

MEAN VELOCITY, TURBULENCE INTENSITY AND  
TURBULENCE CONVECTION VELOCITY  
MEASUREMENTS FOR A CONVERGENT  
NOZZLE IN A FREE JET WIND TUNNEL

COMPREHENSIVE DATA REPORT

PWA-5516



Prepared for  
NASA Lewis Research Center  
Under Contract NAS3-17866



April 1977

Prepared by: C. J. McColgan  
R. S. Larson

Approved by:

H. Kozlowski  
Program Manager



**PRATT & WHITNEY AIRCRAFT GROUP**

Commercial Products Division



**UNITED TECHNOLOGIES.**

EAST HARTFORD, CONNECTICUT

(NASA-CR-135238) MEAN VELOCITY, TURBULENCE INTENSITY AND TURBULENCE CONVECTION VELOCITY MEASUREMENTS FOR A CONVERGENT NOZZLE IN A FREE JET WIND TUNNEL. COMPREHENSIVE DATA REPORT (Pratt and Whitney Aircraft) 262 p N78-17991  
HC A12/MF A01  
Unclas  
63/02 04204

1 Report No CR-135238		2 Government Accession No		3 Recipient's Catalog No	
4 Title and Subtitle Mean Velocity, Turbulence Intensity and Turbulence Convection Velocity Measurements for a Convergent Nozzle in a Free Jet Wind Tunnel-Comprehensive Data Report				5 Report Date Dec., 1977	
				6 Performing Organization Code	
7 Author(s) C. J. McColgan R. S. Larson				8 Performing Organization Report No FWA-5516	
				10 Work Unit No.	
9 Performing Organization Name and Address Commercial Products Division Pratt & Whitney Aircraft Group United Technologies Corporation East Hartford, CT. 06108				11 Contract or Grant No NAS3-17866	
				13 Type of Report and Period Covered Contractor Report	
12 Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D.C. 20546				14 Sponsoring Agency Code	
15 Supplementary Notes Project Manager, Orlando A. Gutierrez, VSTOL and Noise Division, NASA Lewis Research Center, Cleveland, Ohio					
16 Abstract The effect of flight on the mean flow and turbulence properties of a 0.056m circular jet were determined in a free jet wind tunnel. The nozzle exit velocity was 122 m/sec, and the wind tunnel velocity was set at 0, 12, 37, and 61 m/sec. Measurements of flow properties including mean velocity, turbulence intensity and spectra, and eddy convection velocity were carried out using two linearized hot wire anemometers.  This report contains the raw data as obtained from the Saicor Model SAI-42 Probability and Cross-Properties Analyzer and the Spectral Dynamics 301C Spectrum Analyzer and 302C Ensemble Averager. Graphical presentations of the data are also included.  The final technical report, NASA CR-2949, includes a description of the test facilities, test hardware, along with significant test results and conclusions.					
17. Key Words (Suggested by Author(s)) Turbulence Measurements Free Jet Wind Tunnel Hot Wire Anemometers Eddy Convection Velocity			18 Distribution Statement Unclassified - unlimited STAR Category 02		
19 Security Classif (of this report) Unclassified		20 Security Classif (of this page) Unclassified		21. No of Pages 258 <sup>s</sup>	22. Price*

\* For sale by the National Technical Information Service, Springfield, Virginia 22151

FOREWORD

This report is a compilation of the turbulence and mean flow measurements obtained during Task VIII of Contract NAS3-17866.

The companion final report, NASA CR-2949, includes a description of the facilities used, the hot wire measurements, the significant test results and conclusions.

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## INTRODUCTION

The hot wire data measured during Task VIII of the program are presented in this volume in graphical form according to the requirements of the work plan. Hot wire measurements of local flow properties were made at each of the stations in Table 1. The hot wire measurements were divided into two categories according to whether a single probe or two probes were necessary to acquire the data. A single probe was used to measure mean velocity and turbulence intensity profiles, and its signal was analyzed to provide frequency spectra and autocorrelations for selected points in the shear layer. The signals from two probes were cross correlated for varying values of probe separation. The mean velocity, turbulence intensity, and turbulence spectra obtained from a single probe are contained in Sections A to C and the autocorrelations and two probe data are contained in Sections D to G. The specific contents of each section of this report are described below.

Section A

This section contains the mean velocity profiles plotted at constant tunnel velocity at the required axial locations.

Section B

This section contains the turbulence intensity profiles corresponding to the mean velocity profiles in Section A.

Section C

This section presents the turbulence spectra at the maximum turbulence region of the shear layer (i.e., the "center" of the jet shear layer).

Section D

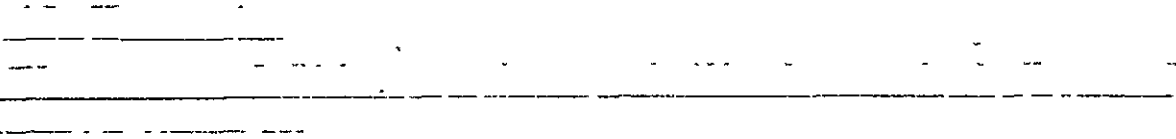
This section contains the auto and cross correlations at each axial station (see Table 1) with the various probe separations for the "inner," "center," and "outer" region of the jet shear layer.

Section E

This section contains the selected filtered auto and cross correlations.

Section F

This section presents the normalized cross correlation coefficients plotted versus the probe separation.



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TEST MATRIX

The convergent nozzle (2.23 in. dia.) was operated at a nominal exit velocity of 400 fps, while the tunnel velocity was set at 0, 40, 120 and 200 fps. The resulting values of the velocity ratio,  $m$ , defined as the wind tunnel velocity divided by the jet velocity, were 0, 0.1, 0.3 and 0.5. The various downstream measurement stations, normalized by the jet diameter,  $D$ , were selected for each velocity ratio as shown below:

TABLE 1

Downstream Measurement Stations

Velocity Ratio,	Axial Measurement Stations, X/D		
$m = \frac{U_e}{U_j}$			
0	3.0	5.0	-
0.1	3.0	5.5	7.7
0.3	3.0	6.8	9.5
0.5	3.0	7.7	12.1

DATA INDEX

The data presented in Sections A through F are arranged by the tunnel to jet velocity ratios,  $m$ . At the constant velocity ratio, data are presented in the ascending order of axial locations. For the two probe data, they are further arranged by the normalized radial locations,  $R/D$ , (i.e., the "inner," "center," and "outer" of the jet shear layer where  $R$  is measured from the jet centerline) and by the increasing probe separation.

The following index delineates the contents of the data compiled in this volume. The index is self-explanatory, listing the type of data, the tunnel to jet velocity ratios ( $m$ ), axial locations ( $X/D$ ), normalized radial locations ( $R/D$ ), probe separations, and the page number.

A. Mean Velocity Profiles

$m$	$\frac{X}{D}$	Page
0	3.0, 5.0	A1
0.1	3.0, 5.5, 7.7	A2
0.3	3.0, 6.8, 9.5	A3
0.5	3.0, 7.7, 12.1	A4

B. Turbulence Intensity Profiles

$m$	$\frac{X}{D}$	Page
0	3.0, 5.0	B1
0.1	3.0, 5.5, 7.7	B2
0.3	3.0, 6.8, 9.5	B3
0.5	3.0, 7.7, 12.1	B4

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C. Normalized Turbulence Spectra (Max. Turbulence Region)

m	$\frac{X}{D}$	Page
0	3.0	C1
0	5.0	C2
0.1	3.0	C3
0.1	5.5	C4
0.1	7.7	C5
0.3	3.0	C6
0.3	6.8	C7
0.3	9.5	C8
0.5	3.0	C9
0.5	7.7	C10
0.5	12.1	C11

D. Auto and Cross Correlations

m	$\frac{X}{D}$	$\frac{R}{D}$	$\Delta X$ (in.)	Page	
0	3.0	0.363	0.6	D1	
		↓	3.0	D4	
		↓	5.4	D6	
		0.507	0.6	D8	
		↓	3.0	D10	
		↓	5.4	D12	
		0.665	0.6	D14	
		↓	3.0	D16	
		↓	5.4	D18	
		5.0	0.304	1.0	D20
		↓	6.0	D22	
		↓	11.0	D24	
		0.462	1.0	D26	
		↓	6.0	D28	
↓	11.0	D30			
0.1	3.0	0.665	1.0	D32	
		↓	6.0	D34	
		↓	11.0	D36	
		0.381	0.5	D38	
		↓	3.0	D40	
		↓	5.5	D42	
0.1	3.0	0.471	0.5	D44	
		↓	3.0	D46	
		↓	5.5	D48	
		0.687	0.5	D50	

$m$	$\frac{X}{D}$	$\frac{R}{D}$	$\Delta X$ (in.)	Page
↓ 0.1 ↓	↓ 5.5 ↓ 5.5 ↓ 7.7 ↓	↓	3.0	D52
		↓	5.5	D54
		0.290	0.3	D56
		↓	3.3	D58
		↓	6.3	D60
		0.484	0.3	D62
		↓	3.3	D64
		↓	6.3	D66
		0.700	0.3	D68
		↓	3.3	D70
↓ 0.3 ↓	↓ 3.0 ↓	↓	6.3	D72
		↓	0.5	D74
		↓	3.0	D76
		↓	5.5	D78
		0.462	0.5	D80
		↓	3.0	D82
		↓	5.5	D84
		0.782	0.5	D86
		↓	3.0	D88
		↓	5.5	D90
↓ 0.3 ↓	↓ 3.0 ↓	0.410	0.3	D92
		↓	1.8	D94
		0.518	3.3	D96
		↓	0.3	D98
		↓	1.8	D100
		0.608	3.3	D102
		↓	0.3	D104
		↓	1.8	D106
		↓	3.3	D108
		↓ 0.3 ↓	↓ 6.8 ↓ 9.5 ↓	0.352
↓	3.3			D112
↓	6.3			D114
0.496	0.3			D116
↓	3.3			D118
↓	6.3			D120
0.658	0.3			D122
↓	3.3			D124
↓	6.3			D126
↓	0.4			D128
↓ 0.450	↓ 9.5 ↓	-0.045	4.4	D130
		↓	8.4	D132
		0.450	0.4	D134

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$m$	$\frac{X}{D}$	$\frac{R}{D}$	$\Delta X$ (in.)	Page
↓	↓	↓	4.4	D136
			8.4	D138
			0.518	D140
			4.4	D142
			8.4	D144
0.5	3.0	0.401	0.2	D146
↓	↓	↓	1.2	D148
			2.2	D150
			0.518	D152
			1.2	D154
			2.2	D156
0.5	3.0	0.586	0.2	D158
↓	↓	↓	1.2	D160
			2.4	D162
			0.4	D164
			4.4	D167
			8.4	D170
			0.304	D172
			4.4	D174
			8.4	D176
			0.489	D178
			4.4	D180
			8.4	D182
			0.4	D184
			4.4	D186
			8.4	D188
			0.287	D190
4.4	D192			
8.4	D194			
0.431	D196			
4.4	D198			
8.4	D200			

E. Filtered Auto and Cross Correlations

$m$	$\frac{X}{D}$	$\frac{R}{D}$	$\Delta \bar{X}$ (in.)	Filtered Frequency	Page
0.3	6.8	0.496	3.3	0.1 - 0.25 KHz	E1
↓	↓	↓	↓	0.25 - 0.63 KHz	E3
				0.63 - 1.60 KHz	E5
				1.60 - 4.00 KHz	E6

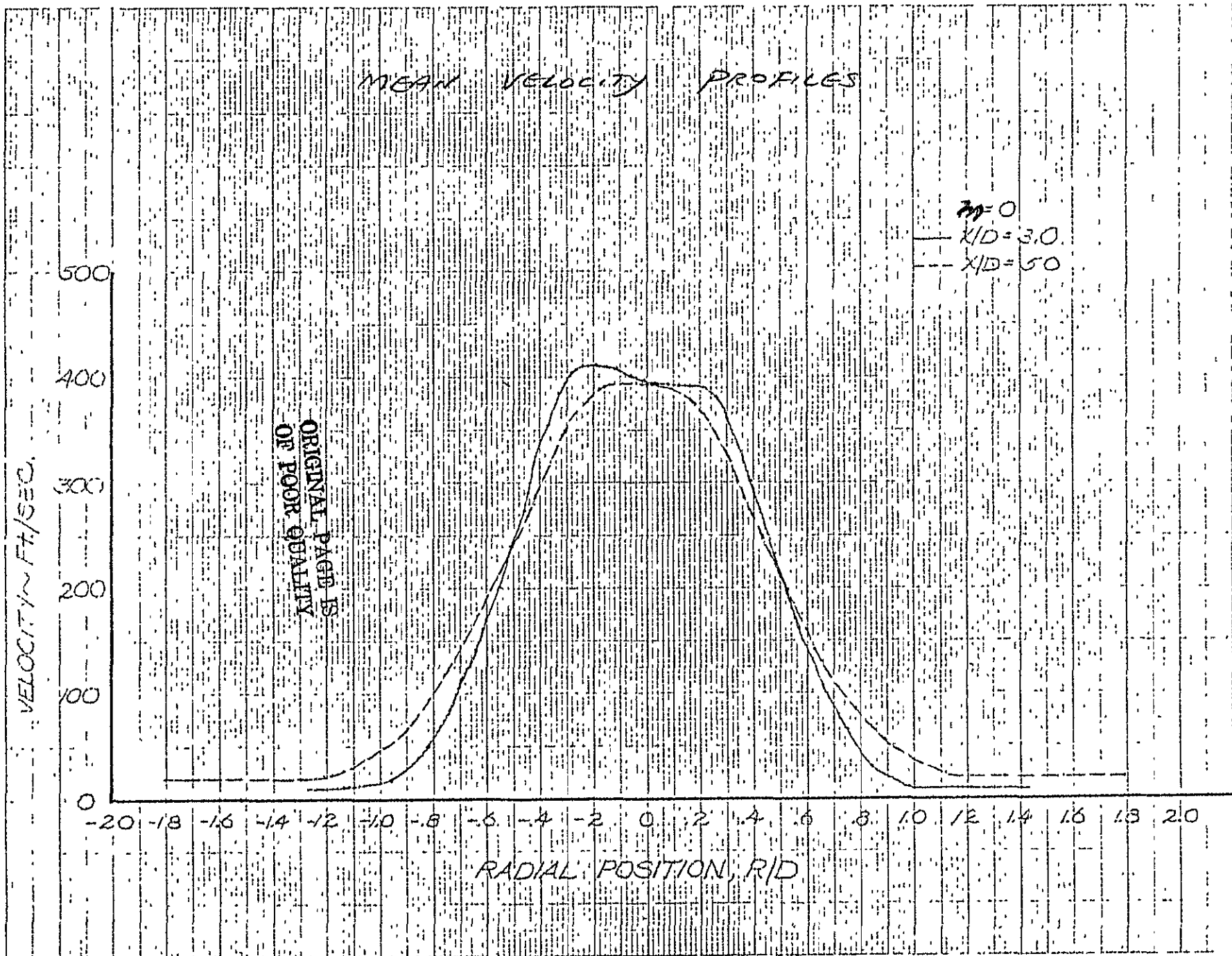
F. Normalized Cross Correlation Coefficients

m	$\frac{X}{D}$	$\frac{R}{D}$	$\Delta X$ (in.)	Page
0	3.0	0.363, 0.507, 0.665	0.6, 3.0, 5.4	F2
0	5.0	0.304, 0.462, 0.665	1.0, 6.0, 11.0	F3
0.1	3.0	0.381, 0.471, 0.687	0.5, 3.0, 5.5	F4
0.1	5.5	0.290, 0.484, 0.700	0.3, 3.3, 6.3	F5
0.1	7.7	-0.006, 0.462, 0.782	0.5, 3.0, 5.5	F6
0.3	3.0	0.410, 0.518, 0.608	0.3, 1.8, 3.3	F7
0.3	6.8	0.352, 0.496, 0.658	0.3, 3.3, 6.3	F8
0.3	9.5	-0.045, 0.450, 0.518	0.4, 4.4, 8.4	F9
0.5	3.0	0.401, 0.518, 0.586	0.2, 1.2, 2.2	F10
0.5	7.7	-0.101, 0.304, 0.489	0.4, 4.4, 8.4	F11
0.5	12.1	-0.118, 0.287, 0.431	0.4, 4.4, 8.4	F12
0.3*	6.8	0.496	3.3	F13

\*Filtered Frequency: 0.1 - 0.25 KHz  
 0.25- 0.63 KHz  
 0.63- 1.60 KHz  
 1.60- 4.00 KHz

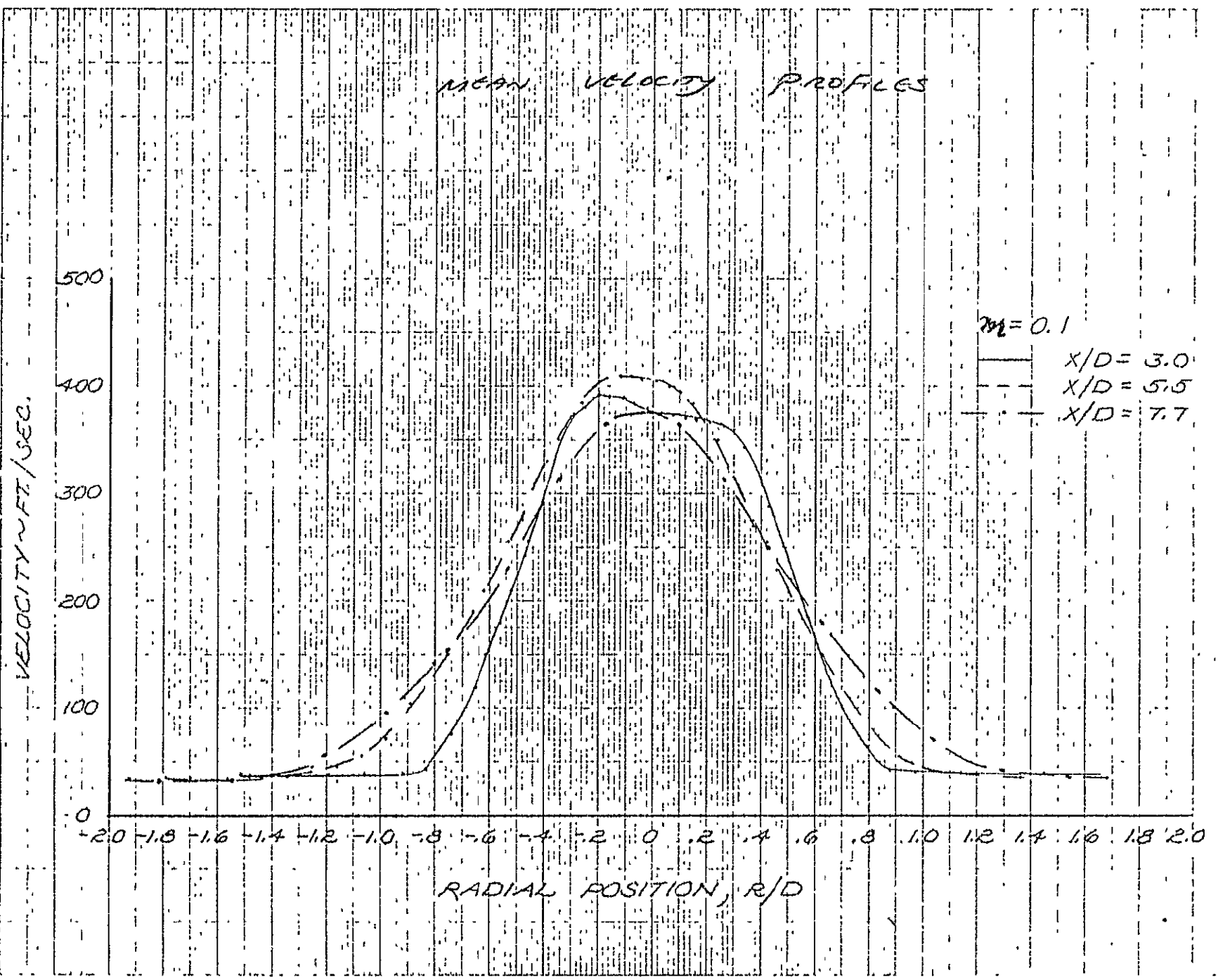
A. Mean Velocity Profiles

The mean velocities were obtained from the mean voltage signals from the radial probe. The voltage signals were read from a digital DC voltmeter and a calibration curve was used to determine the mean velocity from the voltage output. Plots of mean velocity versus normalized radial position,  $R/D$ , are shown in Figures A1 through A4 for the various velocity ratios and axial locations.



A-2

### MEAN VELOCITY PROFILES

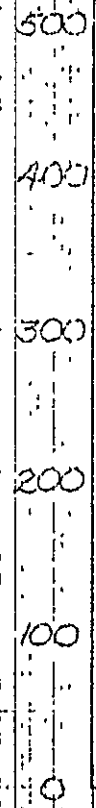


# MEAN VELOCITY PROFILES

$M=0.3$   
 $X/D=3.0$   
 $X/D=6.8$   
 $X/D=9.0$

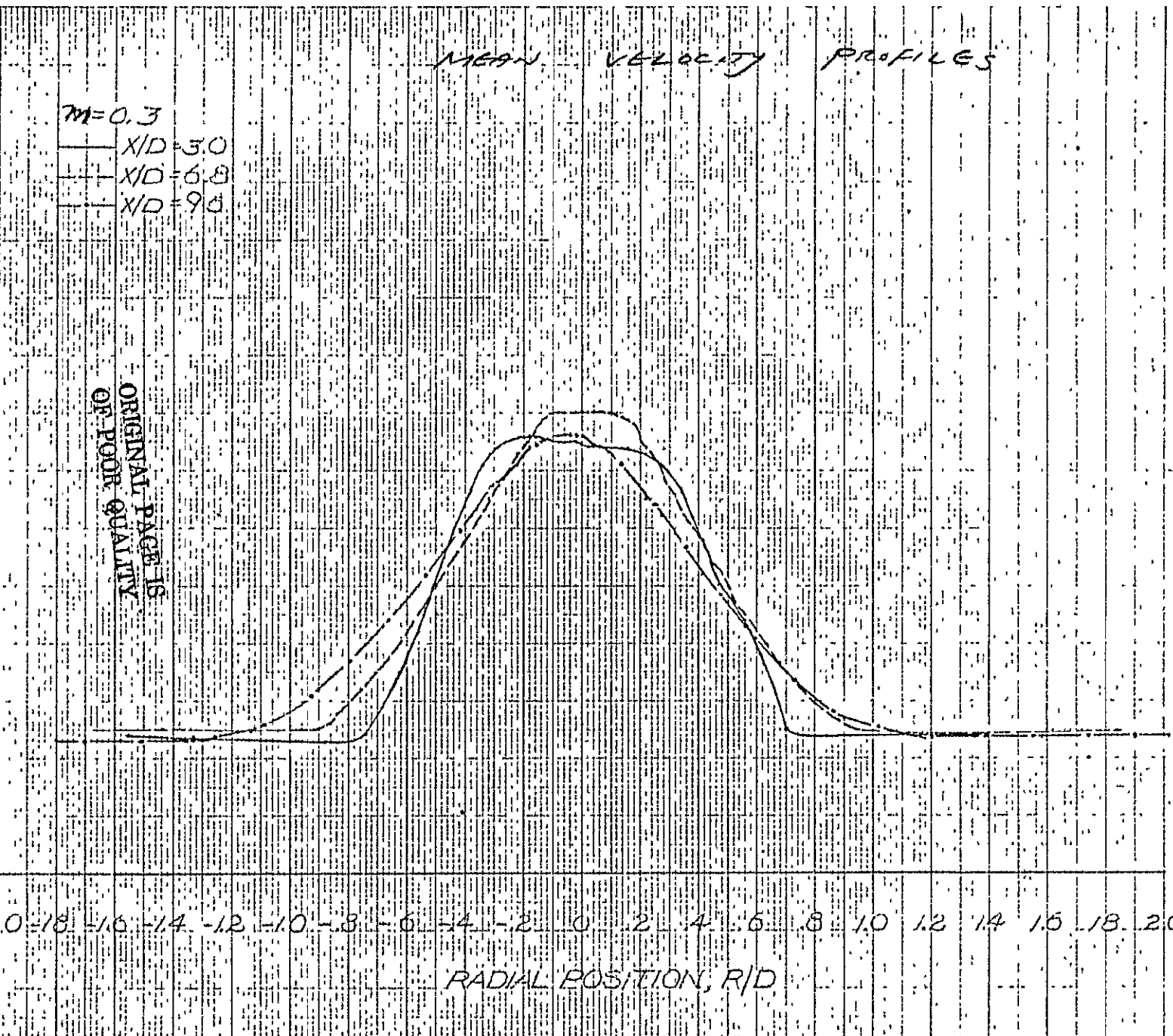
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VELOCITY  $\sim$  ft/SEC

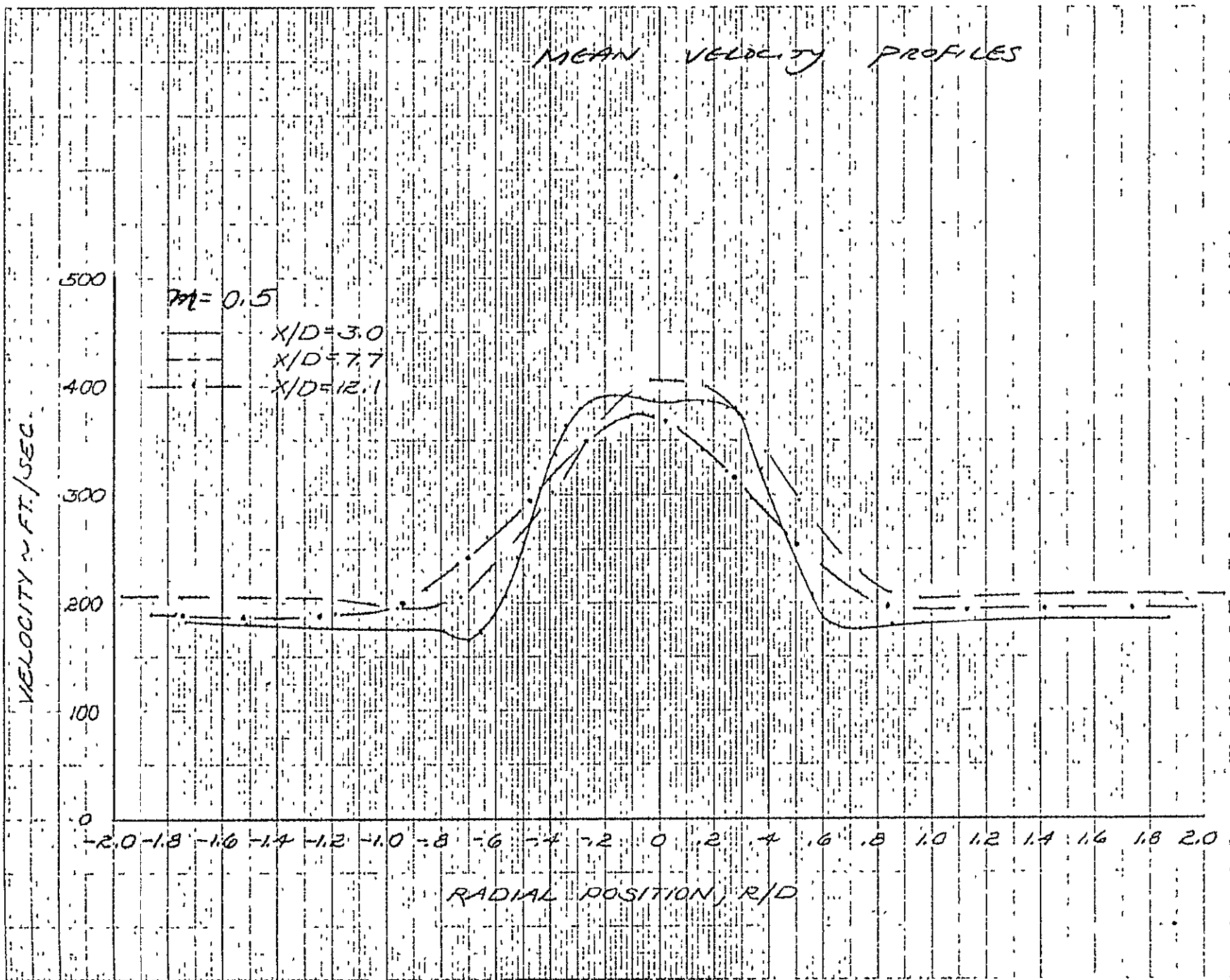


RADIAL POSITION, R/D

A-3







B. Turbulence Intensity Profiles

The turbulence intensities were obtained from the fluctuating voltage signals from the radial probe. The voltage signals were proportional to the turbulence intensities which were read from an RMS AC voltmeter. Plots of turbulence intensity versus normalized radial position,  $R/D$ , are shown in Figures B1 through B4 for the various velocity ratios and axial locations.

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TURBULENCE INTENSITY PROFILES

M=0

— X/D=3.0

- - - X/D=5.0

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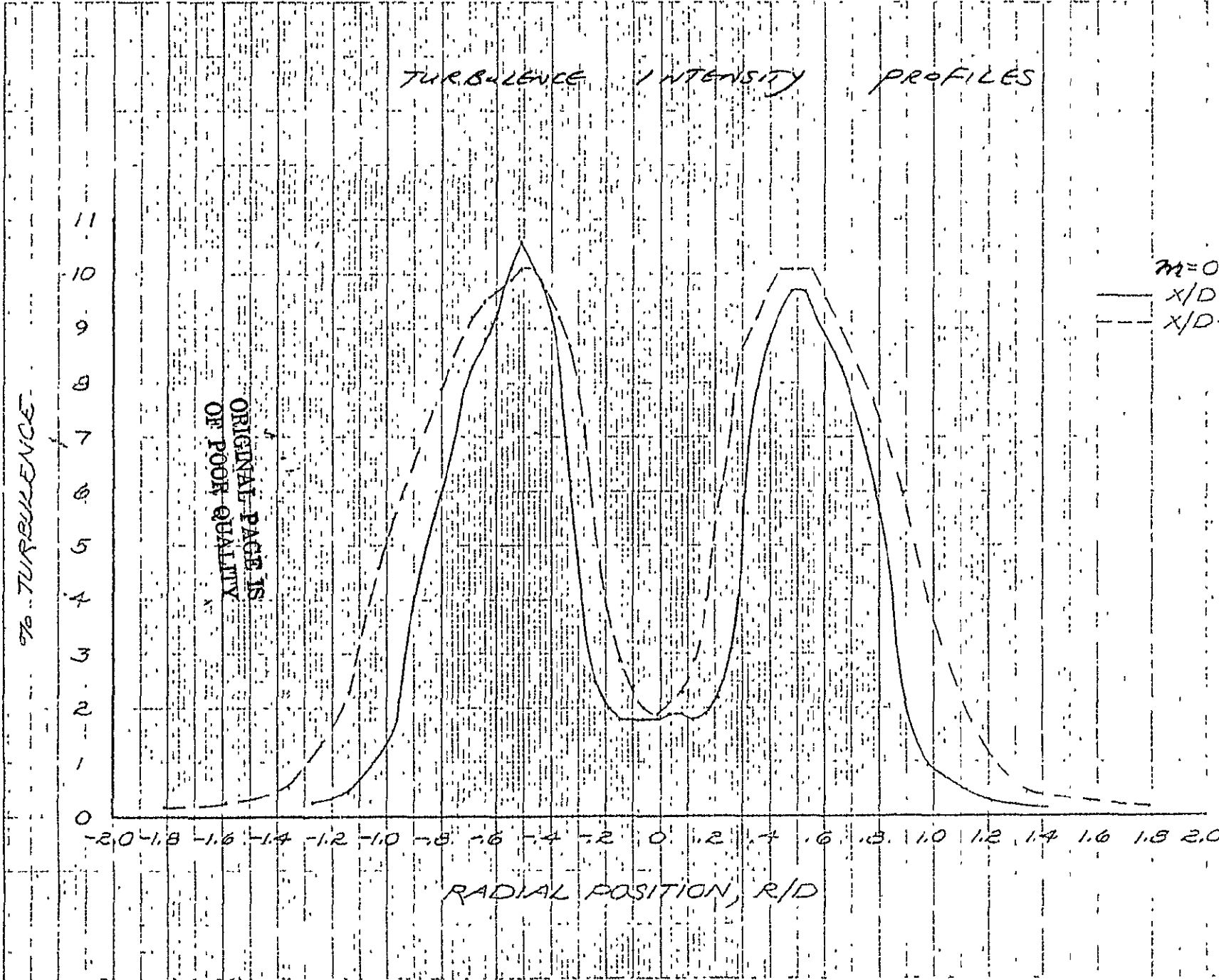
% TURBULENCE

11  
10  
9  
8  
7  
6  
5  
4  
3  
2  
1  
0

-2.0 -1.8 -1.6 -1.4 -1.2 -1.0 -0.8 -0.6 -0.4 -0.2 0 .2 .4 .6 .8 1.0 1.2 1.4 1.6 1.8 2.0

RADIAL POSITION, R/D

B-1



# TURBULENCE INTENSITY PROFILES

$M_0 = 0.1$

- $x/D = 3.0$
- - -  $x/D = 5.5$
- · -  $x/D = 7.7$

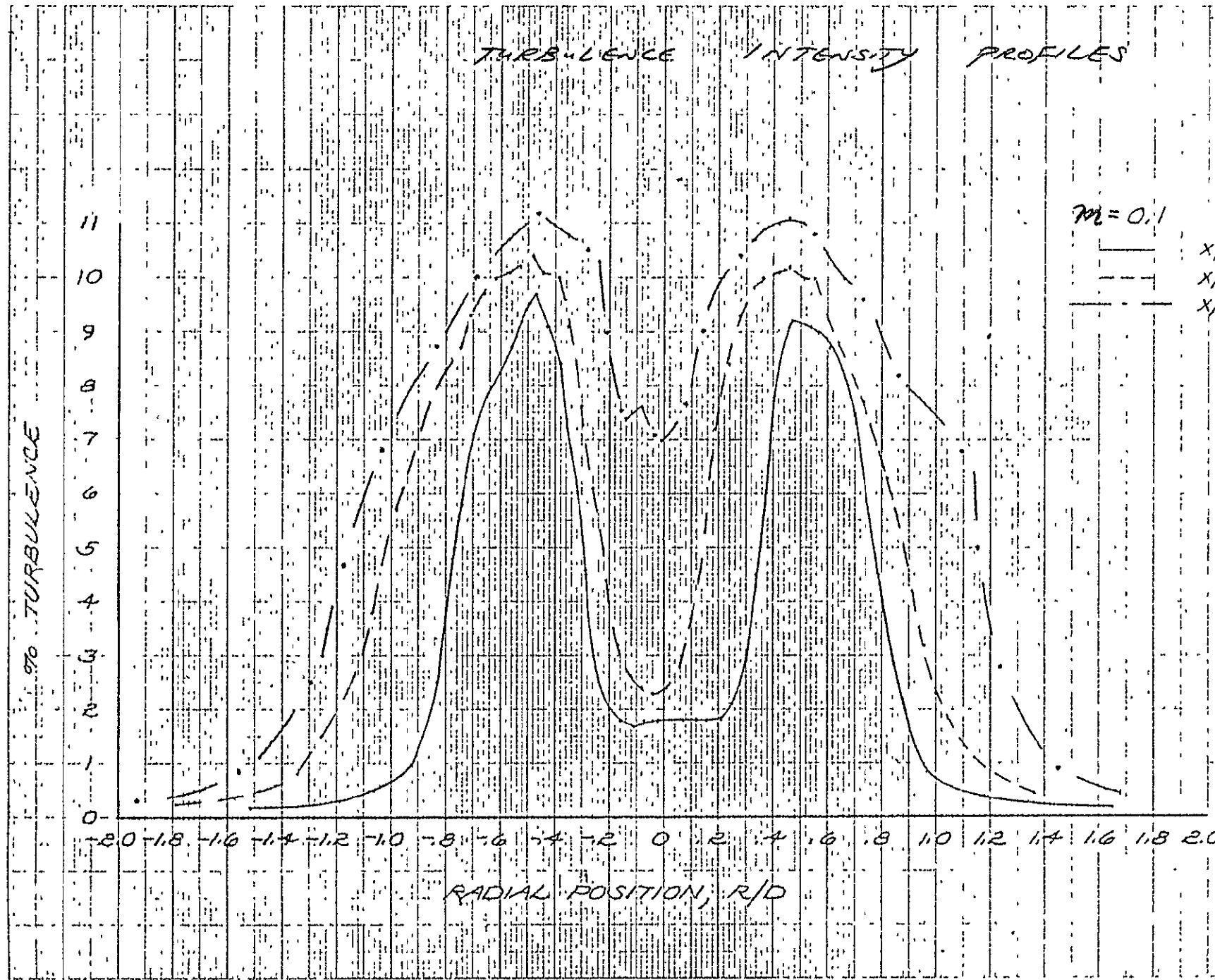
90% TURBULENCE

11  
10  
9  
8  
7  
6  
5  
4  
3  
2  
1  
0

-2.0 -1.8 -1.6 -1.4 -1.2 -1.0 -0.8 -0.6 -0.4 -0.2 0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

RADIAL POSITION, R/D

B-2



# TURBULENCE INTENSITY PROFILES

70 TURBULENCE

10  
9  
8  
7  
6  
5  
4  
3  
2  
1  
0

-20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20

RADIAL POSITION, R/D

$M_2 = 0.3$   
—  $x/D = 3.0$   
- -  $x/D = 6.8$   
· ·  $x/D = 9.5$



B-3

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# TURBULENCE INTENSITY PROFILES



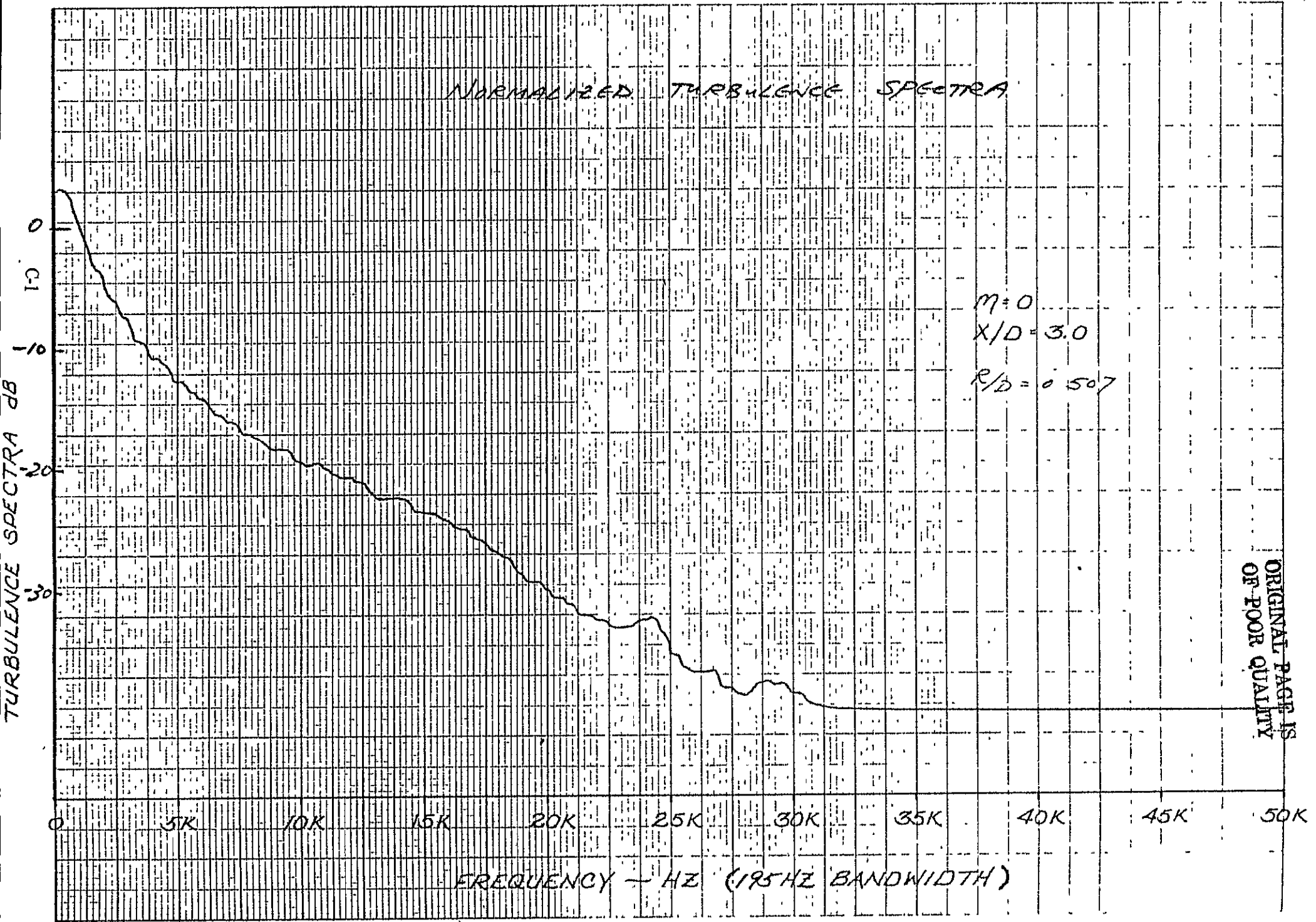
B-4

C. Normalized Turbulence Spectra

All turbulence spectra were normalized to the same relative level by subtracting the recorded attenuations from the raw data spectra. The frequency bandwidth for the 0-50 KHz spectra is 195 Hz, and the frequency bandwidth for the 0-20 KHz spectra is 78 Hz.

