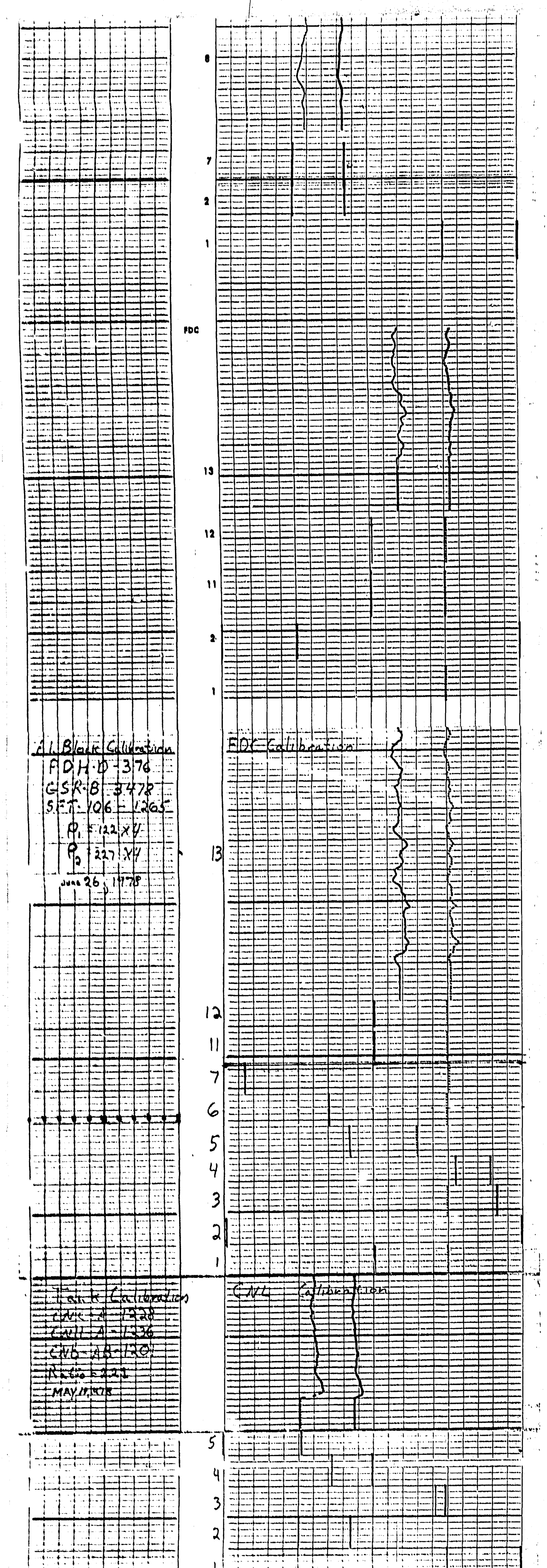
U.S.B.C.F. TECHNOLOGIES


6600
6700
6800
6900
7000
7100
7200
6800
MEMORIZER OUT
F.R. (ON)
F.R. (RO)
F.R. (OUT)
F.R. (CALIBR)
BYPASS (MOTOR)


8-07-78 0363 (HC)
7100
7200
F.R. (DNL)
F.R. (DC)
P.E. (CALIPER)
7000
7100
7200
6800
6900
REPEAT SECTION
MEMORIZER OUT — CURVES INVALID
8-07-78
POROSITY INDEX (%) LIMESTONE
COMPENSATED FORMATION DENSITY POROSITY
COMPENSATED NEUTRON POROSITY
GAMMA RAY API UNITS
CALIPER DIAM. IN INCHES
COMPANY BEARD OIL COMPANY
WELL HANLAD #1
FIELD WILDCAT
COUNTY EDDY
STATE NEW MEXICO
SCHL FR 7210
SCHL TO 7210
BIT SIZE 7 7/8
ELEV. 3852
DF
GL 3852
CALIBRATION BEFORE SURVEY
CNL

N.S.E.C.T. ECHOGRAPHICS





COMPENSATED NEUTRON CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDED SENSITIVITY (THRU MEMORIZER IF USED

PANEL TEST

	RATIO	OH POROSITY LS ☒	OH POROSITY SS ☐	OH POROSITY DOL ☐	CH POROSITY SS ☐	CH POROSITY LS ☐
3.	1	1.6	4.9	−0.2	2.4	0.1
4.	2	15.6	19.7	8.1	13.0	9.0
5.	3	30.5	36.0	25.2	29.1	24.1
6.	4	45.4	53.1	47.5	47.4	43.2

7. POROSITY NORMALIZED WITH CNB-A IN PLACE
   7A. TOOL IN NCT-B
8. LOG POSITION WITH CNB-A IN PLACE
   8A. LOG POSITION WITH TOOL IN NCT-B

OH LS	OH SS	OH DOL	CH SS	CH LS
18	22.2	10.4	15.3	11.2

RATIO (NORMALIZED) = 2.17 / RATIO (NCT-B) RATIO LOG

FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST

FDC LIQUID

	POS	ρ	Δρ
3.	# 1	2.92	.00
4.	# 2	2.78	+.14
5.	# 3	2.42	−.10
6.	# 4	2.35	.00
7.	# 5	2.08	.01

