



Acoustic Cement Bond Log Signature

FILE NO. GL02613

MASTER FILE FIELD PRINT

COMPANY AEROJET NUCLEAR - INEL

WELL RRGE #1

FIELD RAFT RIVER GEOTHERMAL

COUNTY CASSIA STATE IDAHO

LOCATION: NE4 + SW4

Other Services

SEC 23 TWP 155 RGE 26 E

Permanent Datum GROUND LEVEL Elev. 4835
 Log Measured from KB, 18 Ft. Above Permanent Datum
 Drilling Measured from KB

Elevations:
 KB 4853
 DF 4853
 GL 4835

Date	2-24-75	CSG. RECORD	Surface	Protection	Production	Liner
Run No.	ONE	Size			13 3/8	
Depth-Driller	2950	Wt./Ft.			61	
Depth-Logger	2836	Grade			J55	
Bottom Logged Int.	2830	Type Joint			8R	
Top Logged Int.	1200	Top			SURF	
Ft. Measured	1630	Bottom			3642	
Type Fluid in Csg.	H2O	PRIMARY CEMENTING DATA				
Density of Fluid	-	Type Cement			50/50 P02	
Fluid Level	FULL	Vol. of Cement			1900 SKS	
Max. Temp. Deg. F.	-	Additive			SILICA FLOUR	
Tool Series No.	1408M	% Additive			60%	
Tool Diam.	3 5/8"	Retarder			HR 12	
Standoff Size	CENT	% Retarder			3/10%	
Logging Speed	40 FPM	Slurry Wt.			15.1	
R/A Log Type	GAMMA	Water Loss				
T.C.	ONE	Drlg. Mud Type				
Sens. Setting	440	Drlg. Mud Wt.				
API Units/Div.	10	PRIMARY CEMENTING PROCEDURE				
Truck or Unit No.	HP6102	Started Pumping	1:10	DATE	Preceding Fluid	WATER
Location	ROOSEVELT	Plug on Bottom	2:45		Vol.	454 Bbls.
Opr. Rig Time	3.0	Pres. Released	2:45		Returns: Full	Partial None
Recorded by	HUBER	Started Bond Log	1200	2-24	Pipe Rot. During Pumping:	Yes No
Witnessed by	MR. MASON	Finished Bond Log	1500	2-24	Pipe Rot. After Plugdown:	Yes No

FOLD HERE

REMARKS CEMENT BOND LOG IS 28' SHALLOW TO OPEN HOLE LOGS. CEMENT BOND LOG MEASURED FROM K.B. WHICH WAS 18' ABOVE GROUND LEVEL

SQUEEZE JOB DETAIL	Squeeze No.	1	2	3	4	Scratcher Depths
	Date					
	Depth Interval					
	Type Cement					
	Vol. of Cement					
	Additive					
	% Additive					
	Retarder					
	% Retarder					
	Slurry Wt.					
	Preceding Fluid					
	Vol. Preceding Fluid					
	Breakdown Pressure					
	Max. Pres. — Stage 1					
	" " " 2					
" " " 3						
Final Max. Pressure						
Time Brkdn. (hr.-date)						
Pumping Stopped						
Pres. Released						
Started Bond Log						
Finished Bond Log						

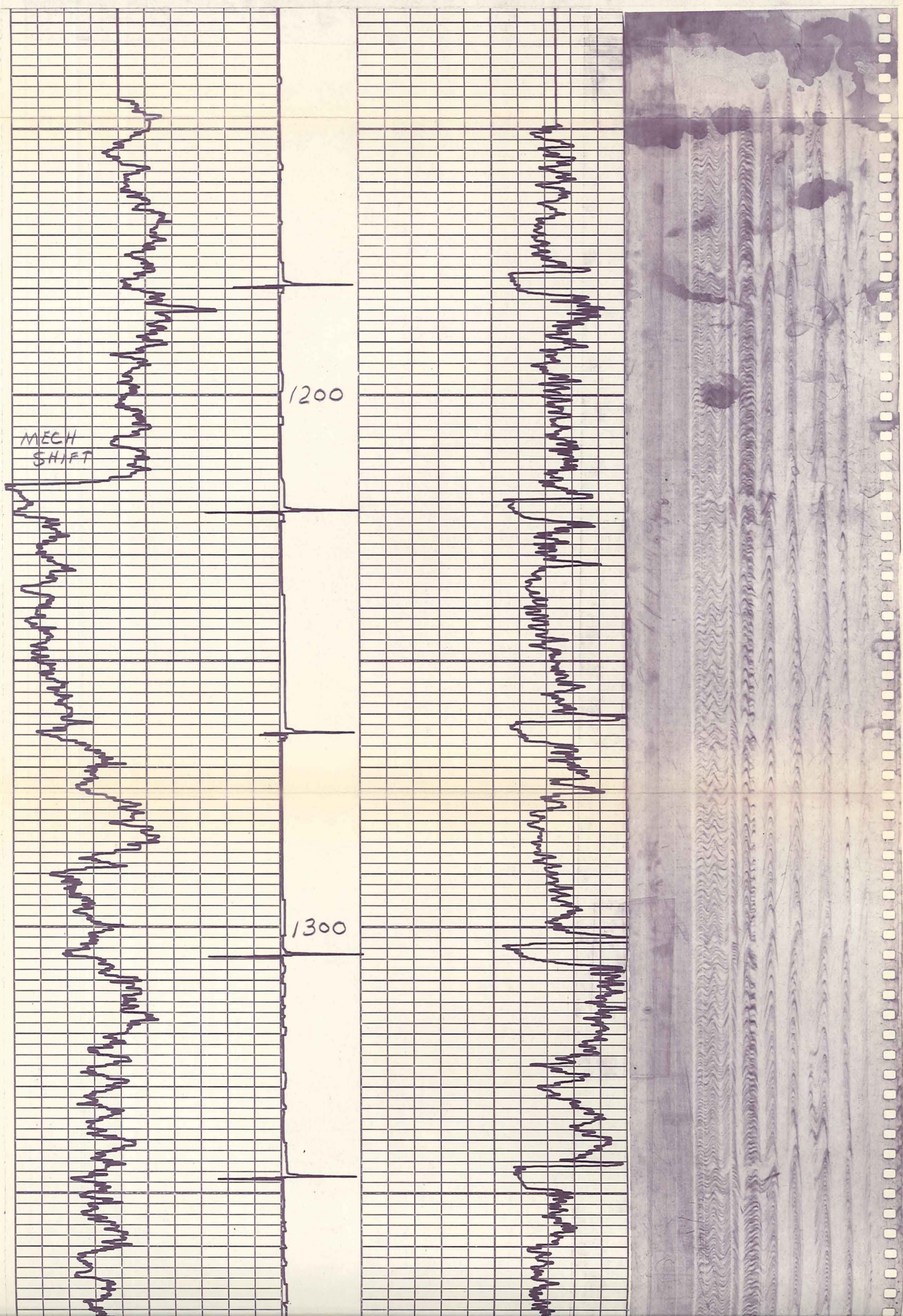
Pressure read at: Surface _____ Bottom Hole _____

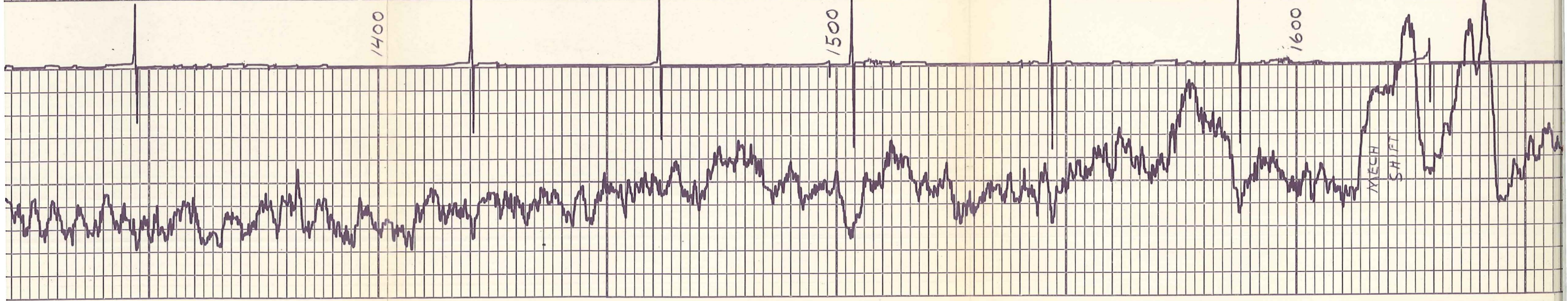
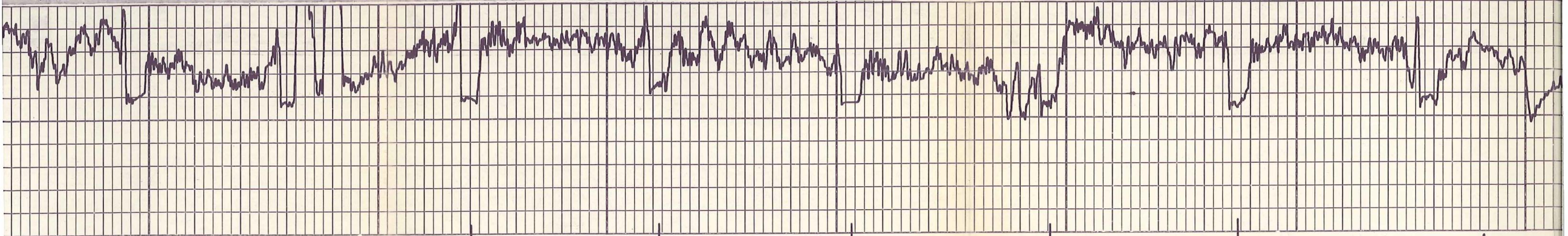
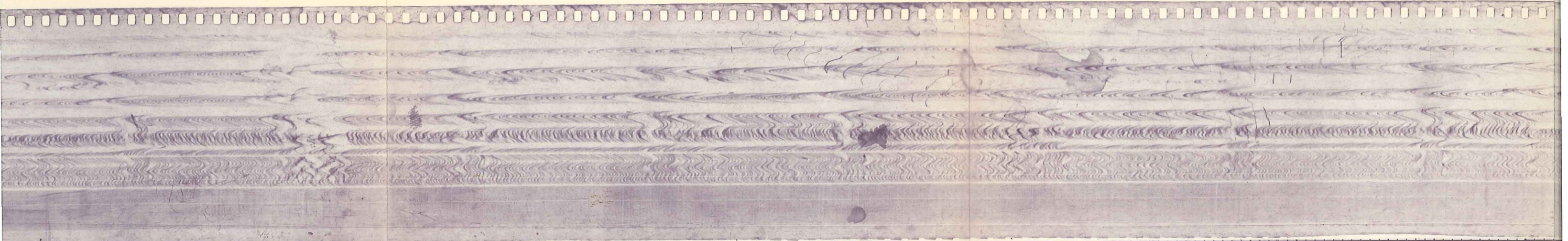
SEQUENCE OF CEMENT BOND LOGS		AVERAGE WELL DRIFT	
Log run following:	CBL Run	° from _____ to _____	° from _____ to _____
Surface Casing Cement	Squeeze No. 1	° from _____ to _____	° from _____ to _____
Protection Casing Cement	Squeeze No. 2		
Production Casing Cement	Squeeze No. 3		
Liner Cement	Squeeze No. 4		