41  
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NORMALIZED TURBULENCE SPECTRA



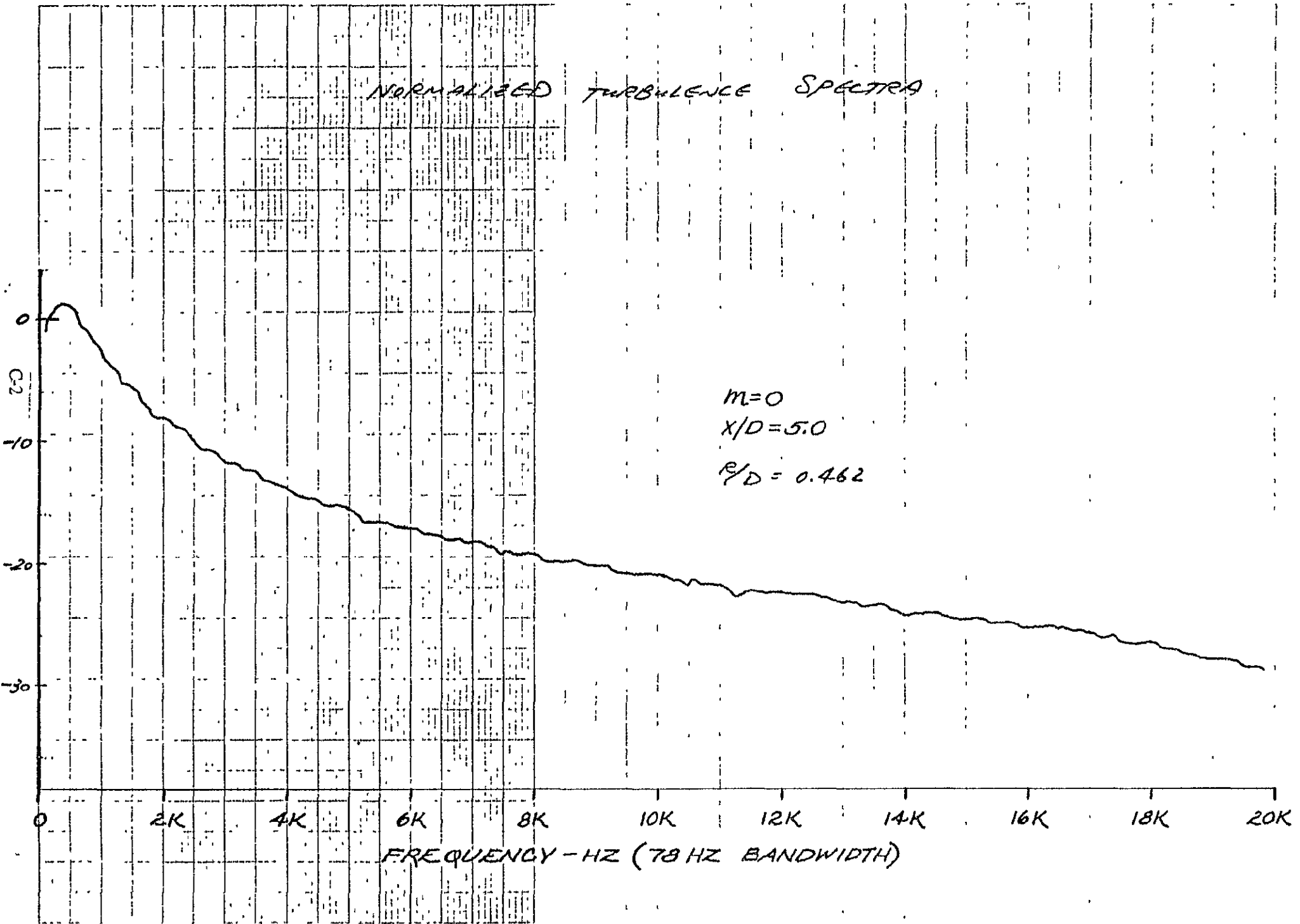
$M=0$   
 $X/D=3.0$   
 $R/D=0.507$

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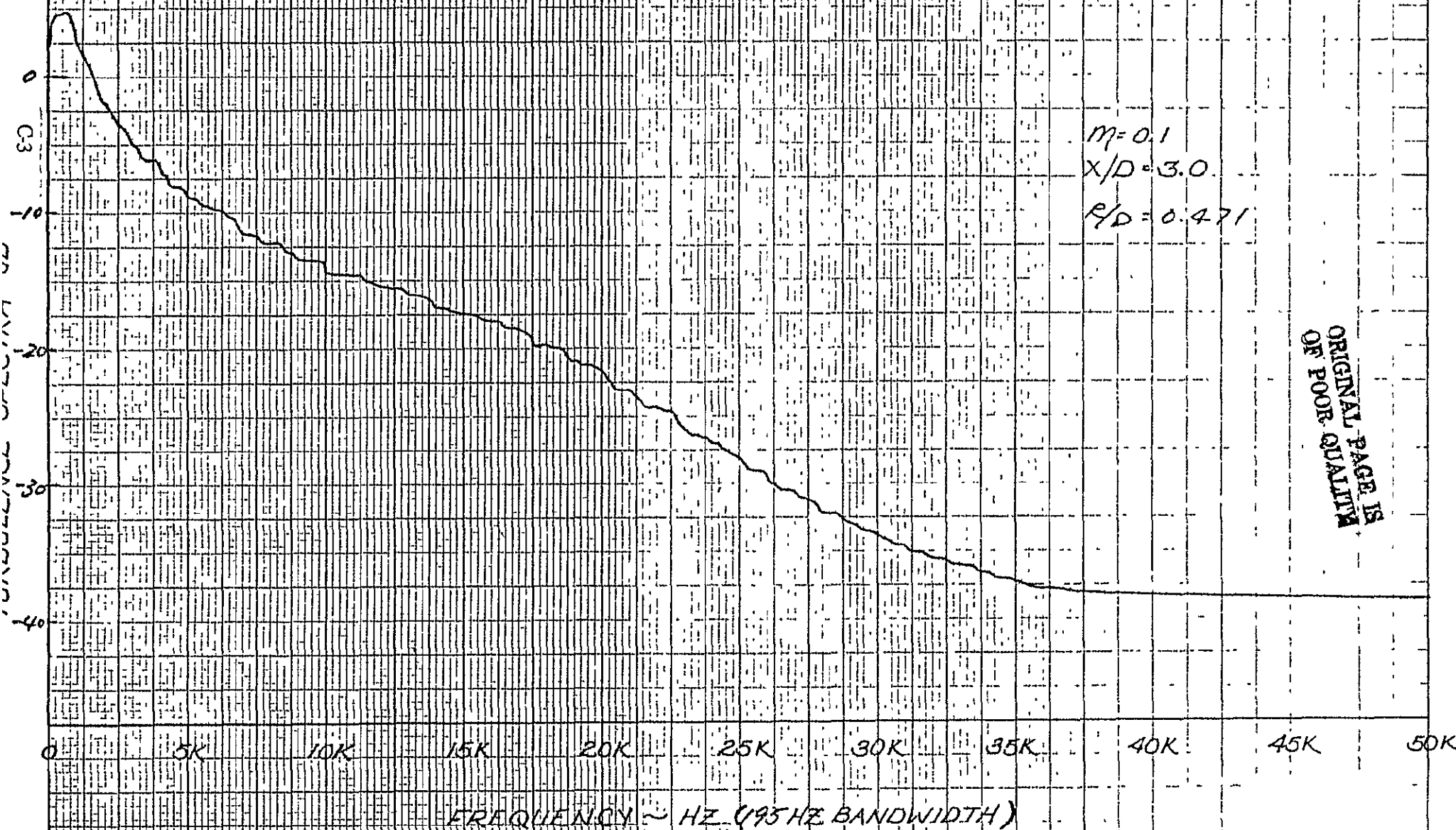


NORMALIZED TURBULENCE SPECTRA

$M=0$   
 $X/D=5.0$   
 $R/D=0.462$

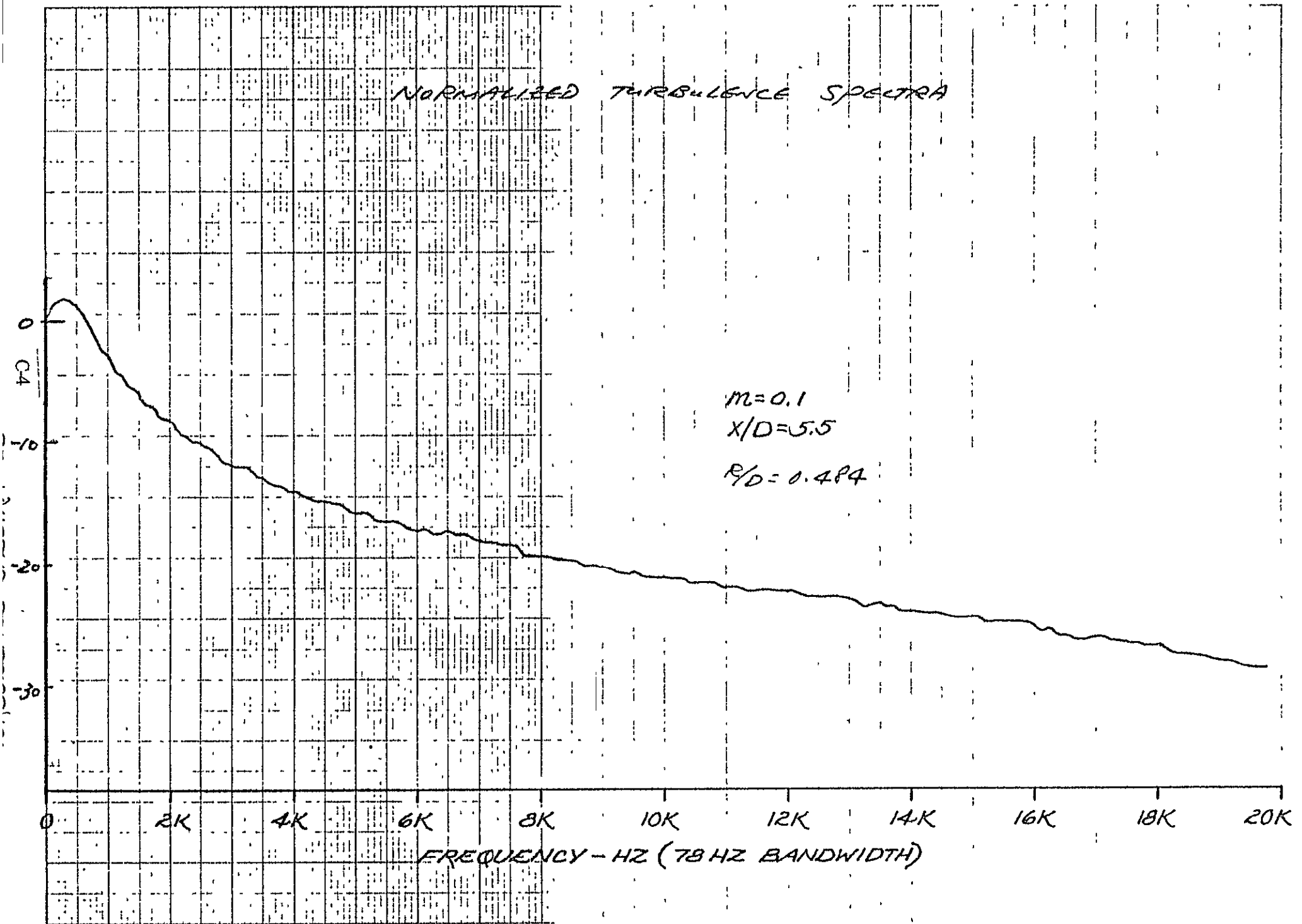


NORMALIZED TURBULENCE SPECTRA

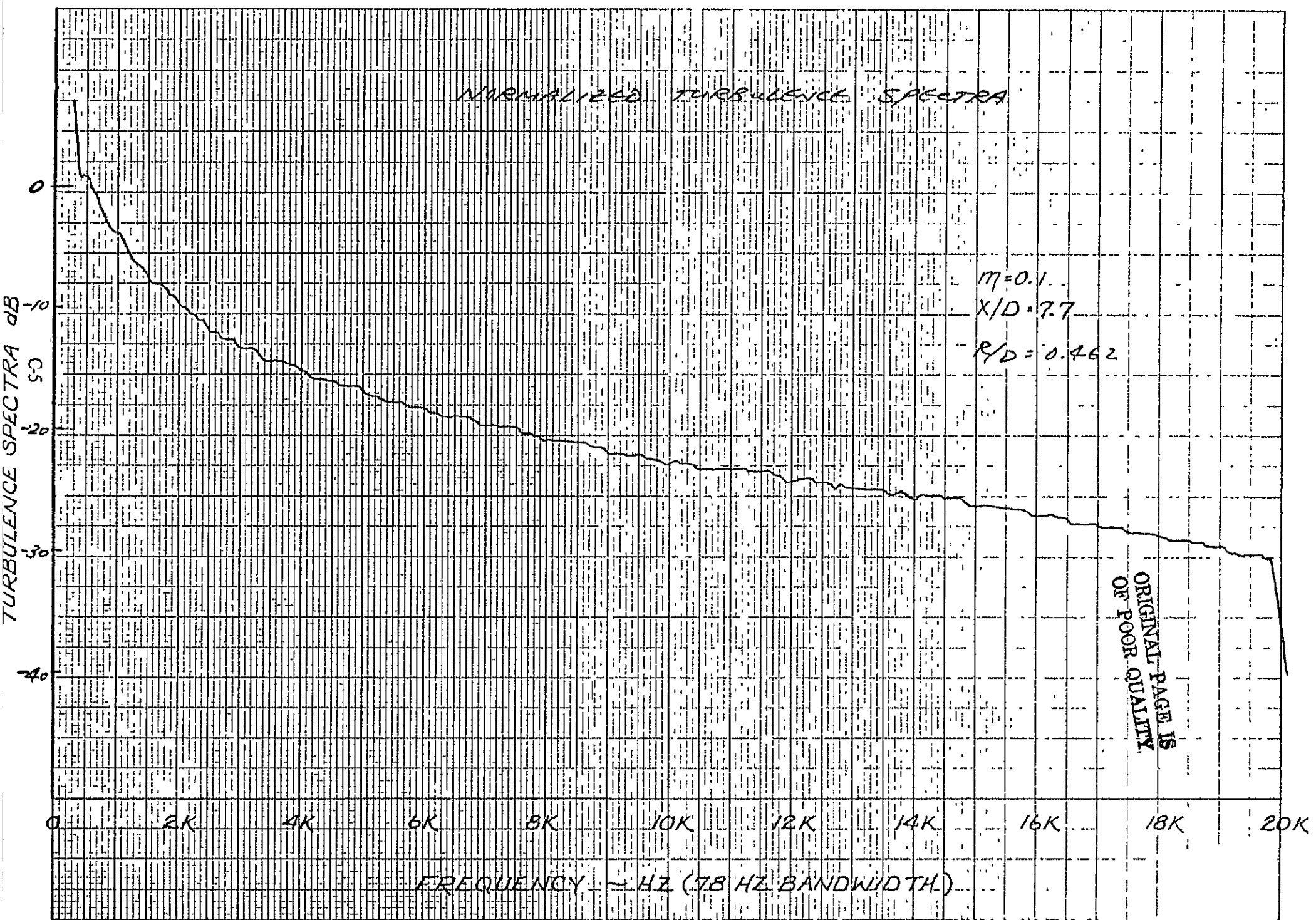


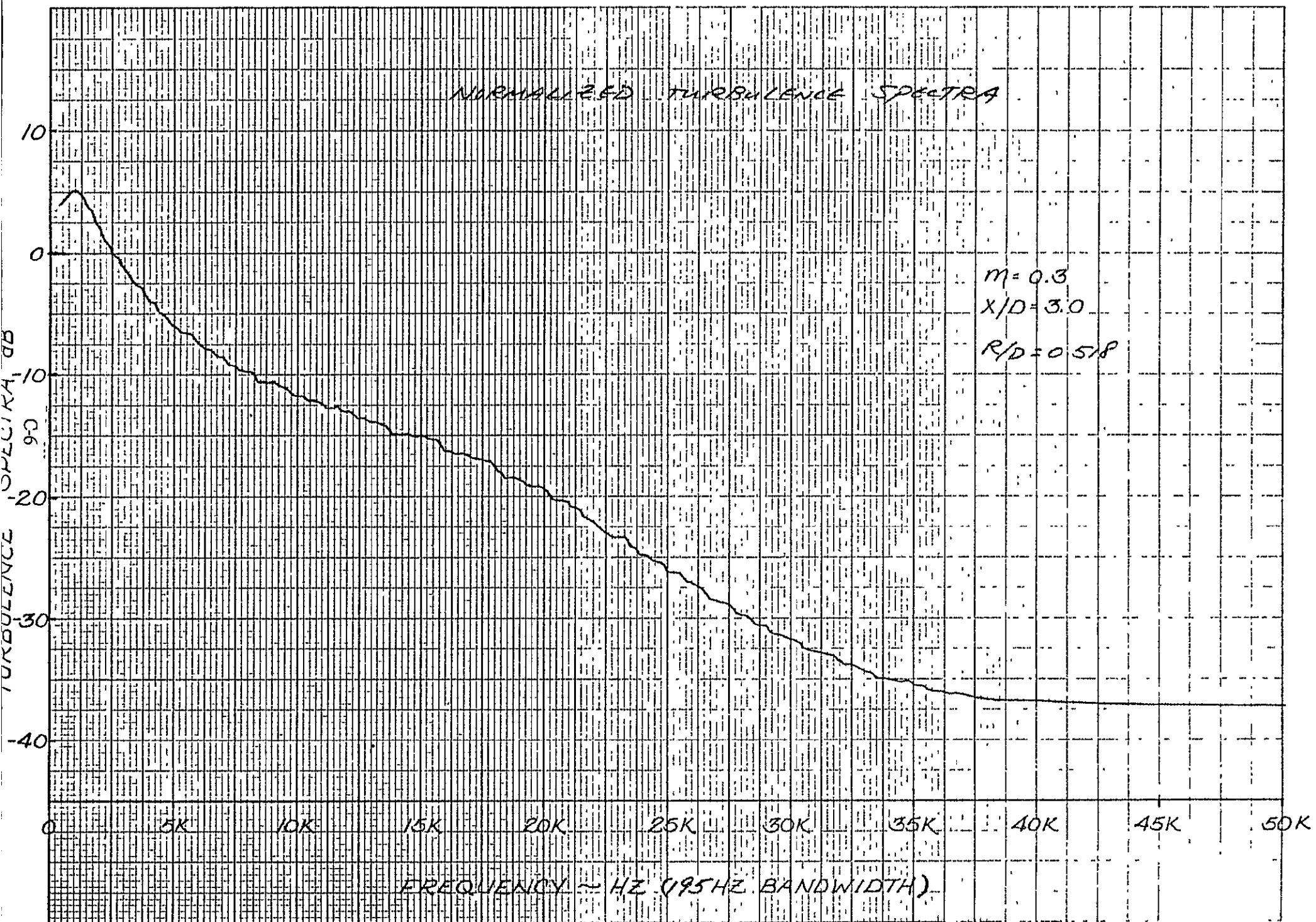
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NORMALIZED TURBULENCE SPECTRA



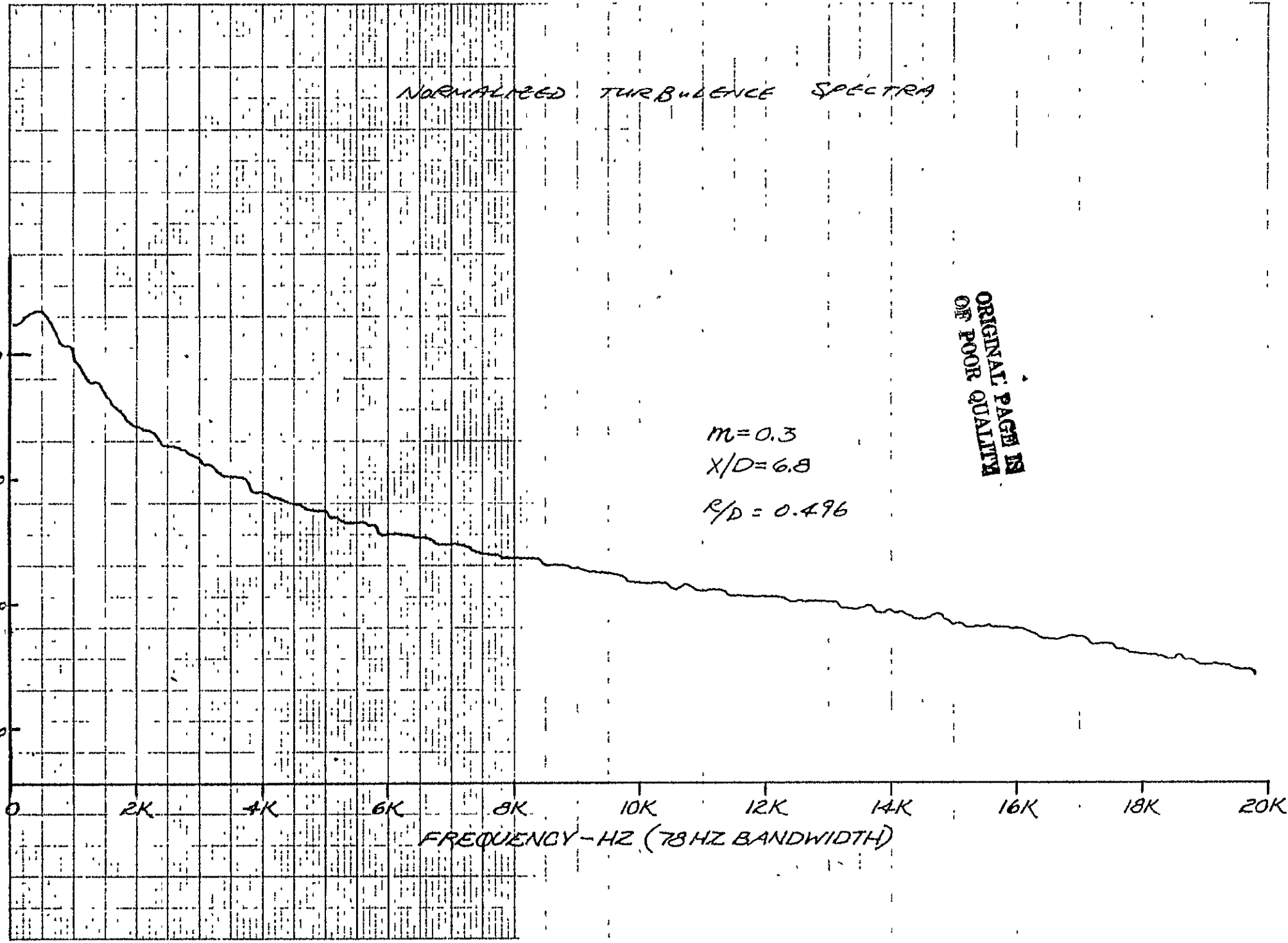
NORMALIZED TURBULENCE SPECTRA





NORMALIZED TURBULENCE SPECTRA

TURBULENCE SPECTRA  
BP  
-7  
-8  
-20  
-30

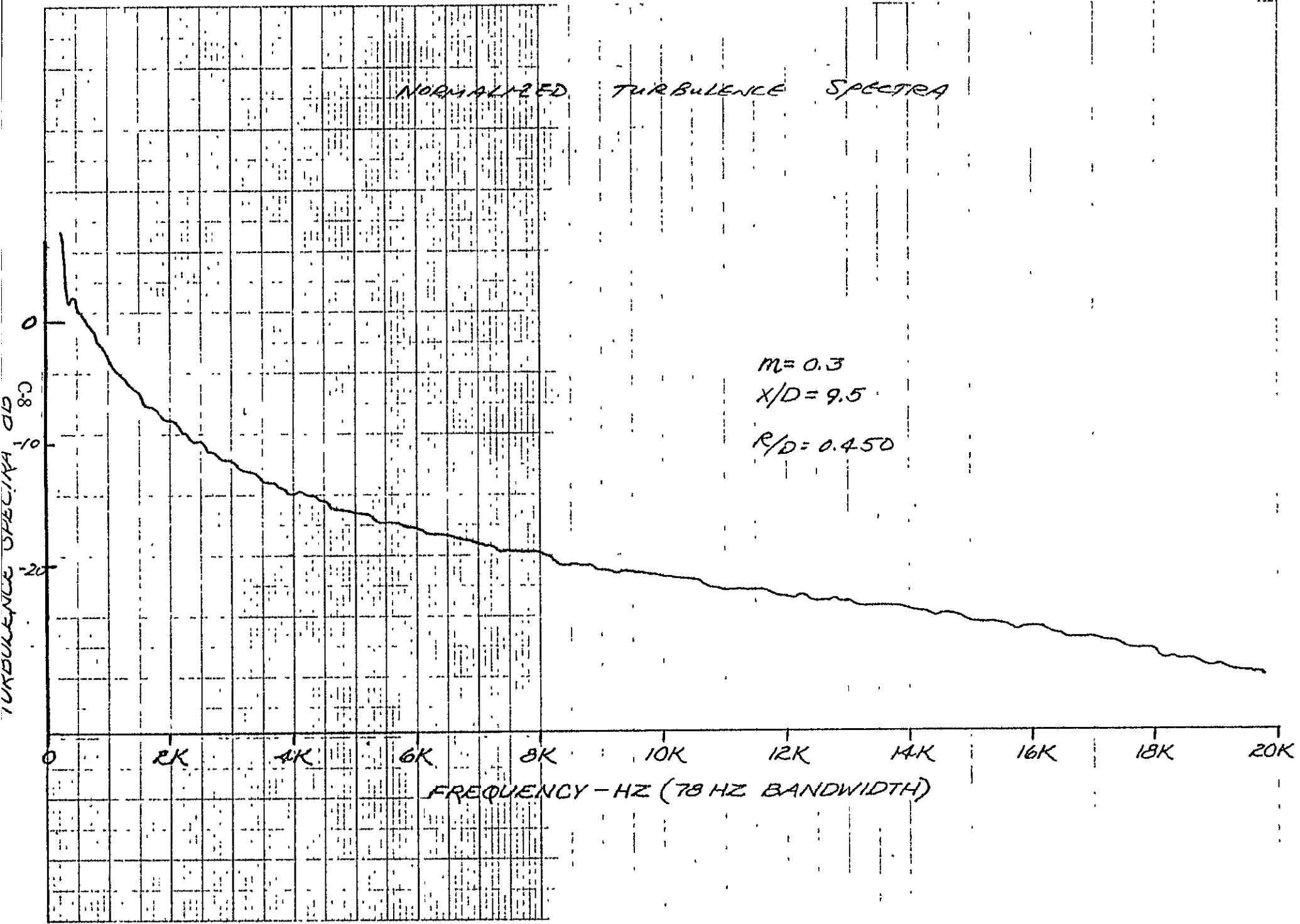


$m=0.3$   
 $X/D=6.8$   
 $R/D=0.496$

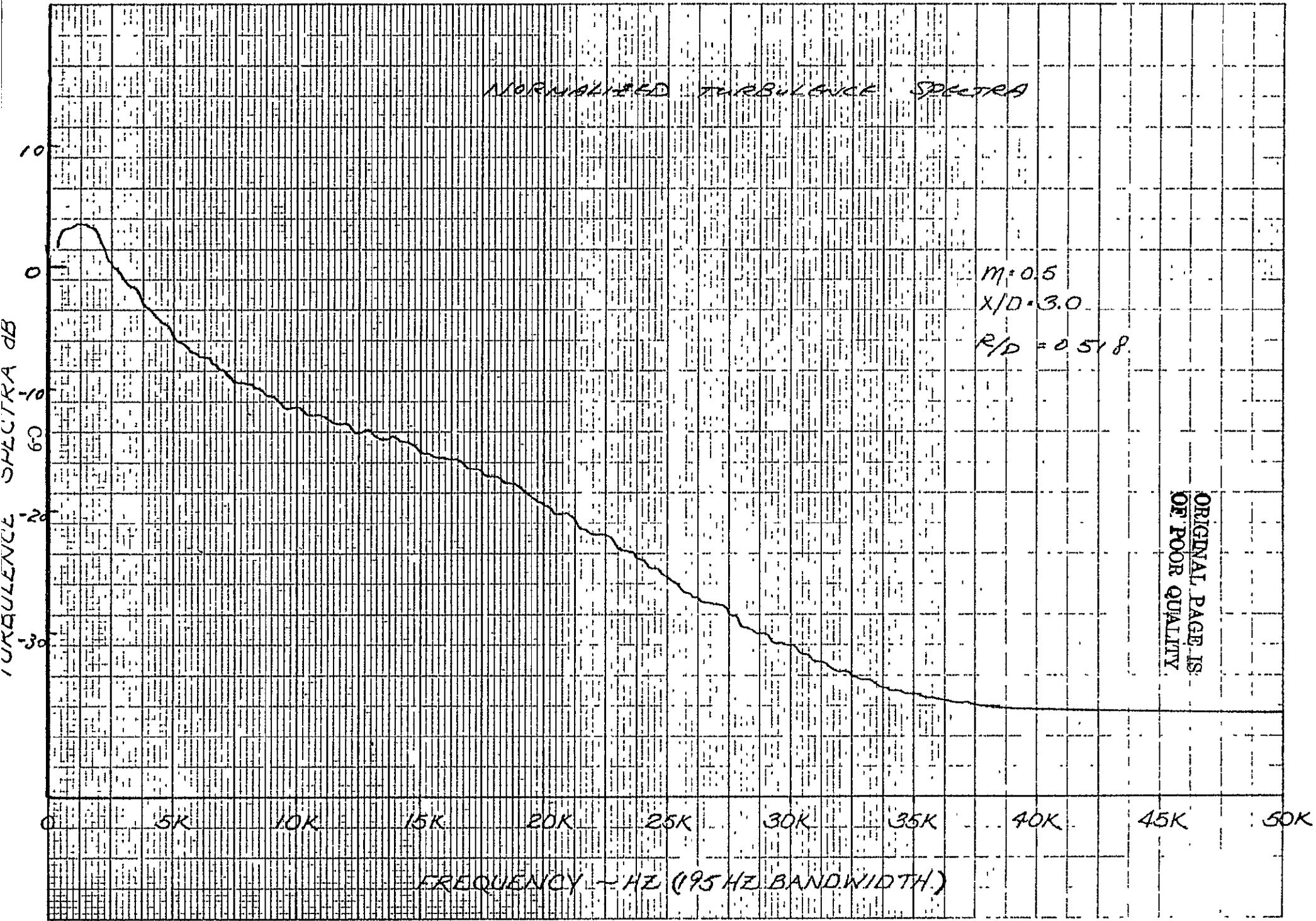
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FREQUENCY - HZ (78 HZ BANDWIDTH)