8. MECHANICAL ZERO CALIPER
9. 8" RING
10. 12" RING
11. TOOL CALIBRATE #1 SET ρ = 2.50
12. TOOL CALIBRATE #2 SET Δρ = .00
13. LOG POSITION ρ = 2.59, Δρ = .015

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATE - SOURCE IN PLACE

CALIBRATION RECORD

COMPANY BEARD OIL COMPANY

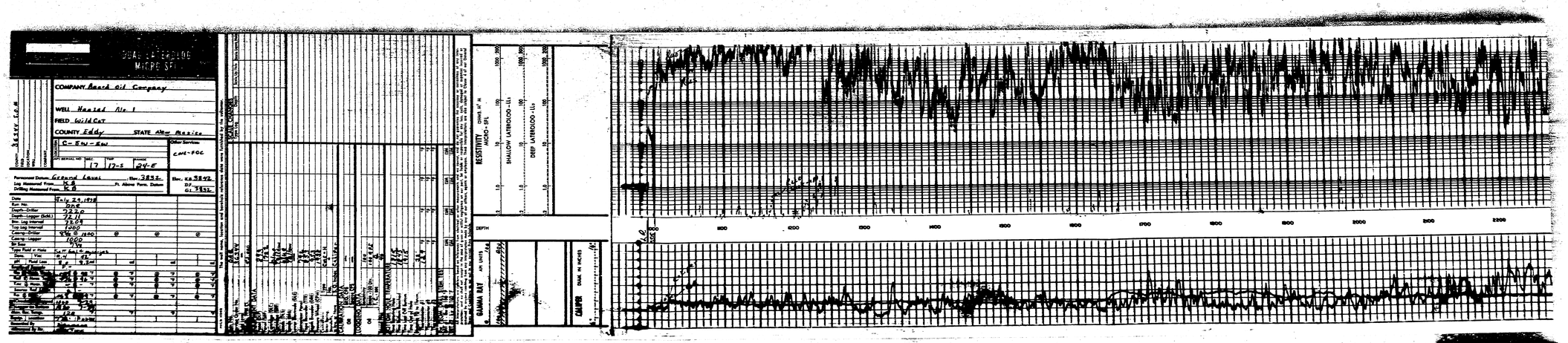
WELL HANLAD #1

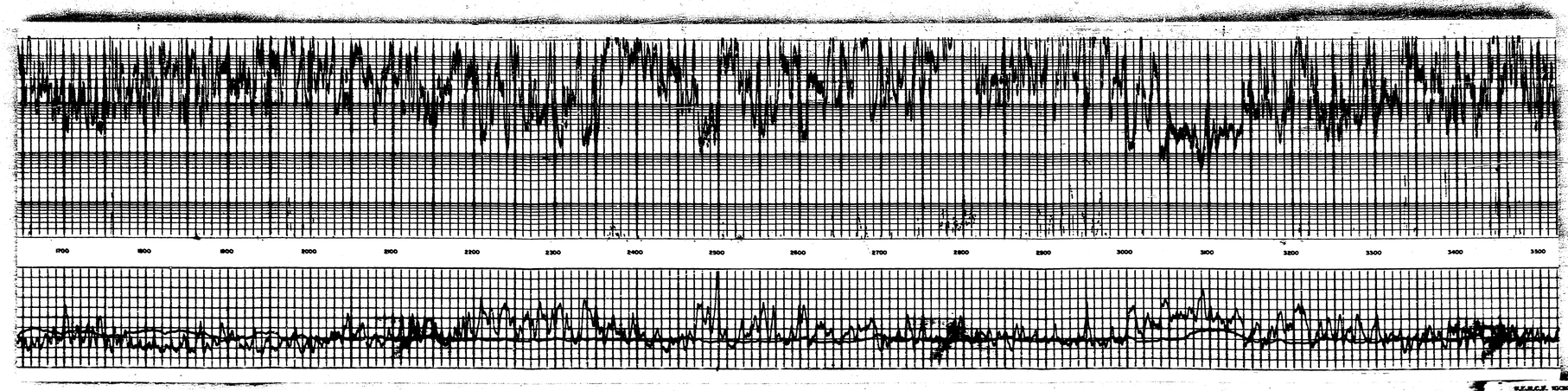
FIELD WILDCAT

COUNTY EDDY STATE NEW MEXICO

SCHL. FR 7210
SCHL. TD 7211
DRLR. TD 7220

Elev: KB 3832