GAMMA RAY	DEPTH	COMPRESSION WAVE AMPLITUDE	SIGNATURE
			CASING COLLARS
RADIATION		AMPLITUDE INCREASES ↑	

Surface Casing Cement		Squeeze No. 1		from	to
Protection Casing Cement		Squeeze No. 2		° from	to
Production Casing Cement		Squeeze No. 3		° from	to
Liner Cement		Squeeze No. 4			

GAMMA RAY	DEPTH	COMPRESSION WAVE AMPLITUDE	SIGNATURE
RADIATION INCREASES → PFC	CASING COLLARS	AMPLITUDE INCREASES → PERCENT UNBONDED PIPE SIGNAL 64 16 40	Signature 100 μ SEC
		300	1200



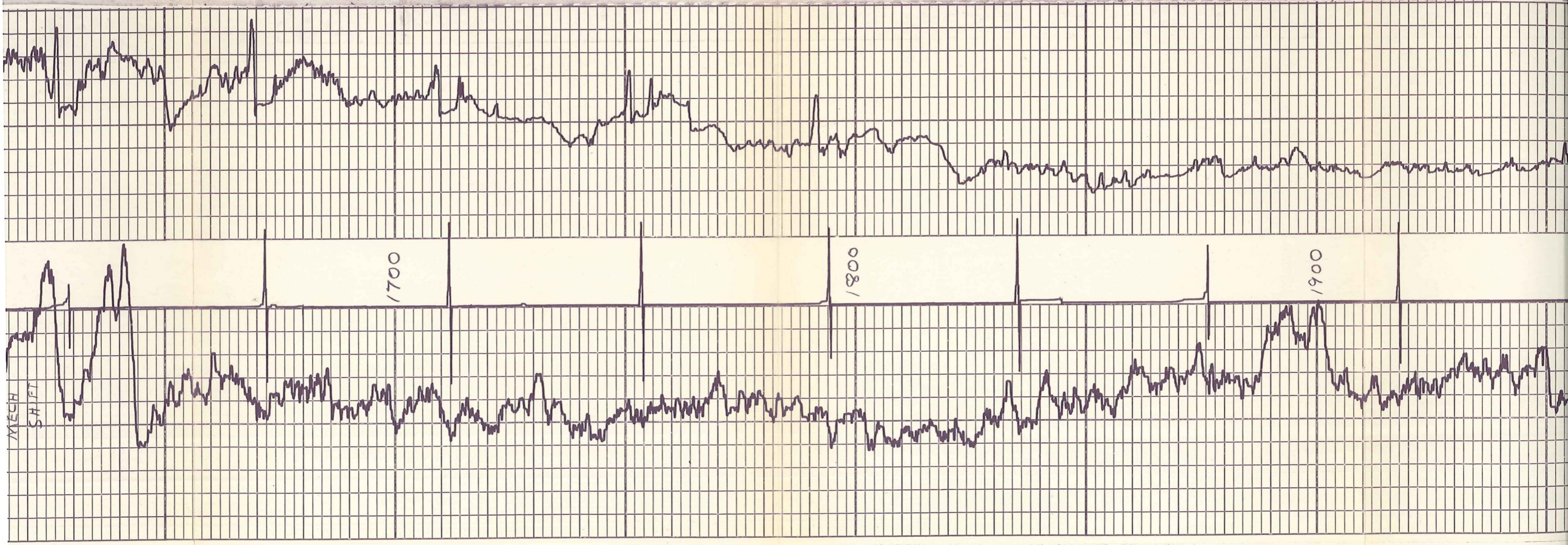


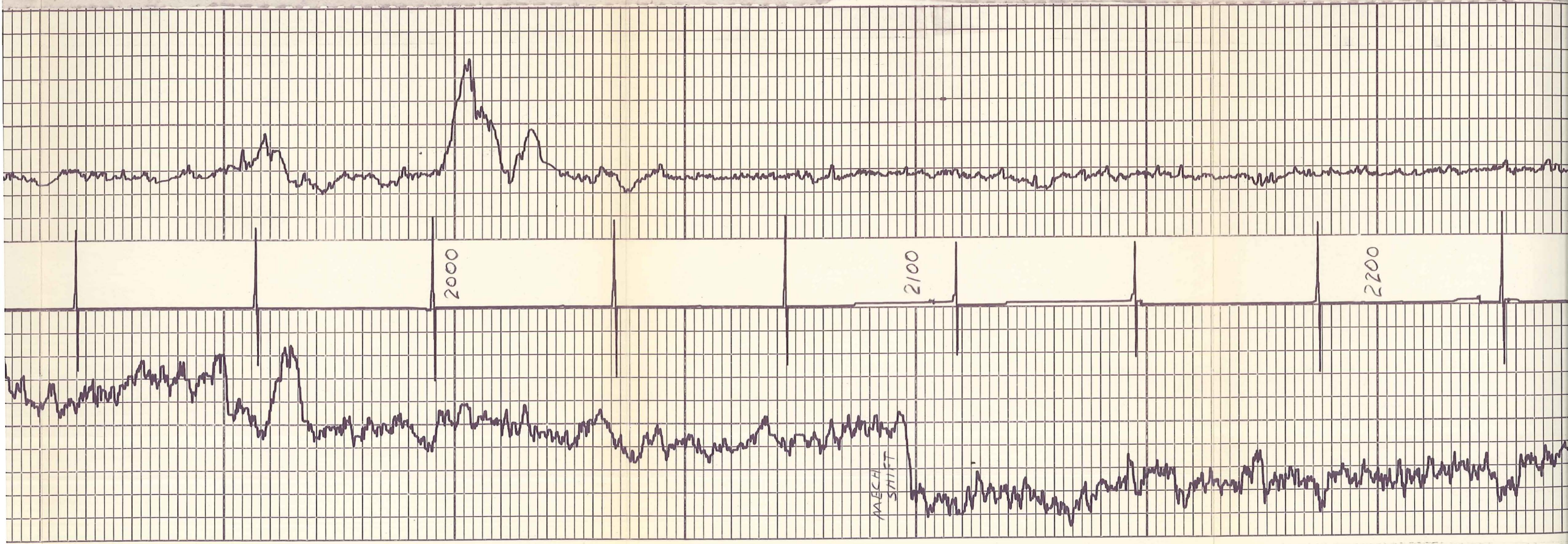
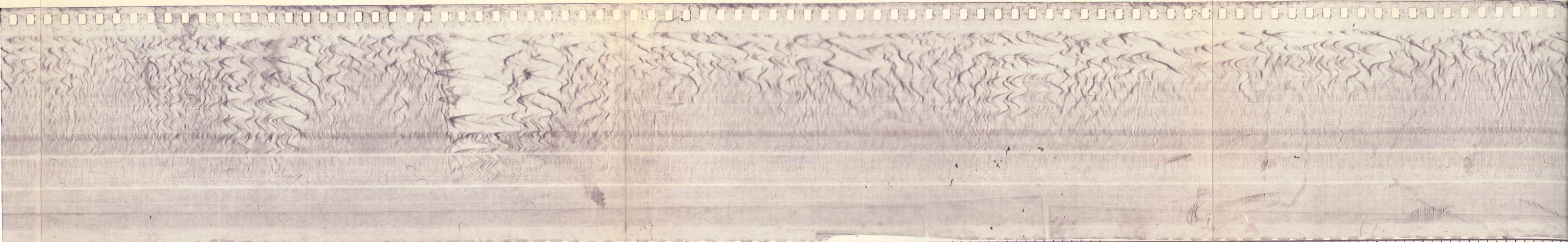
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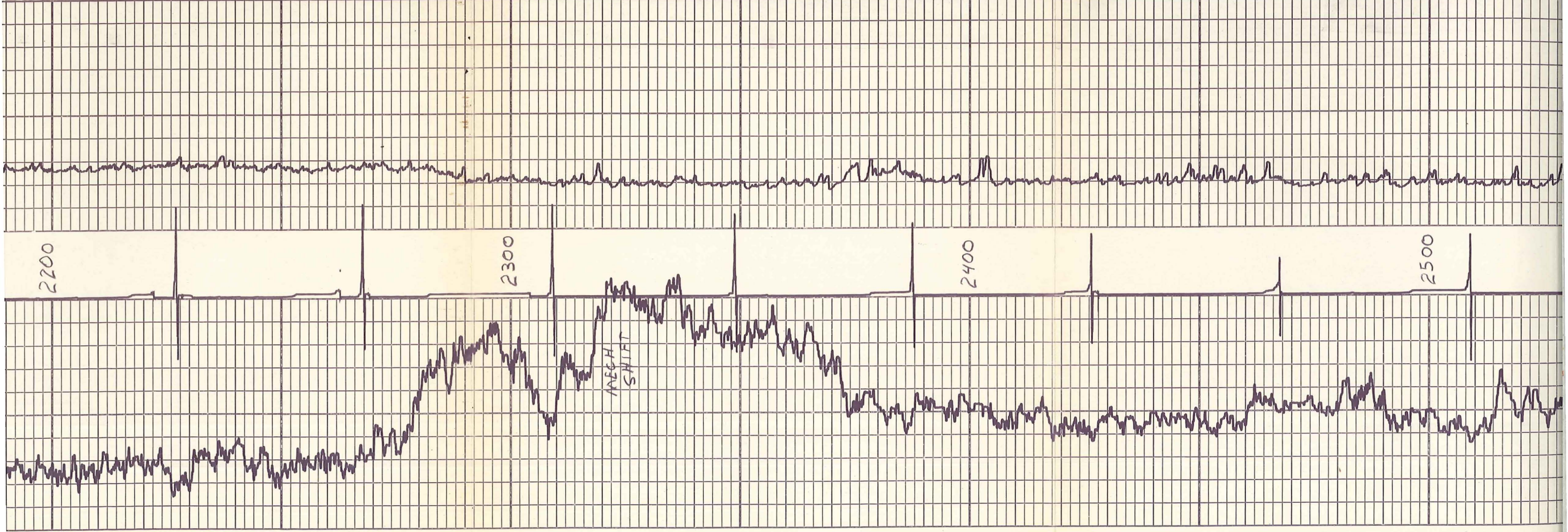
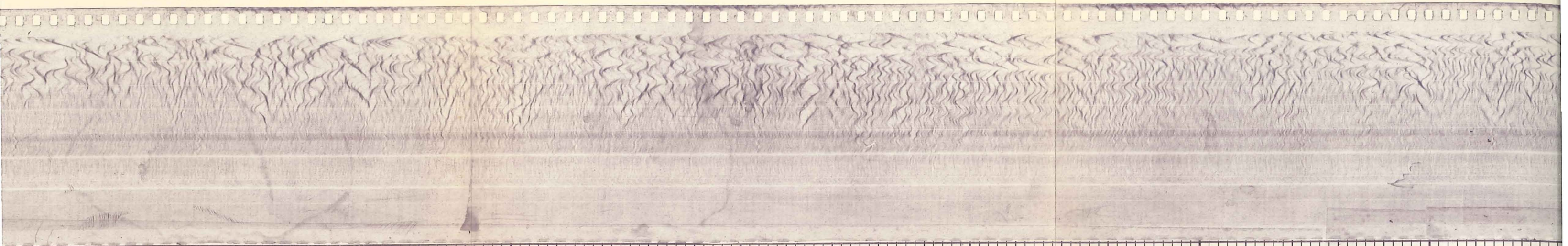
1500