NORMALIZED TURBULENCE SPECTRA



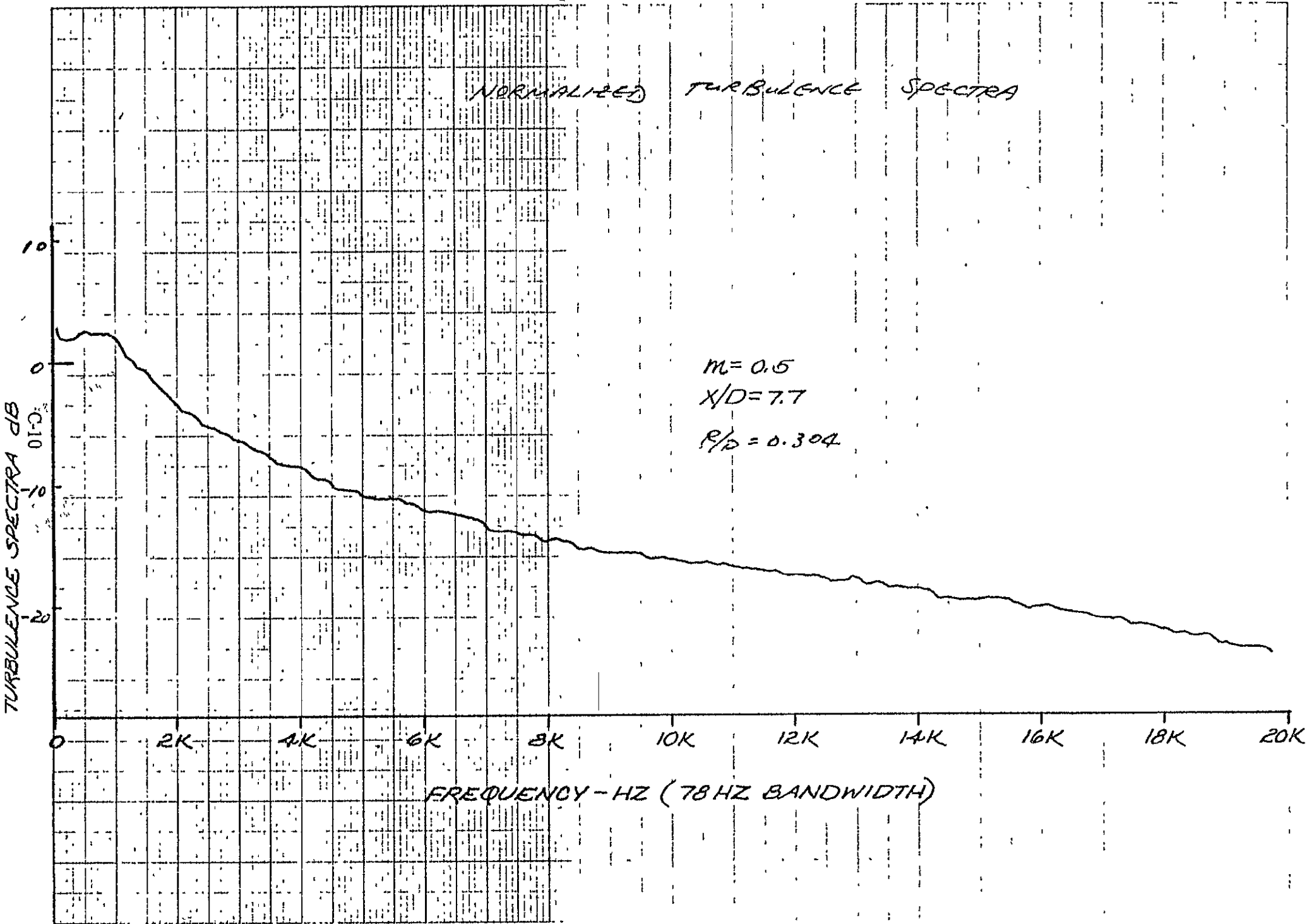
NORMALIZED TURBULENCE SPECTRA



M=0.5  
X/D=3.0  
R/D=0.518

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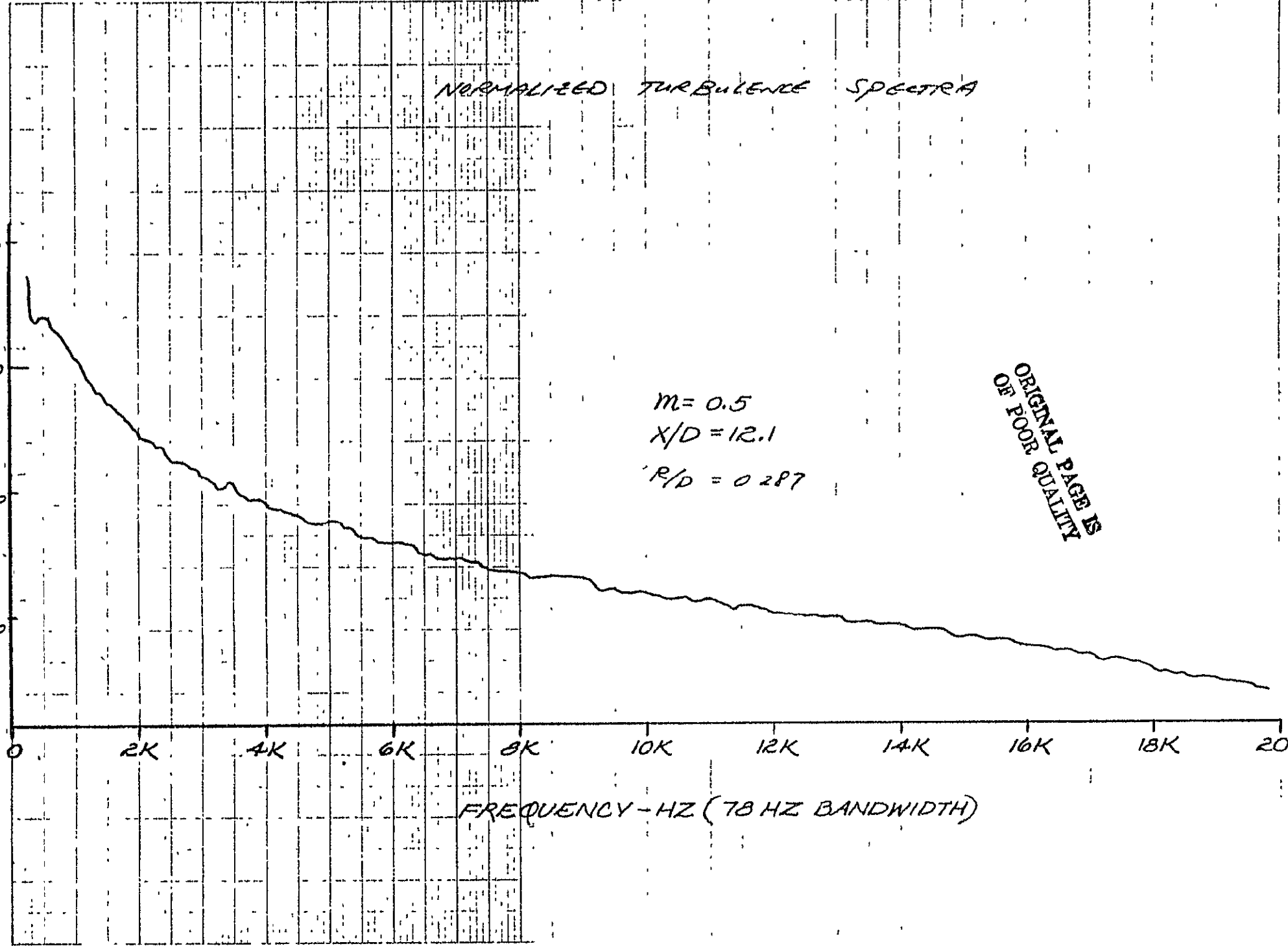


NORMALIZED TURBULENCE SPECTRA

$M = 0.5$   
 $X/D = 12.1$   
 $R/D = 0.287$

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DB WITHIN BANDWIDTH



FREQUENCY - HZ (78 HZ BANDWIDTH)

#### D. Auto and Cross Correlations

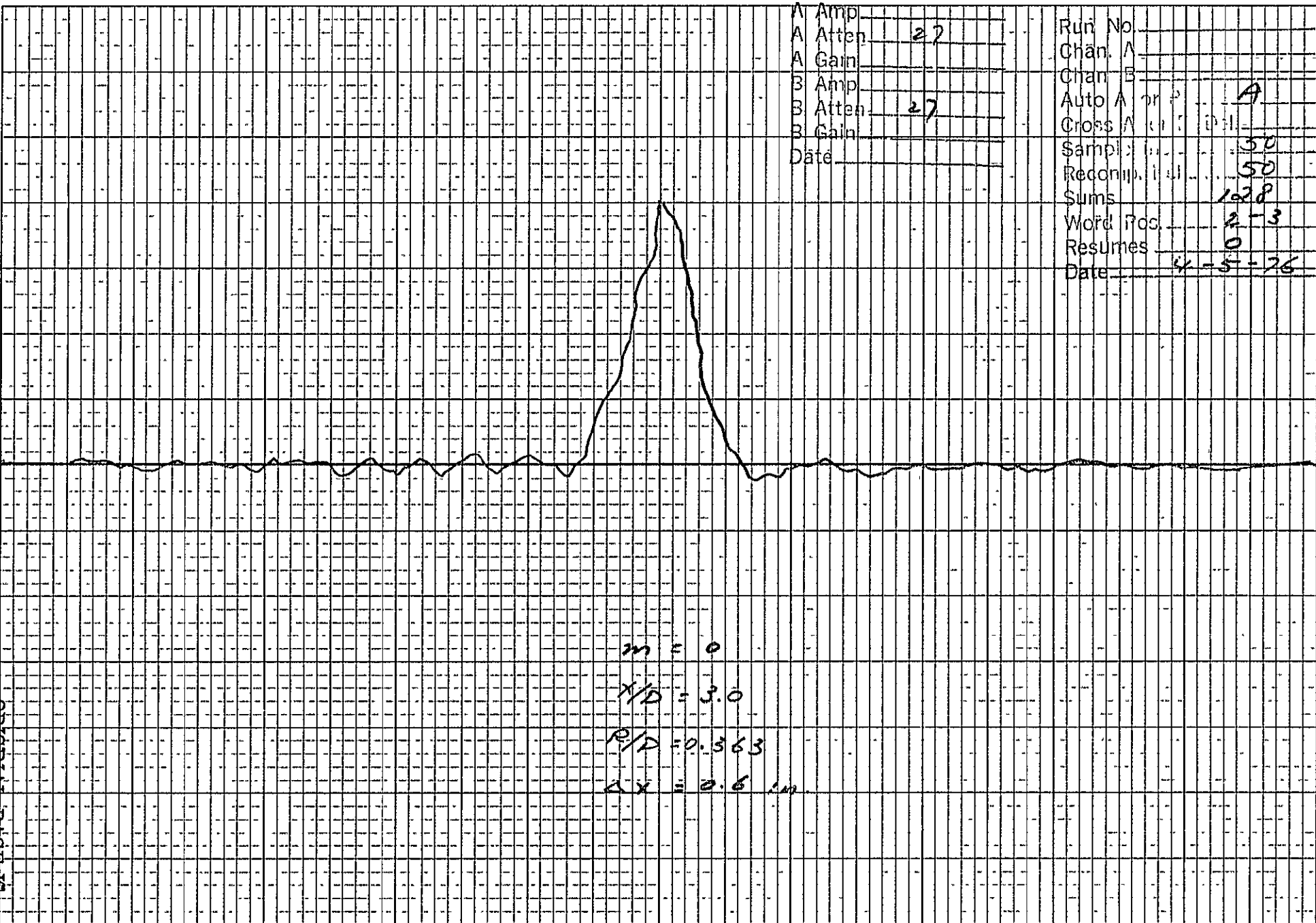
This section contains the raw data from the two probe correlations. The probes were mounted on traverse mechanisms. The upstream probe, denoted as probe "A", traversed radially, while the downstream probe, denoted as probe "B", traversed axially along the jet. The signals from probes "A" and "B" were analyzed to provide autocorrelations and cross correlations for varying values of probe separation. Such correlations are shown in this section. For each radial location, the autocorrelations of probes "A" and "B" are presented first then followed by the cross correlation of probes "A" and "B". For each correlation, the velocity ratio ( $m$ ), axial location ( $X/D$ ), radial location ( $R/D$ ), and probe separation ( $\Delta X$ ) in inches are listed on the bottom center of the plots. Additional information necessary to calculate the normalized cross correlation coefficients are also recorded.

On the left top corner the attenuation of probes "A" and "B" are listed under (A Atten) and (B Atten), respectively. On the right top corner the increments of each unit on the time axis ( $X$  coordinate) in microseconds ( $\mu$  sec. or  $10^{-6}$  seconds) are listed under sample increment (Sample Inc) where the origin of the time axis is listed under (Recomp Del) in terms of units from the left. On the vertical axis ( $Y$  coordinate), each unit is equivalent to 1. Other information, such as the word position (Word Pos) and resumes (Resumes) are also recorded. The word position refers to the vertical scale expansion. A word position of 2-3 means that the displayed vertical scale was expanded by a factor of  $2^3$  or 8, and therefore the actual level must be multiplied by  $1/8$ . Each resume increases the number of data points in the ensemble average by an equal amount. The procedure to calculate the cross correlation coefficients using the preceding information is described in Section F.

In this section the signals from both probes were band-pass filtered from 0-20 KHz to remove a spurious electrical resonance in the frequency range of 200 to 500 KHz.

A Amp  
A Atten 27  
A Gain  
B Amp  
B Atten 27  
B Gain  
Date

Run No  
Chan. A  
Chan. B  
Auto A or B A  
Cross A or B  
Sample 50  
Reconip. 50  
Sums 1028  
Word Pos. 2-3  
Resumes 0  
Date 4-5-76



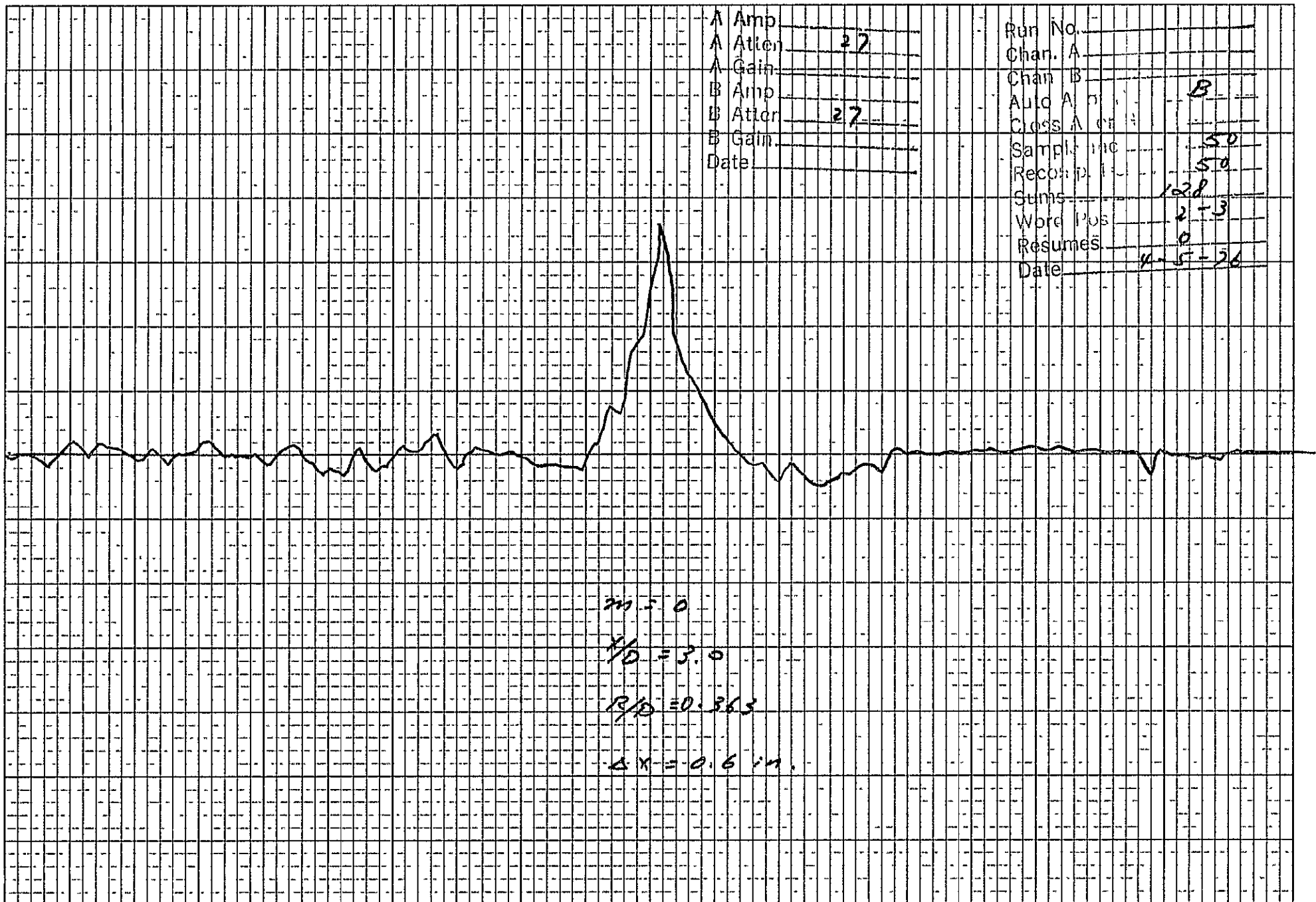
$m = 0$   
 $\lambda/D = 3.0$   
 $R/D = 0.363$   
 $\Delta x = 0.6 \text{ cm}$

D-1

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 27  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 27  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A. on B  
 Cross A. of \_\_\_\_\_  
 Sample Inc. 50  
 Recon. Inc. 50  
 Sums 128  
 Word Pos. 2-3  
 Resumes 0  
 Date 4-5-56

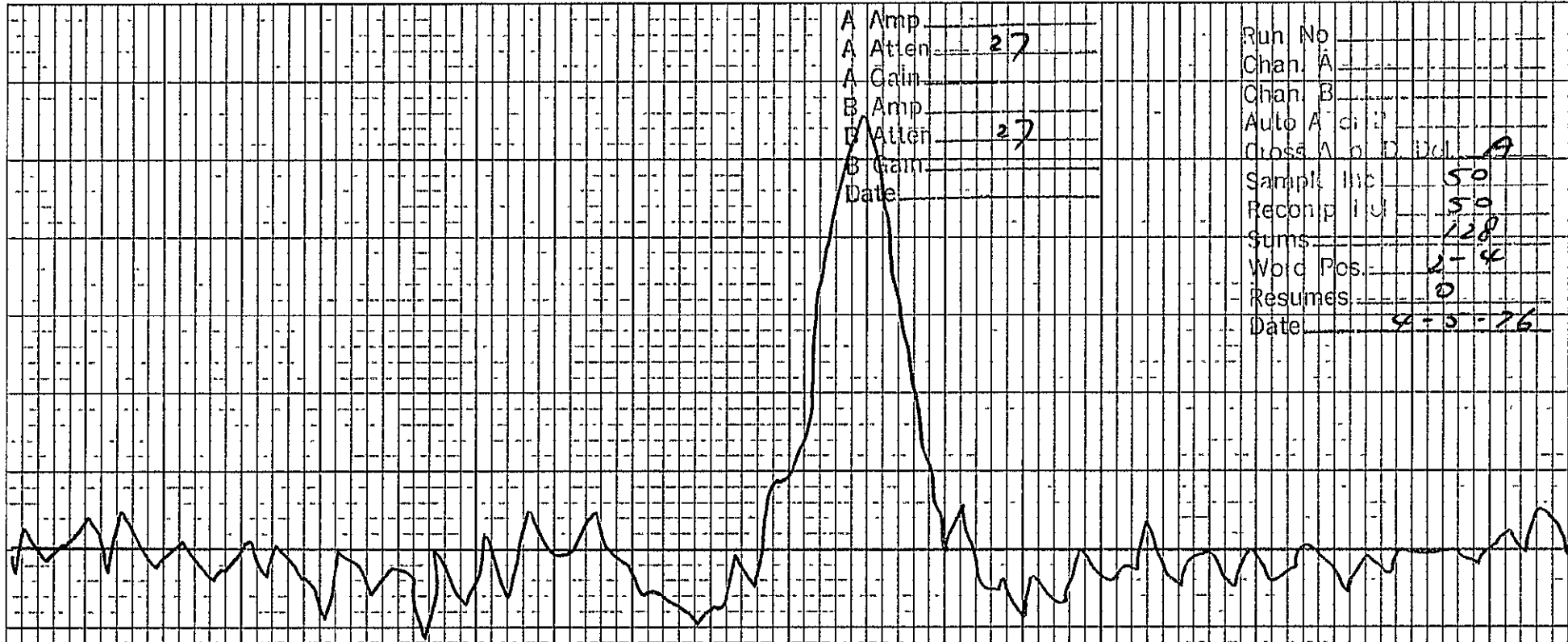


M.F.O  
 $\lambda/D = 3.0$   
 $B/D = 0.363$   
 $\Delta x = 0.6 \text{ in.}$

D-2

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A gain \_\_\_\_\_  
Cross A or D Idl. A  
Sample Inc 50  
Recomp IU 50  
Sums 128  
Word Pos. 1-4  
Resumes 0  
Date 4-3-76



$m = 0$   
 $\lambda/D = 3.5$   
 $R/D = 0.363$   
 $\Delta x = 0.6 \text{ in}$

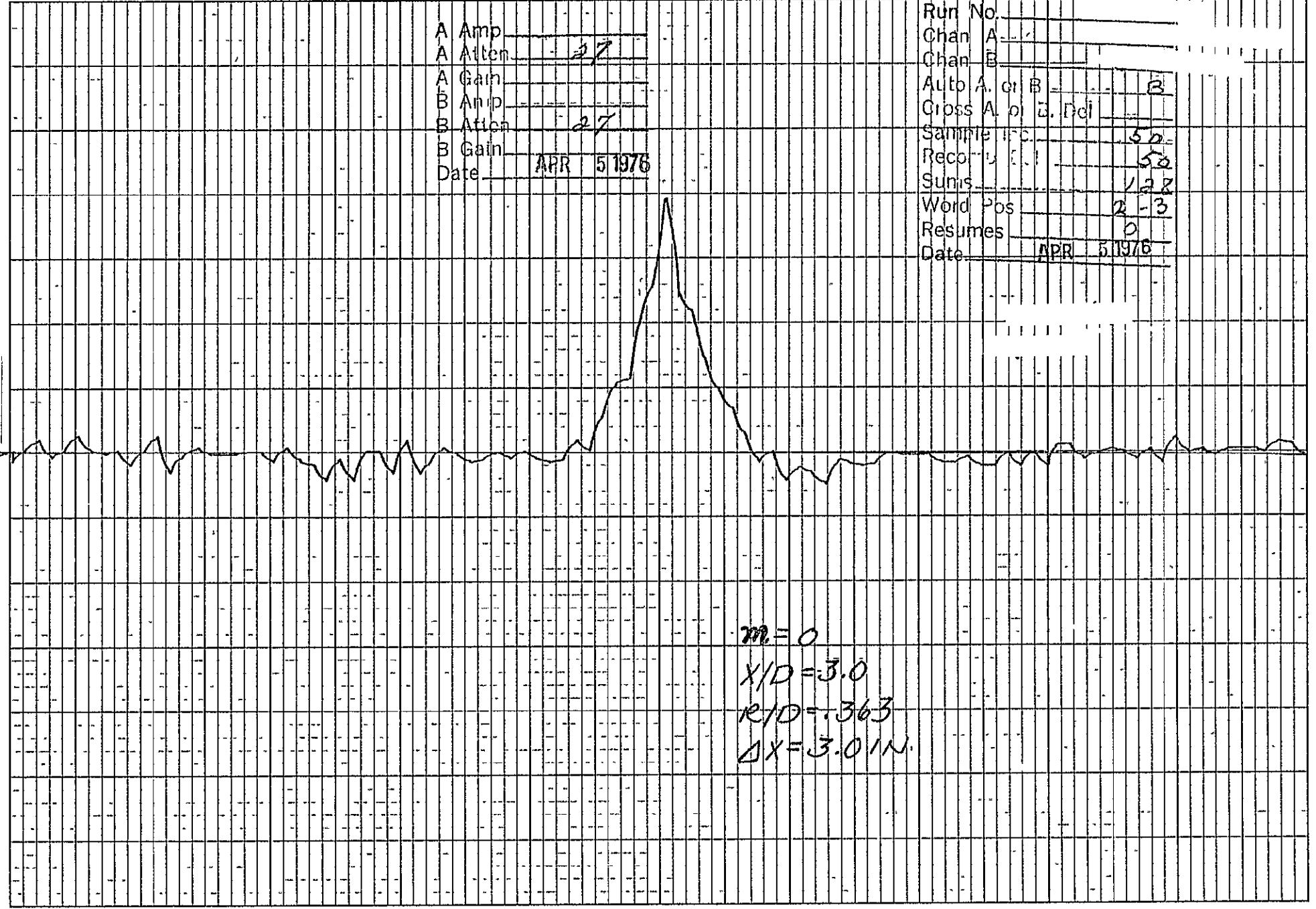
D-3

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date APR 5 1976

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Def \_\_\_\_\_  
Sample Inc. 50  
Records 50  
Sumis 128  
Word Pos 2-3  
Resumes 0  
Date APR 5 1976

D4

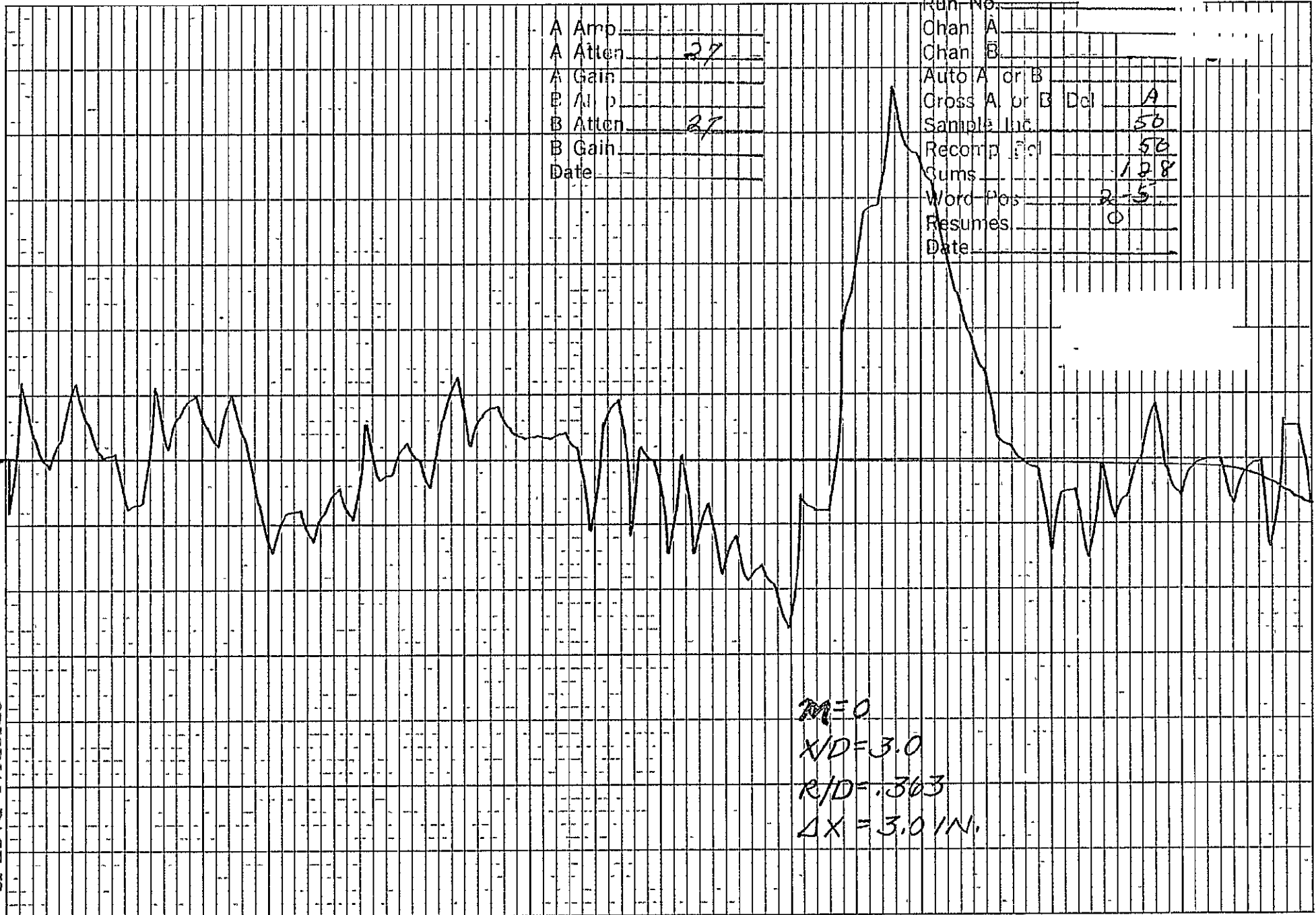


$m = 0$   
 $X/D = 3.0$   
 $R/D = .363$   
 $\Delta X = 3.0 IN.$

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
E Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del A  
Sample Inc 50  
Recomp Fct 50  
Cums 128  
Word Pos 2-5  
Resumes 0  
Date \_\_\_\_\_

D-5



$M=0$   
 $X/D=3.0$   
 $R/D=.363$   
 $\Delta X=3.0 IN.$

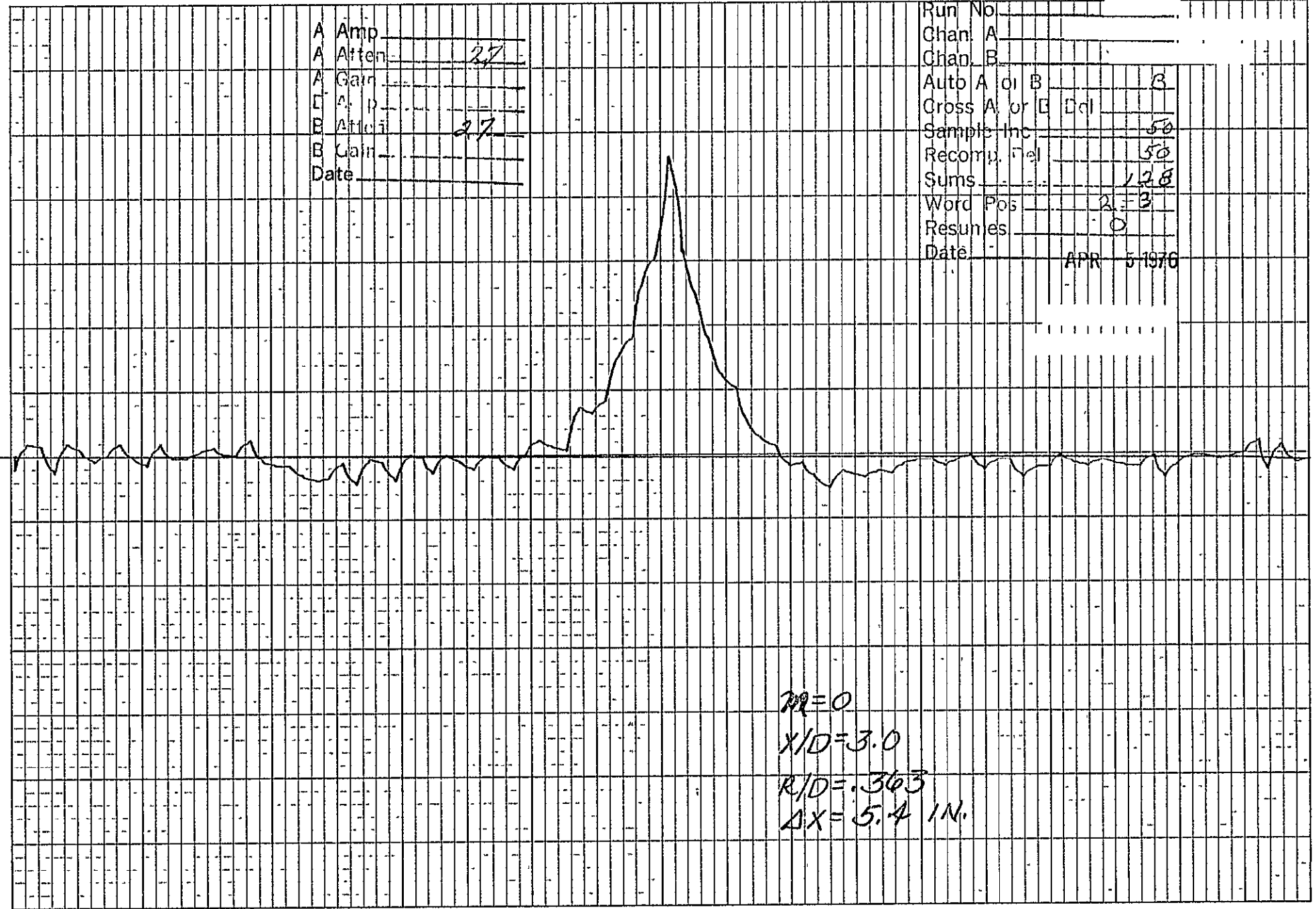
ORIGINAL PAGE IS  
OF POOR QUALITY



A Amp \_\_\_\_\_  
A Atten. 27  
A Gain \_\_\_\_\_  
A. D. \_\_\_\_\_  
B Atten. 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross A or B Dcl \_\_\_\_\_  
Sample Inc 50  
Recomp. Del 50  
Sums 128  
Word Pos 2-3  
Resumes 0  
Date APR 5 1976

D-6



$TR=0$   
 $X/D=3.0$   
 $R/D=.363$   
 $\Delta X=5.4 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
A Lin \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan: A \_\_\_\_\_  
Chan: B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Gross A or B. Vol 9  
Sample Inc. 50  
Recomp. Vol 50  
Sums 1.28  
Word Pos R-5  
Resumes. \_\_\_\_\_  
Date APR 5 1976

D-7

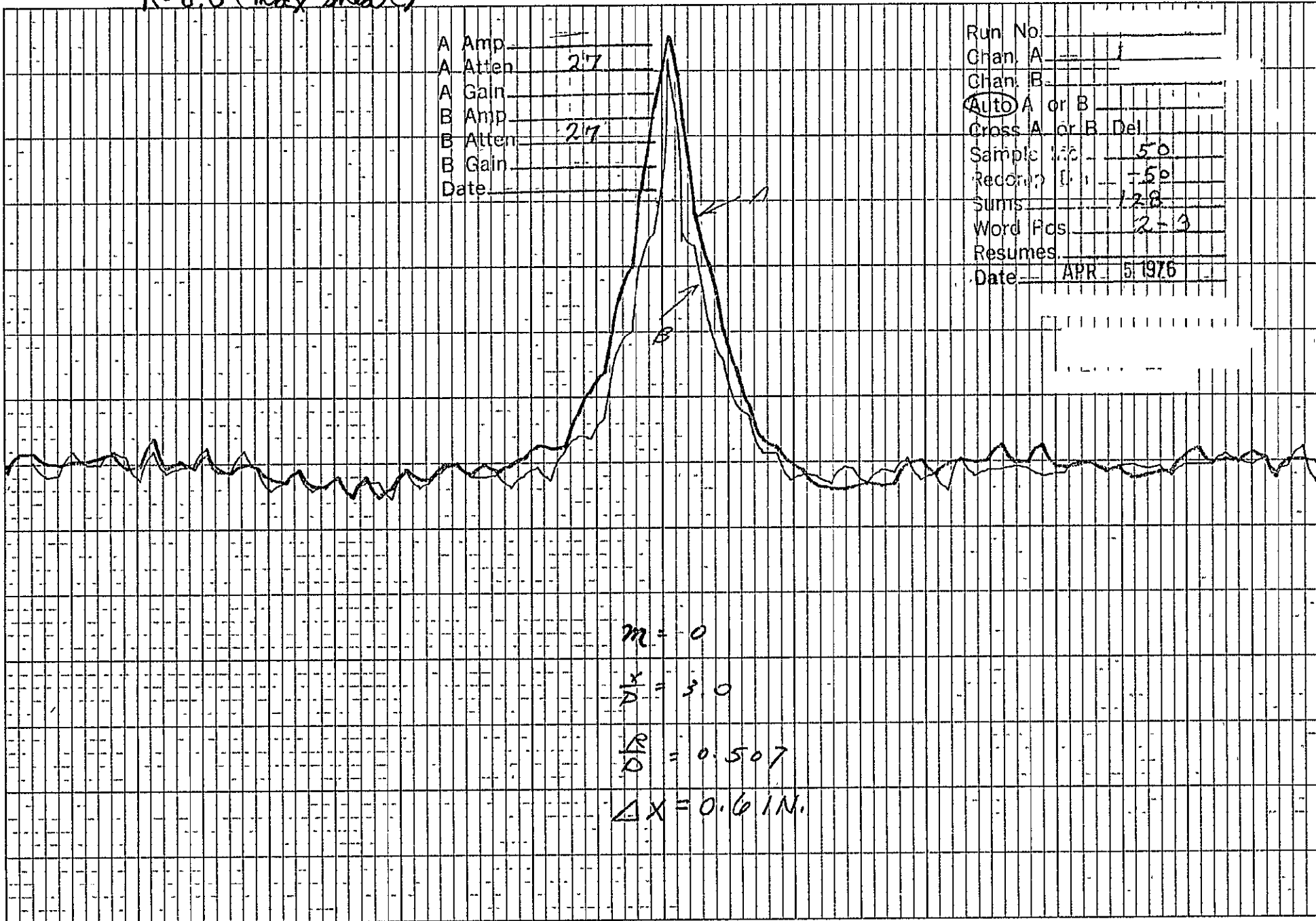
ORIGINAL PAGE IS  
OF POOR QUALITY

M=0  
X/D=3.0  
R/D=3.63  
 $\Delta X = 5.4 \text{ IN.}$

R=0.0 (max shear)

A Amp \_\_\_\_\_  
A Atten 2.7  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 2.7  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A 1  
Chan. B \_\_\_\_\_  
Auto A or B  
Cross A or B Del. \_\_\_\_\_  
Sample Rate 50  
Recording [ ] -50  
Summs 128  
Word Fcs 2-3  
Resumes \_\_\_\_\_  
Date APR 5 1976