DF
GL 3822


DUAL LATEROLOG MICRO SFL
COMPANY Beard Oil Company
WELL Harted No. 1
FIELD Wildcat
COUNTY Eddy STATE New Mexico
C-SW-SW
17 17-S 24-E
DUAL LATEROLOGS
RESISTIVITY
MICRO-SFL
SHALLOW LATEROLOG-LL3
DEEP LATEROLOG-LL8
GAMMA RAY
CALIPER
DEPTH
1600
1700
1800
1900
2000
2100
2200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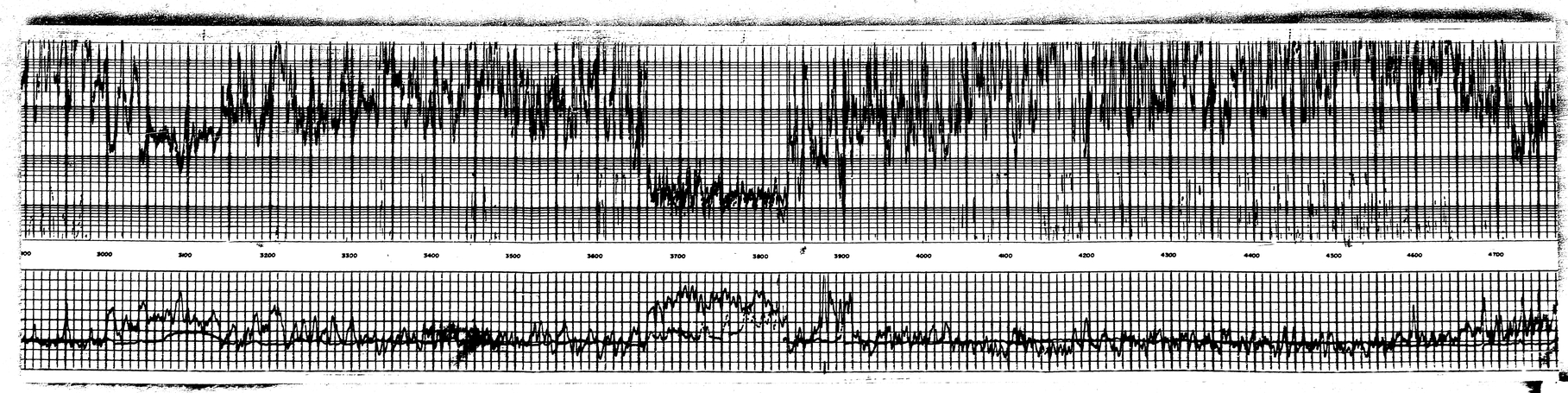
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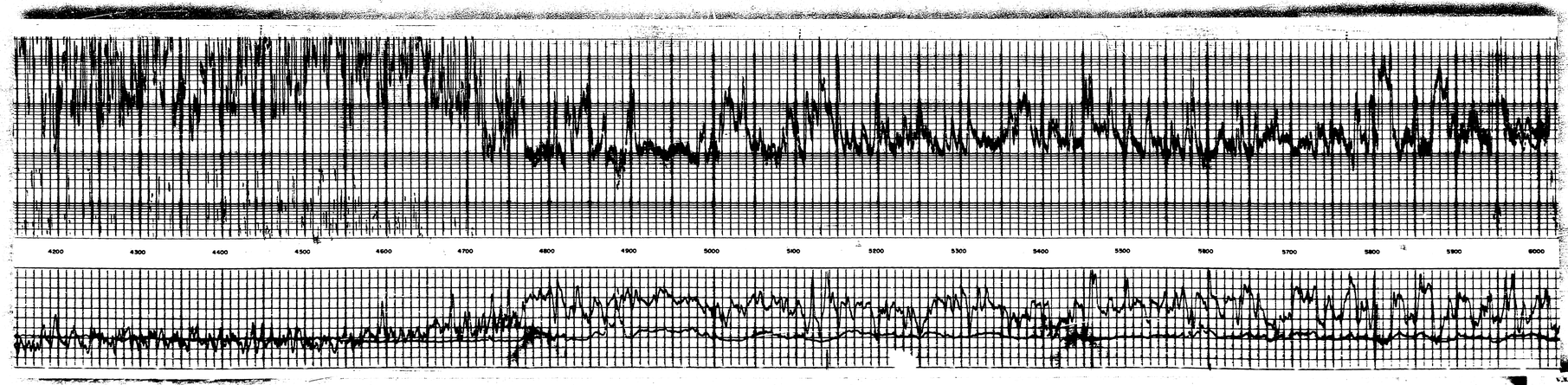
4700