1600

MECH
SHIFT







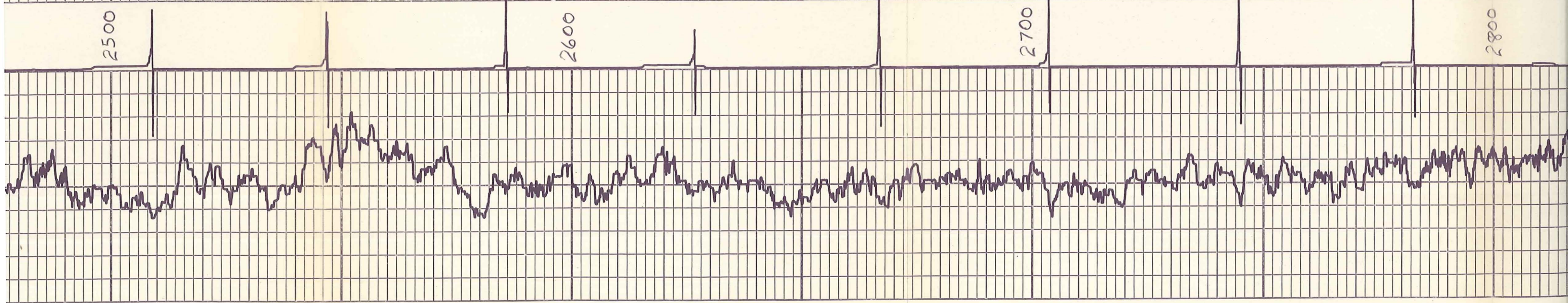
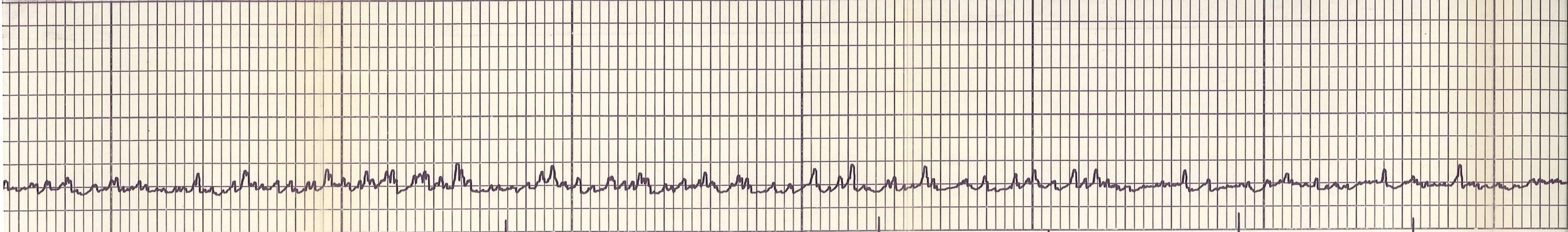
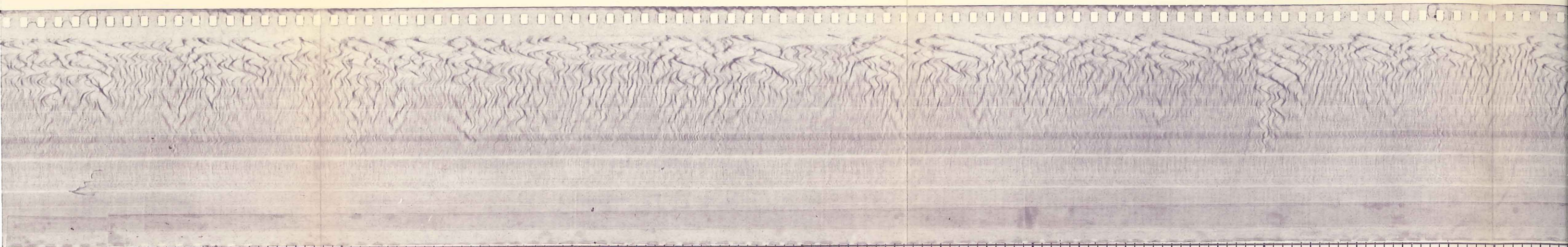
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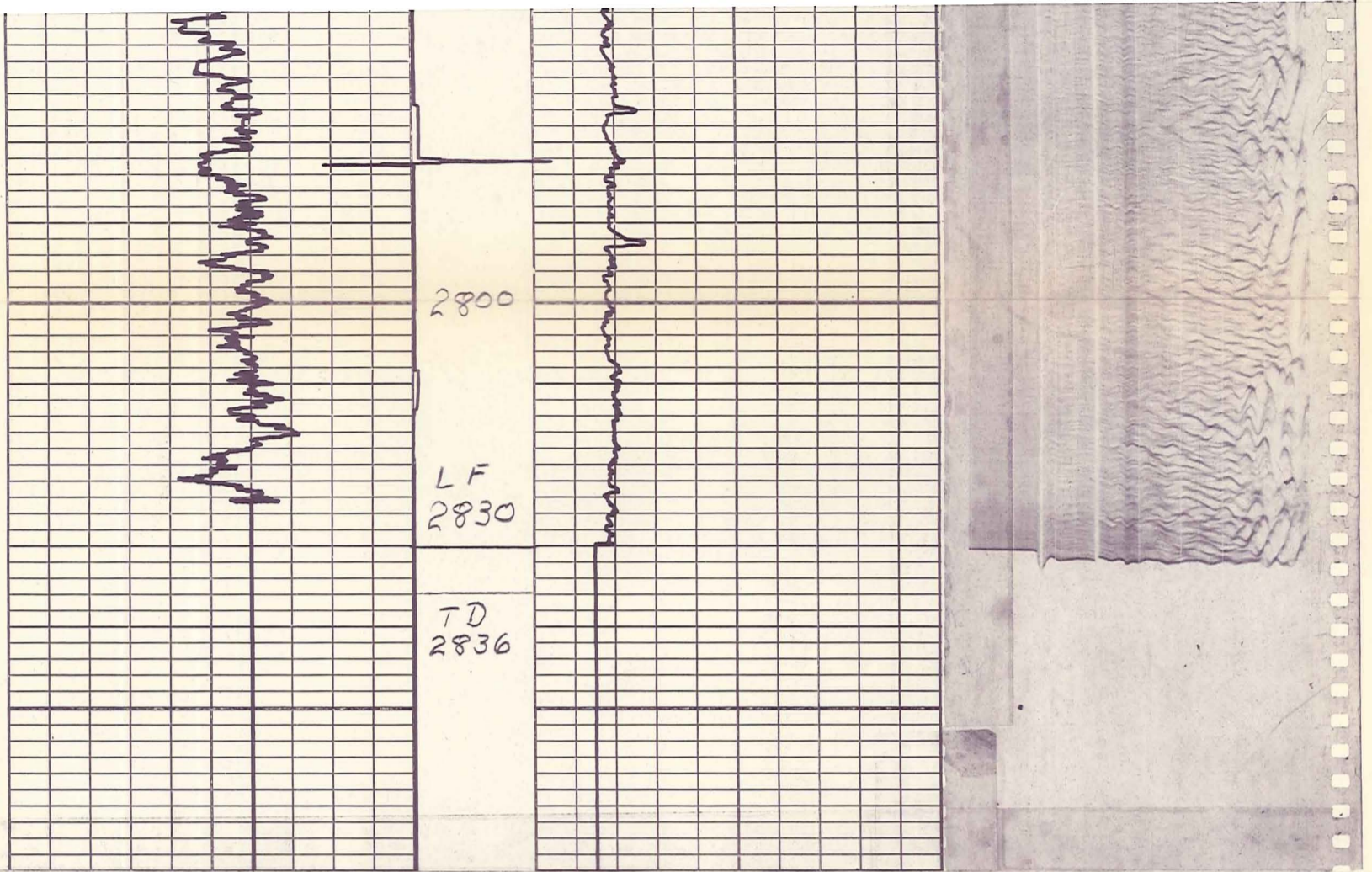
2300

