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PROGRESS REPORT

ANNISTON LABORATORY

JOB NO. 435-1-65 REPORT NO. 1 DATE: November 9, 1965

TITLE: GLC Analyses of Aroclor 1242

OBJECTIVE: Determine isomer distribution of Aroclor 1242 to detect any changes in Anniston production, and to compare Anniston material with competitive Aroclor.

REPORTED BY: J. A. Liddle

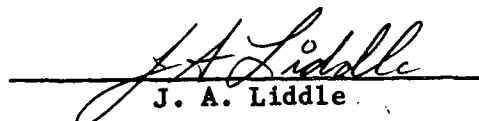
PERSONNEL: J. A. Liddle (O. E. Dolin)

SUMMARY: Since the first progress report on the study, August 6, 1965, 36 lots of Anniston material have been analyzed by GLC. A statistical evaluation of the data indicates no significant shifts in the isomer distribution have occurred.

RECOMMENDATIONS:

Continue analyses of Aroclor 1242 to obtain sufficient data for a reliable factor analysis.

1610A
at 1000°C


J. A. Liddle

DSW 248352

STLCOPCB4054063

DETAILSBackground

The main objective of this study is to determine the isomer distribution of Aroclor 1242 and to detect any shifts due to changes in process or equipment.

Thirty six Anniston lots and seven Krummrich lots have been analyzed since the first report on this study.

Data: Graphs of isomer values for material produced at Anniston during 1965 are attached. The scale of each graph is based on an analytical reproducibility factor of $\pm 1\%$ of the amount present.

Isomer values for three lots of Aroclor 1242 produced at W.G.K. are listed.

<u>Isomer Group</u>	<u>KE 432</u>	<u>KE 441</u>	<u>KE 446</u>
1	0.10	0.06	0.11
2	0.15	0.09	0.13
3, 4, & 5	0.06	0.03	0.04
6 & 7	3.58	2.97	2.97
8, 9, 10, & 11	11.35	9.70	9.54
12, 13, 14, & 15	27.66	26.23	24.99
16, 17, 18, 19, & 20	31.76	32.67	32.37
21, 22, 23, & 24	6.94	7.45	7.56
25, 26, & 27	9.87	10.14	10.50
28, 29, 30, & 31	4.81	6.96	7.74
32, 33, & 34	2.53	2.65	3.47
35, 36, 37, 38, 39, & 40	0.80	0.73	0.17
41 & 42	0.25	0.21	0.27
43, 44, & 45	0.13	0.11	0.13
46	0.01	0.01	0.01
47	Trace	Trace	Trace
48	Trace	NDA	Trace
49 & 50	NDA	NDA	NDA

The stability properties, electric properties, etc., for typical Anniston material are listed below:

<u>Property</u>	<u>AE-171</u>	<u>AE-204</u>	<u>AE-213</u>	<u>AE-238</u>	<u>Specifications</u>
Specific Gravity @ 25/15.5°C	1.387	1.391	1.388	1.388	1.381 - 1.392
Refractive Index @ 25°C	1.6245	1.6250	1.6247	1.6250	1.6240 - 1.6260
Monsanto Stability	0.08	0.16	0.12	0.09	0.4 ppm., Max.
Hydrolysis Stability	0.21	0.18	0.15	0.14	1.0 ppm., Max.
Thermal Stability	0.38	0.26	0.44	0.46	0.75 ppm., Max.
Dielectric Constant @ 100°C, 1000 Cycles	4.90	4.85	4.83	4.88	4.70 - 4.90
Resistivity @ 100°C OHM-CM @ 500 V.O.C.	1035×10^9	640×10^9	1550×10^9	880×10^9	500×10^9 Min.
Power Factor @ 1000 Cycles	0.29	0.20	0.20	0.17	
Sampling Date	7-29	9-8	9-19	10-19	DSW 248353

DISCUSSION

Lots AE-171, AE-204, AE-213, and AE-238 are typical of Anniston production.

Starting with Lot AE-182, a new column was used in the gas chromatograph. A comparison of isomer distribution data obtained from the old and new columns indicates a slight shift in percentages due to the column change. Isomer groups 12 through 20 appeared to increase slightly, while isomer groups resolving after 28 appeared to decrease.