4200
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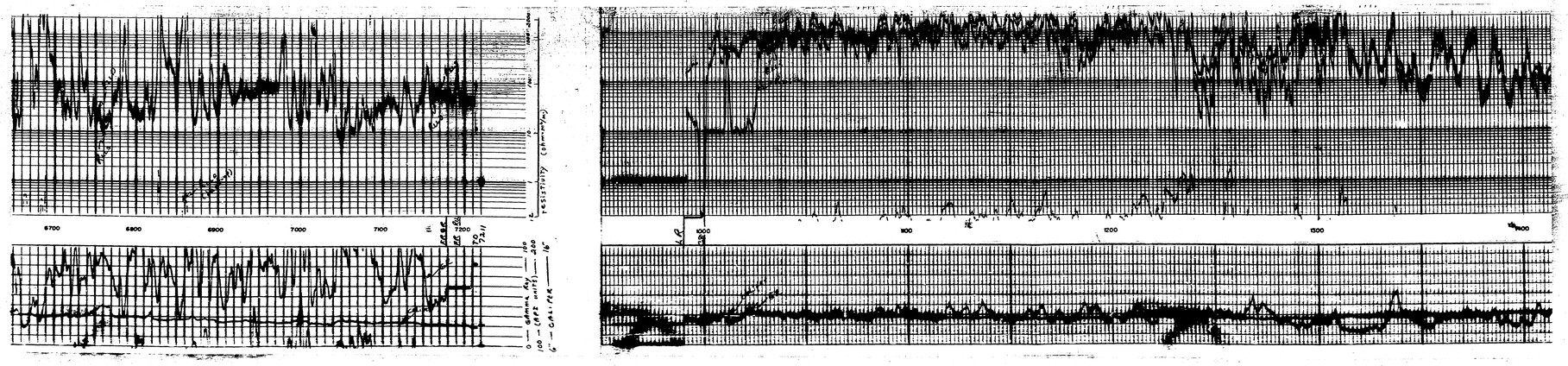
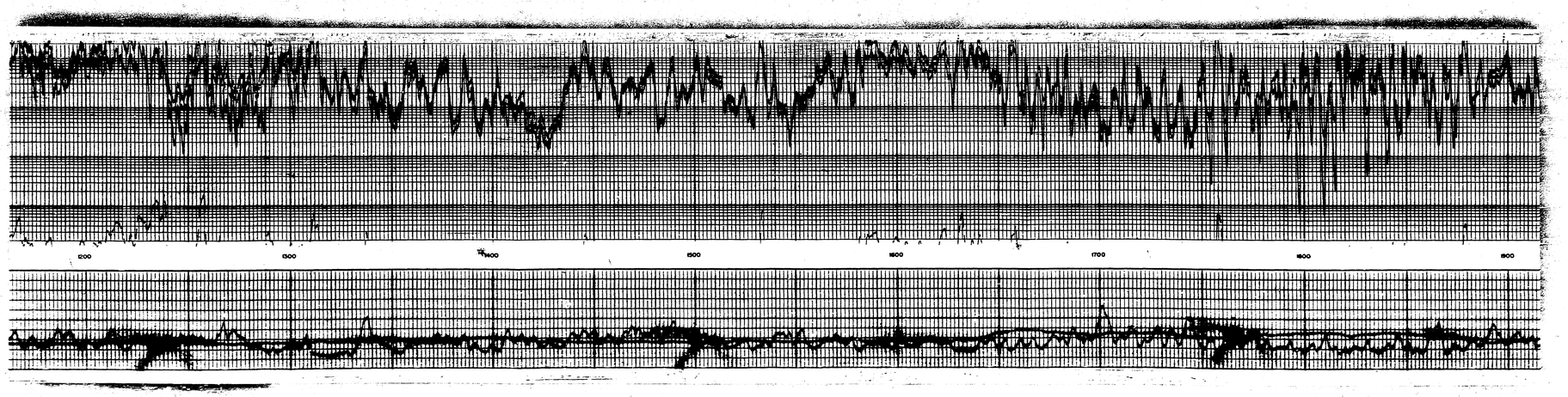
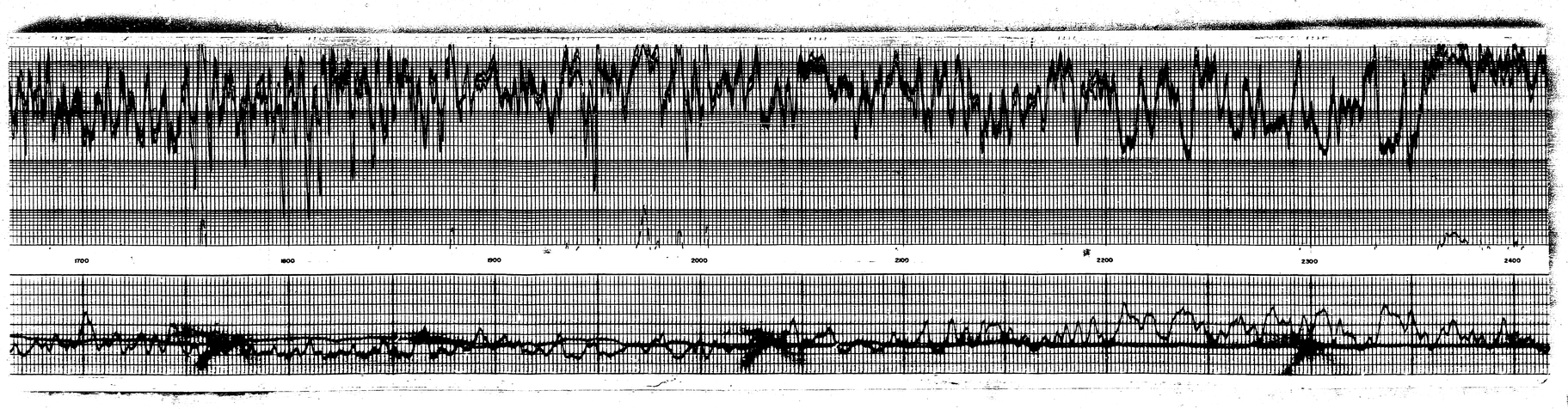

6700
6800
6900
7000
7100
7200
7300
7311
RESISTIVITY (ohmm²/m)
0 — GAMMA RAY — 200
100 — (API units) — 0
6" — CALIPER — 16"
1100
1200
1300
1400