2400

2500

NEG.
SHIFT

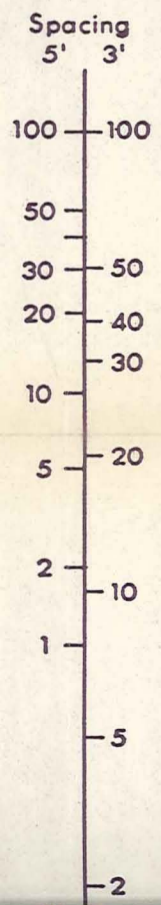




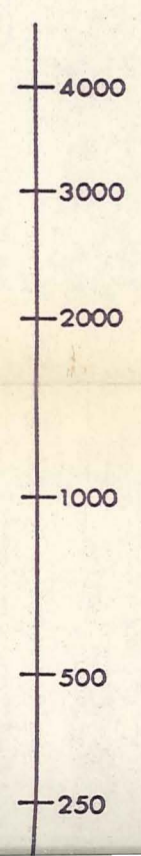
<p>0 PFC</p> <p style="text-align: center;">RADIATION INCREASES</p>	<p style="text-align: center;">6.416 40</p> <p style="text-align: center;">PERCENT UNBONDED PIPE SIGNAL</p> <p style="text-align: center;">AMPLITUDE INCREASES →</p>	<p style="text-align: right;">200 1200</p> <p style="text-align: center;">11</p> <p style="text-align: center;">100 μ SEC</p>	
GAMMA RAY	DEPTH	COMPRESSION WAVE AMPLITUDE	SIGNATURE
Company	AEROJET NUCLEAR INEL	Drillers T.D.	2950
Well	RGE #1	Log F.R.	2830
Field	RAFT RIVER GEOTHERMAL	Log T.D.	2836
County	CASSIA	Elevations:	
State	IDAHO	K.B. 4853	D.F. 4853 G.L. 4835

CEMENT STRENGTH

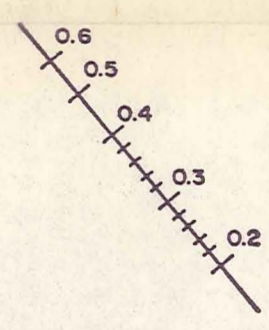
PERCENT OF SIGNAL
IN UNBONDED PIPE

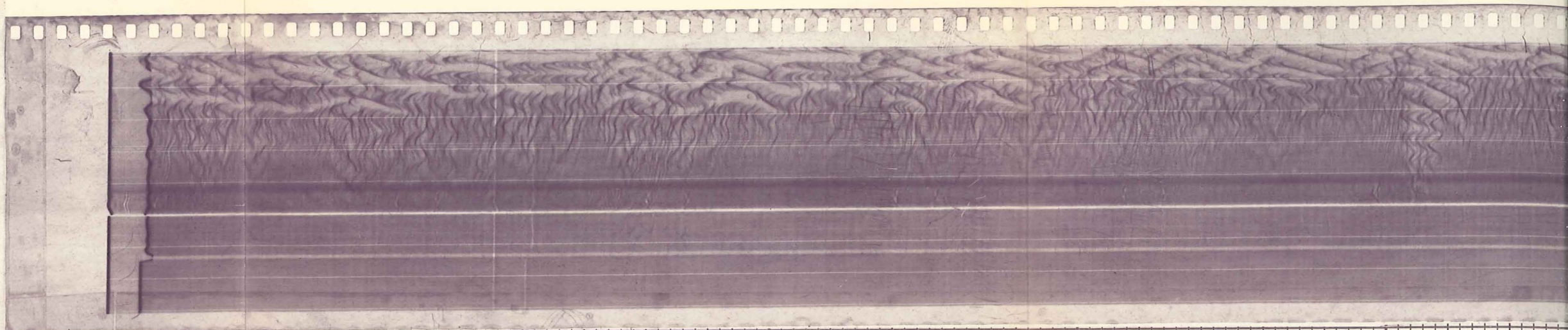


AVERAGE
COMPRESSIVE
STRENGTH (psi)



CASING THICKNESS
(inches)

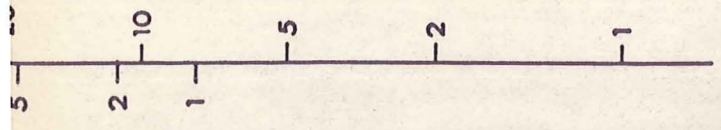
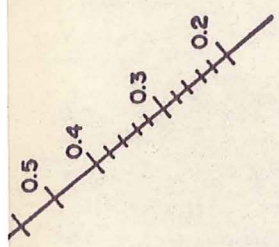
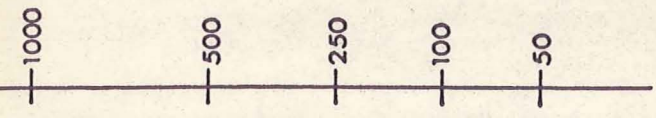
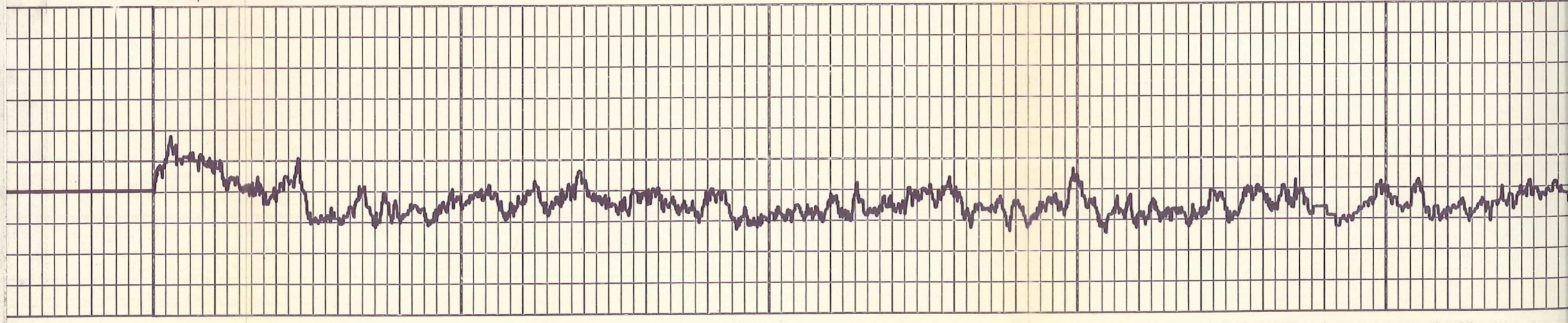