The decrease in random variability of isomer distribution is believed to be due to the fact that all samples are now being analyzed and calculated by one person. This minimizes errors arising from baseline corrections, integrator counting, etc.

Comparing Anniston material with W.G.K. material, the following differences are noted:

Peaks 2 to 11	W.G.K. has a lower concentration
Peaks 12 to 15	W.G.K. has about a 2% higher concentration
Peaks 16 to 20	W.G.K. has about a 4% higher concentration
	W.G.K. has slightly lower concentration after Peak 24

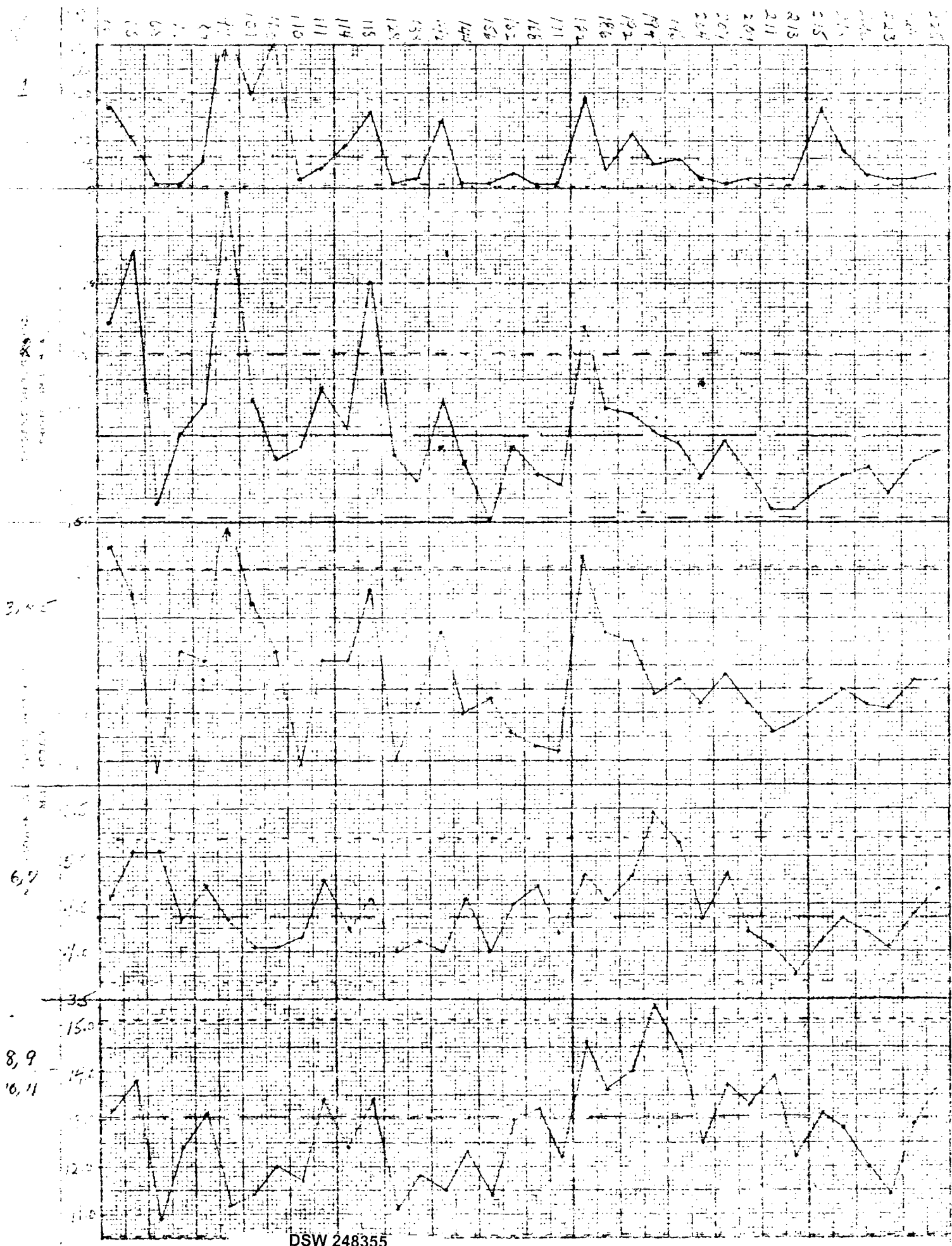
CONCLUSIONS

No significant shifts in isomer distribution have occurred in Aroclor 1242 produced at Anniston. TSD will evaluate GLC data to obtain information for optimizing chlorination in reference to dielectric constant and stability. (Progress Report 370-340, No. 2)

Samples for the study of the effects of slow and fast chlorination rates on isomer distribution have not been obtained at the present time.