1200
1300
1400
1500
1600
1700
1800
1900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1900
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2100
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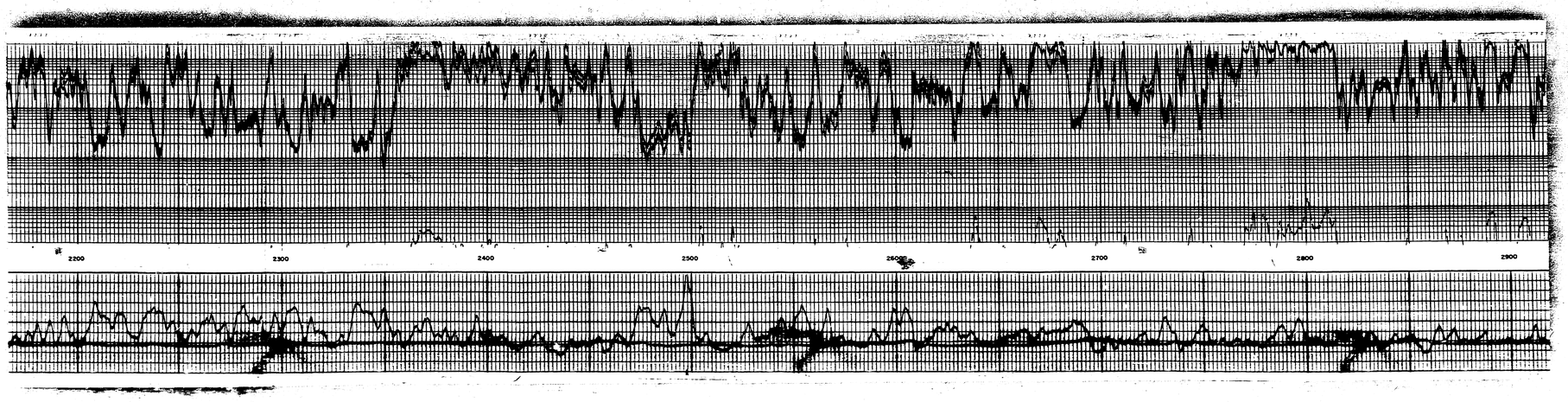
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2300