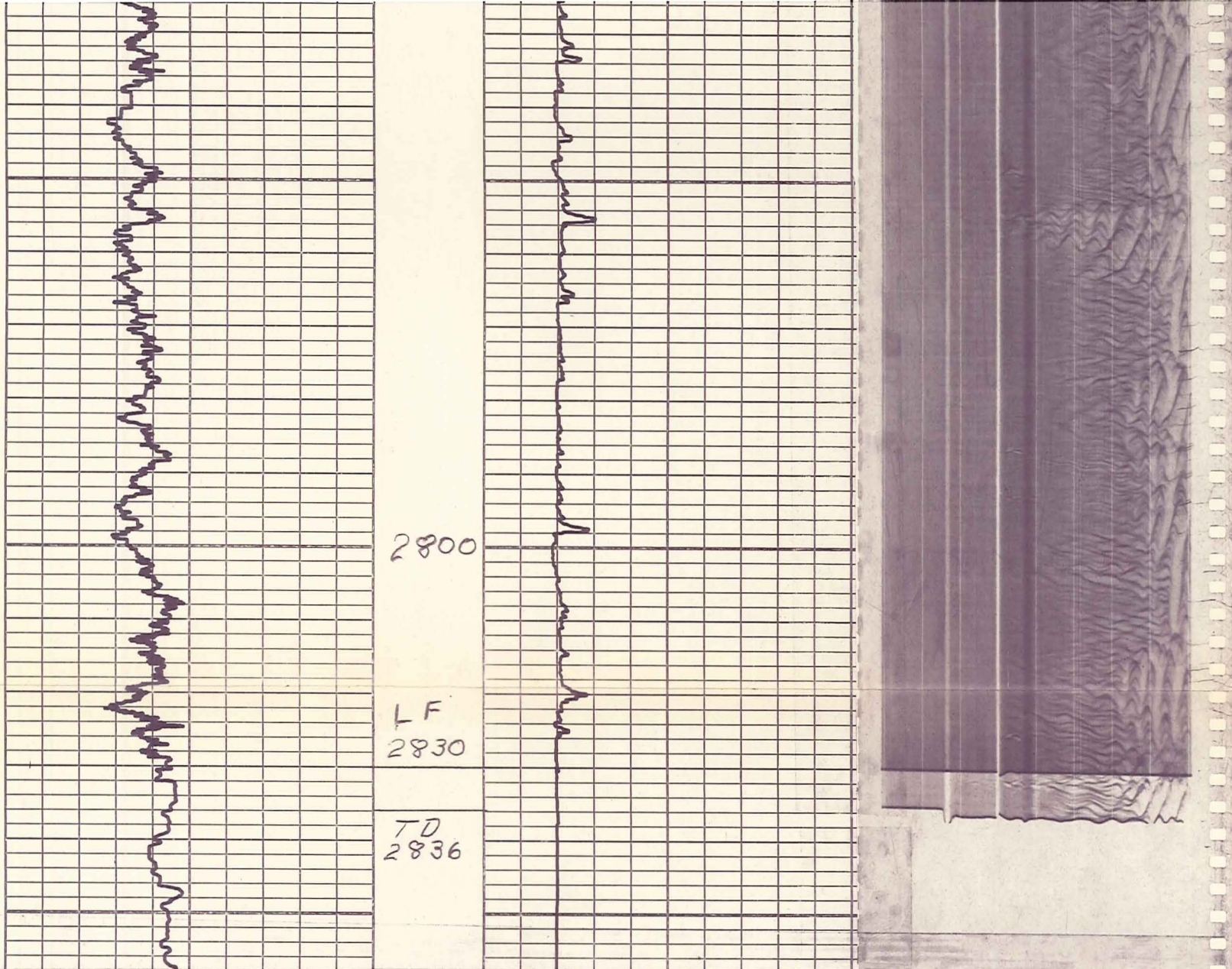


REPEAT
SECTION

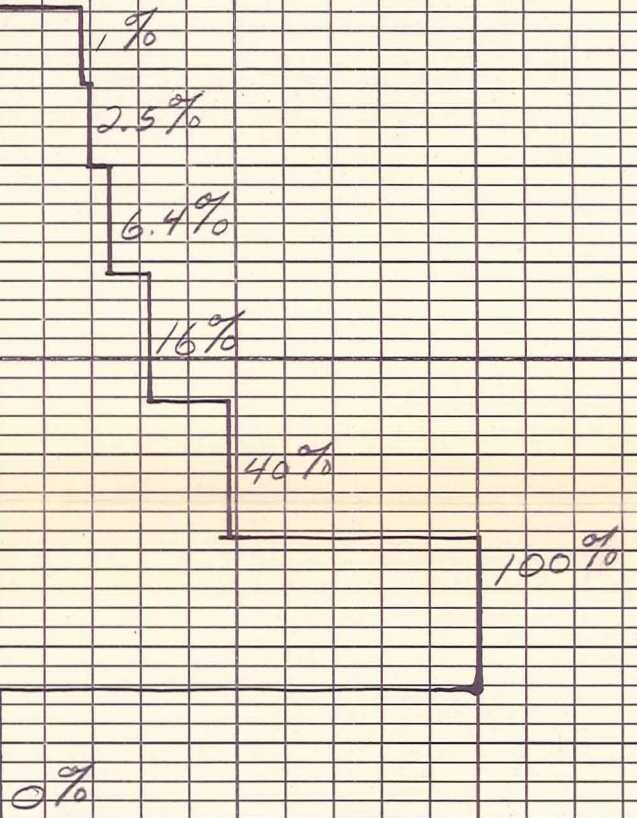
2600

2700





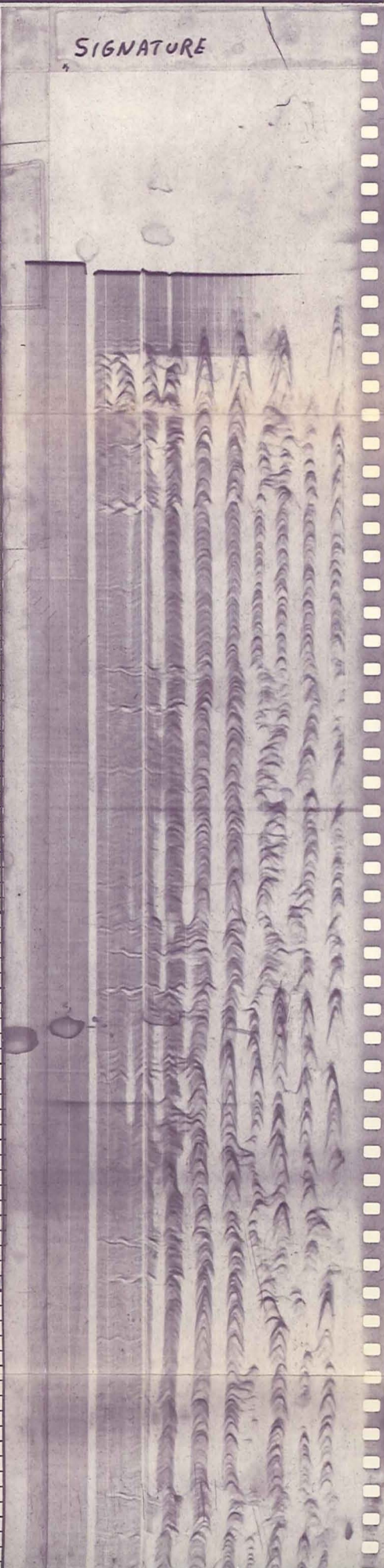
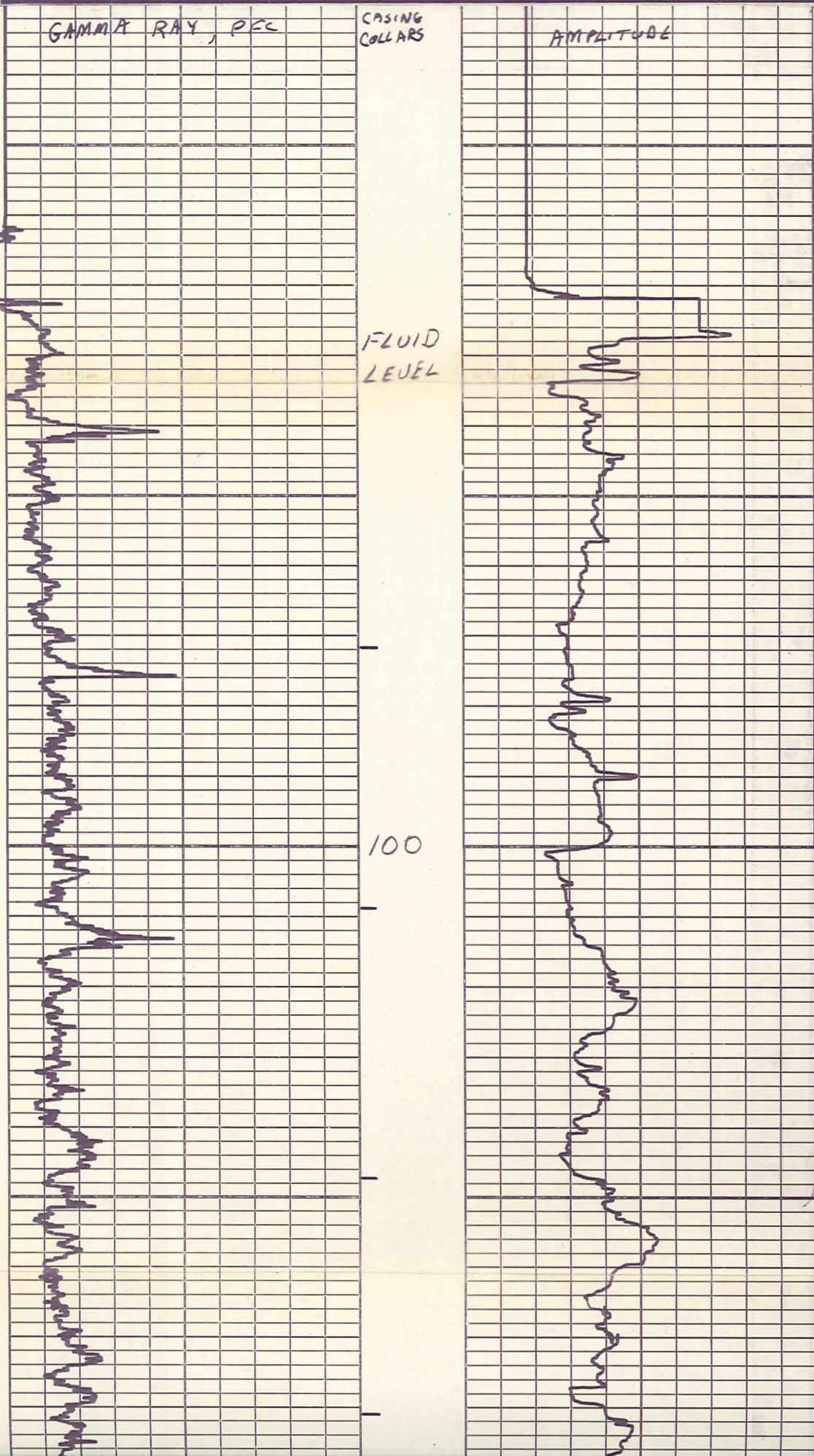
AFTER
LOG
CALIB
AT
1083

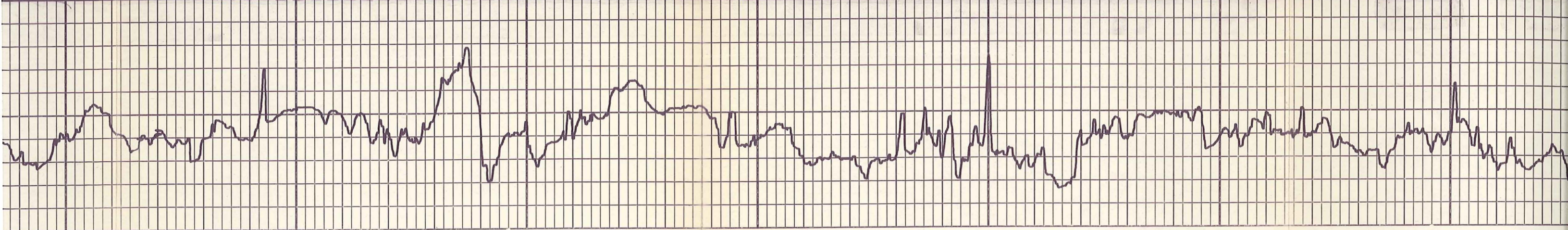
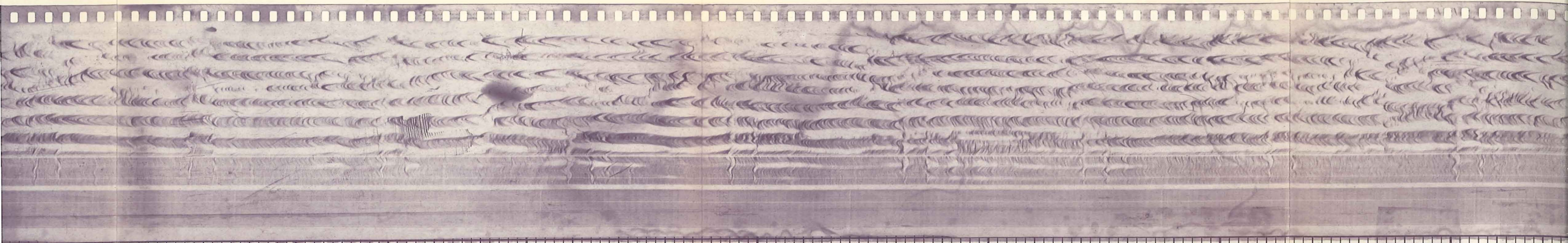