FUTURE

1. Continue GLC analyses of approximately 20% lot samples of Aroclor 1242.
2. Analyze additional samples of typical W.G.K. material.
3. Have Research run IR analyses of typical and abnormal (1956) samples.
4. Have Research run GLC-mass spectrometer analyses of typical material to identify additional isomers.
5. Analyze batch vs. continuous and slow vs. fast chlorination^{ate} samples when received. *ed*



August
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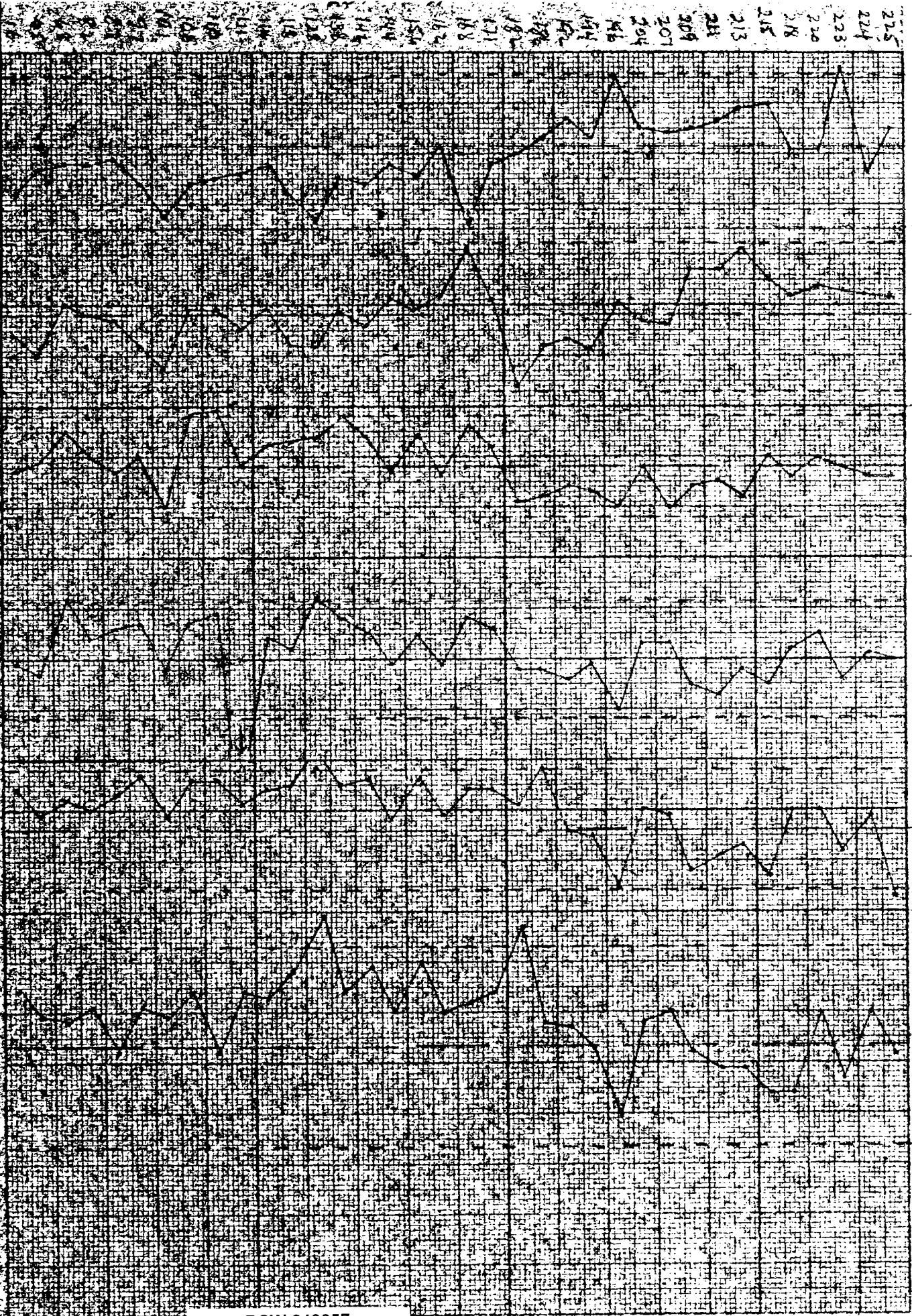
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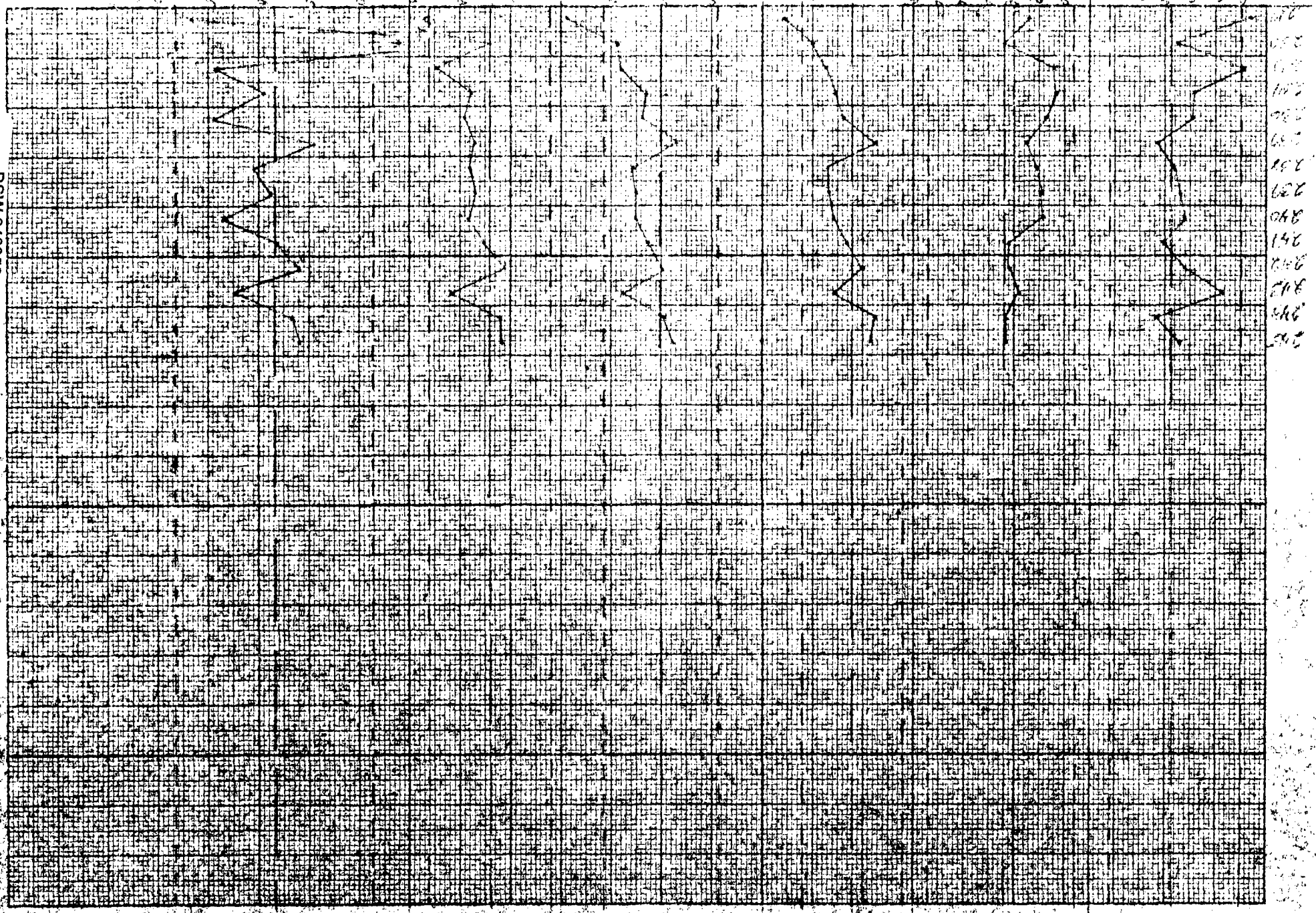
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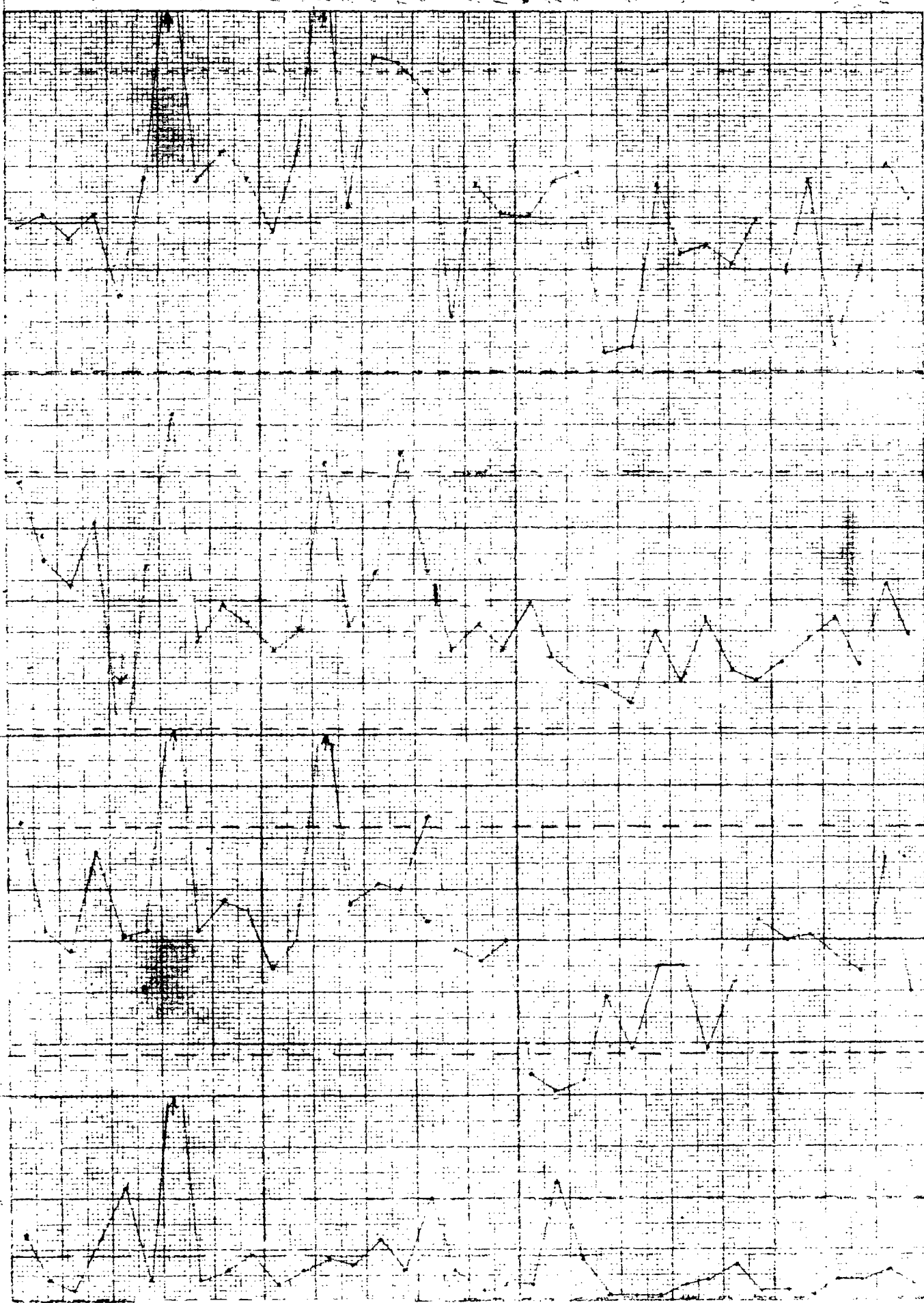