2400
2500
2600
2700
2800
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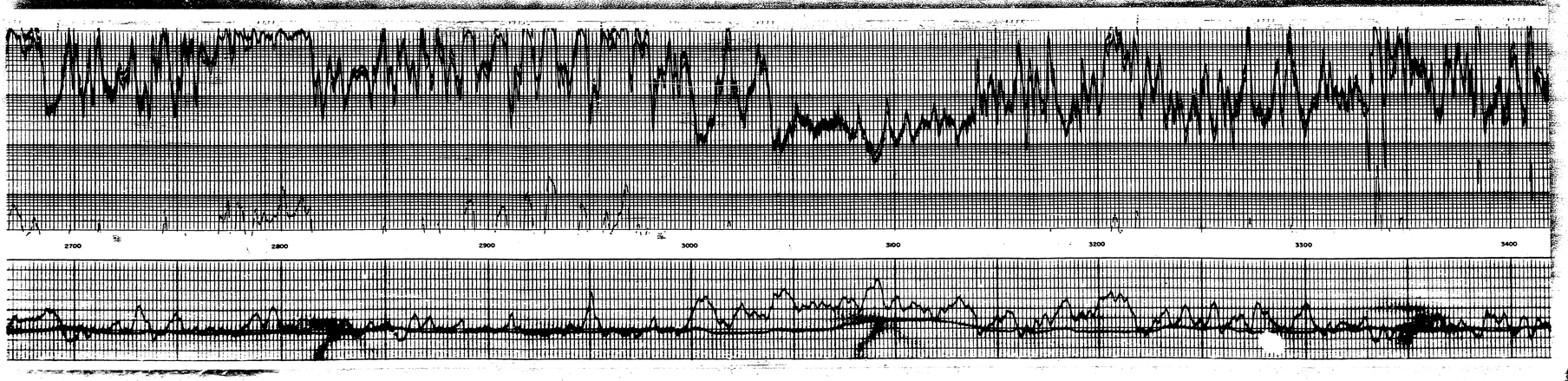
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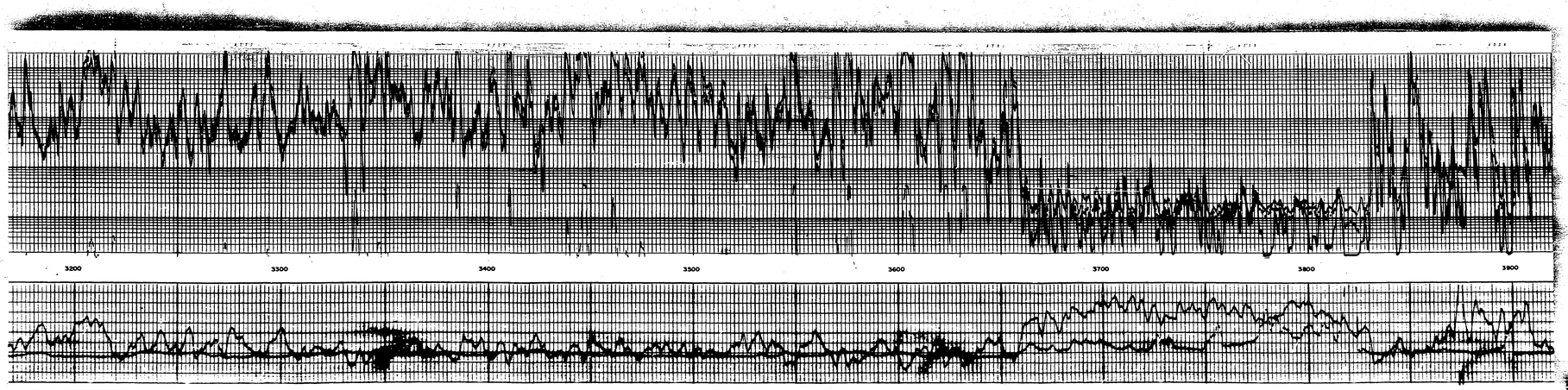
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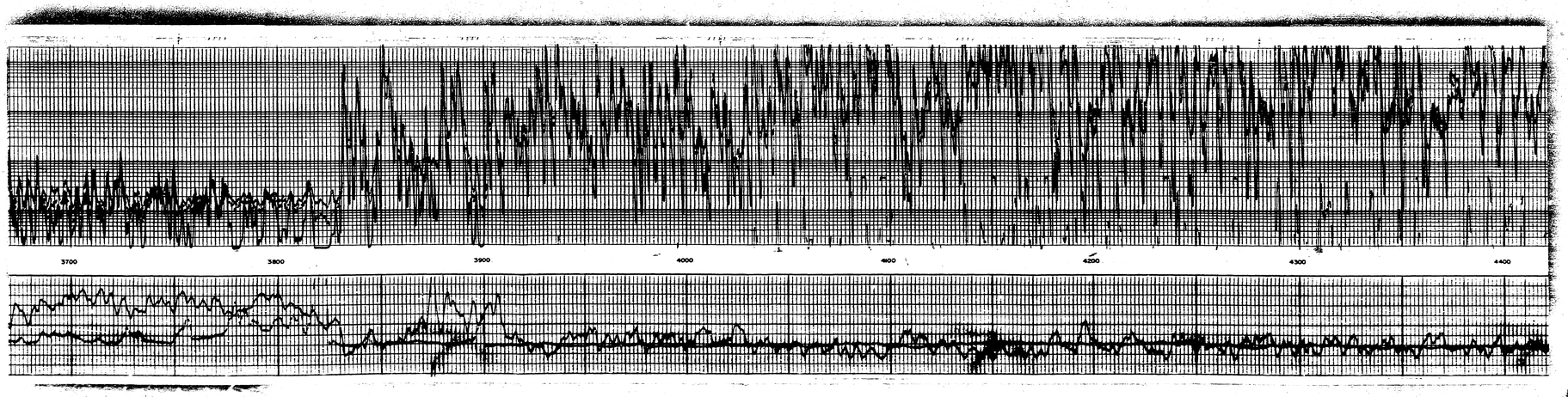