REMARKS
UNABLE TO FIND FREE PIPE FOR CALIBRATIONS.
USED CALIBRATIONS FROM BOND LOG RAN 2-24-75

SQUEEZE JOB DETAIL					Centralizer Depths	Scratcher Depths
Squeeze No.	1	2	3	4		
Date	ONE	SPEARHEAD				
Depth Interval	SURF - 1800	50/50 POZ				
Type Cement	50/50 POZ MIX	40% GEL				
Vol. of Cement	1150 SKS.	25162. GILSINITE				
Additive	SILICA FLOUR	3% CaCl ₂				
% Additive	60%					

SQUEEZE JOB DETAIL					Centralizer Depths	Scratcher Depths
Squeeze No.	1	2	3	4		
Date	ONE	SPEARHEAD				
Depth Interval	SURF - 1800	50/50 POZ				
Type Cement	50/50 POZ MIX	40% GEL				
Vol. of Cement	1150 SKS.	251 lb. GILSINITE				
Additive	SILICA FLOUR	3% CAC				
% Additive	60%					
Retarder	NONE					
% Retarder	NONE					
Slurry Wt.						
Preceding Fluid						
Vol. Preceding Fluid						
Breakdown Pressure						
Max. Pres. — Stage 1						
" " " 2						
" " " 3						
Final Max. Pressure						
Time Brkdn. (hr.-date)						
Pumping Stopped						
Pres. Released						
Started Bond Log	1000 2-25/75					
Finished Bond Log	1300 2-25/75					
Pressure read at: Surface _____ Bottom Hole _____						
SEQUENCE OF CEMENT BOND LOGS				AVERAGE WELL DRIFT		
Log run following:	CBL Run	CBL Run		_____ ° from _____ to _____		
Surface Casing Cement		Squeeze No. 1		_____ ° from _____ to _____		
Protection Casing Cement		Squeeze No. 2		_____ ° from _____ to _____		
Production Casing Cement		Squeeze No. 3				
Liner Cement		Squeeze No. 4				

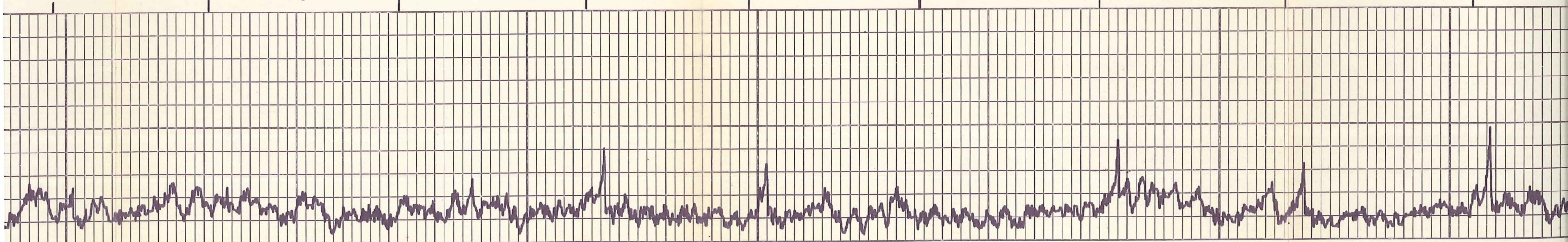


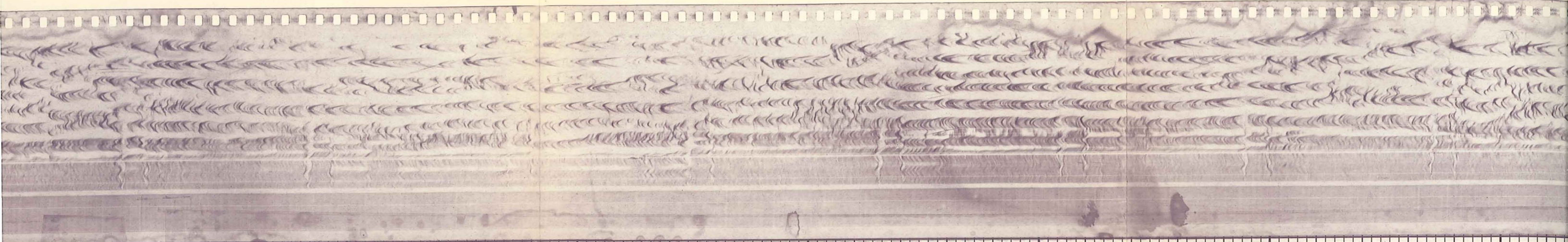


200

300

400

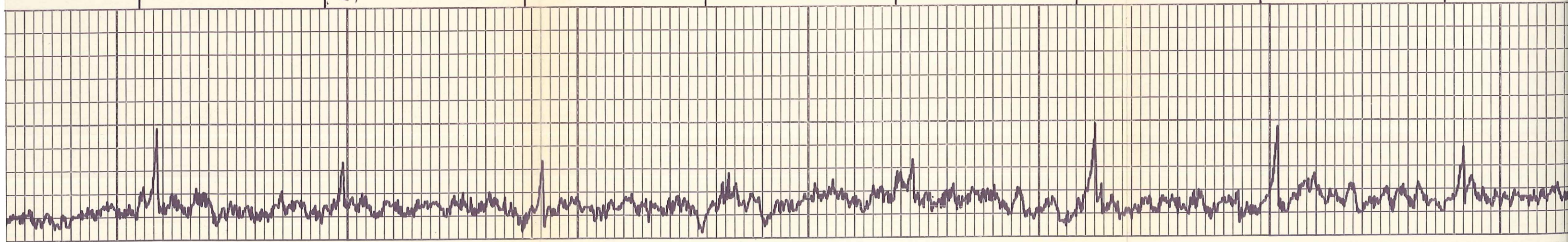


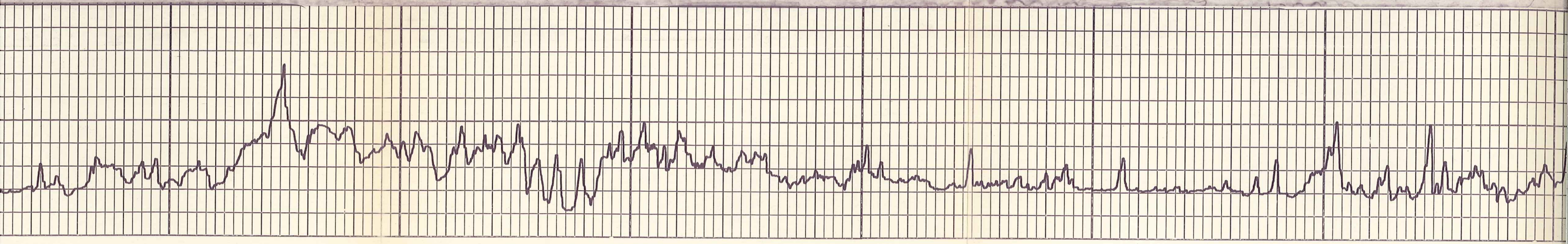
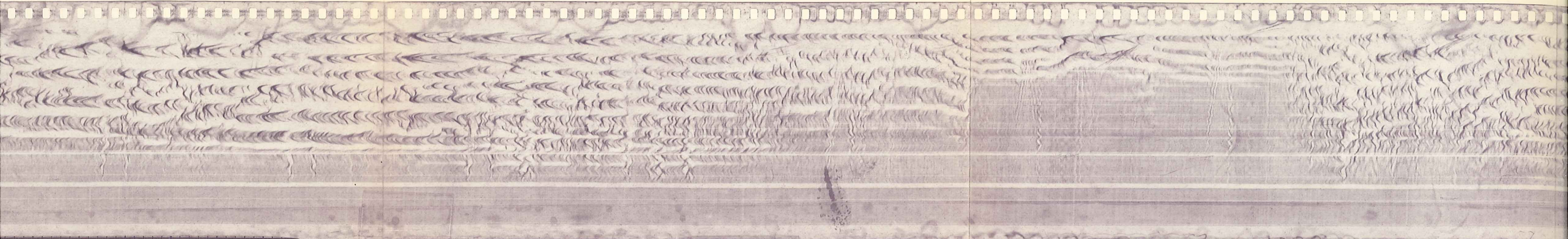