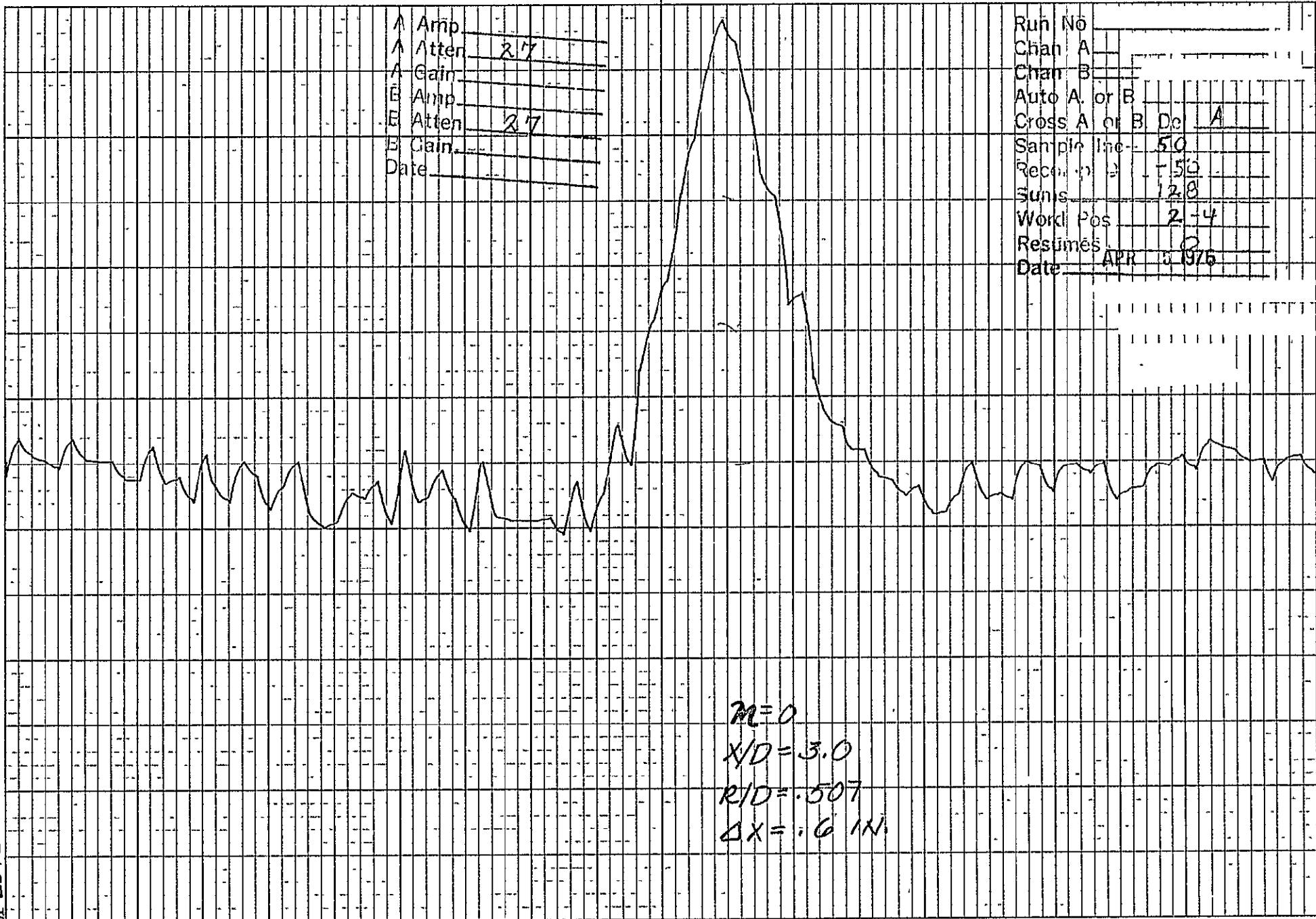


$$m = 0$$
$$\frac{x}{D} = 3.0$$
$$\frac{R}{D} = 0.507$$
$$\Delta X = 0.6 \text{ IN.}$$

A Amp \_\_\_\_\_  
A Atten 2.7 \_\_\_\_\_  
A Gain \_\_\_\_\_  
E Amp \_\_\_\_\_  
E Atten 2.7 \_\_\_\_\_  
E Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A. or B \_\_\_\_\_  
Cross A or B De A \_\_\_\_\_  
Sample Inc 50 \_\_\_\_\_  
Recon B -50 \_\_\_\_\_  
Suns 12.8 \_\_\_\_\_  
Work Pos 2-4 \_\_\_\_\_  
Resumes 2 \_\_\_\_\_  
Date APR 5 1976 \_\_\_\_\_

D-9



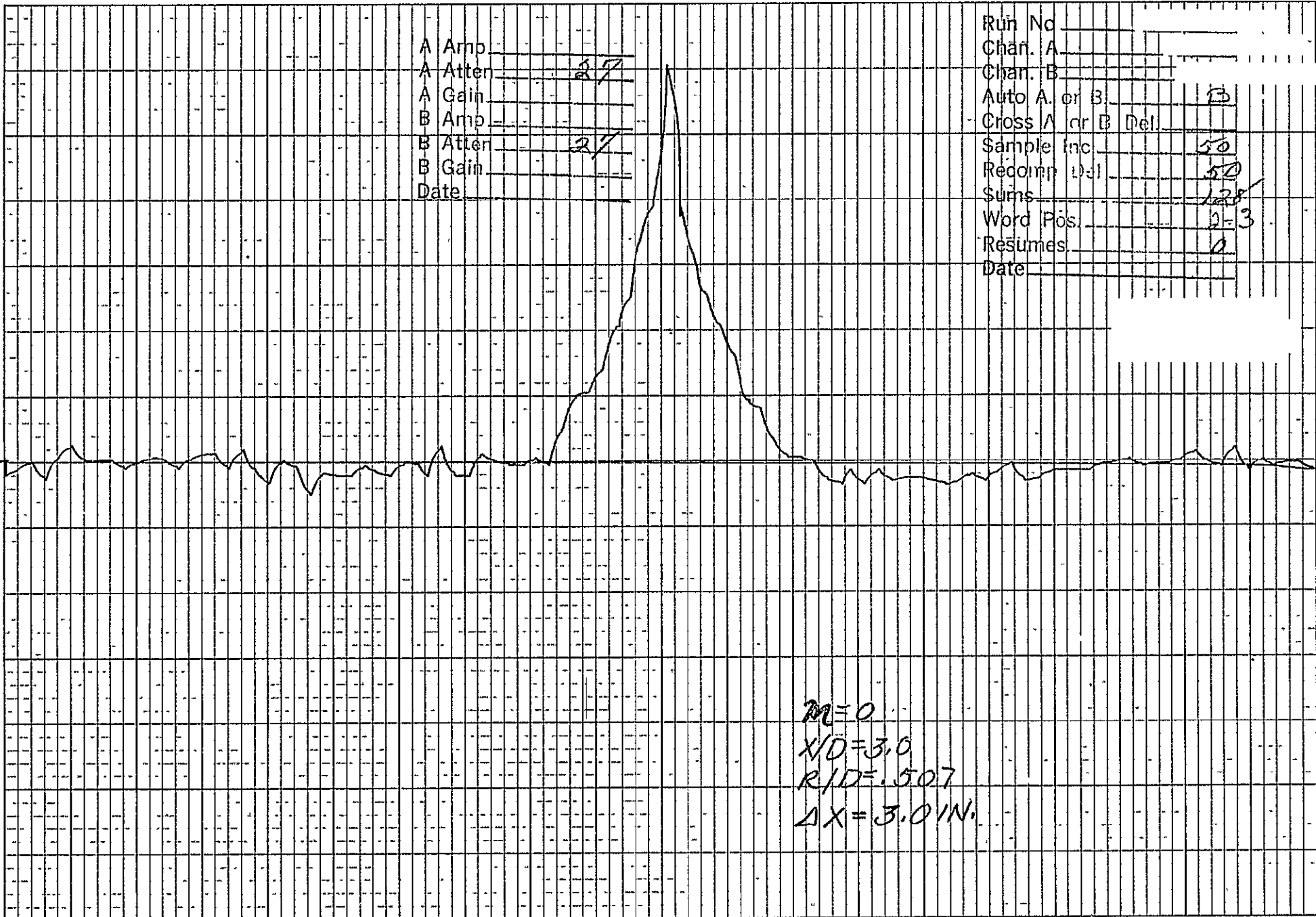
$M=0$   
 $X/D=3.0$   
 $R/D=.507$   
 $\Delta X=.6 IN.$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 50  
Recomp Del. 50  
Sums 128  
Word Pos. 2-3  
Resumes 0  
Date \_\_\_\_\_

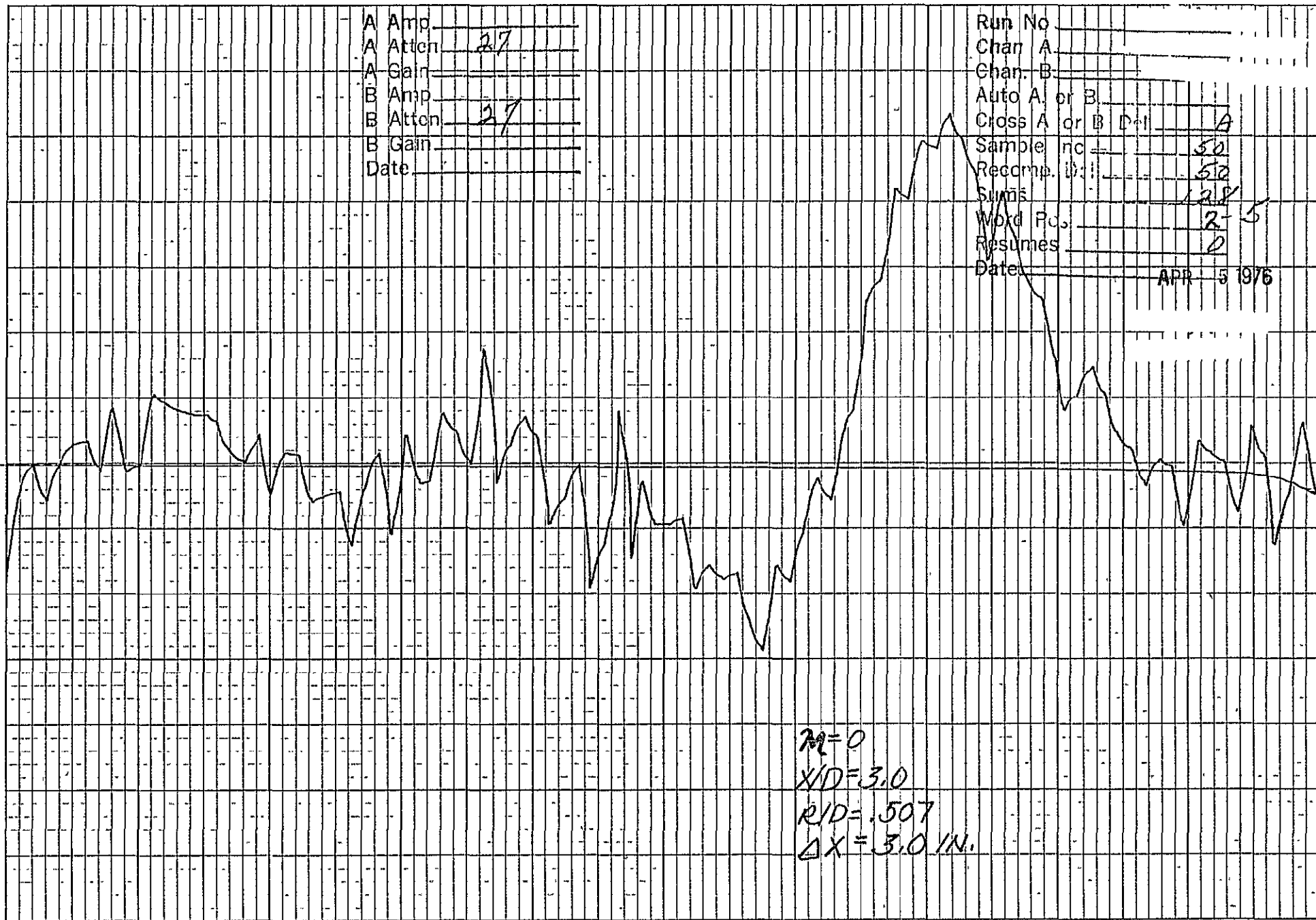
D-10



A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A or B D-I A  
Sample no 50  
Recomp. Wt. 50  
Summ 12.8  
Word Pcs. 2-5  
Resumes 0  
Date APR 5 1976

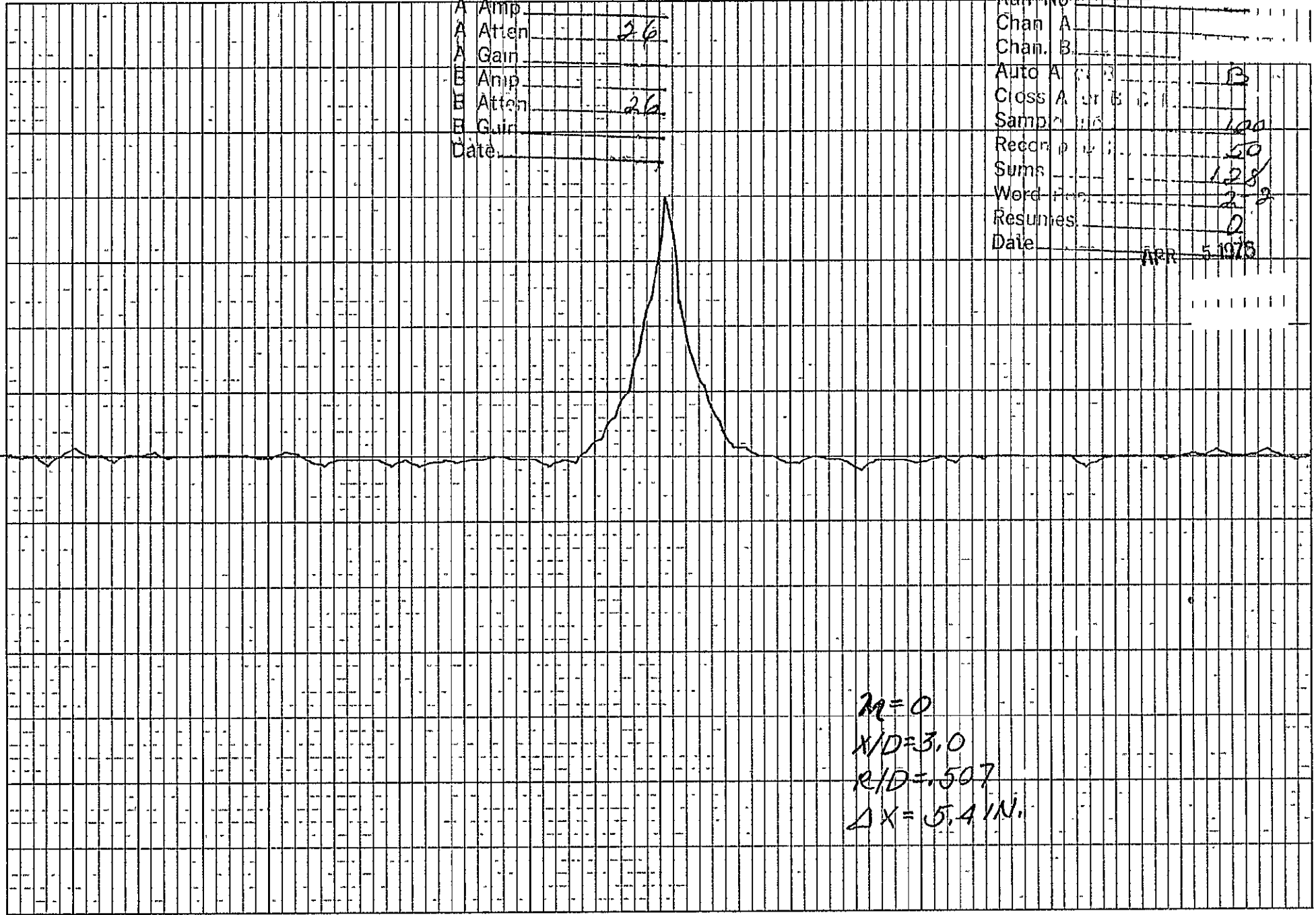
D-11



A Amp  
A Atten 26  
A Gain  
B Amp  
B Atten 26  
B Gain  
Date

Run No  
Chan A  
Chan B  
Auto A or B B  
Cross A or B  
Samp 100  
Recor p 50  
Sums 128  
Word 2  
Resumes 2  
Date APR 5 1975

D-12



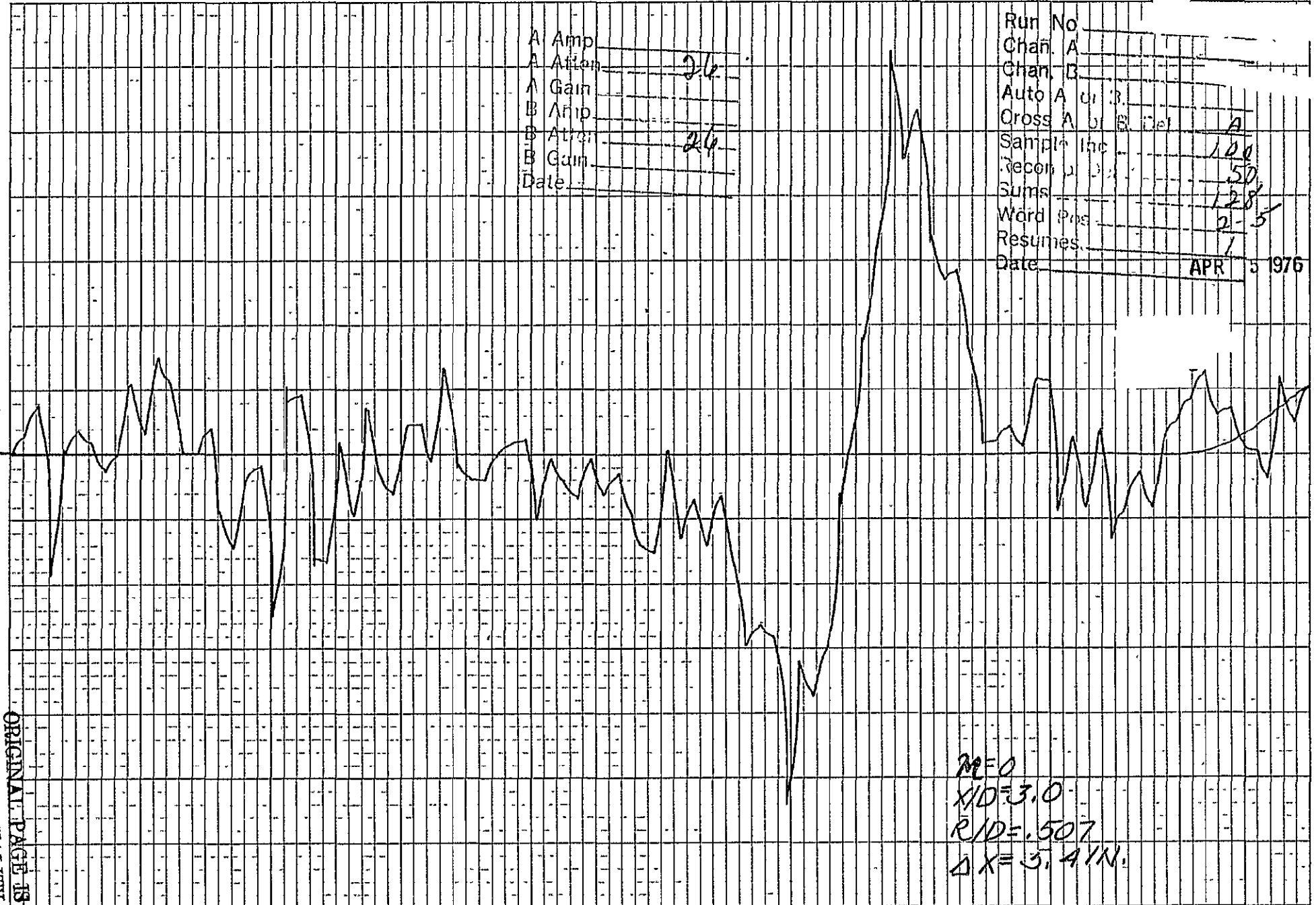
$M=0$   
 $X/D=3.0$   
 $R/D=.507$   
 $\Delta X=5.4 \text{ IN.}$

A Amp  
A Atten 26  
A Gain  
B Amp  
B Atten 26  
B Gain  
Date

Run No  
Chan. A  
Chan. B  
Auto A or B  
Cross A or B Det A  
Sample Inc 100  
Recor. J. Det 50  
Sums 128  
Word Pres 2-5  
Resumes 1  
Date APR 5 1976

D-13

ORIGINAL PAGE IS  
OF POOR QUALITY



$MEO$   
 $X/D = 3.0$   
 $R/D = .507$   
 $\Delta X = 3.41N$

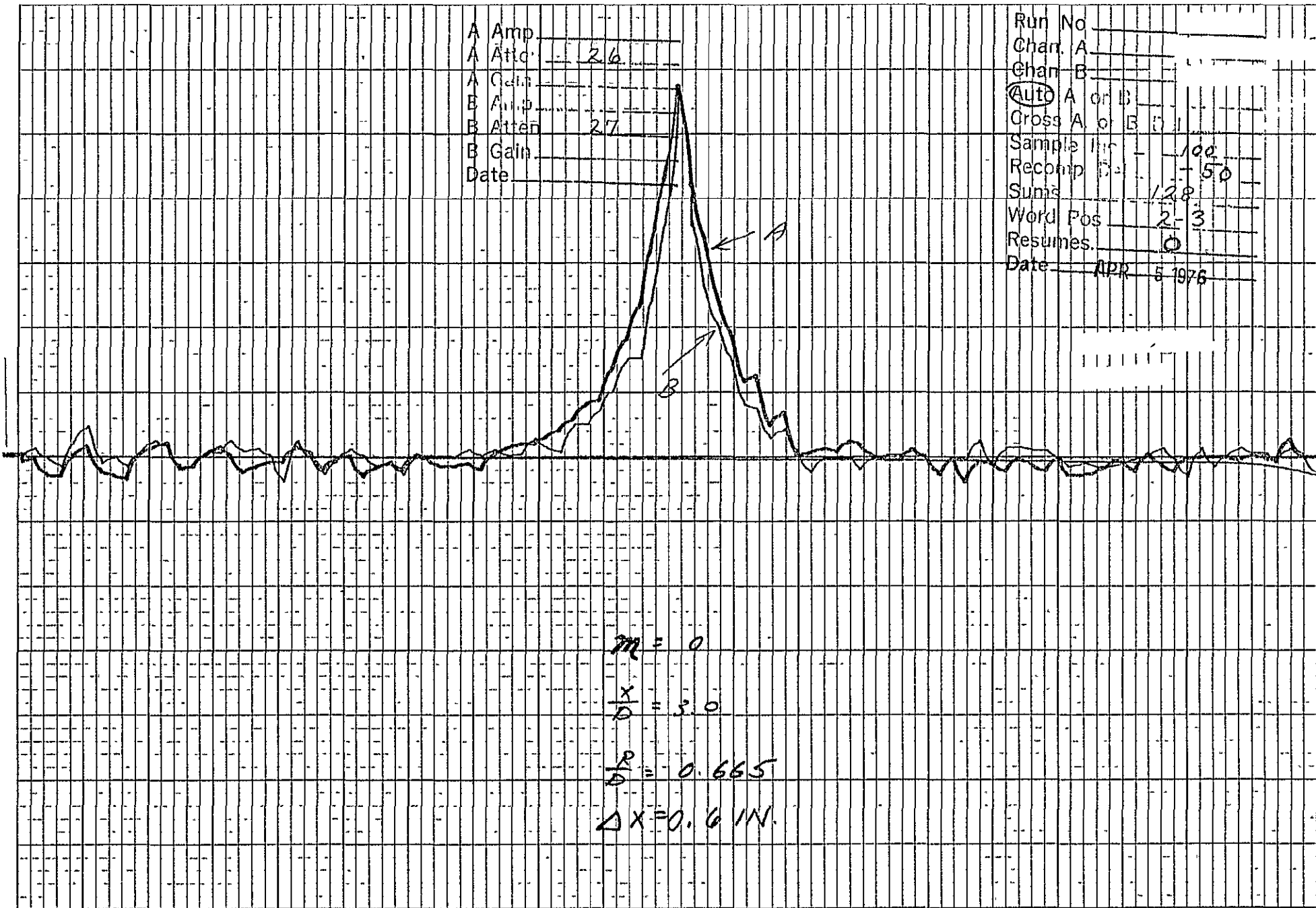




A Amp  
 A Attc. 26  
 A Gain  
 B Amp  
 B Attc. 27  
 B Gain  
 Date

Run No  
 Chan. A  
 Chan. B  
 (Auto) A or B  
 Cross A. of B ( )  
 Sample Inc. 100  
 Recomp. 50  
 Sum 128  
 Word Pos 2-3  
 Resumes. 0  
 Date APR 5 1976

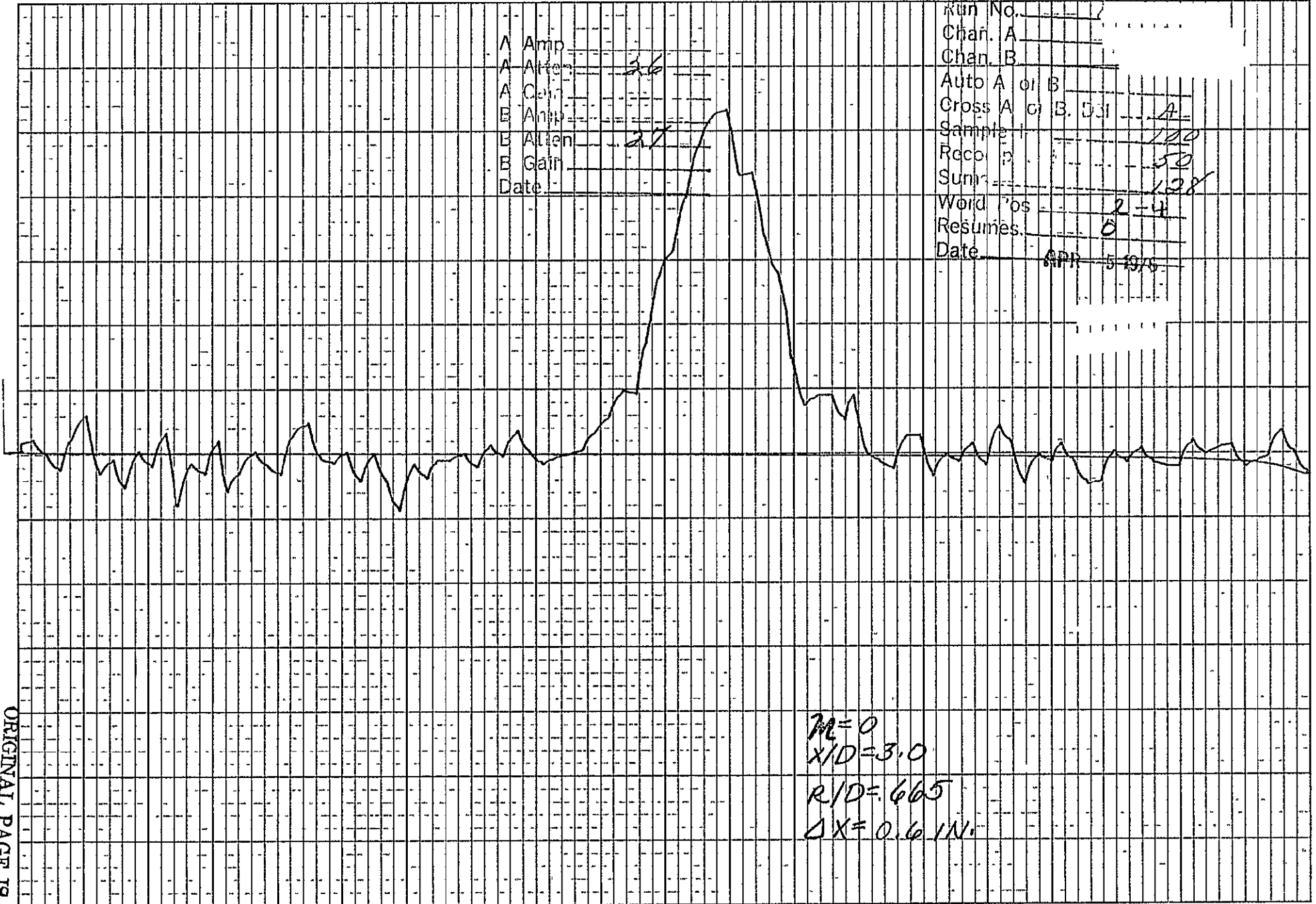
D-14



$m = 0$   
 $\frac{x}{D} = 3.0$   
 $\frac{P}{D} = 0.665$   
 $\Delta x = 0.6 \text{ IN.}$

A Amp  
A Attenuation 2.6  
A Gain  
B Amp  
B Attenuation 2.7  
B Gain  
Date

Run No. 1  
Chan. A  
Chan. B  
Auto A or B  
Cross A or B. Off A  
Sample 120  
Recomp 50  
Sum 128  
Word Pos 2-4  
Resumes 0  
Date APR 5 1976



$M=0$   
 $X/D=3.0$   
 $R/D=665$   
 $\Delta X=0.6 IN.$

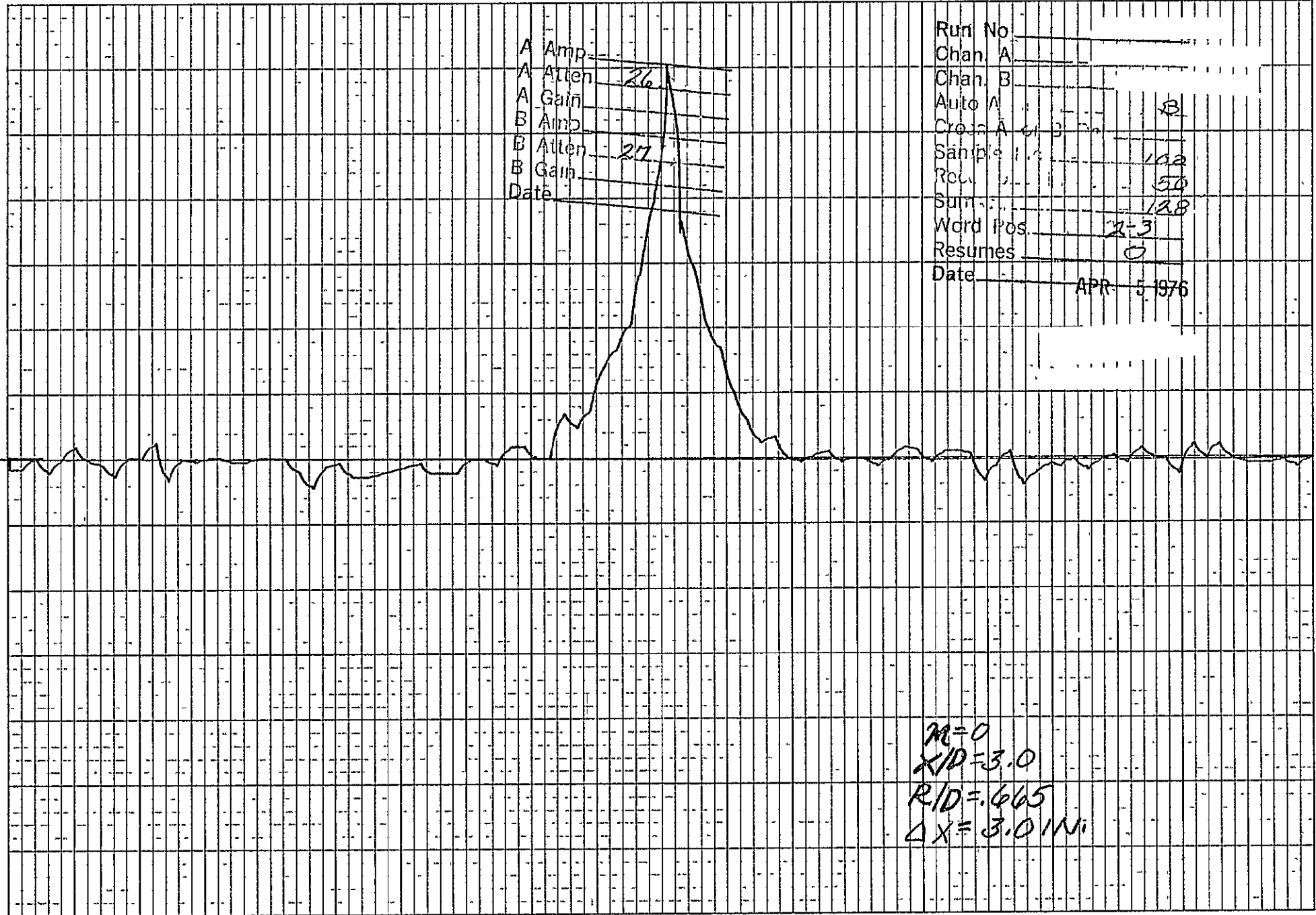
D-15

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp  
A Atten - 26  
A Gain  
B Amp  
B Atten - 27  
B Gain  
Date

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A \_\_\_\_\_  
Cross A of B \_\_\_\_\_  
Sample Int. \_\_\_\_\_  
Row \_\_\_\_\_  
Sum \_\_\_\_\_  
Word Pos. \_\_\_\_\_  
Resumes \_\_\_\_\_  
Date APR 5 1976

D-16



M=0  
X/D=3.0  
R/D=.665  
 $\Delta X = 3.0 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten. 2.6  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 2.7  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Det. A  
Sample Int. 1.00  
Recomp. (s) 50  
Sums 1.28  
Word Pos 2-4  
Resumes 1  
Date \_\_\_\_\_

APR 5 1976

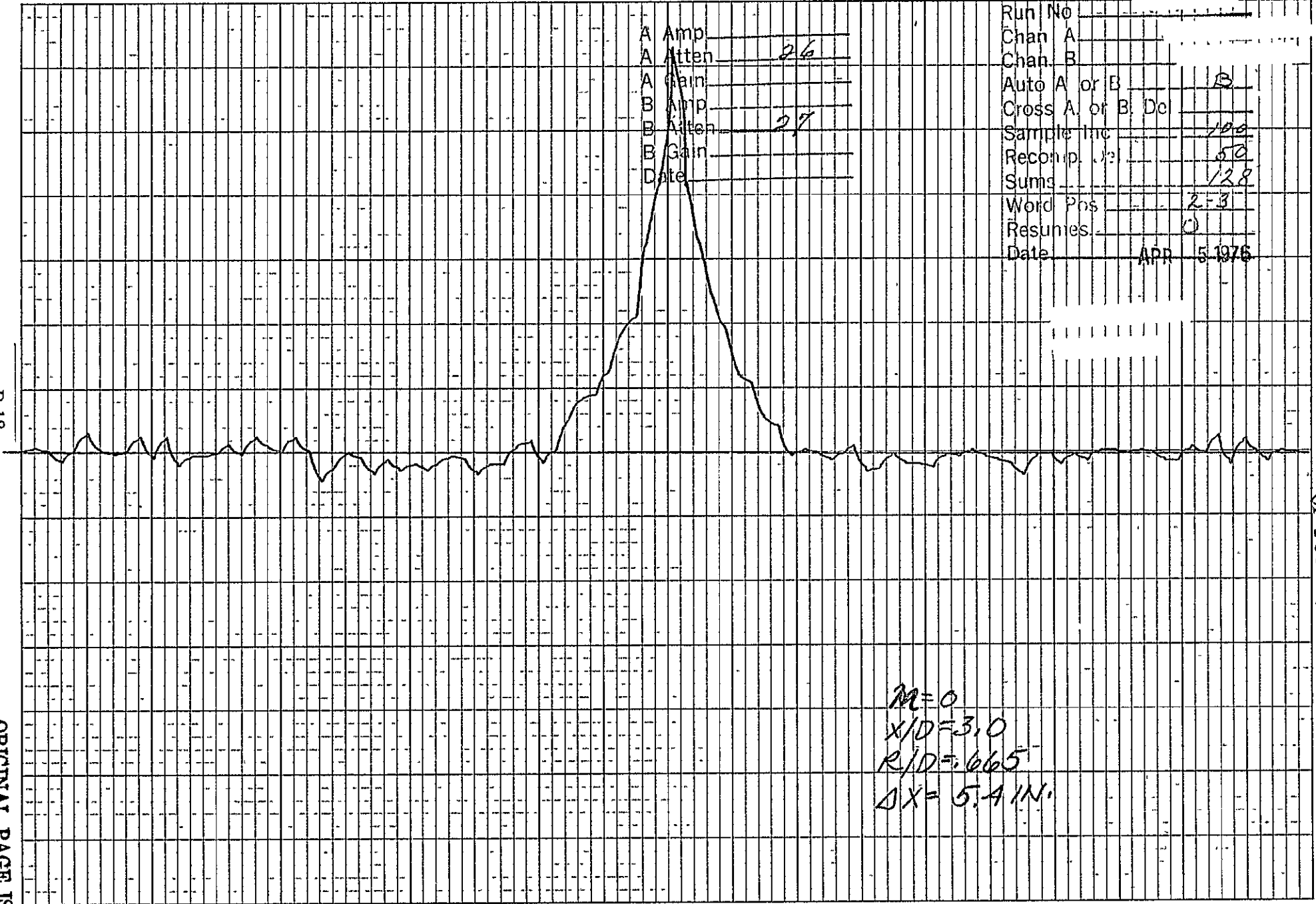
D-17



$M=0$   
 $X/D=3.0$   
 $R/D=.665$   
 $\Delta X=3.0 IN.$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A or B B  
Cross A. of B. Del \_\_\_\_\_  
Sample Inc 100  
Recomp. % 50  
Sums 128  
Word Pns 2-3  
Resumes 0  
Date APR 5 1976



M=0  
X/D=3.0  
R/D=0.665  
DX=5.4 IN.