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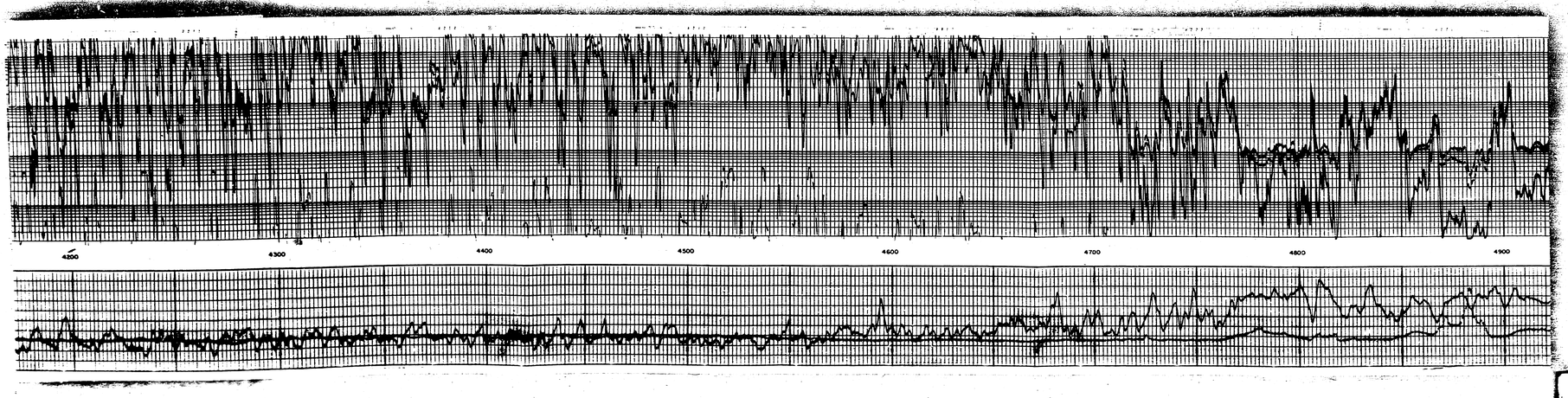
4400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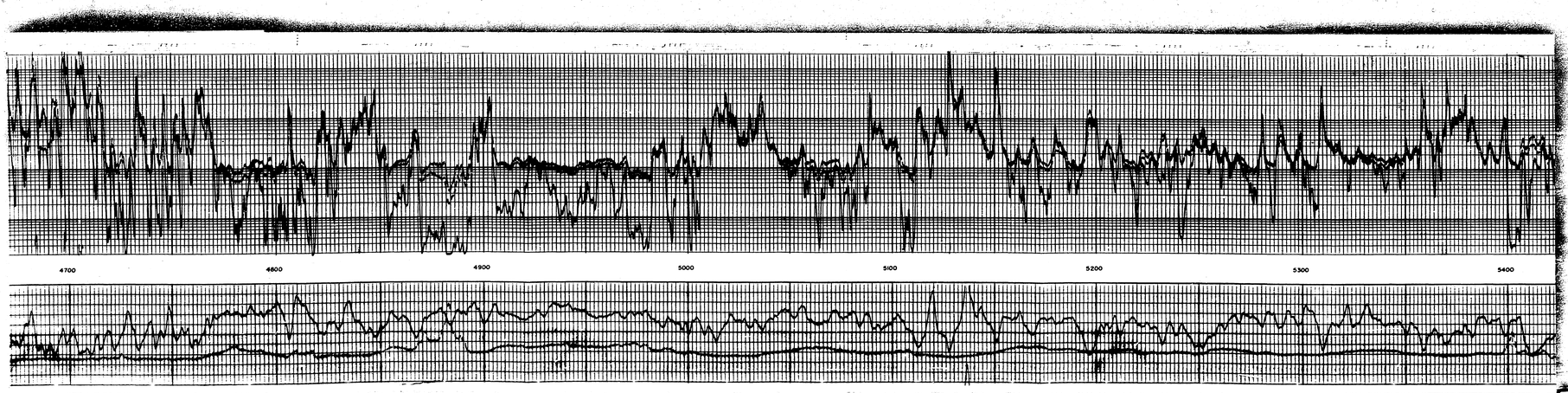
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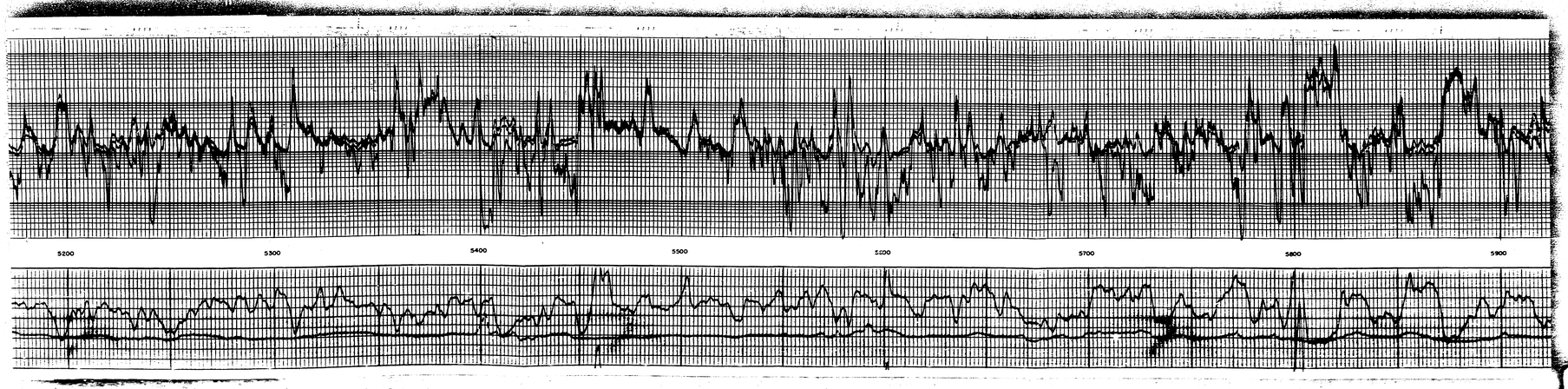
5400