500

600

700



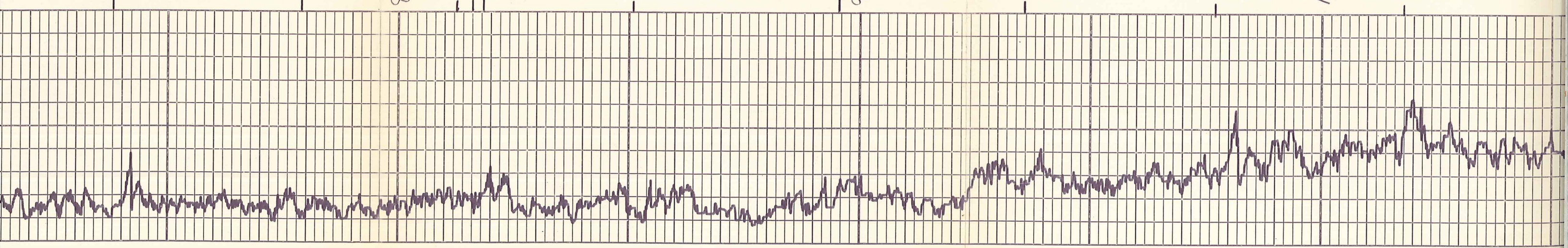


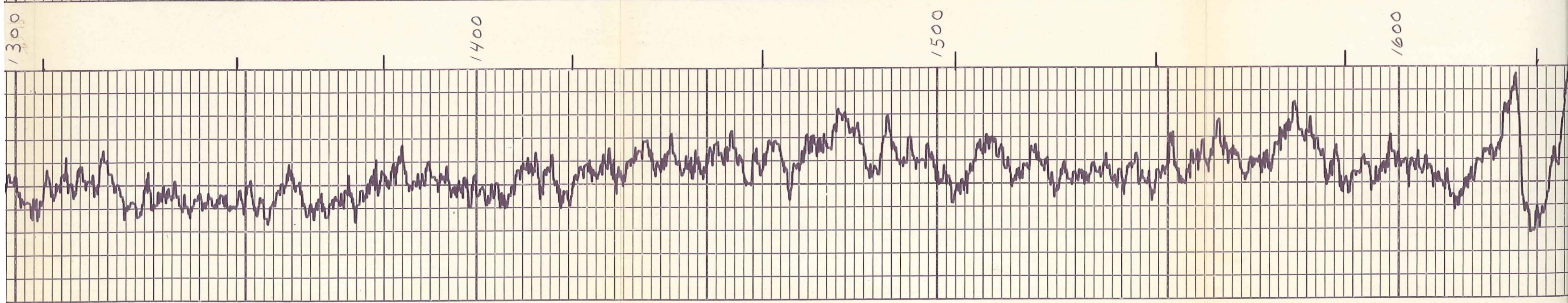
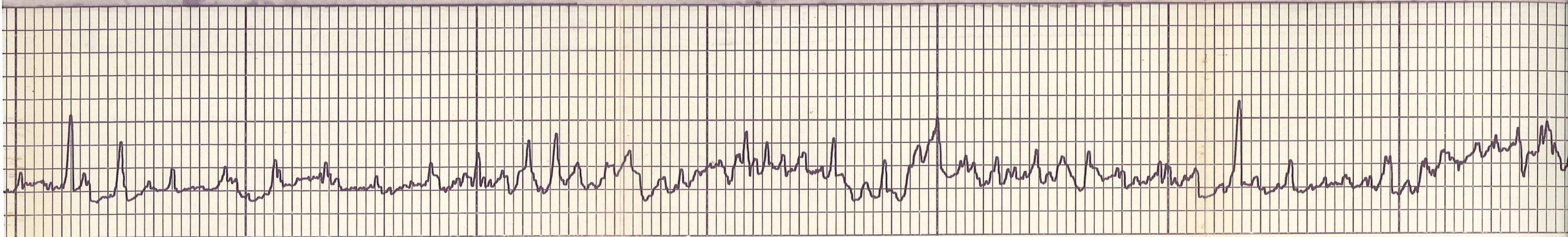
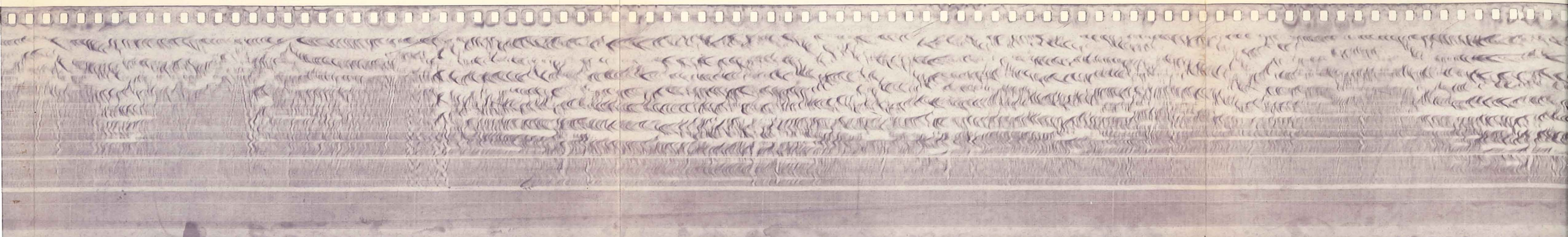
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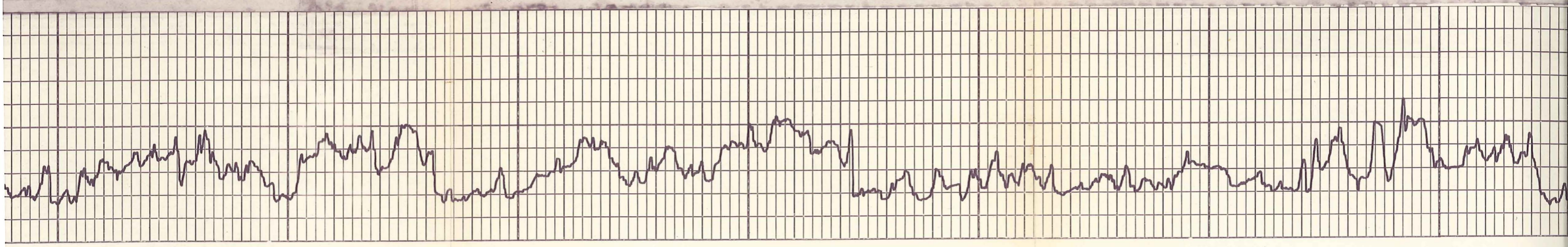
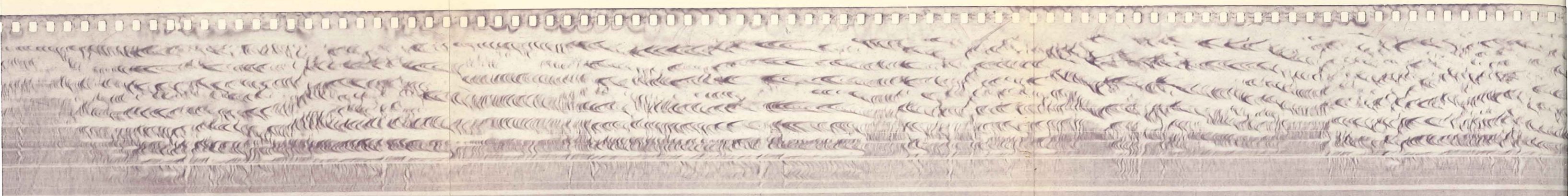
max