D-18

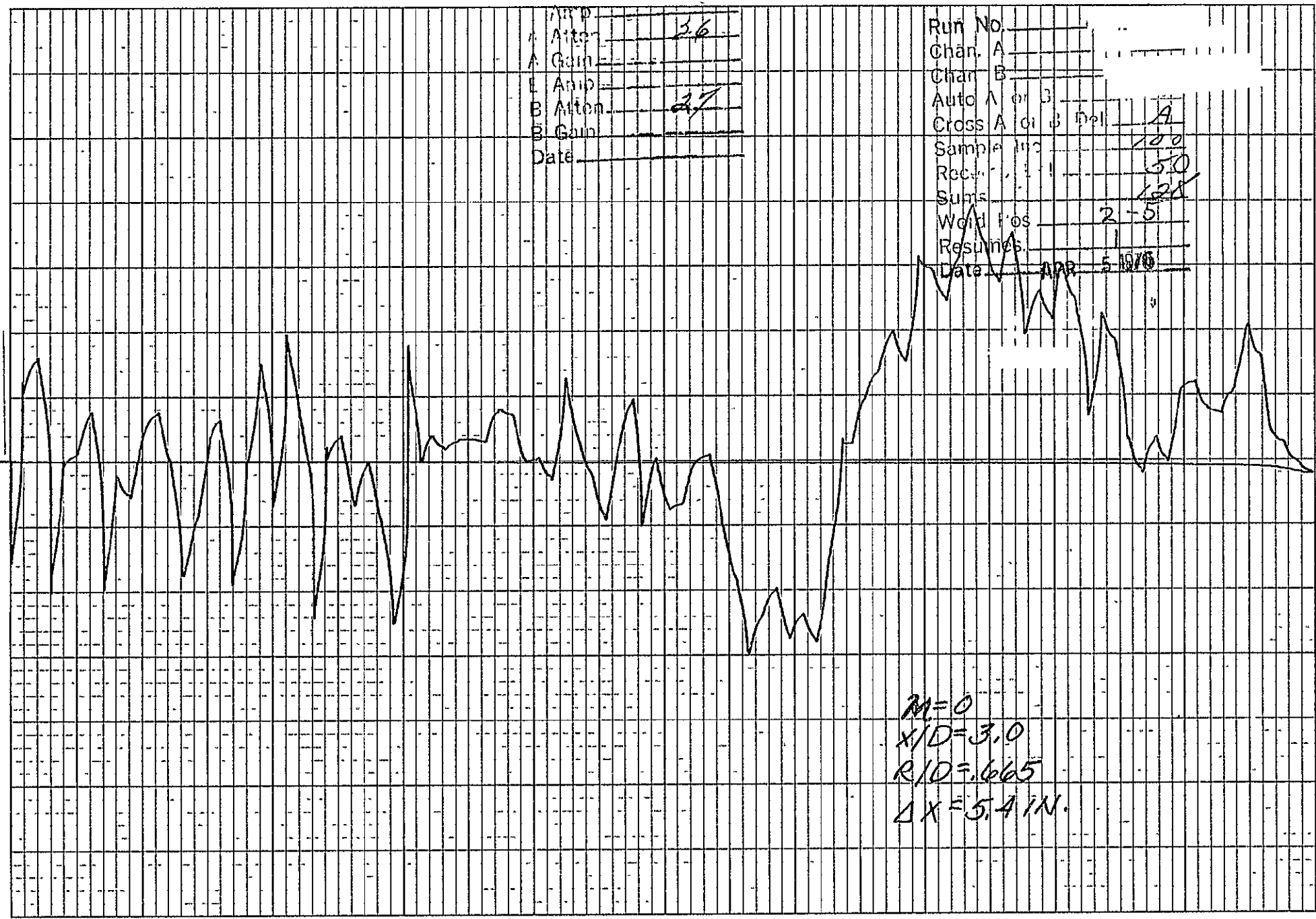
ORIGINAL PAGE IS  
A GOOD COPY

ORIGINAL PAGE IS  
OF POOR QUALITY

Y Axis  
A Att'n 2.6  
A Gain \_\_\_\_\_  
E Amp \_\_\_\_\_  
B Att'n 2.7  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Inl. A  
Sample Inc. 100  
Rec. 370  
Sum. 128  
Word Pos. 2-5  
Resolves \_\_\_\_\_  
Date APR 5 1970

D-19

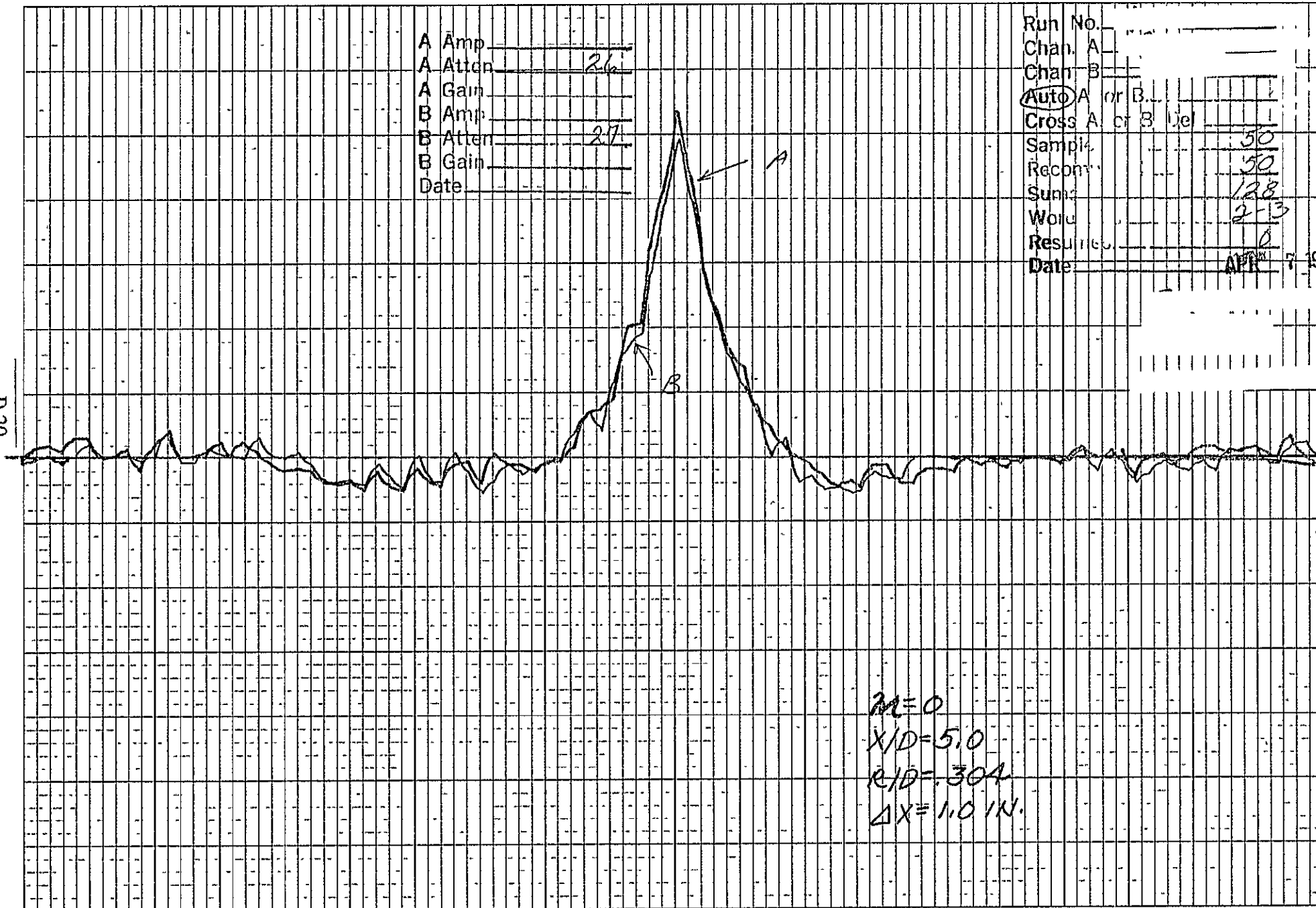


$M=0$   
 $X/D=3.0$   
 $R/D=.665$   
 $\Delta X=5.4 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. or B. Del \_\_\_\_\_  
Sample \_\_\_\_\_ 50  
Recon. \_\_\_\_\_ 50  
Sum. \_\_\_\_\_ 128  
Word \_\_\_\_\_ 2-13  
Result. \_\_\_\_\_ 0  
Date \_\_\_\_\_ APR 7 1976

D-20



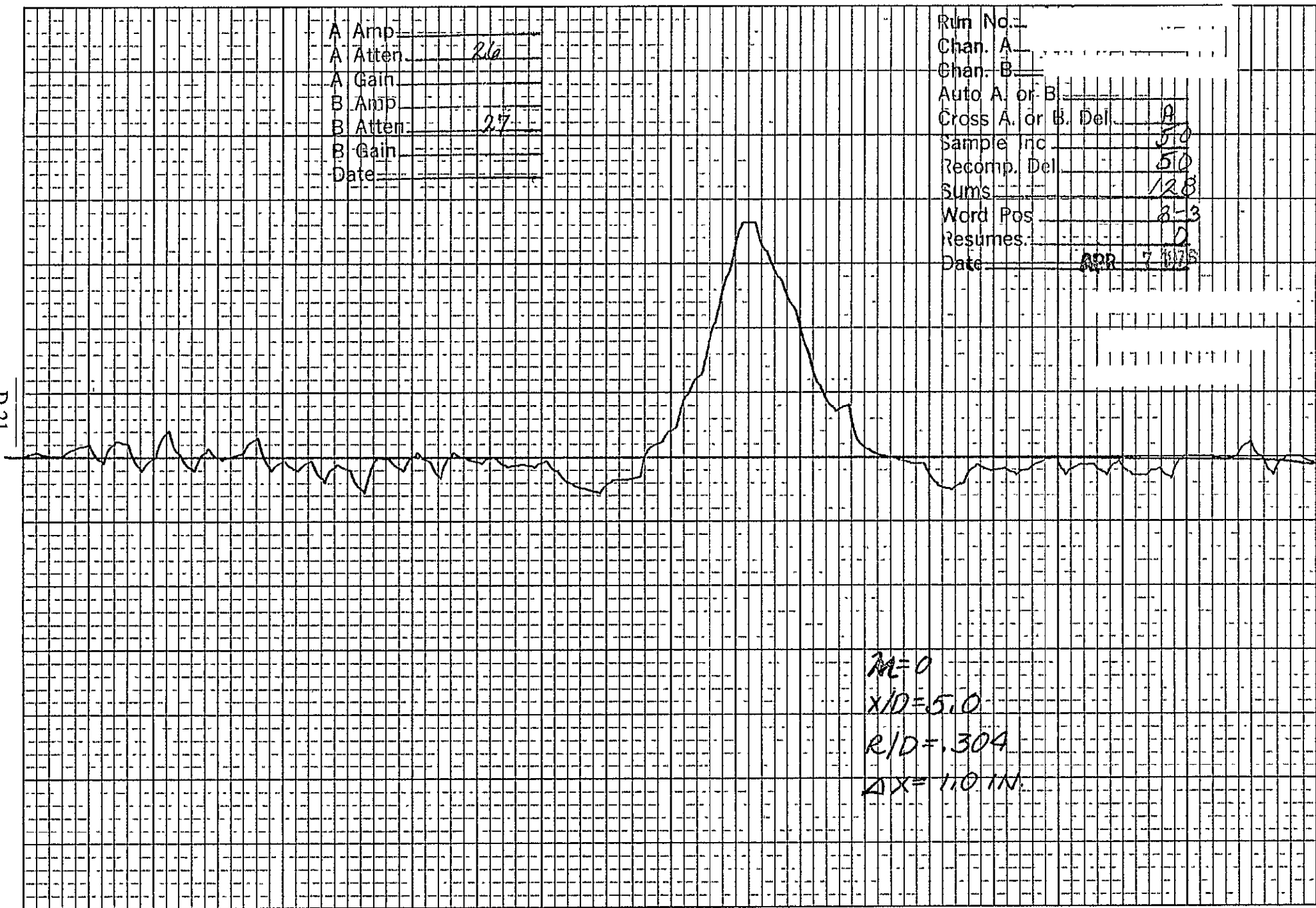
$M=0$   
 $X/D=5.0$   
 $R/D=304$   
 $\Delta X=1.0 \text{ IN.}$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten: 2.6  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten: 2.7  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del. A  
Sample Inc. 5.0  
Recomp. Del. 5.0  
Sums 128  
Word Pos 8-3  
Resumes 0  
Date APR 7 1978

D-21



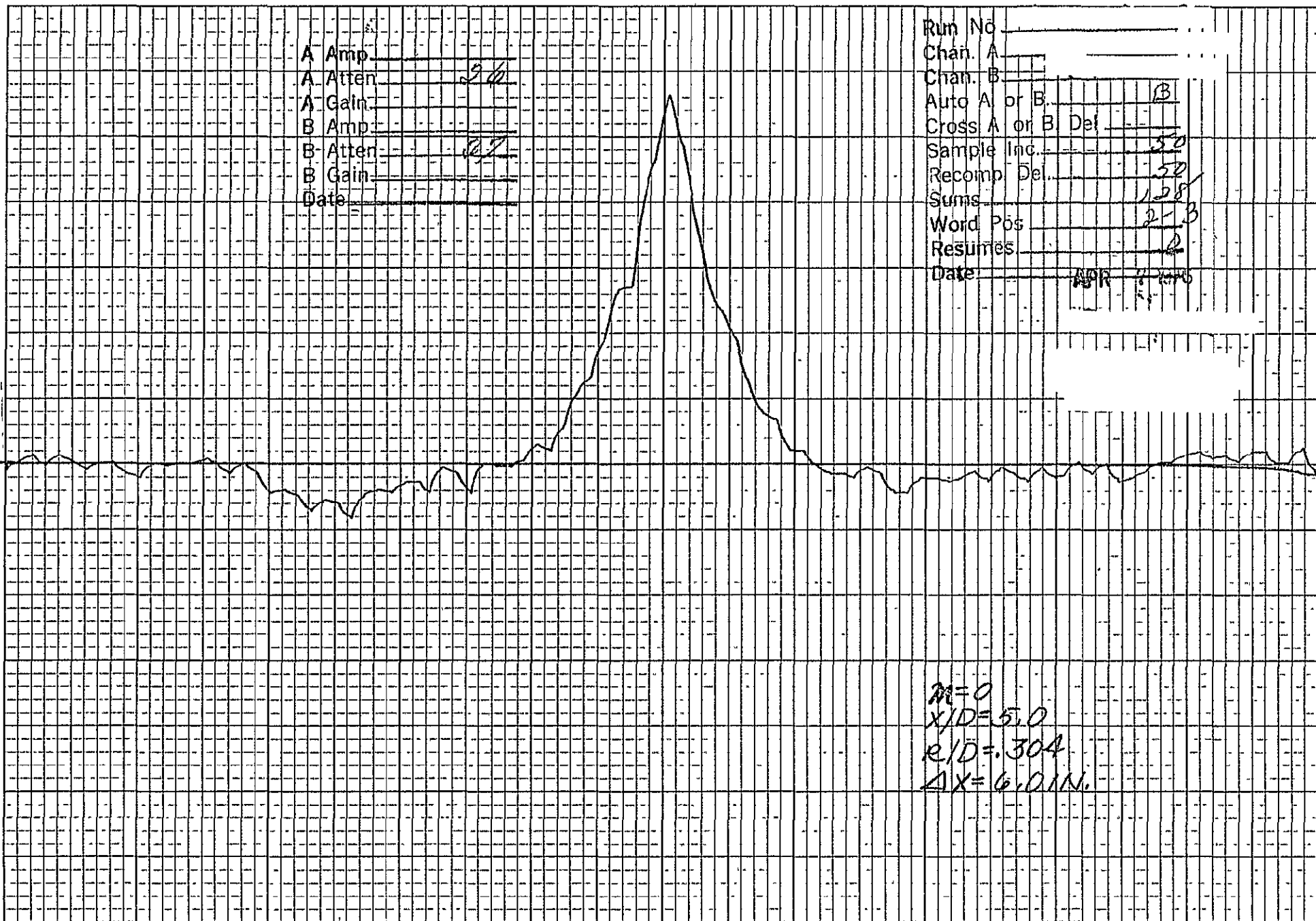
M=0  
X/D=5.0  
R/D=.304  
ΔX=1.0 IN.



A Amp \_\_\_\_\_  
A Atten 20  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 20  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross A or B Del \_\_\_\_\_  
Sample Inc. 50  
Recomp Del. 50  
Sums 128  
Word Pos 2-3  
Resumes 2  
Date APR 4 1966

D-22

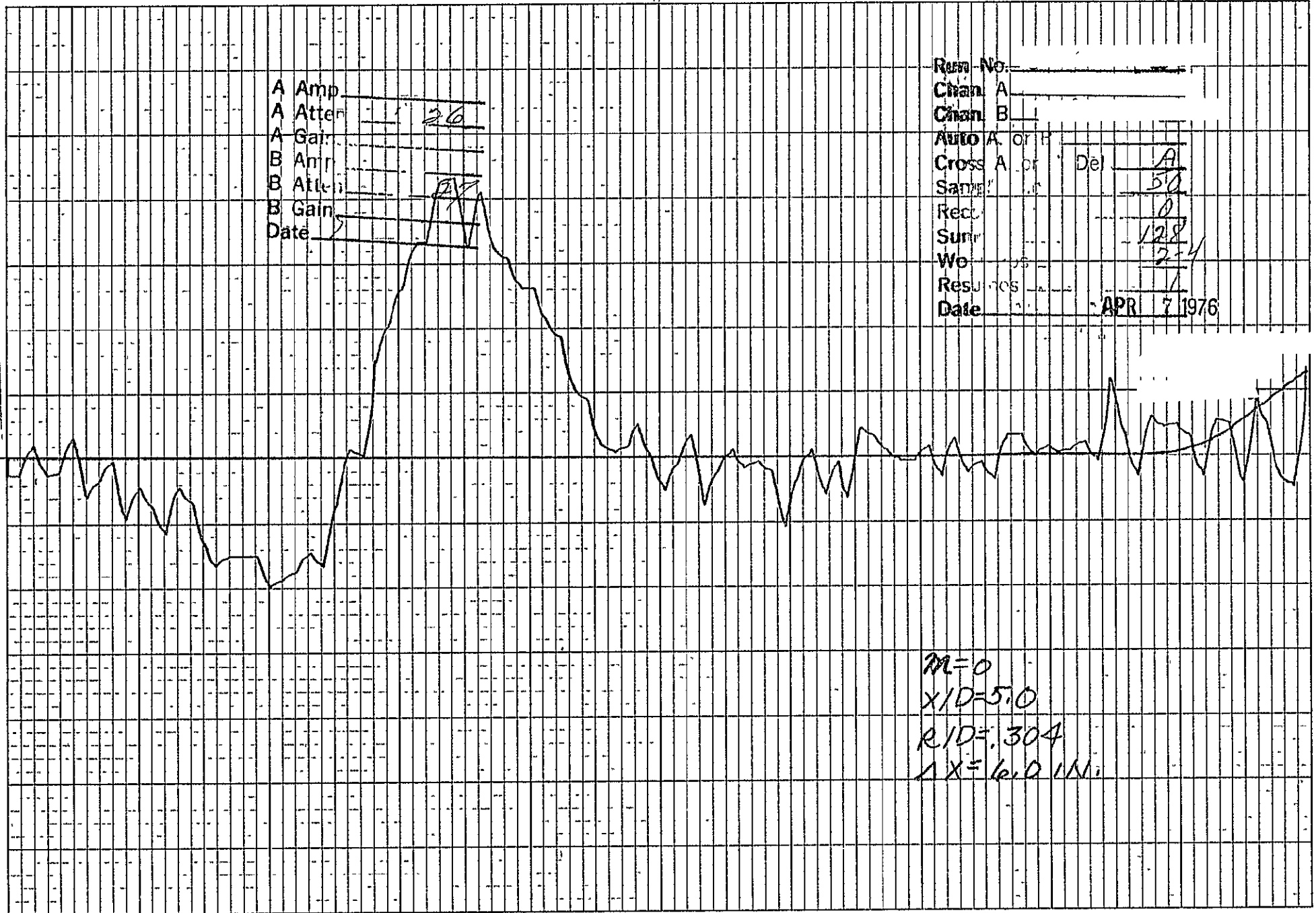


$M=0$   
 $X/D=5.0$   
 $R/D=304$   
 $\Delta X=6.0 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten \_\_\_\_\_ 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten \_\_\_\_\_ 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or Del. A  
Sample \_\_\_\_\_ 50  
Rect. \_\_\_\_\_ 0  
Surr \_\_\_\_\_ 128  
W. \_\_\_\_\_ 2-4  
Res. \_\_\_\_\_ 1  
Date \_\_\_\_\_ APR 7 1976

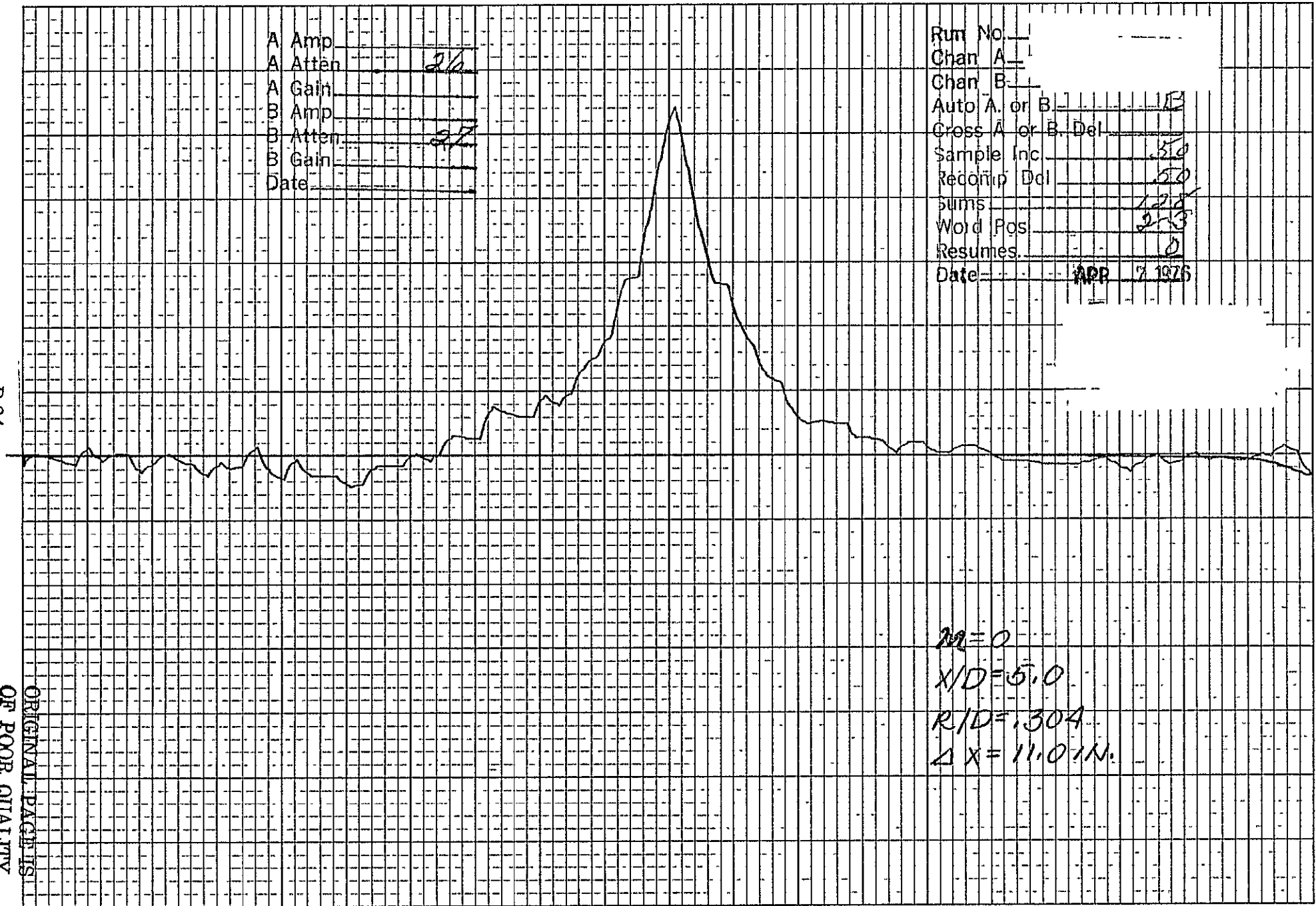
D-23



M=0  
X/D=5.0  
R/D=.304  
ΔX=16.0 IN.

A Amp \_\_\_\_\_  
A Atten 24  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Del \_\_\_\_\_  
Sample Inc. 5.0  
Reconip Del 5.0  
Summs 12.4  
Word Pos 2.3  
Resumes 0  
Date APR 7 1975



$M=0$   
 $X/D=5.0$   
 $R/D=1.304$   
 $\Delta X=11.0 IN.$

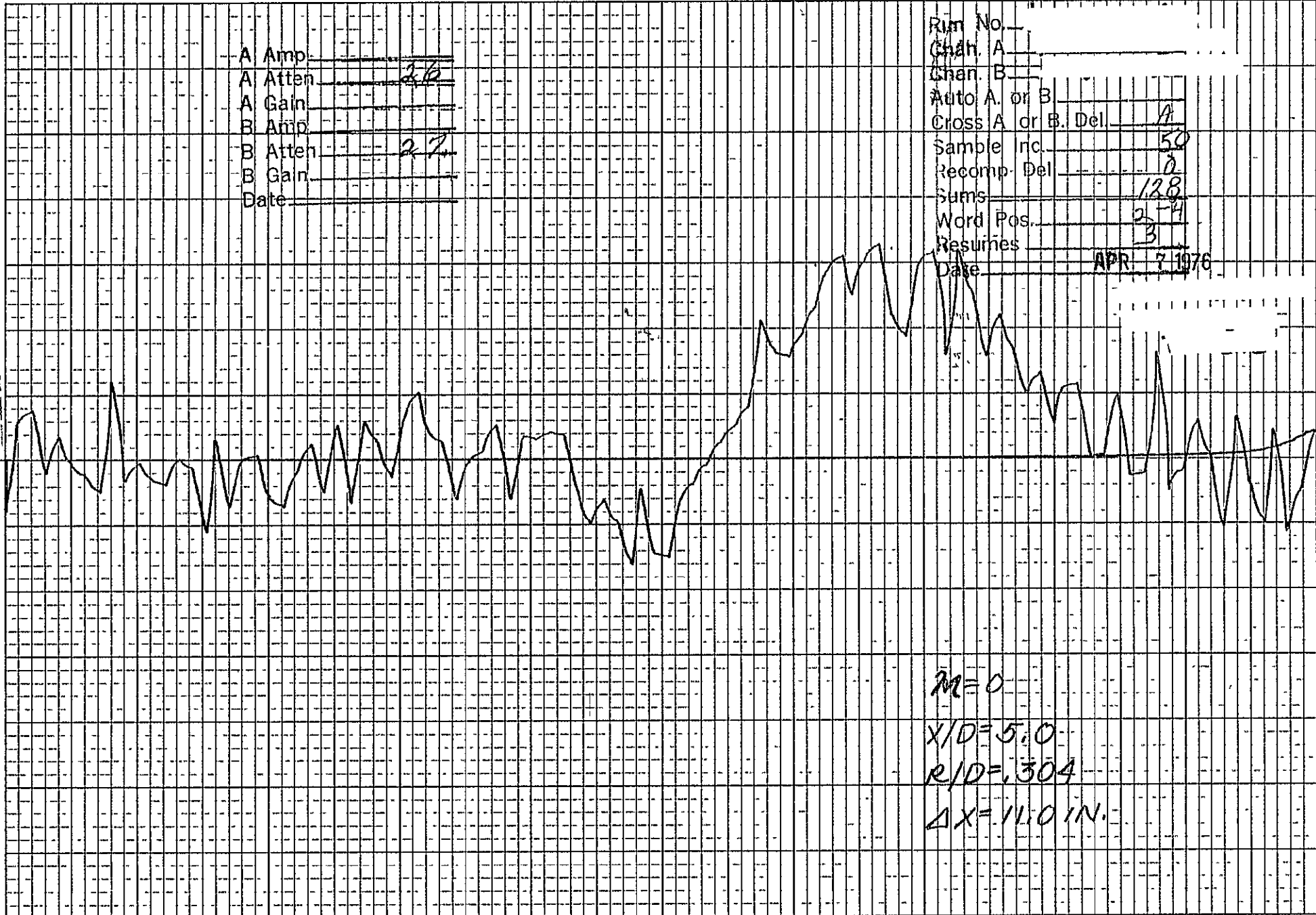
D-24

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 2.6  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 2.7  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Rim No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B \_\_\_\_\_  
Cross A or B. Del. A  
Sample Inc. 50  
Recomp. Del. 0  
Sums 128  
Word Pos. 2-4  
Resumes 3  
Date APR 7 1976

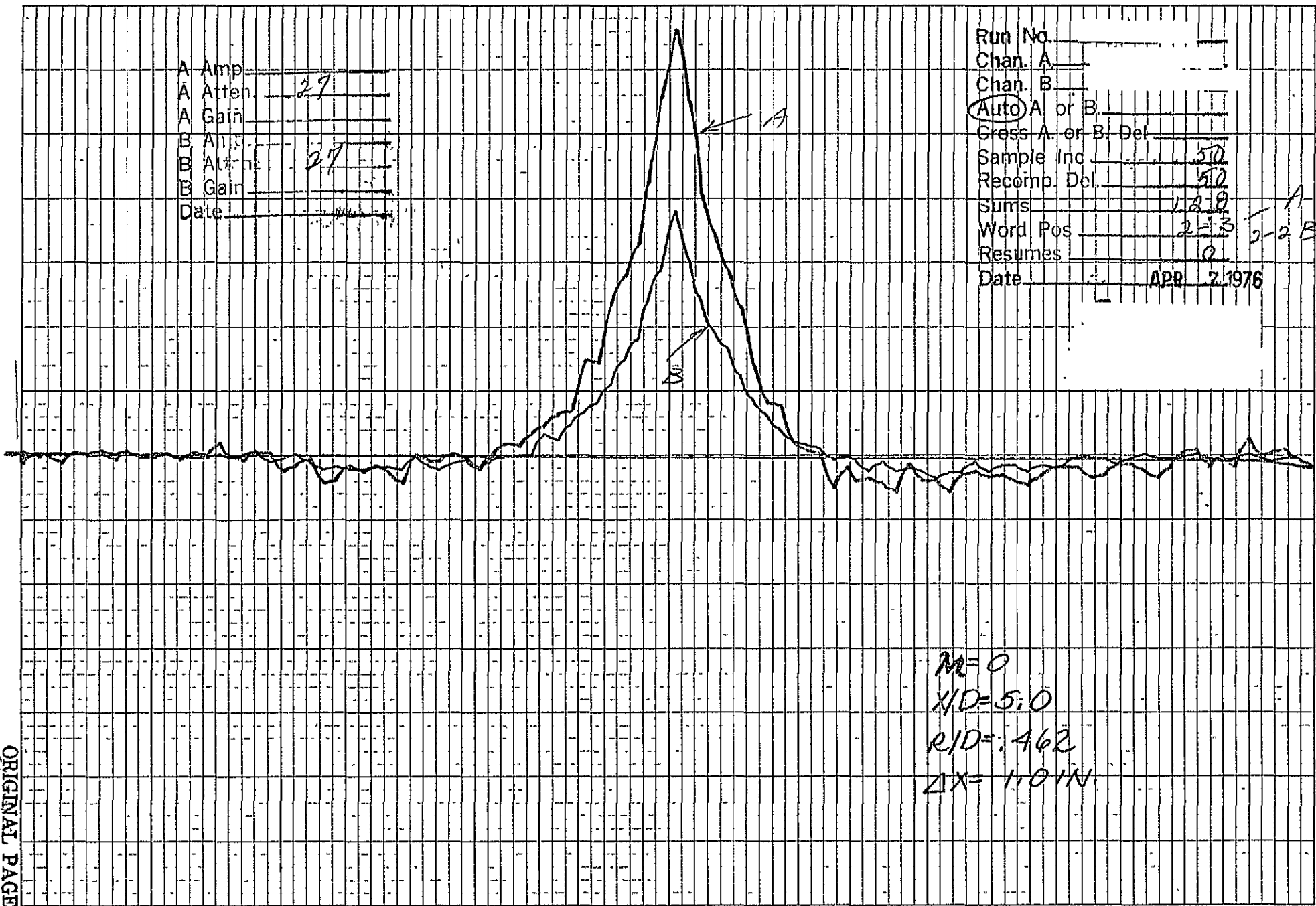
D-25



$M=0$   
 $X/D=5.0$   
 $R/D=.304$   
 $\Delta X=11.0 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten. 27 \_\_\_\_\_  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 27 \_\_\_\_\_  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Gross A. or B. Del \_\_\_\_\_  
Sample Inc. 50 \_\_\_\_\_  
Recomp. Del. 50 \_\_\_\_\_  
Sums 1210 \_\_\_\_\_  
Word Pos. 253 1 A  
Resumes 0 2-2 B  
Date APR 2 1976



$M = 0$   
 $X/D = 5.0$   
 $R/D = .462$   
 $\Delta X = 1.0 IN.$

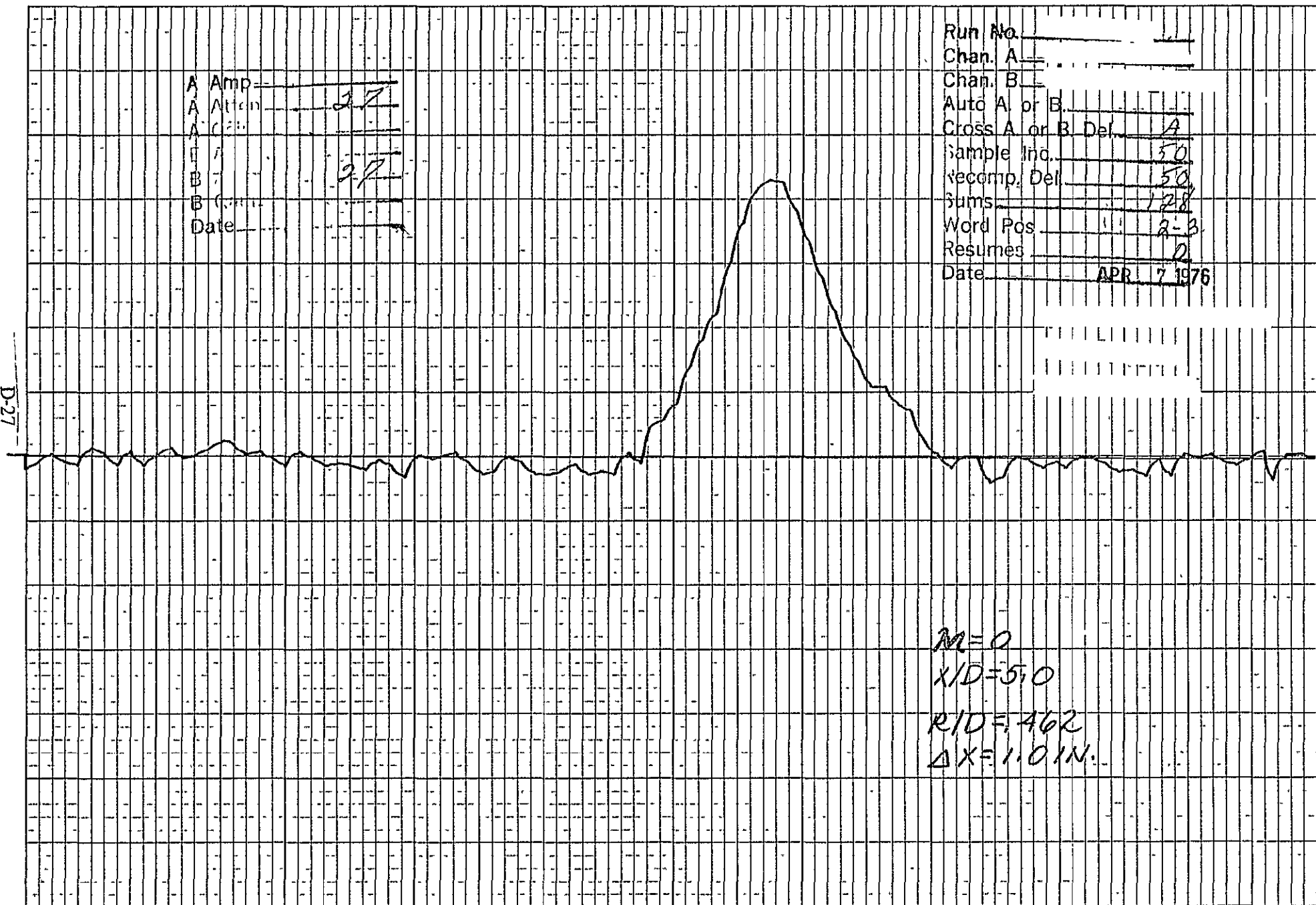
D-26

ORIGINAL PAGE IS  
OF POSITIVE QUALITY

A Amp \_\_\_\_\_  
A Alt. \_\_\_\_\_ 2.7  
A Gain \_\_\_\_\_  
B \_\_\_\_\_ 2.7  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Def. A  
Sample Inc. 50  
Recomp. Del. 50  
Sums 128  
Word Pos. 2-3  
Resumes 0  
Date APR 7 1976

D-27

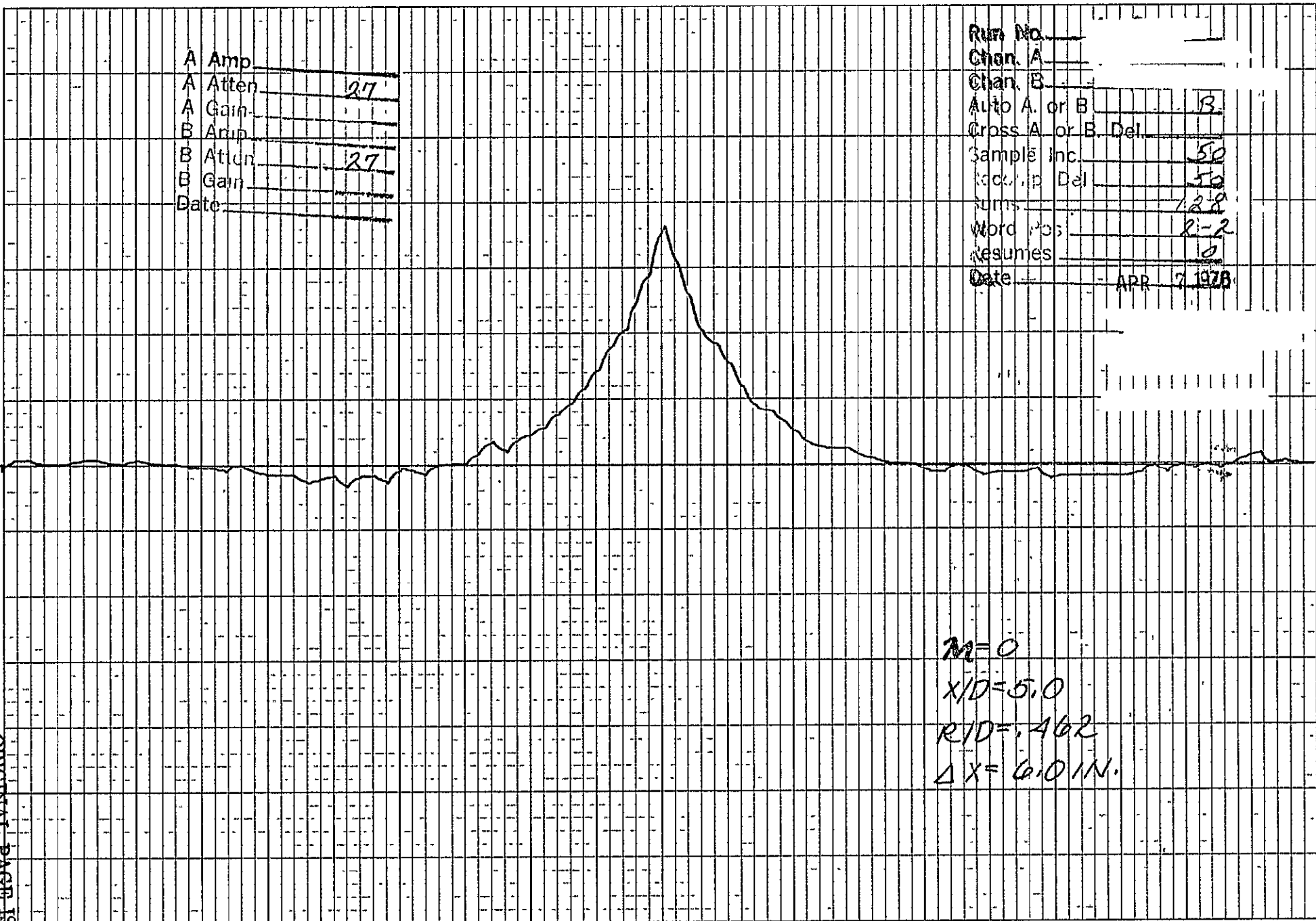


M=0  
X/D=5.0  
R/D=462  
 $\Delta X=1.0$  IN.