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LOIO - ME



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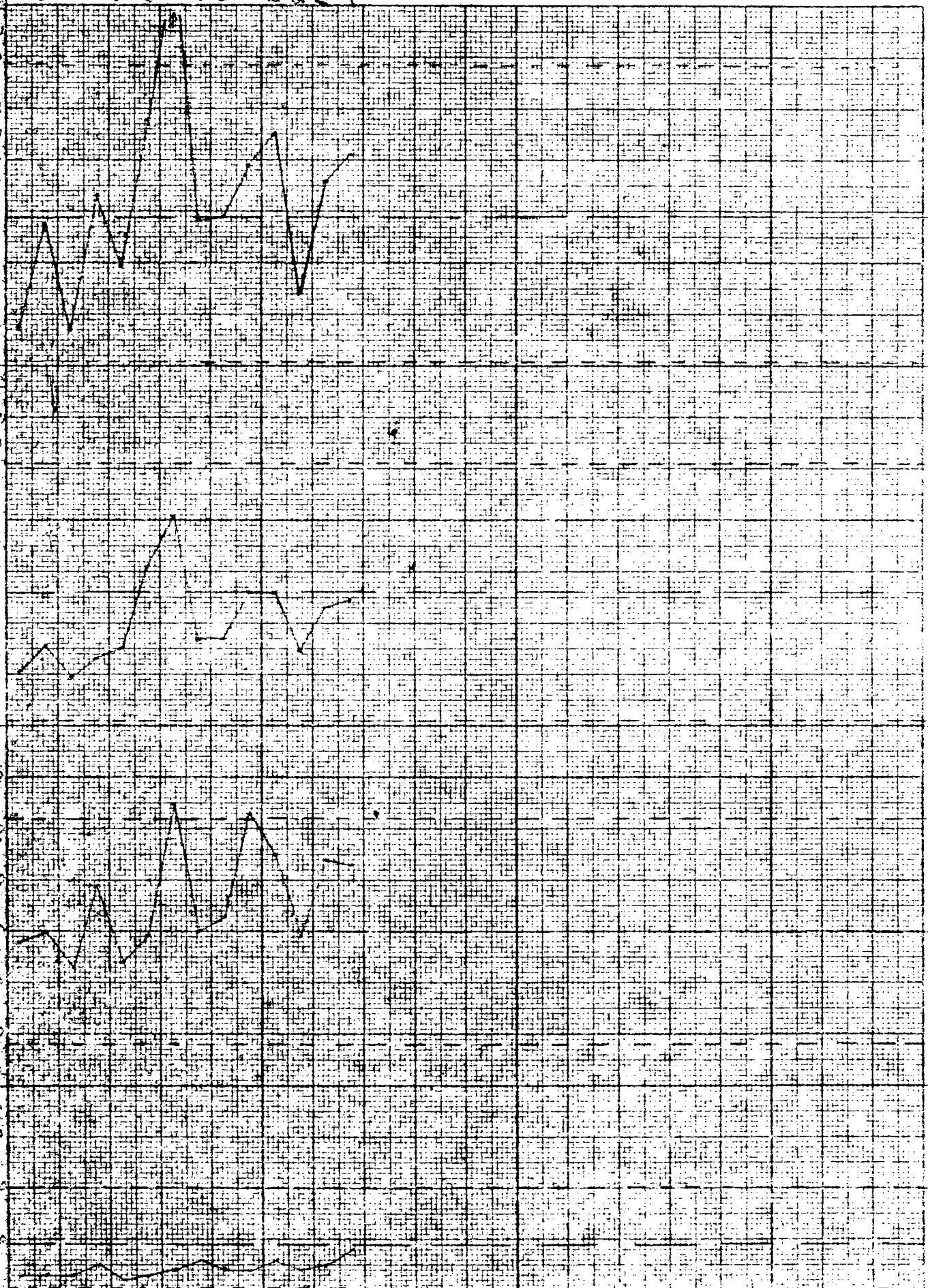
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Average
 2σ or 95% Probability