900

1000





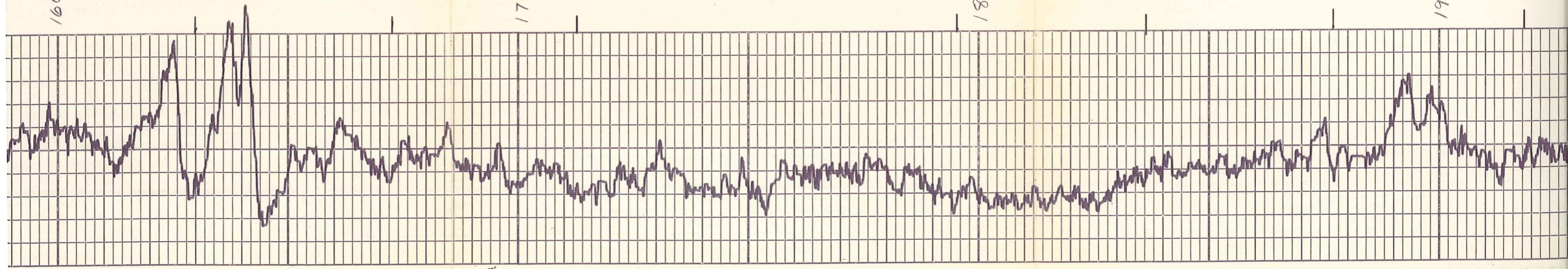


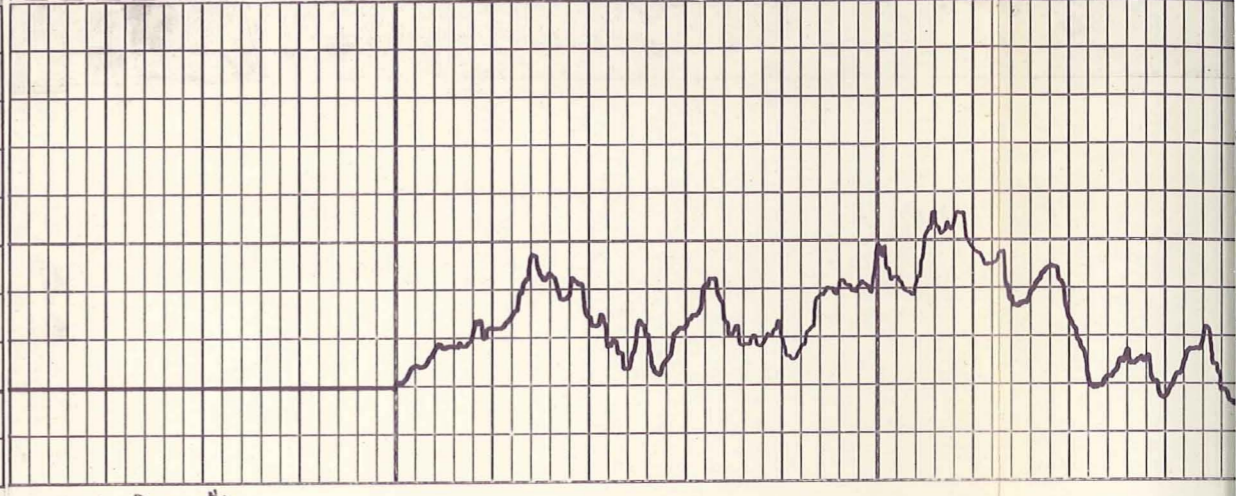
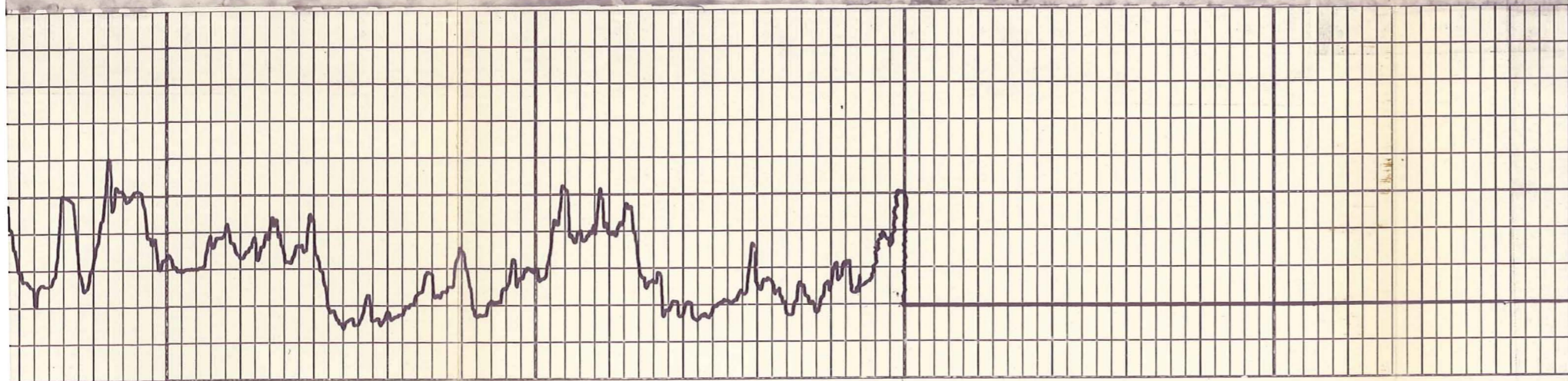
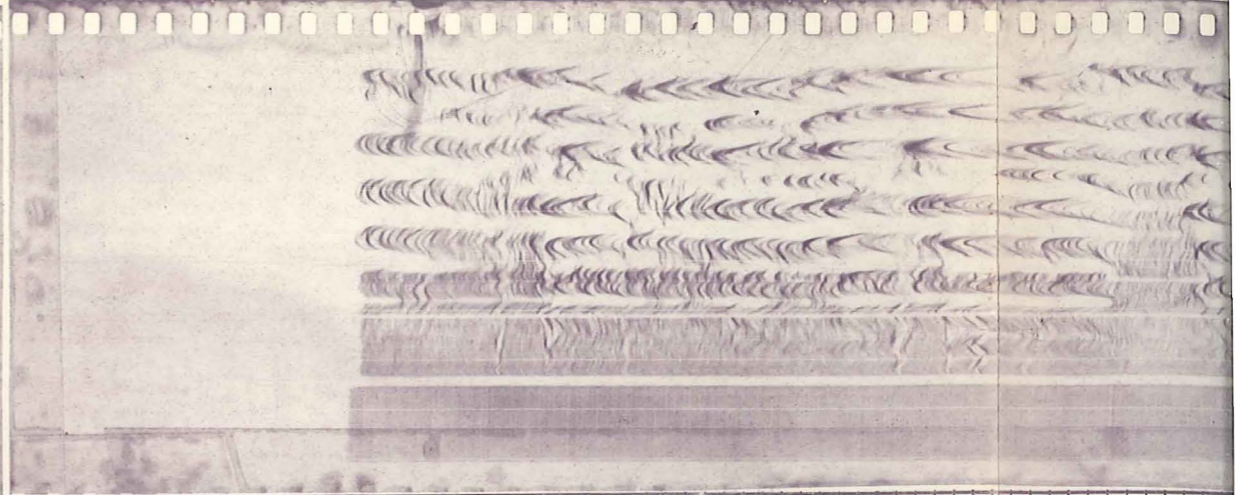
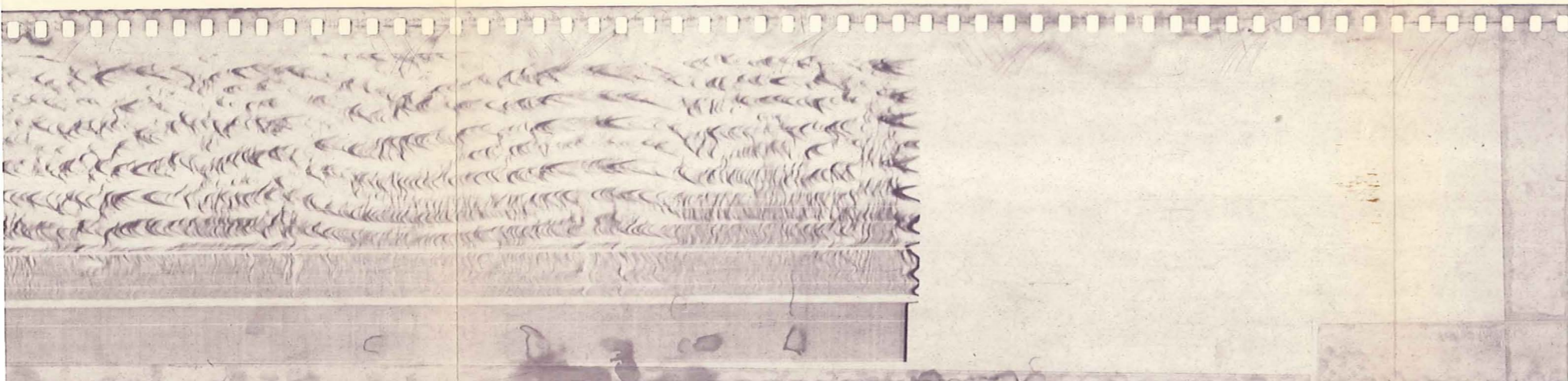
1600

1700

1800

1900



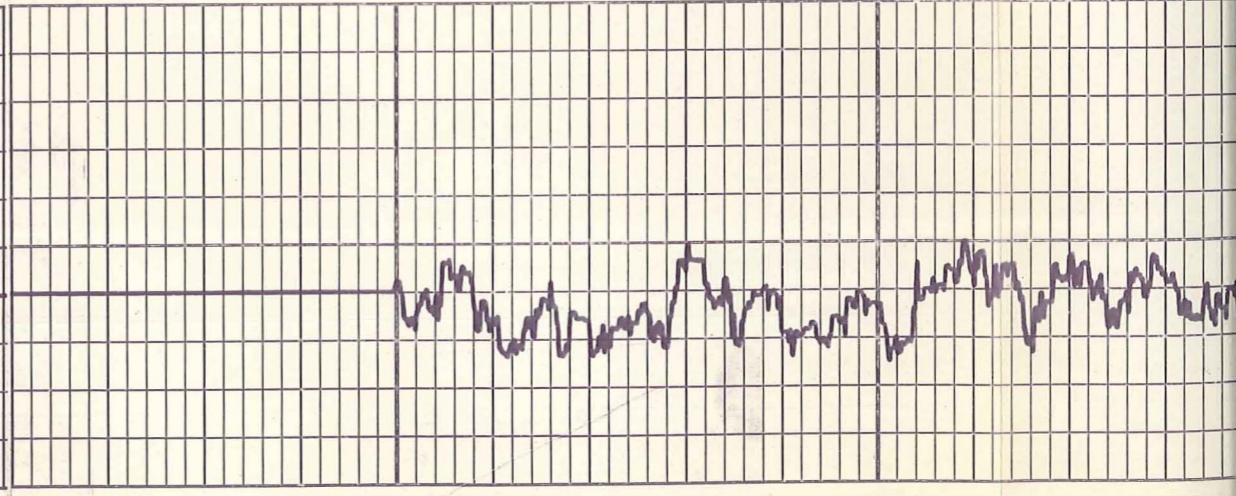
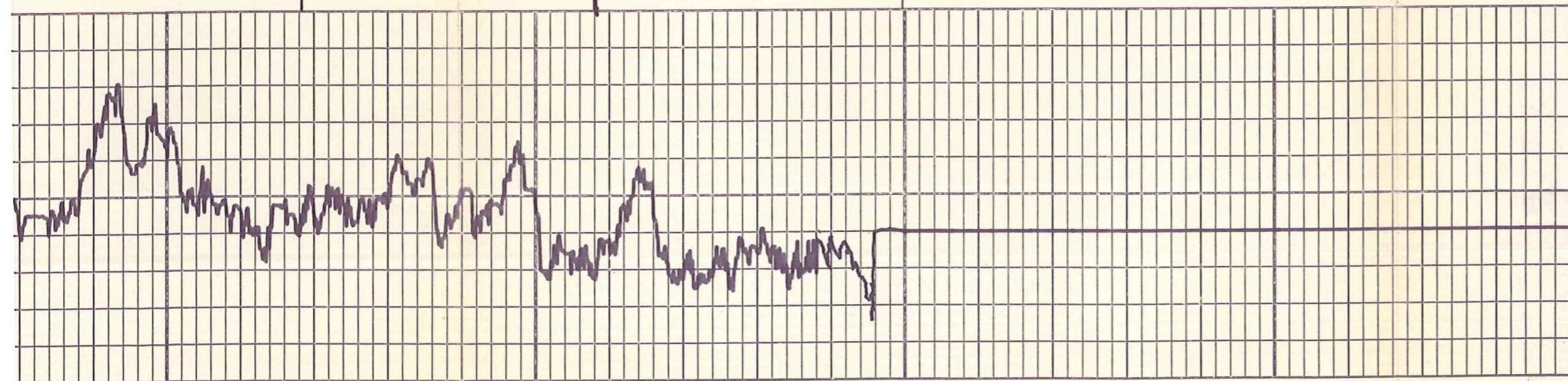


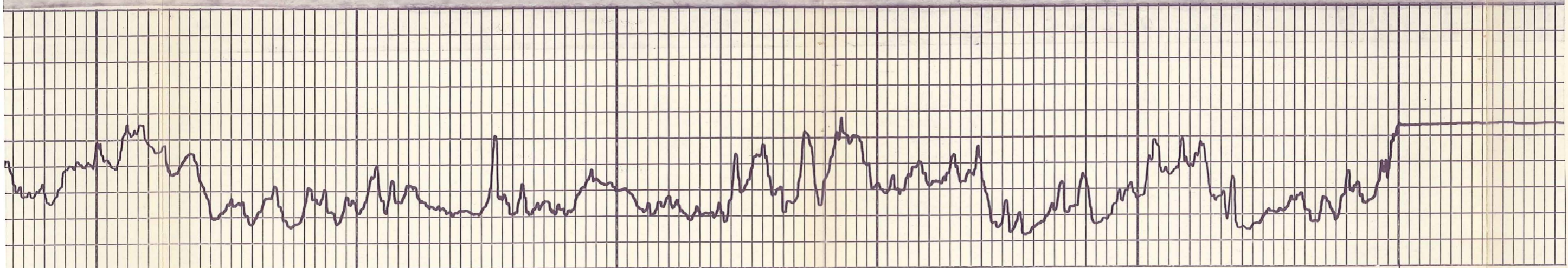
1900

L F
2000

REPEAT
SECTION
AFTER
SQUEEZE

1700





1800

1900

LF
2000