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. B.  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 50  
Lockup Del. 50  
Sums 128  
Word Pos. 8-2  
Resumes 0  
Date APR 7 1978

D-28



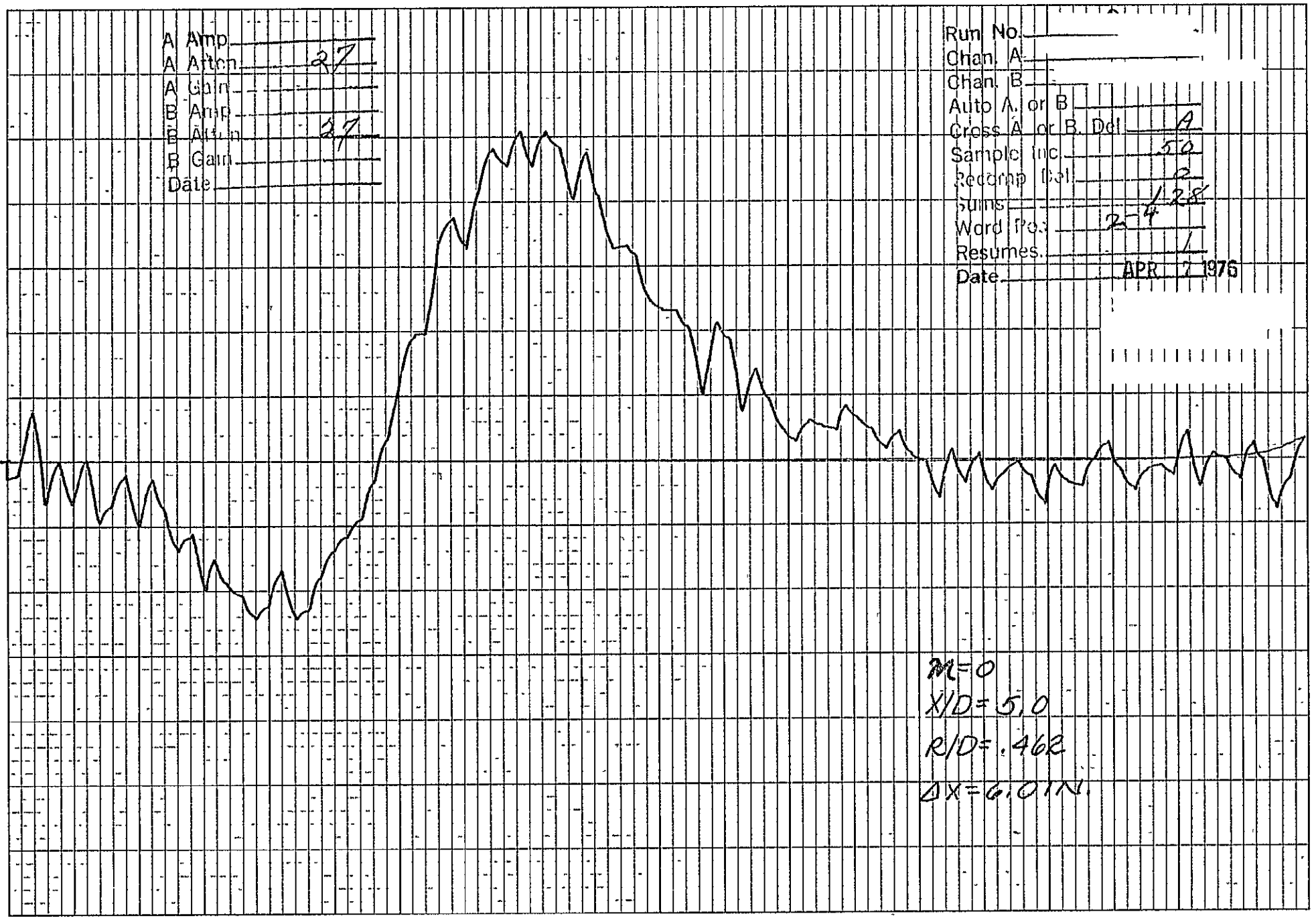
$M=0$   
 $X/D=5.0$   
 $R/D=.462$   
 $\Delta X=6.0 IN.$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B \_\_\_\_\_  
Cross A. or B. Def A  
Sample Inc. 5.0  
Recordsp. Def 2  
Sums 128  
Word Pos. 2-4  
Resumes. 1  
Date APR 7 1976

D-29



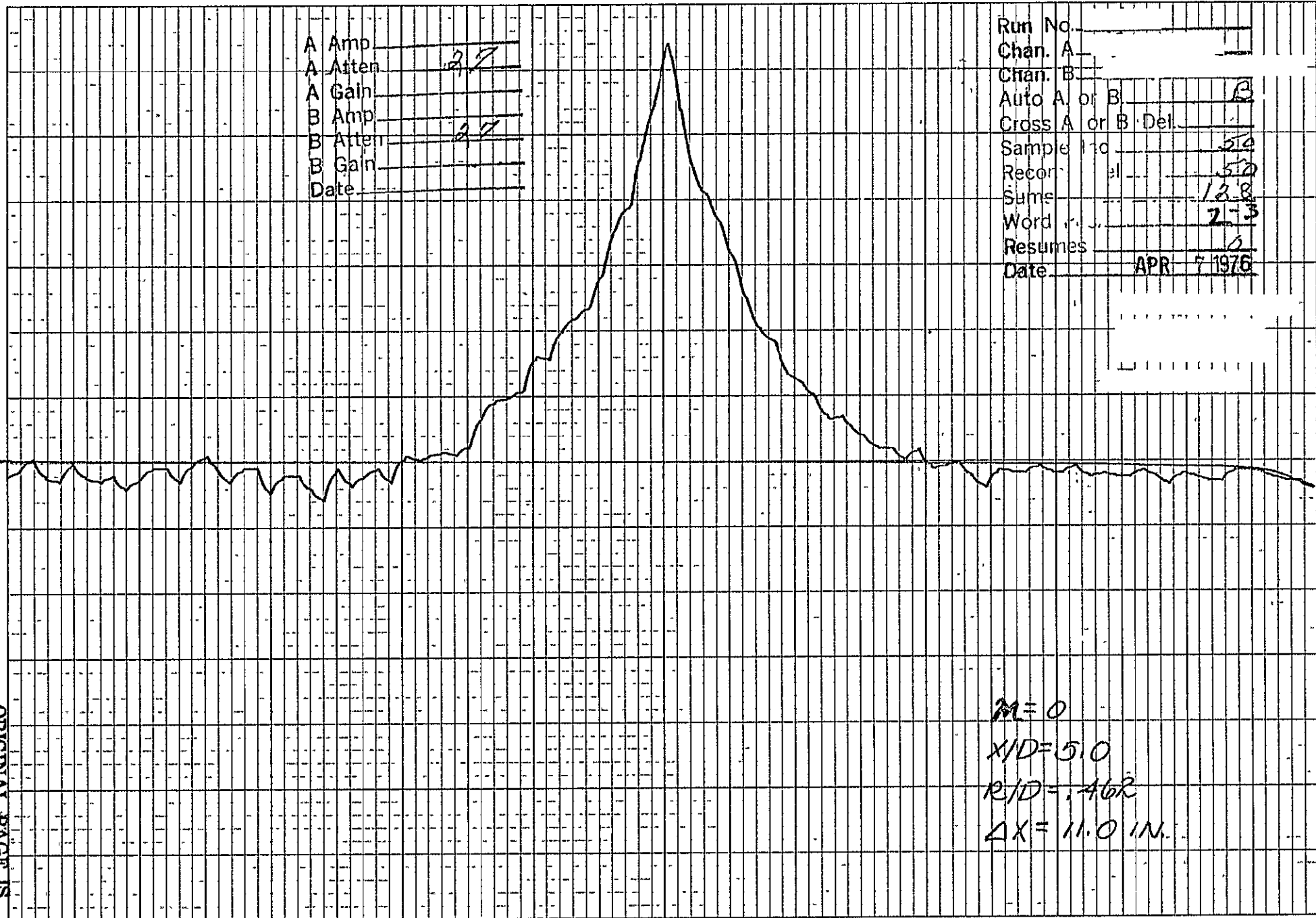
$M=0$   
 $X/D=5.0$   
 $R/D=.462$   
 $\Delta X=6.01N$



A Amp \_\_\_\_\_  
A Atten 2.7  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 2.7  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. B  
Cross A or B Del. \_\_\_\_\_  
Sample No. 510  
Record # 510  
Sum 12.8  
Word 2-3  
Resumes 0  
Date APR 7 1976

D-30



$M = 0$   
 $X/D = 5.0$   
 $R/D = .462$   
 $\Delta X = 11.0 \text{ IN.}$

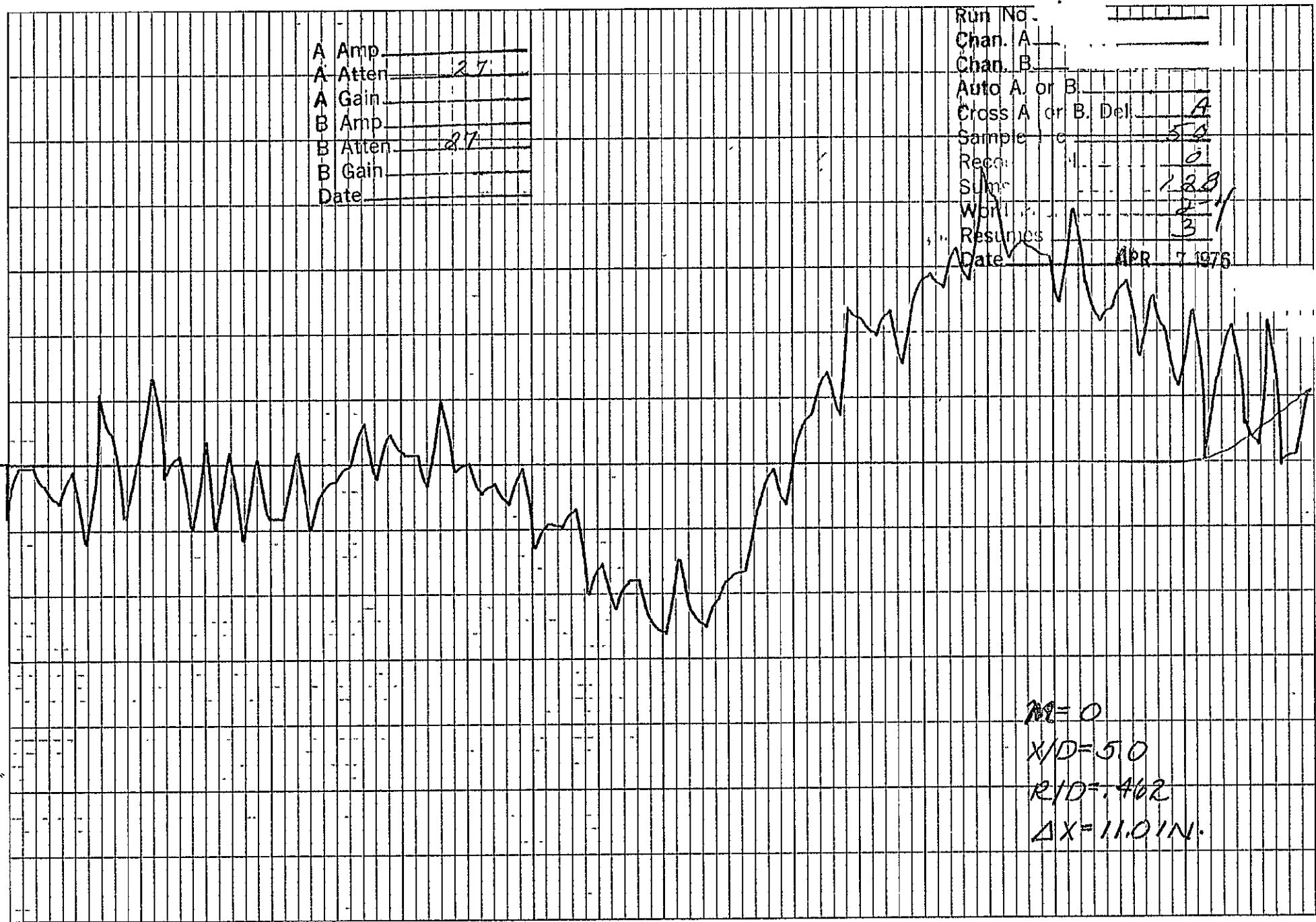
ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B. Del. A  
Sample c 50  
Reco. 0  
Sum 1.20  
Wrt. 2-1  
Resumes 3  
Date APR 7 1976

D-31

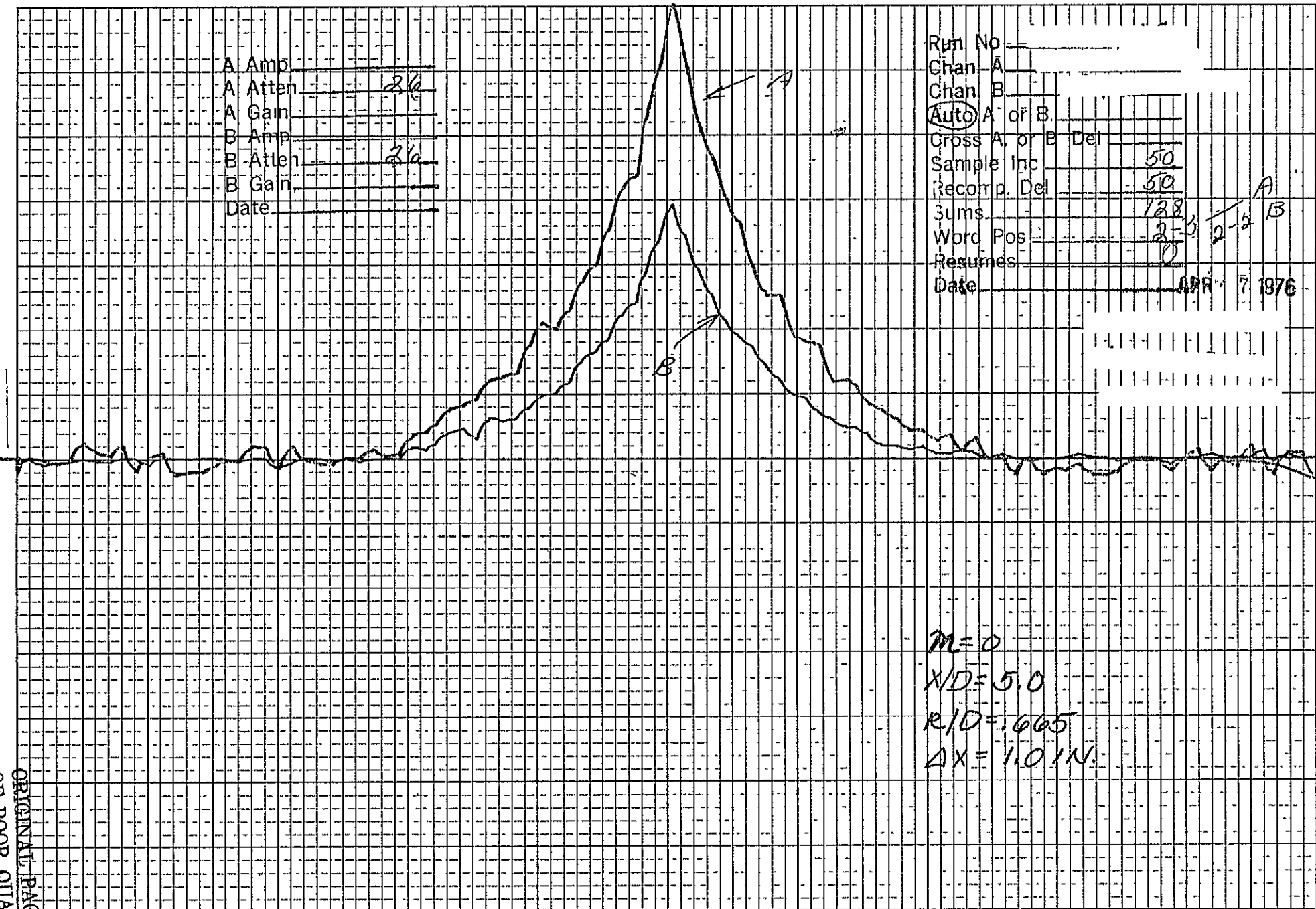
A 1 1/2



~~M~~ = 0  
X/D = 5.0  
R/D = .462  
 $\Delta X = 11.0 \text{ IN.}$

A Amp \_\_\_\_\_  
 A Atten 2/6  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 2/6  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No \_\_\_\_\_  
 Chan A \_\_\_\_\_  
 Chan B \_\_\_\_\_  
 (Auto) A or B \_\_\_\_\_  
 Cross A or B Del \_\_\_\_\_  
 Sample Inc 50  
 Recomp. Del 50  
 Sums 128  
 Word Pos 2-3 2-2 A B  
 Resumes 0  
 Date APR 7 1976



M=0  
 X/D=5.0  
 R/D=.665  
 AX=1.0 IN.

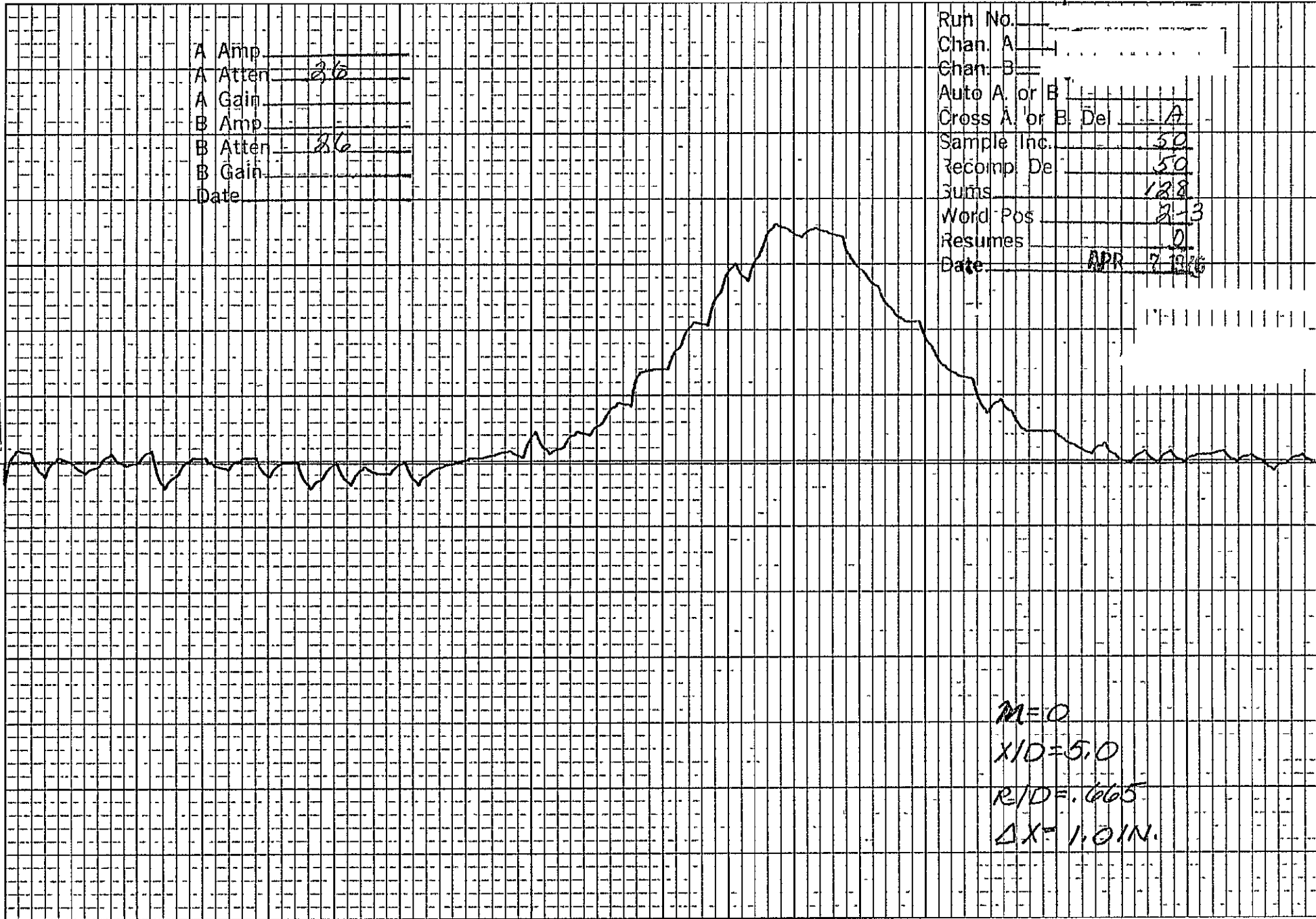
D-32

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del A  
Sample Inc. 50  
Recomp. De 50  
Sums 128  
Word Pos 2-3  
Resumes 0  
Date APR 7 1966

D-33

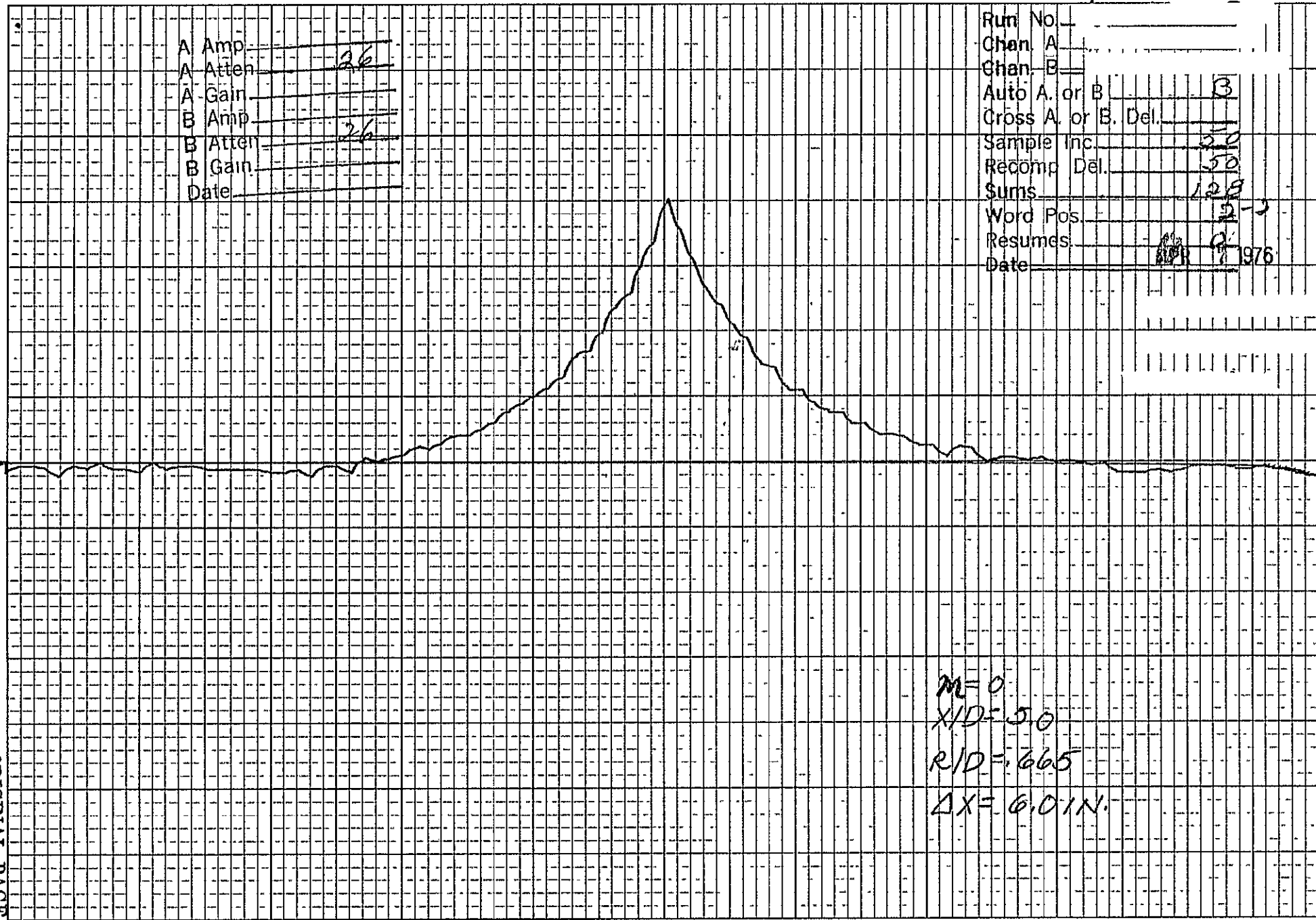


M=0  
X/D=5.0  
R/D=.665  
 $\Delta X=1.01N.$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 30  
Recomp Del. 50  
Sums 128  
Word Pos. 2-3  
Resumes. 9  
Date APR 9 1976

D-34



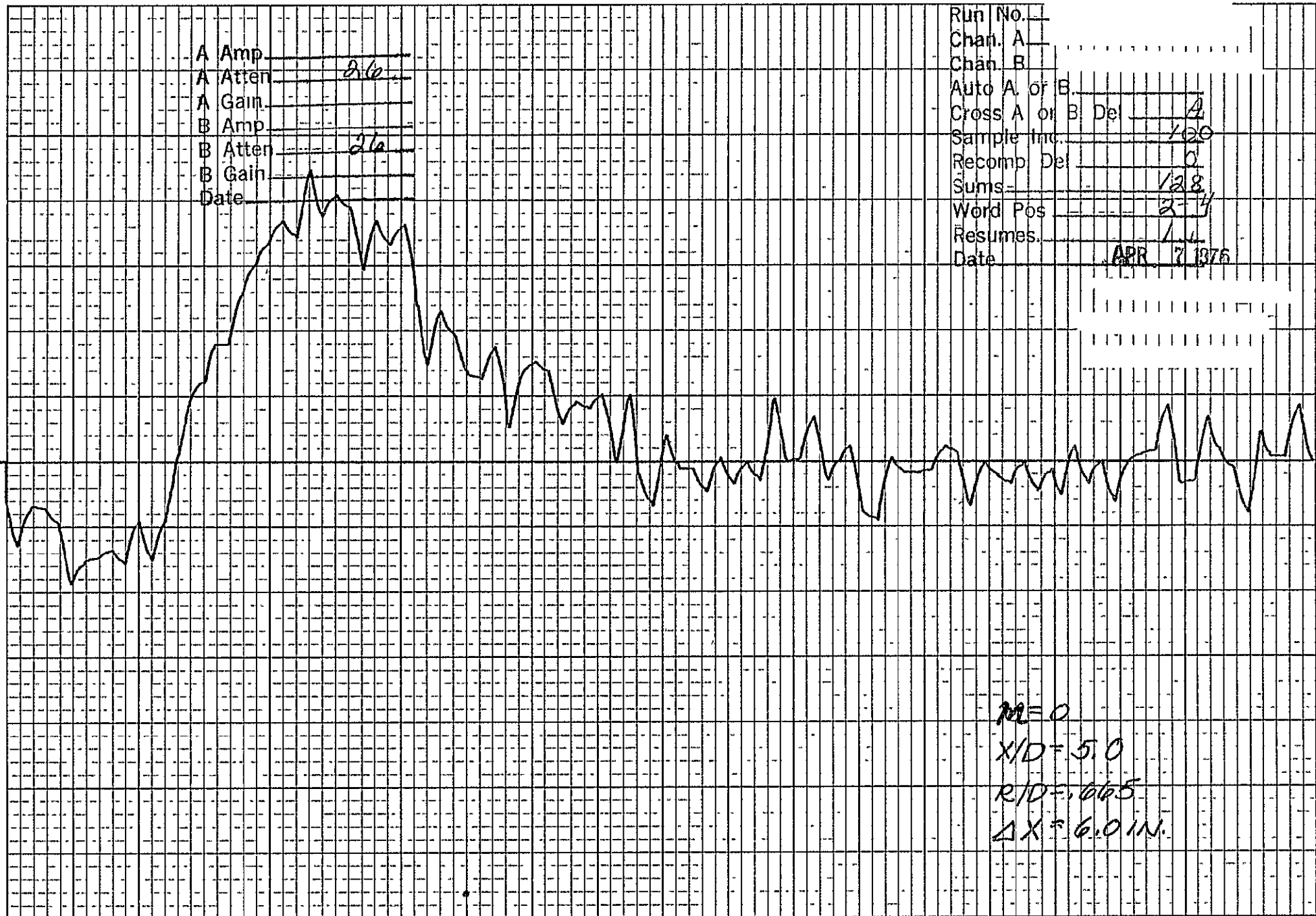
M=0  
X/D=5.0  
R/D=6.65  
 $\Delta X = 6.0 \text{ IN.}$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A or B. Det. A  
Sample Inc. 100  
Recomp. Det. 0  
Sums 128  
Word Pos 2-4  
Resumes 1-4  
Date APR 7 1976

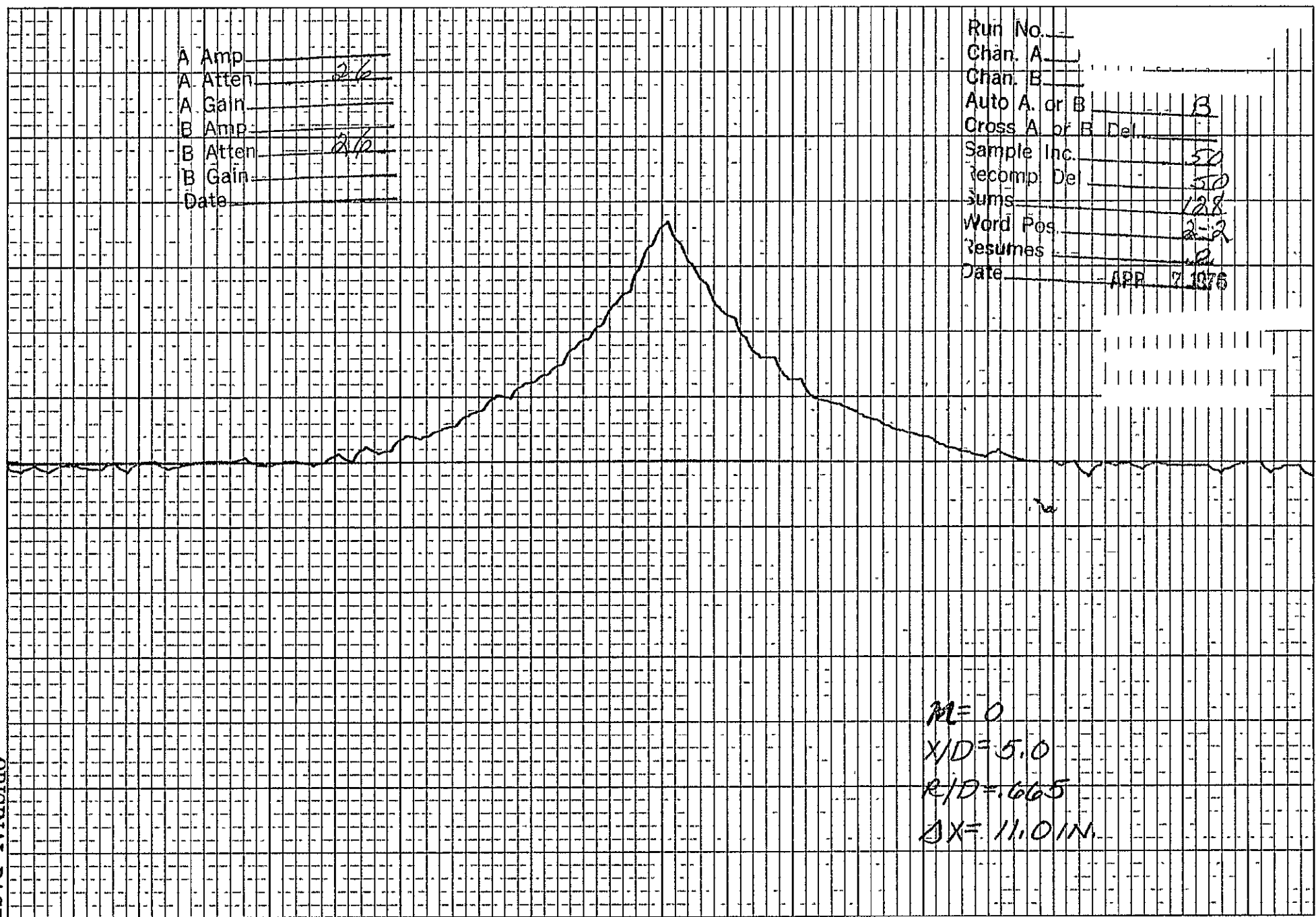
D-35



$M=0$   
 $X/D=5.0$   
 $R/D=0.65$   
 $\Delta X=6.0 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A     
Chan. B \_\_\_\_\_  
Auto A. or B.   B    
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 50  
recomp. Del. 50  
Sums 128  
Word Pos. 2-2  
Resumes     
Date   APR 7 1976  



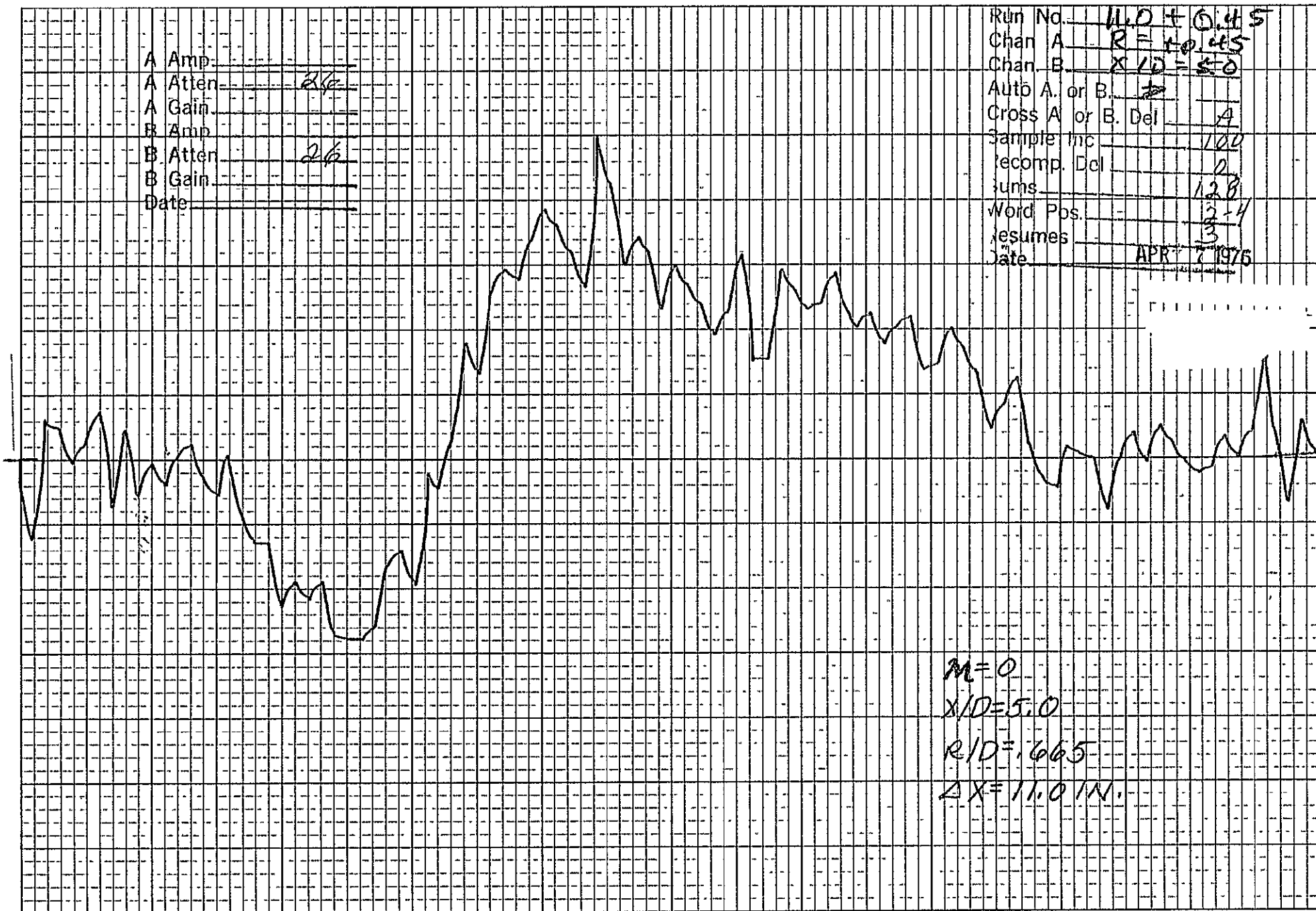
M=0  
X/D=5.0  
R/D=665  
ΔX=11.0 IN.