U.S.S.R.C.F. HYDROGRAPHICS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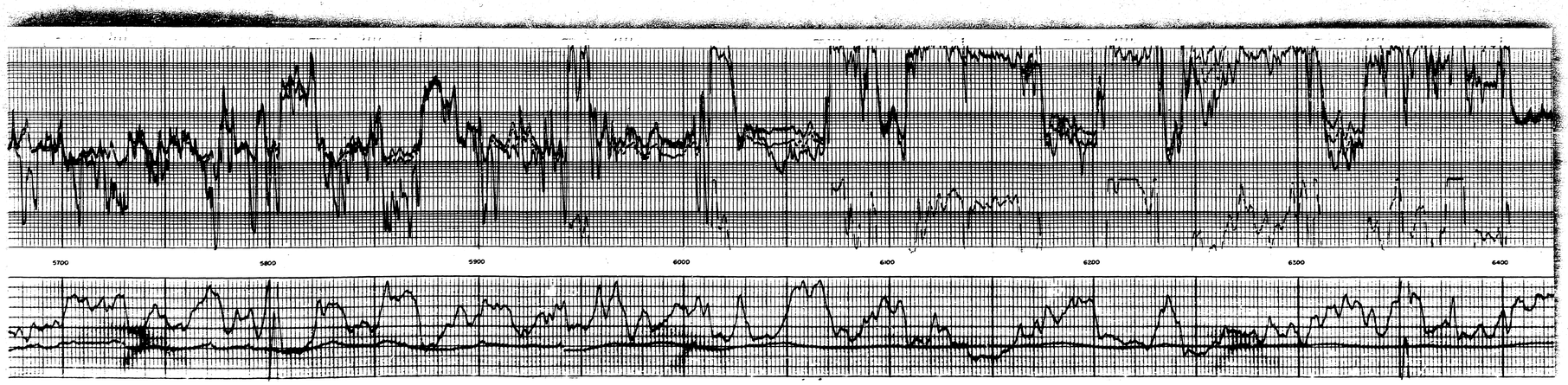
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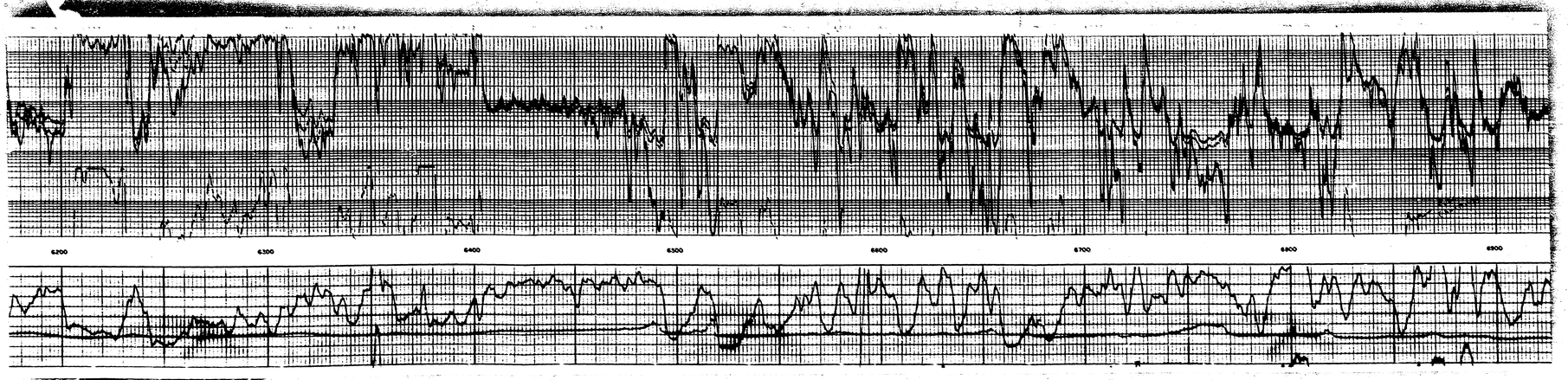
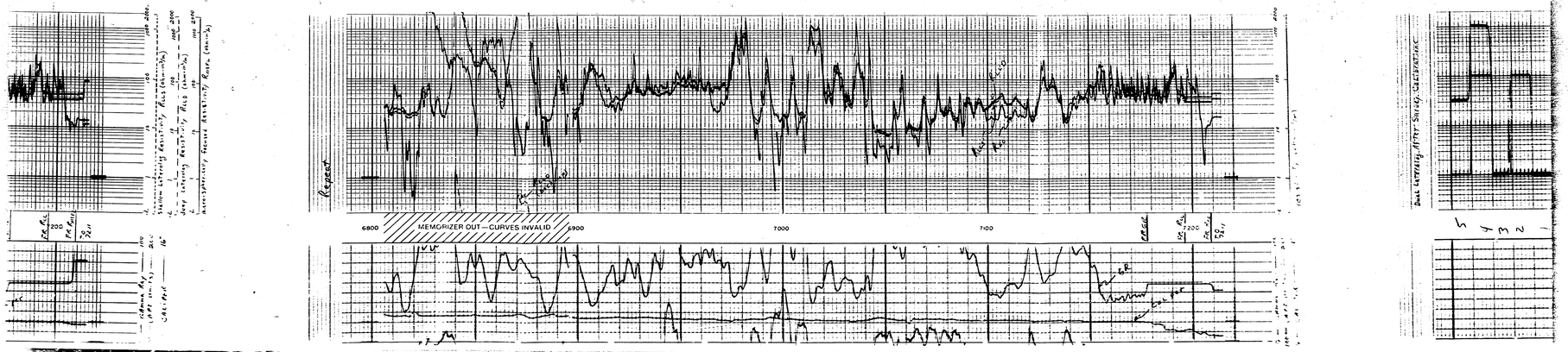
5800
5900
6000
6100
6200
6300
6400


6200
6300
6400
6500
6600
6700
6800
6900

6700
6800
6900
7000
7100
Repeat
6800
MEMORIZER OUT — CURVES


Repeat
6800
MEMCRIZER OUT—CURVES INVALID
6900
7000
7100
Dual Latrolog After Sleep Calibration
5
4
3
2
1

SIMULTANEOUS DUAL LATEROLOG CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORD SFP CALIBRATE
3. TEST 1 (0-1000, 0-SPU-100)
4. TEST 2 (0-1000, 0-SPU-100)
5. TOOL CALIBRATE W/SPU-II

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. TEST CALIBRATE
3. TOOL CAL. RECORDING
4. TOOL CAL. TEST ON
5. CAL CHECK / TEST OFF