D-36  
ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp. \_\_\_\_\_  
A Atten. 26  
A Gain. \_\_\_\_\_  
B Amp. \_\_\_\_\_  
B Atten. 26  
B Gain. \_\_\_\_\_  
Date \_\_\_\_\_

Run No. 11.0 + 0.45  
Chan A R = 10.45  
Chan B X/D = 5.0  
Auto A. or B. A  
Cross A. or B. Del. A  
Sample Inc. 100  
Recomp. Del. 2  
Sums 128  
Word Pos. 3-4  
Resumes 3  
Date APR 7 1975

D-37

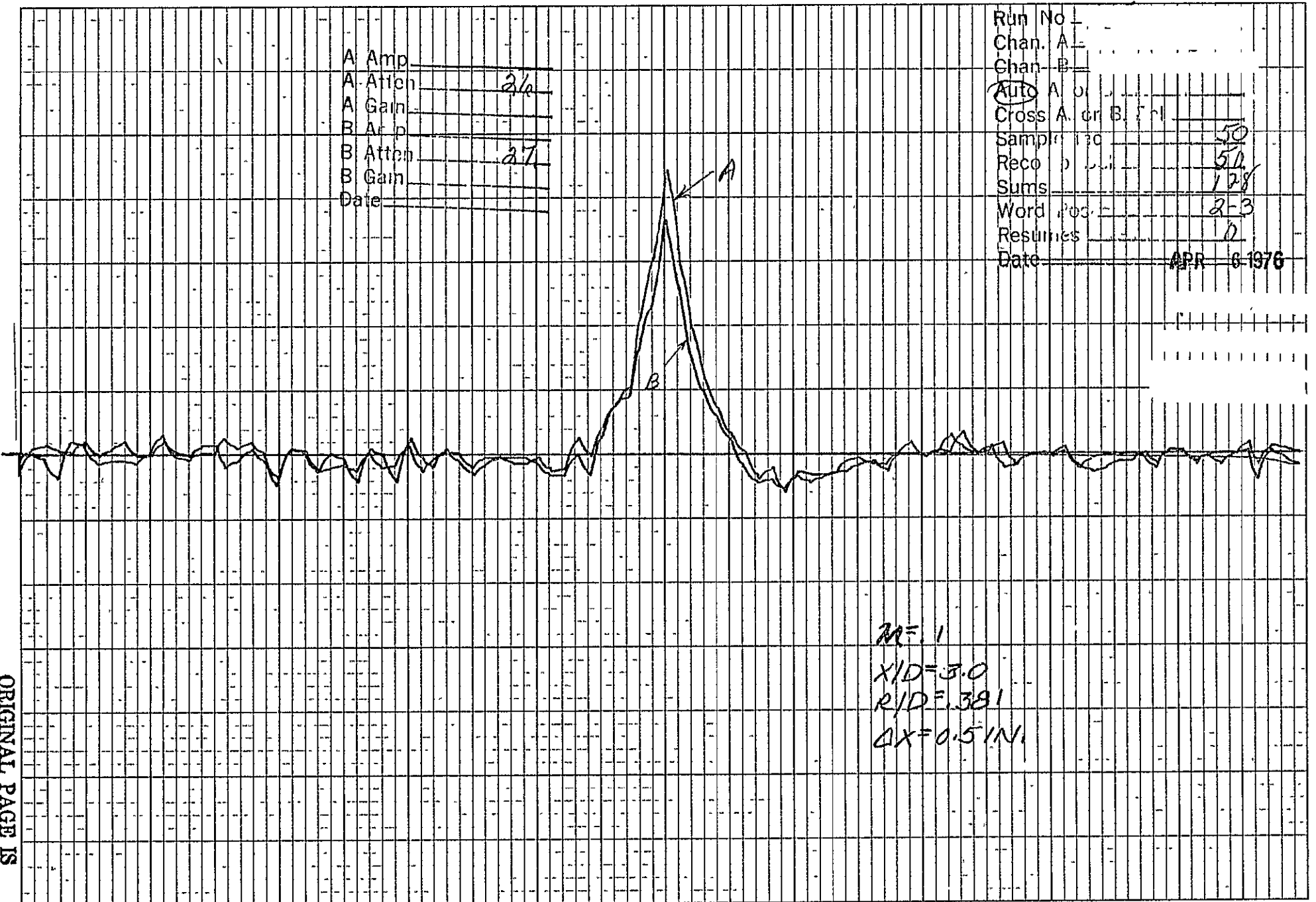


M=0  
X/D=5.0  
R/D=665  
 $\Delta X = 11.0 IN.$



A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. or B. F. H. \_\_\_\_\_  
Sampling Rate 50  
Reco. D. \_\_\_\_\_ 50  
Sums \_\_\_\_\_ 128  
Word Proc. \_\_\_\_\_ 2-3  
Resolves \_\_\_\_\_ 0  
Date \_\_\_\_\_ APR 6 1976



$M=1$   
 $X/D=3.0$   
 $R/D=.381$   
 $\Delta X=0.5 IN.$

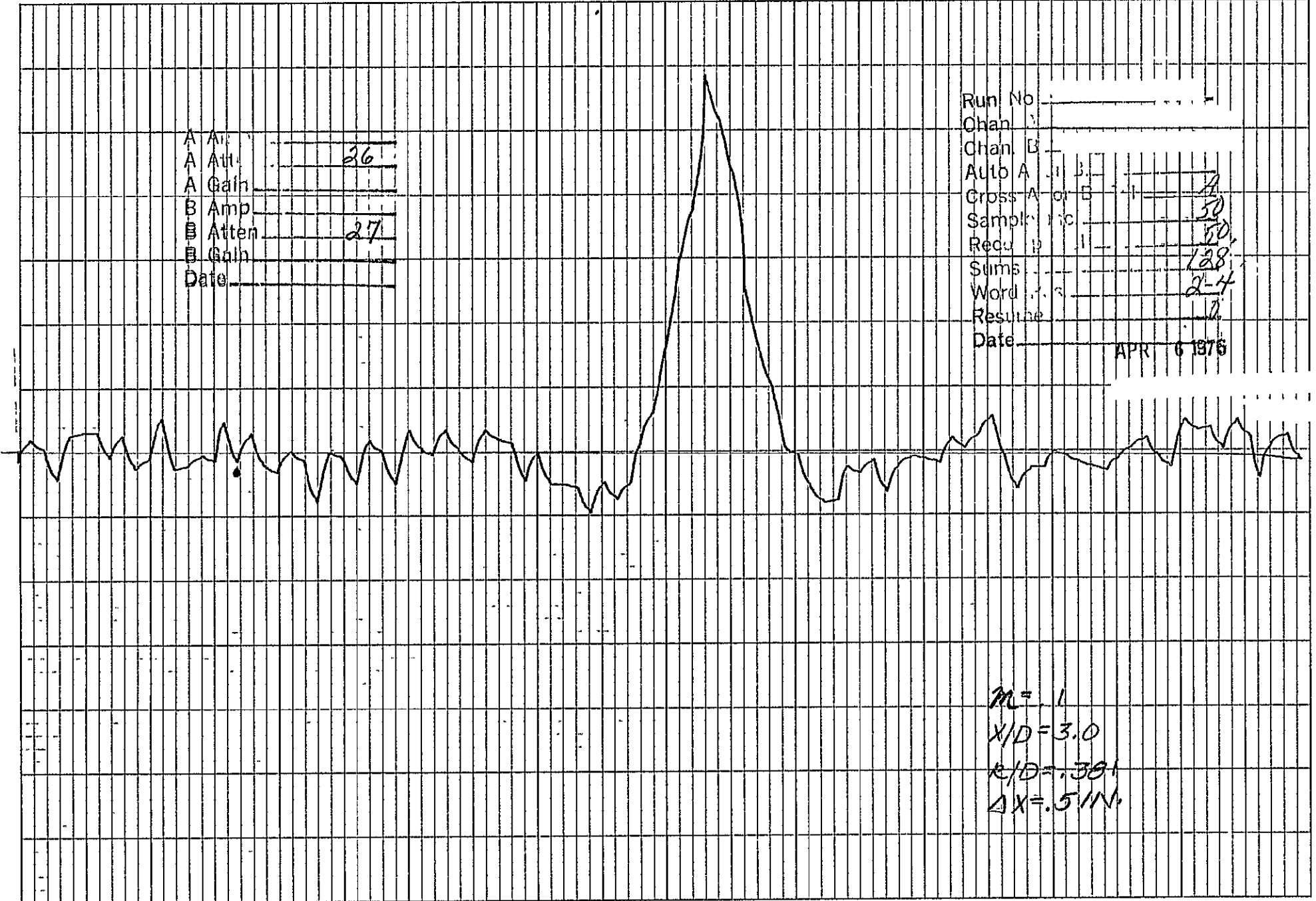
D-38

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Att. 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A    \_\_\_\_\_  
Cross A or B   A  
Sample Rate 50  
Rec. p. 50  
Sums 128  
Word Length 2-4  
Res. 2  
Date APR 6 1976

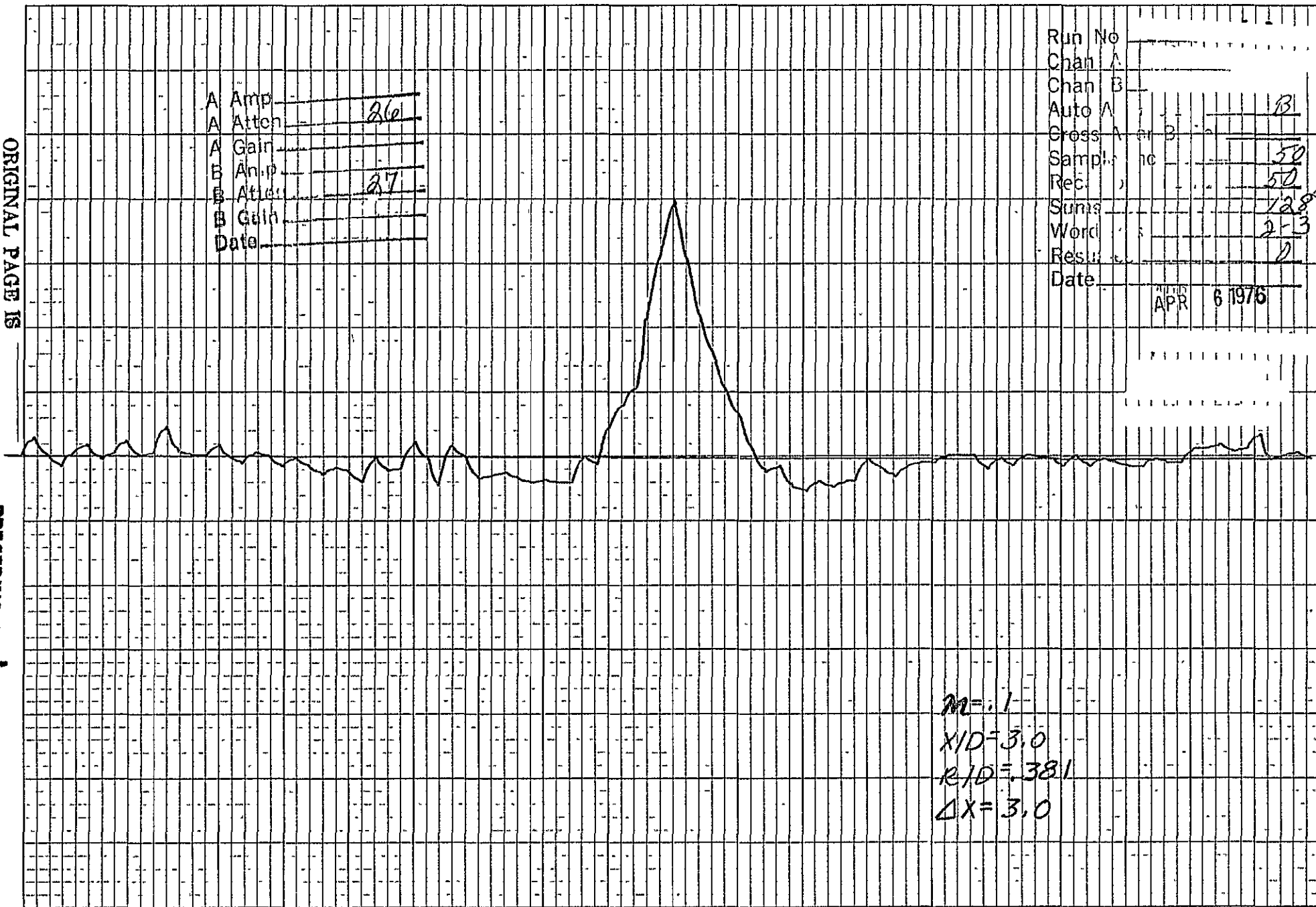
D-39



$m = 1$   
 $X/D = 3.0$   
 $R/D = .381$   
 $\Delta X = .5/W$

A Amp \_\_\_\_\_  
A Atten. 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A  B   
Cross A or B \_\_\_\_\_  
Sample No \_\_\_\_\_ 50  
Rec. No \_\_\_\_\_ 50  
Summ. \_\_\_\_\_ 128  
Words \_\_\_\_\_ 253  
Res. \_\_\_\_\_ 1  
Date \_\_\_\_\_  
APR 6 1976



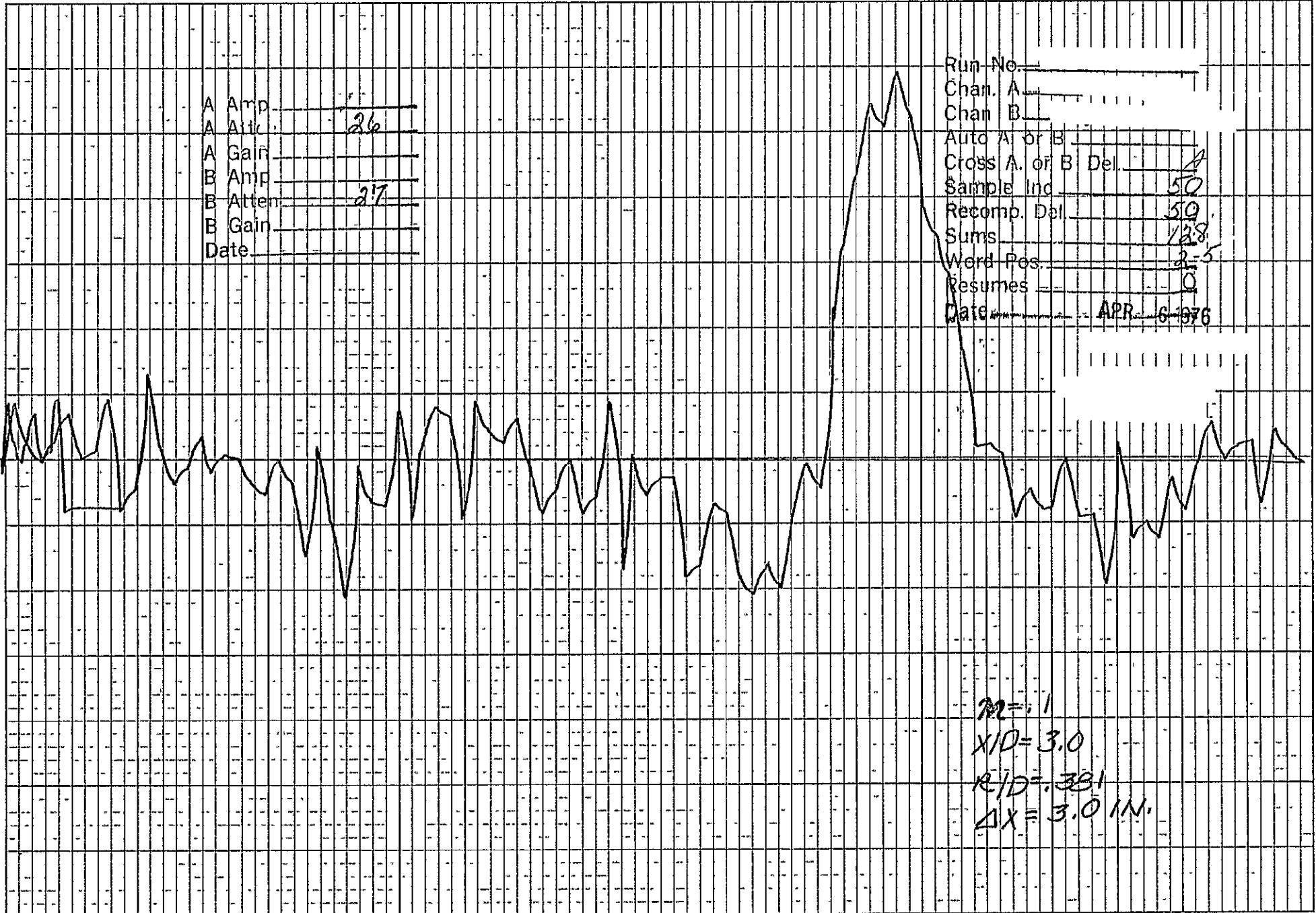
$M = 1$   
 $X/D = 3.0$   
 $R/D = 381$   
 $\Delta X = 3.0$

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OF POOR QUALITY  
D-40  
PRECEDING PAGE BLANK NOT FILMED

A Amp \_\_\_\_\_  
A Attc. 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. of B Del. A  
Sample Inc. 50  
Recomp. Del. 50  
Sums 128  
Word Pos. 2-5  
Resumes 0  
Date APR. 6 1976

D41

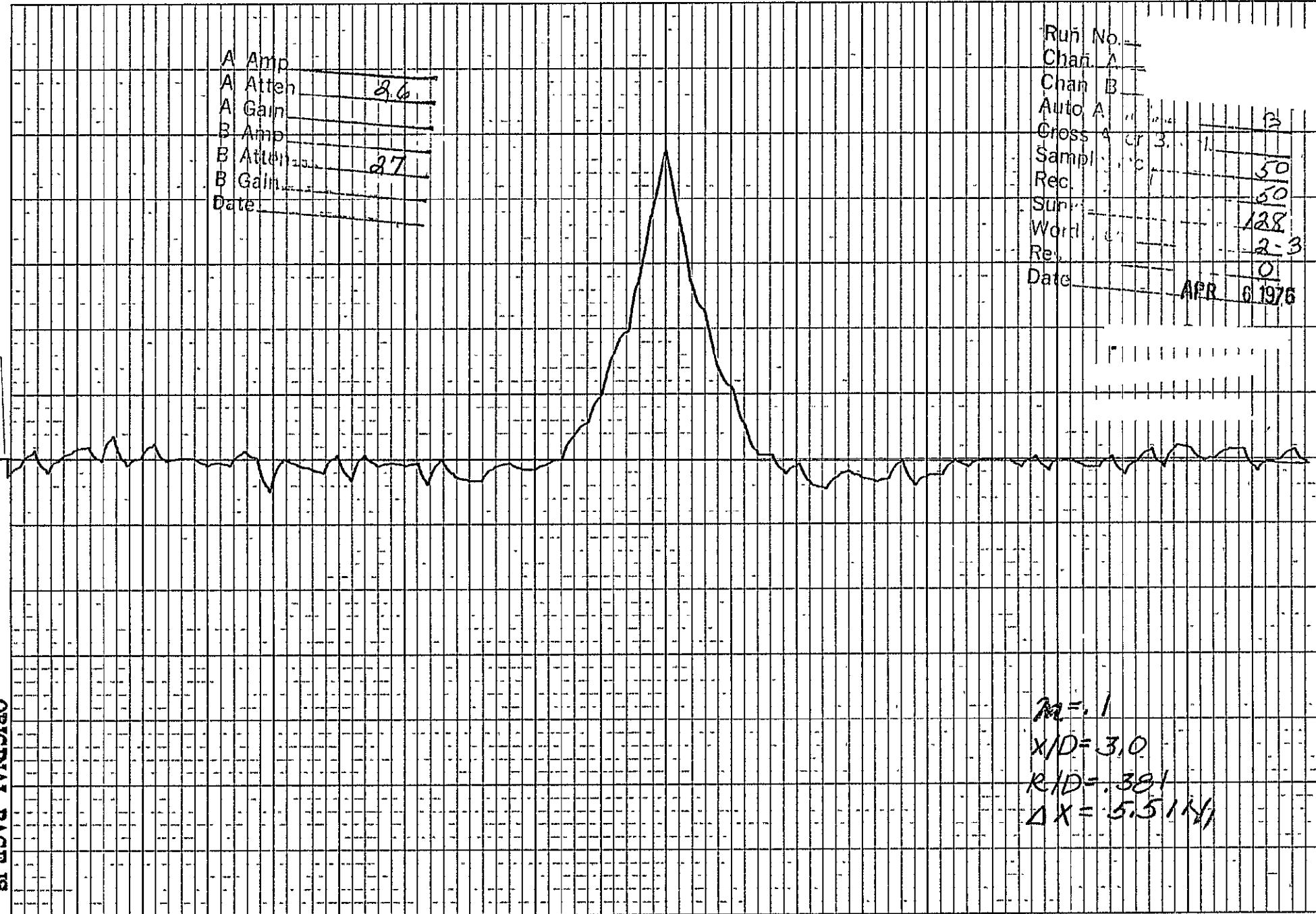


$R=1$   
 $X/D=3.0$   
 $R/D=381$   
 $\Delta X=3.0 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A \_\_\_\_\_  
Cross A 3  
Sampl. 50  
Rec. 50  
Surr. 128  
Word 2-3  
Re. 0  
Date APR 6 1976

D42

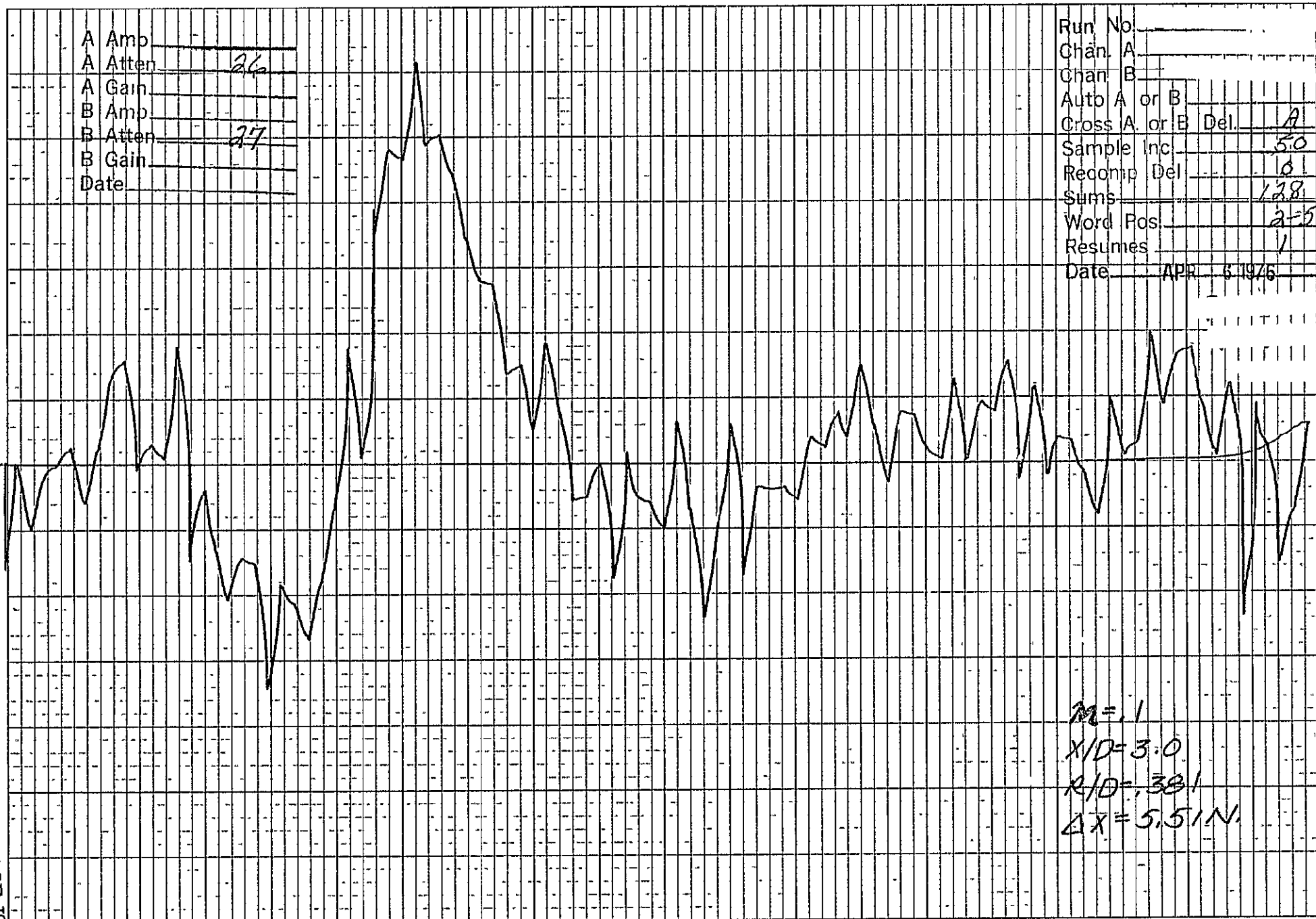


$M = .1$   
 $X/D = 3.0$   
 $R/D = .381$   
 $\Delta X = 5.51 \mu V$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. or B Del. A  
Sample Inc. 50  
Recomp Del. 0  
Sums 128  
Word Pos. 2-5  
Resumes 1  
Date APR 5 1976



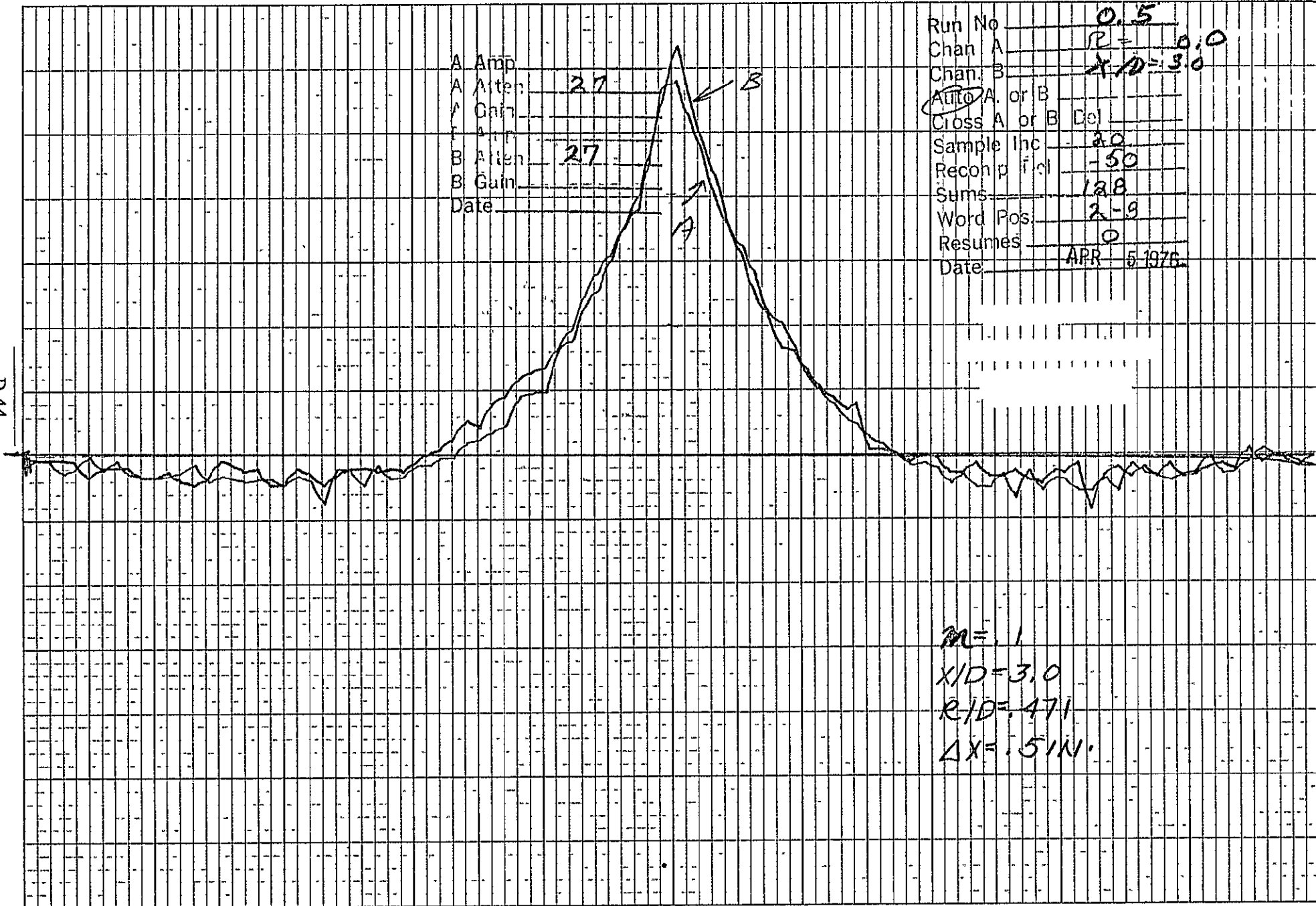
$M=1$   
 $X/D=3.0$   
 $R/D=.381$   
 $\Delta X=5.51N.$

D-43

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten: 27  
A Gain \_\_\_\_\_  
B Atten: 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No: 0.5  
Chan A: R = 0.0  
Chan B: A/D = 3.0  
 Auto A or B  
Cross A or B Del: \_\_\_\_\_  
Sample Inc: 20  
Recon p: -50  
Sums: 128  
Word Pos: 2-9  
Resumes: 0  
Date: APR 5 1976

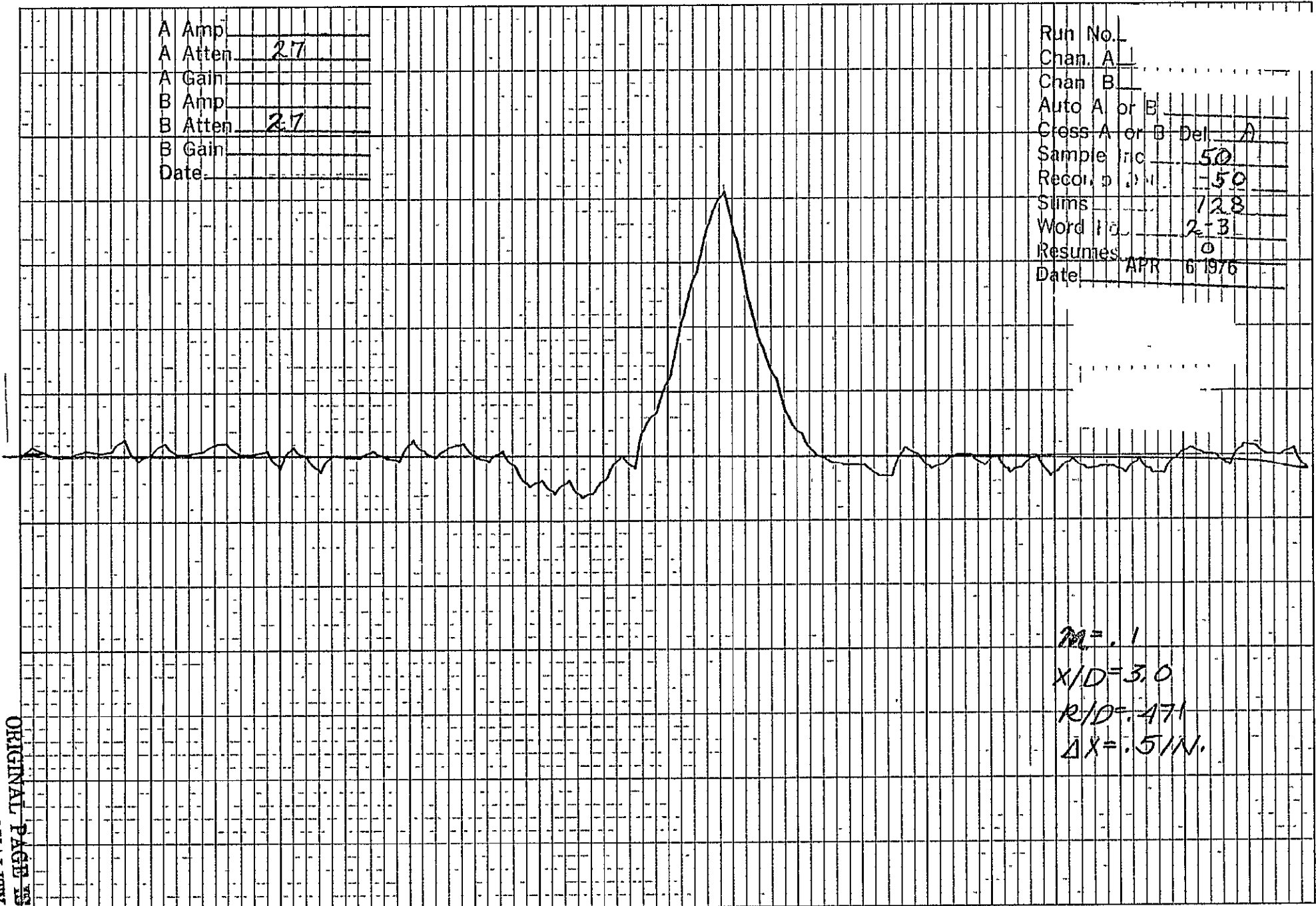


D-44

$M = 1$   
 $X/D = 3.0$   
 $R/D = 471$   
 $\Delta X = .5 IN.$

A Amp \_\_\_\_\_  
A Atten 2.7  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 2.7  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del. A  
Sample Freq 50  
Recor. p. Vol. -50  
Slits \_\_\_\_\_  
Word No. 2-31  
Resumes 0  
Date APR 6 1976



$M = .1$   
 $X/D = 3.0$   
 $R/D = .471$   
 $\Delta X = .51N.$

D-45

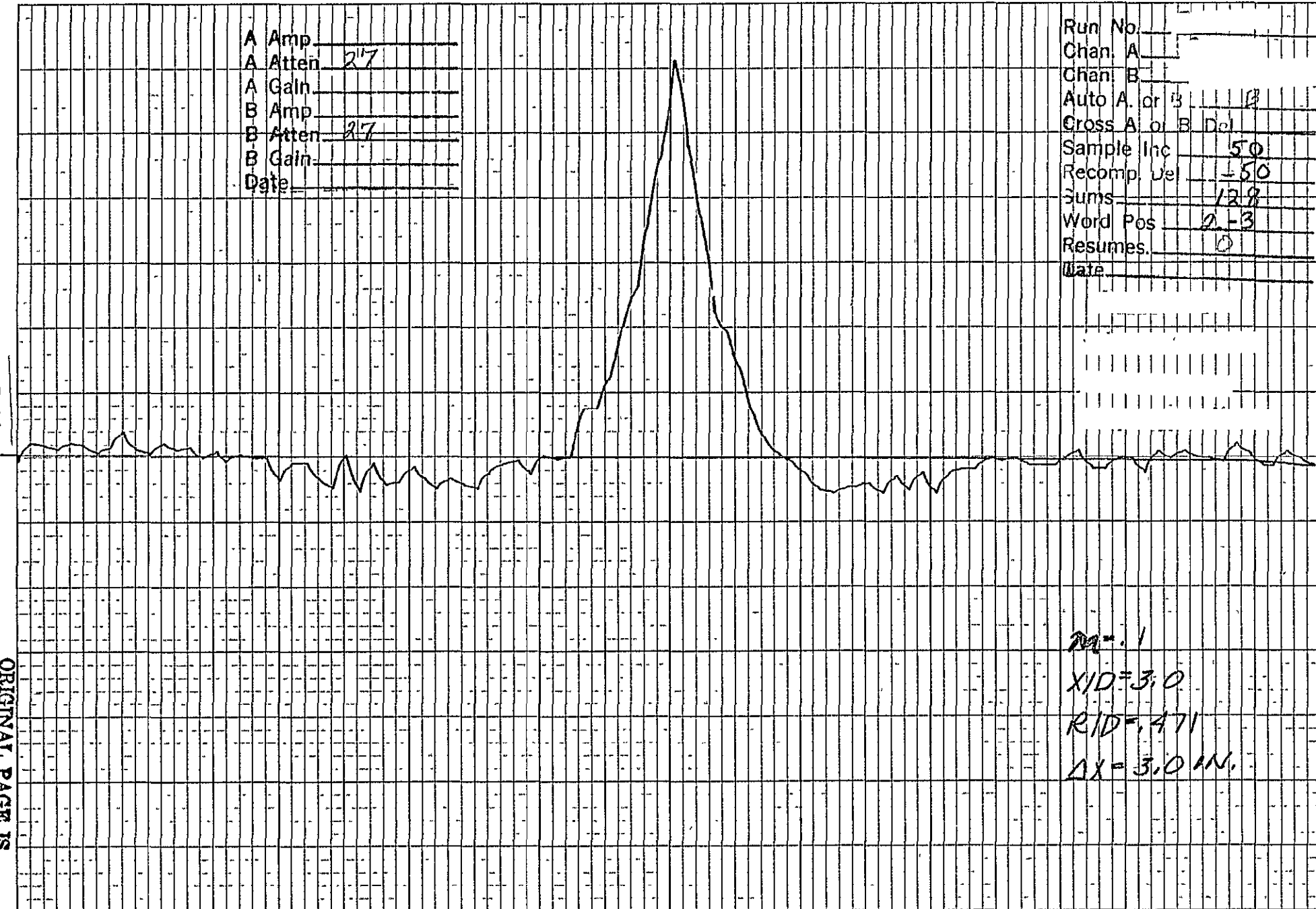
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OF POOR QUALITY



A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Del \_\_\_\_\_  
Sample Inc 50  
Recomp. Del 50  
Sums 128  
Word Pos 2-3  
Resumes 0  
Date \_\_\_\_\_

D-46



$M = .1$   
 $XID = 3.0$   
 $RID = .471$   
 $\Delta X = 3.0 \text{ IN.}$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

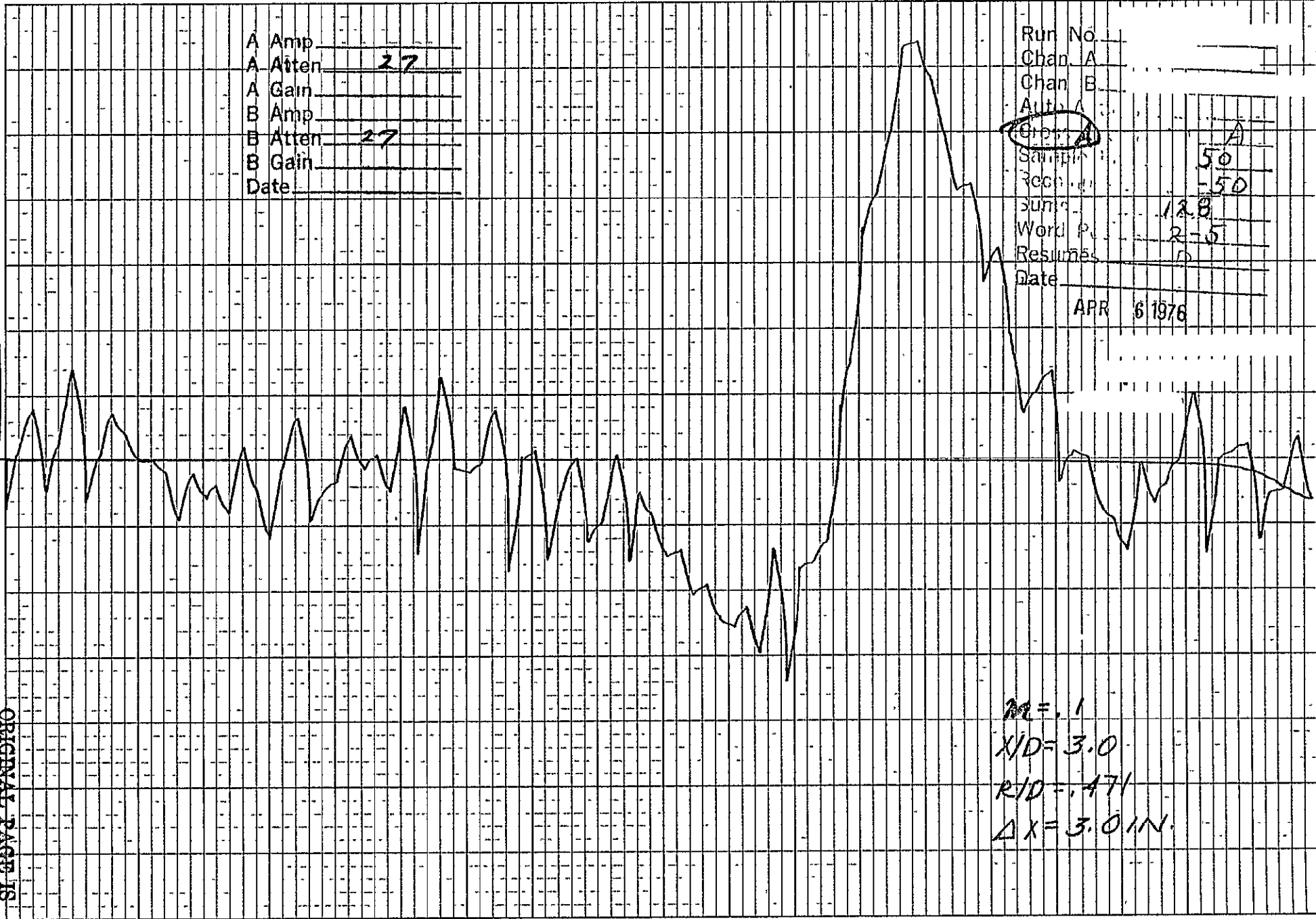
Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A \_\_\_\_\_  
Gain A  
Sampling \_\_\_\_\_  
Recd \_\_\_\_\_  
Summ \_\_\_\_\_  
Word P. 2-5  
Resumes \_\_\_\_\_  
Date \_\_\_\_\_

APR 6 1976

D-47

ORIGINAL PAGE IS  
OF POOR QUALITY

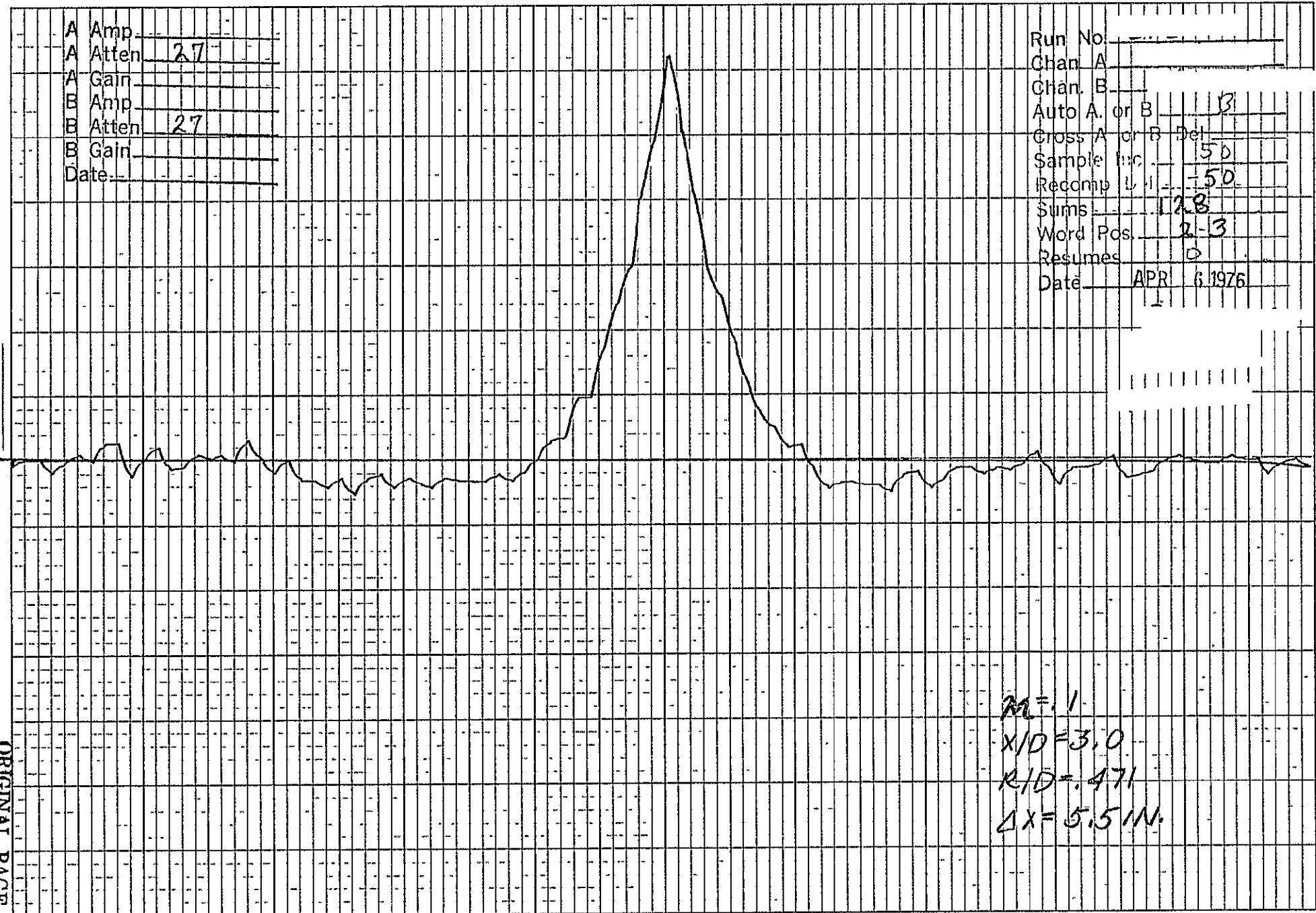
$M = .1$   
 $X/D = 3.0$   
 $R/D = .471$   
 $\Delta X = 3.0 IN.$



A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date: \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 50  
Recomp. Del. 50  
Sums 128  
Word Pos. 2-3  
Resumes 0  
Date APR 6 1976

D-48



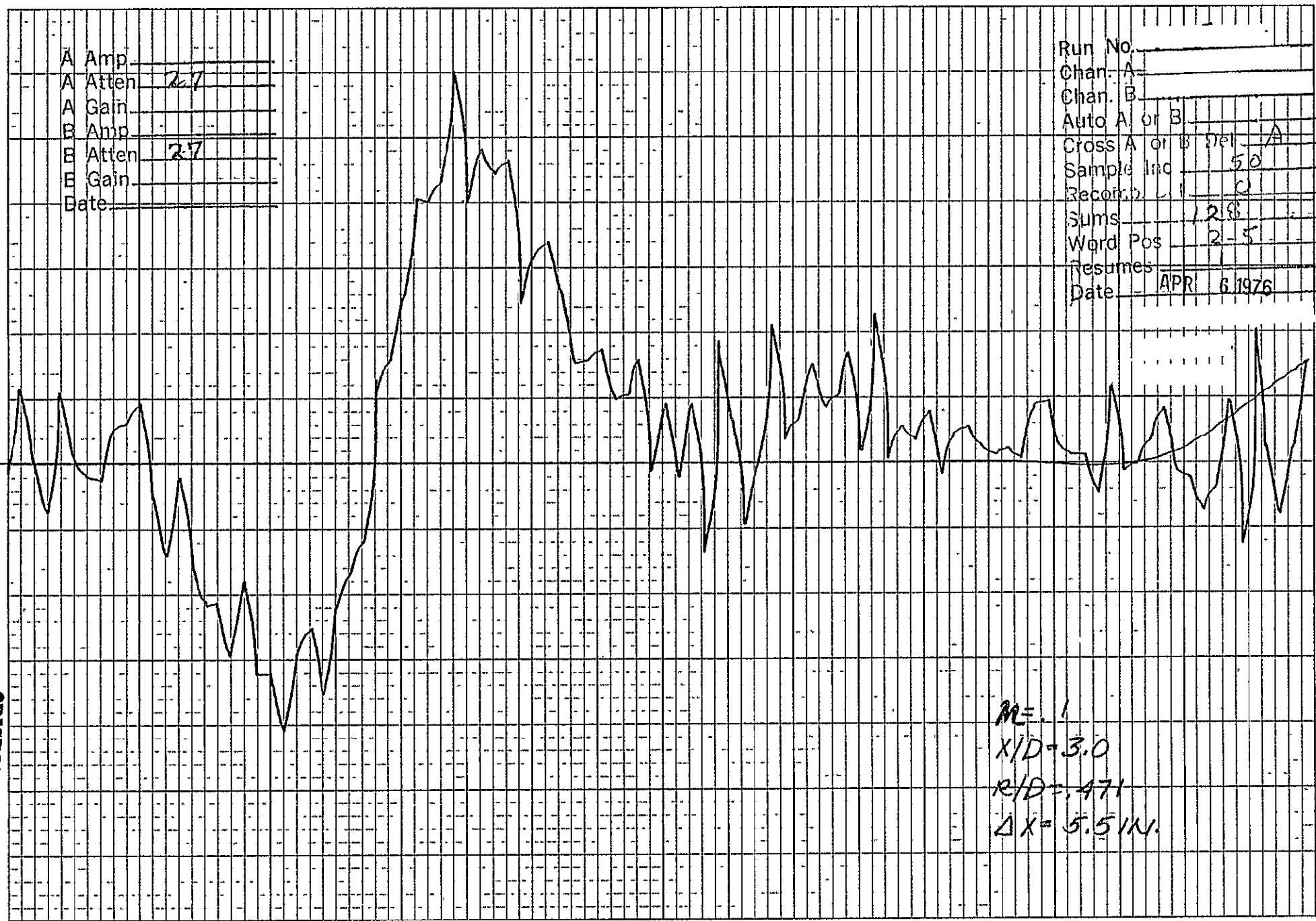
$M = 1$   
 $X/D = 3.0$   
 $R/D = .471$   
 $\Delta X = 5.5 \text{ IN.}$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 2.7  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 2.7  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Sel A  
Sample Inc 50  
Records 2  
Sums 128  
Word Pos 2-5  
Resumes \_\_\_\_\_  
Date APR 6 1976

D-49



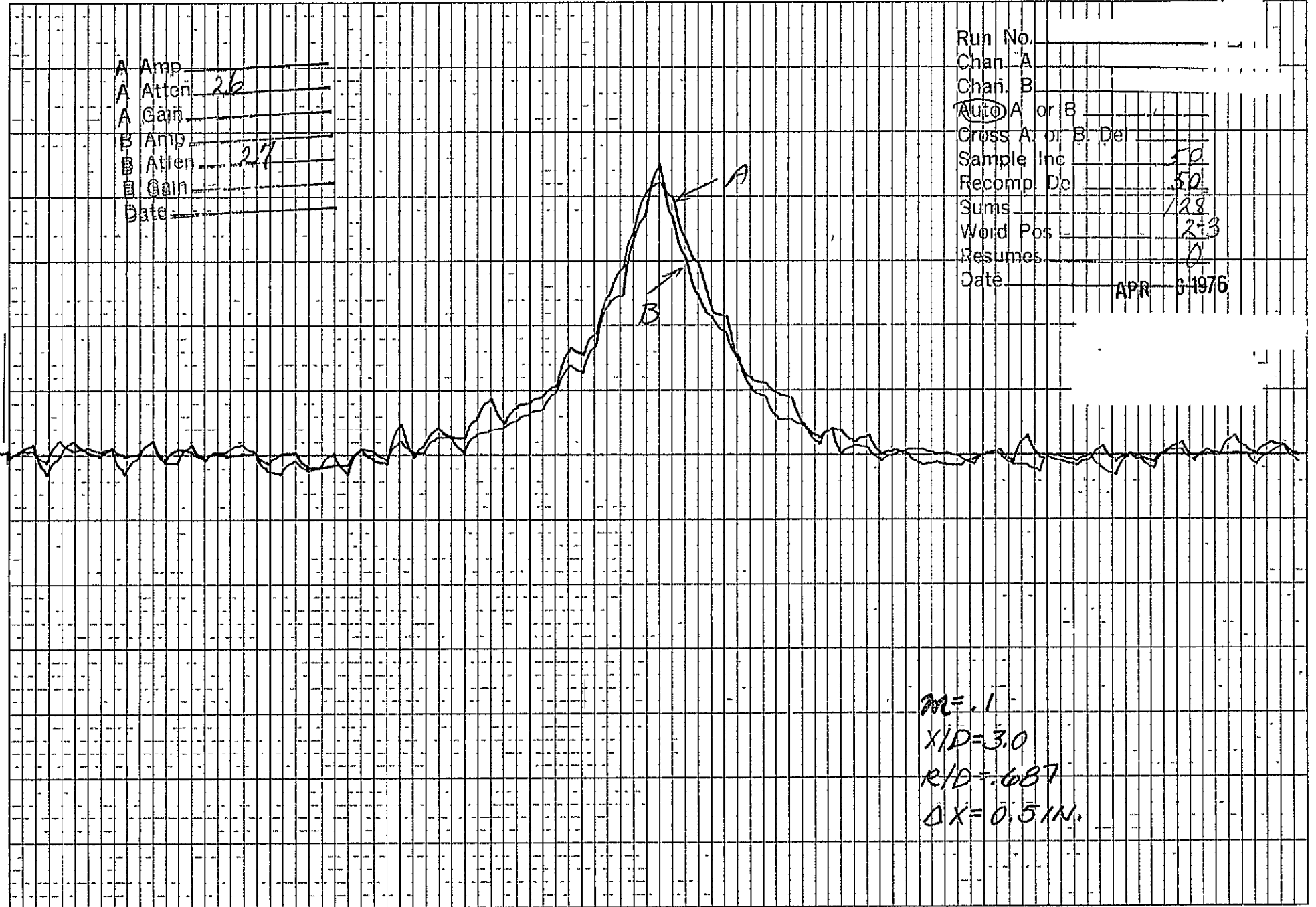
ME-1  
X/D = 3.0  
R/D = .471  
 $\Delta X = 5.5 \text{ IN.}$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
 Auto  A or B \_\_\_\_\_  
Cross A or B Det \_\_\_\_\_  
Sample Inc \_\_\_\_\_ 50  
Recomp. De \_\_\_\_\_ 50  
Sums \_\_\_\_\_ 128  
Word Pos \_\_\_\_\_ 23  
Resumes \_\_\_\_\_ 0  
Date \_\_\_\_\_ APR 6 1976

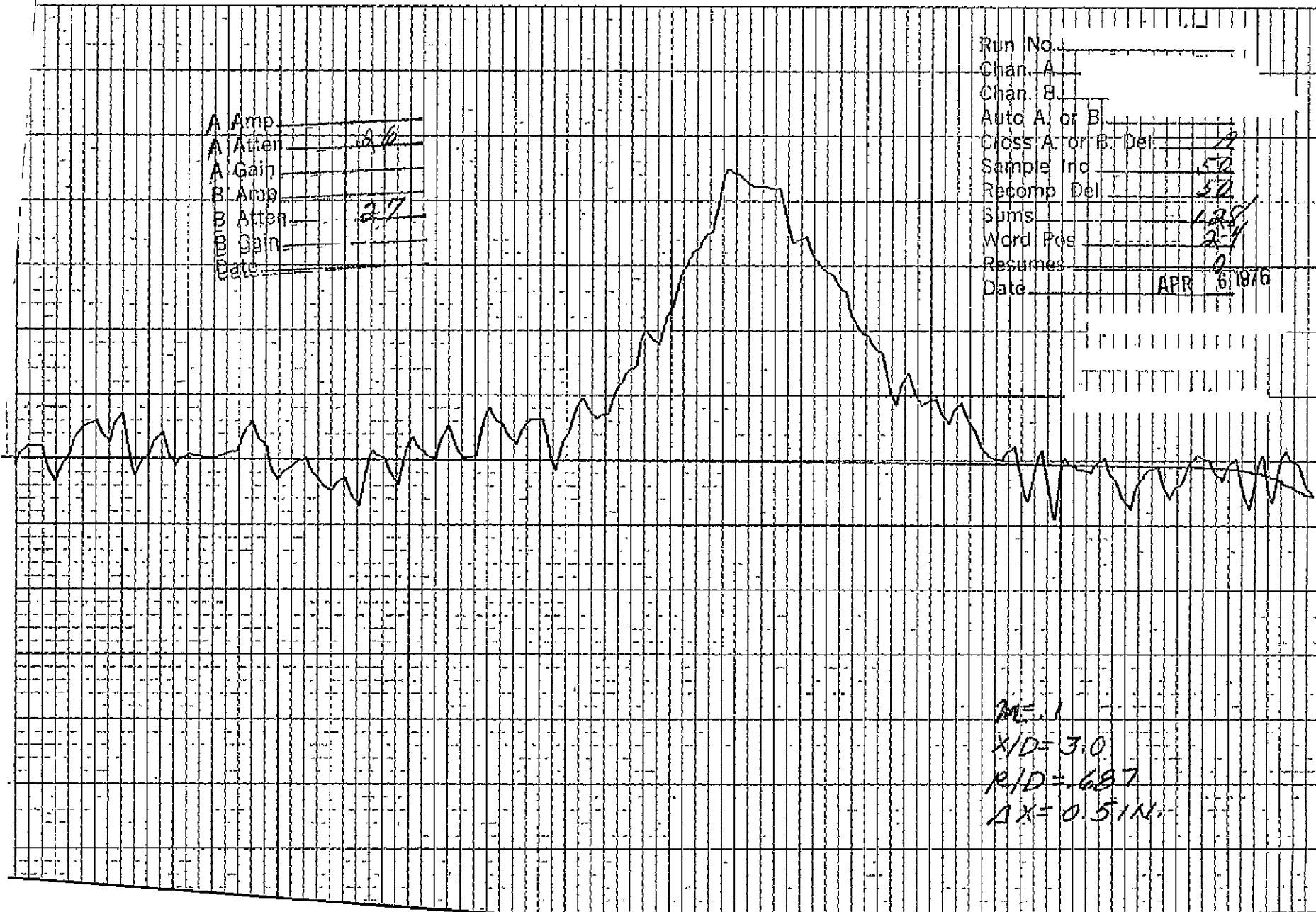
D-50



$M = .1$   
 $X/D = 3.0$   
 $R/D = .687$   
 $\Delta X = 0.51N.$

A Amp	
A Atten	26
A Gain	
B Amp	
B Atten	27
B Gain	
Gate	

Run No.	
Chan. A	
Chan. B	
Auto A. or B.	
Cross A. or B. Del.	2
Sample Inc	50
Recomp Del	50
Sum	125
Word Pos	2-4
Resumes	0
Date	APR 6 1976

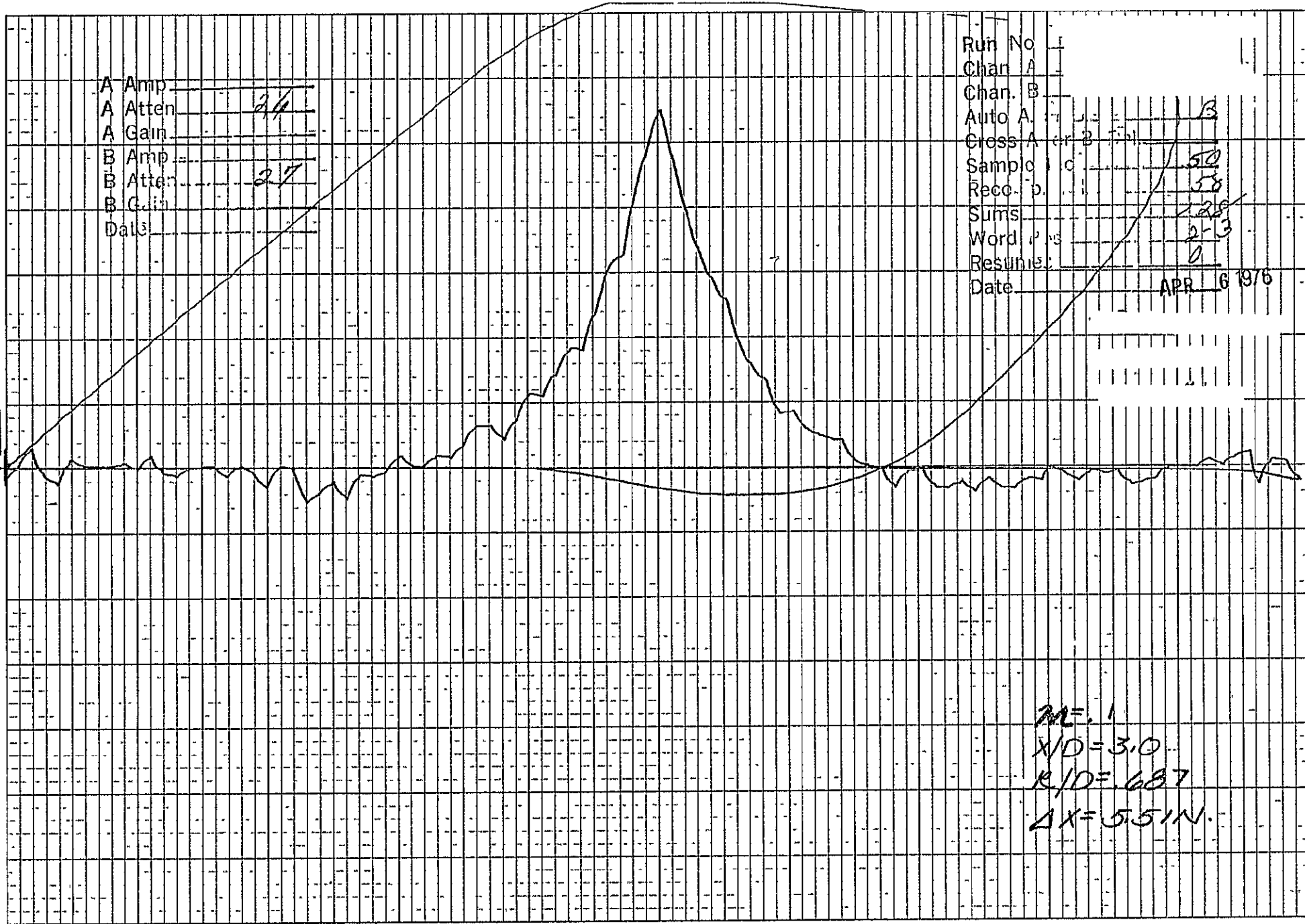


ME-1  
X/D=3.0  
R/D=687  
AX=0.5 IN.

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten: 24  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten: 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. B  
Cross A or B 1  
Sample C 50  
Rec. 58  
Sums 228  
Word P. 2-3  
Resun: 0  
Date APR 6 1976

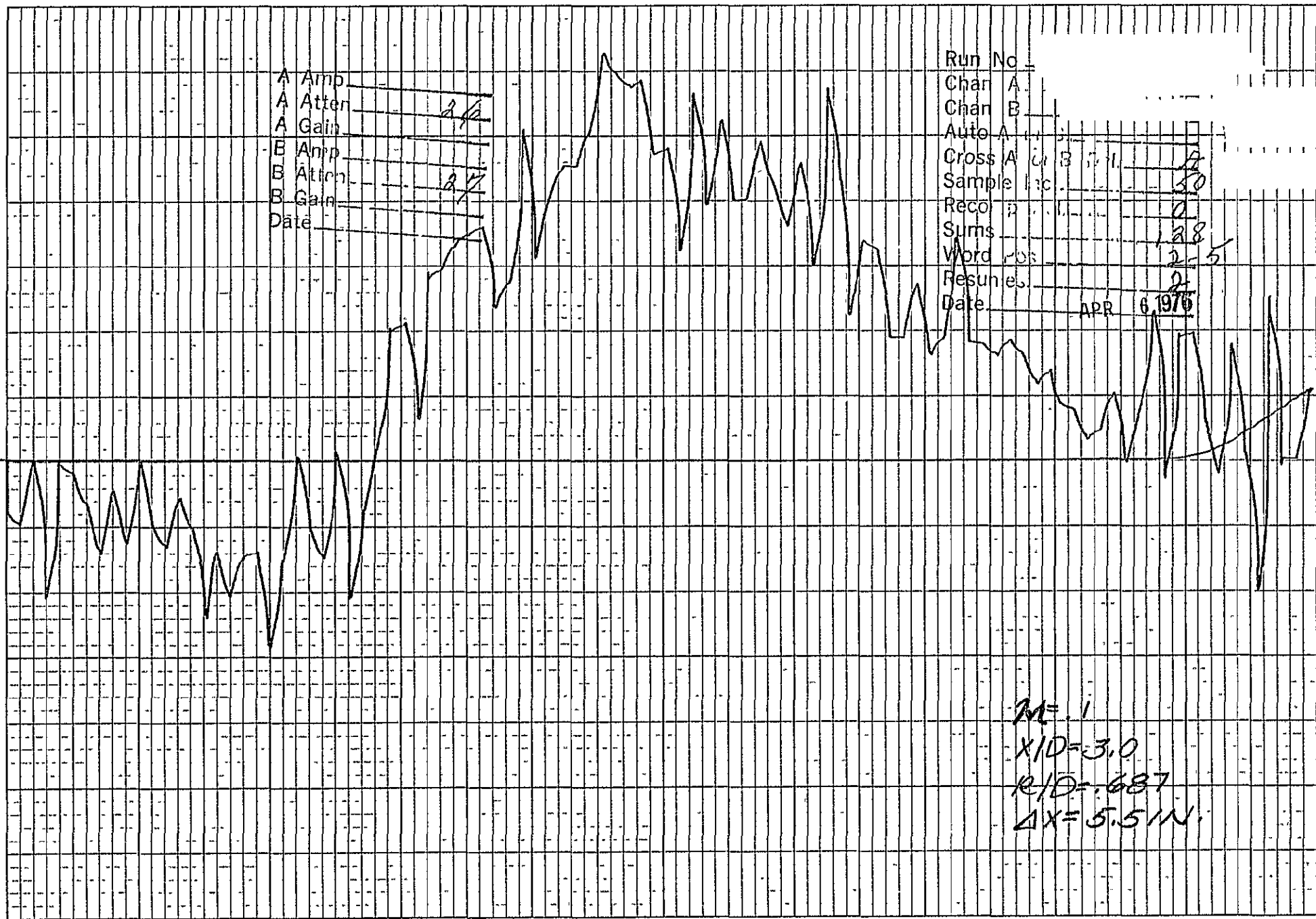


$M = 1$   
 $X/D = 3.0$   
 $R/D = 687$   
 $\Delta X = 5.5 \text{ IN.}$

D-54 PRECEDING PAGE BLANK NOT FILLED

A Amp \_\_\_\_\_  
 A Atten \_\_\_\_\_ 2.5  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten \_\_\_\_\_ 2.5  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No \_\_\_\_\_  
 Chan A \_\_\_\_\_  
 Chan B \_\_\_\_\_  
 Auto A    
 Cross A to B    
 Sample Inc. \_\_\_\_\_ 30  
 Reco. Inc. \_\_\_\_\_ 0  
 Sums \_\_\_\_\_ 128  
 Word Pos. \_\_\_\_\_ 2-51  
 Results \_\_\_\_\_ 2  
 Date \_\_\_\_\_ APR 6 1976



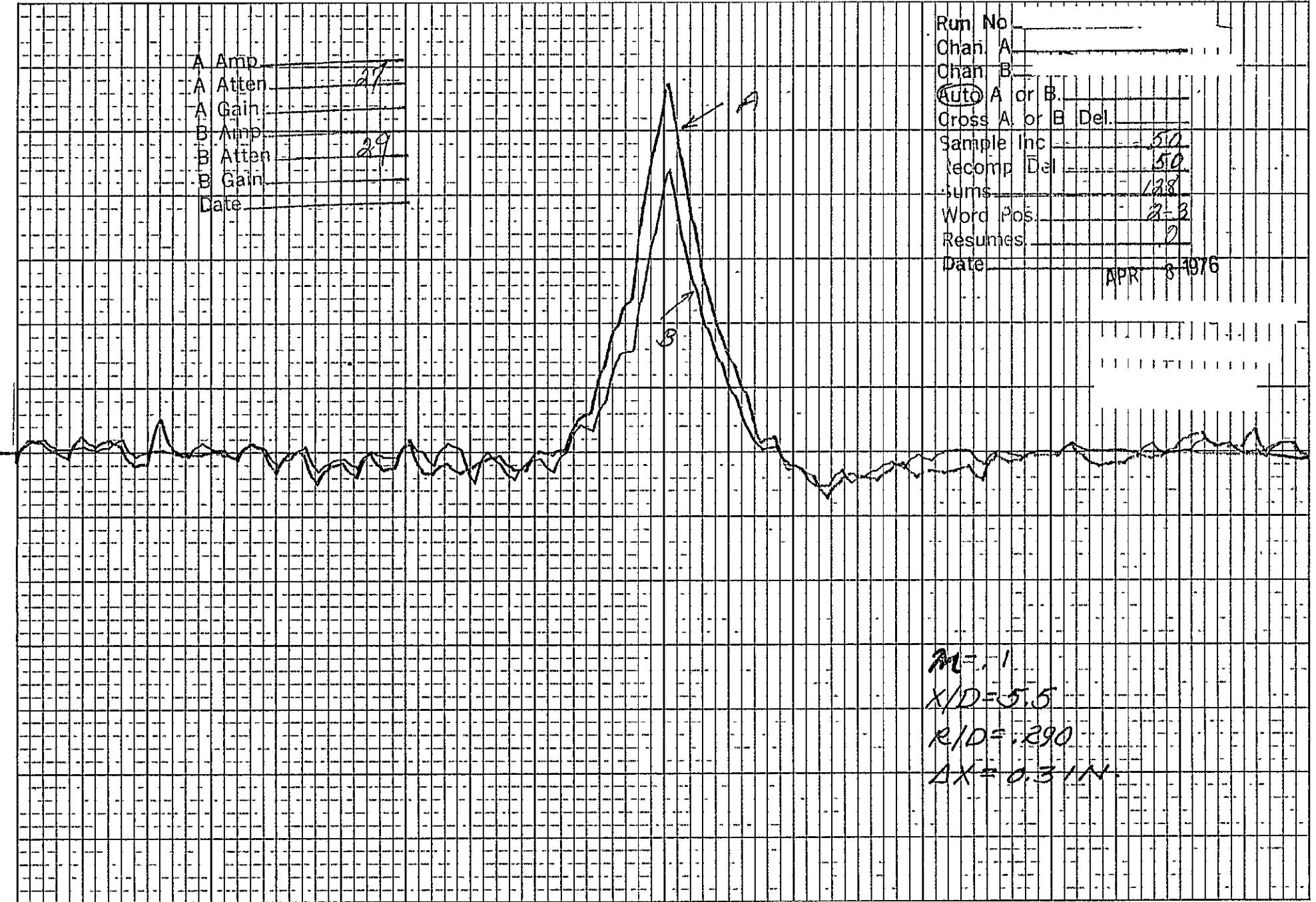
$M = 1$   
 $X/D = 3.0$   
 $R/D = .687$   
 $\Delta X = 5.51N$

D-55



A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 29  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
(AUTO) A or B \_\_\_\_\_  
Cross A or B Del. \_\_\_\_\_  
Sample Inc 50  
Recomp Del 50  
Sums 138  
Word Pos. 2-3  
Resumes 0  
Date APR 8 1976



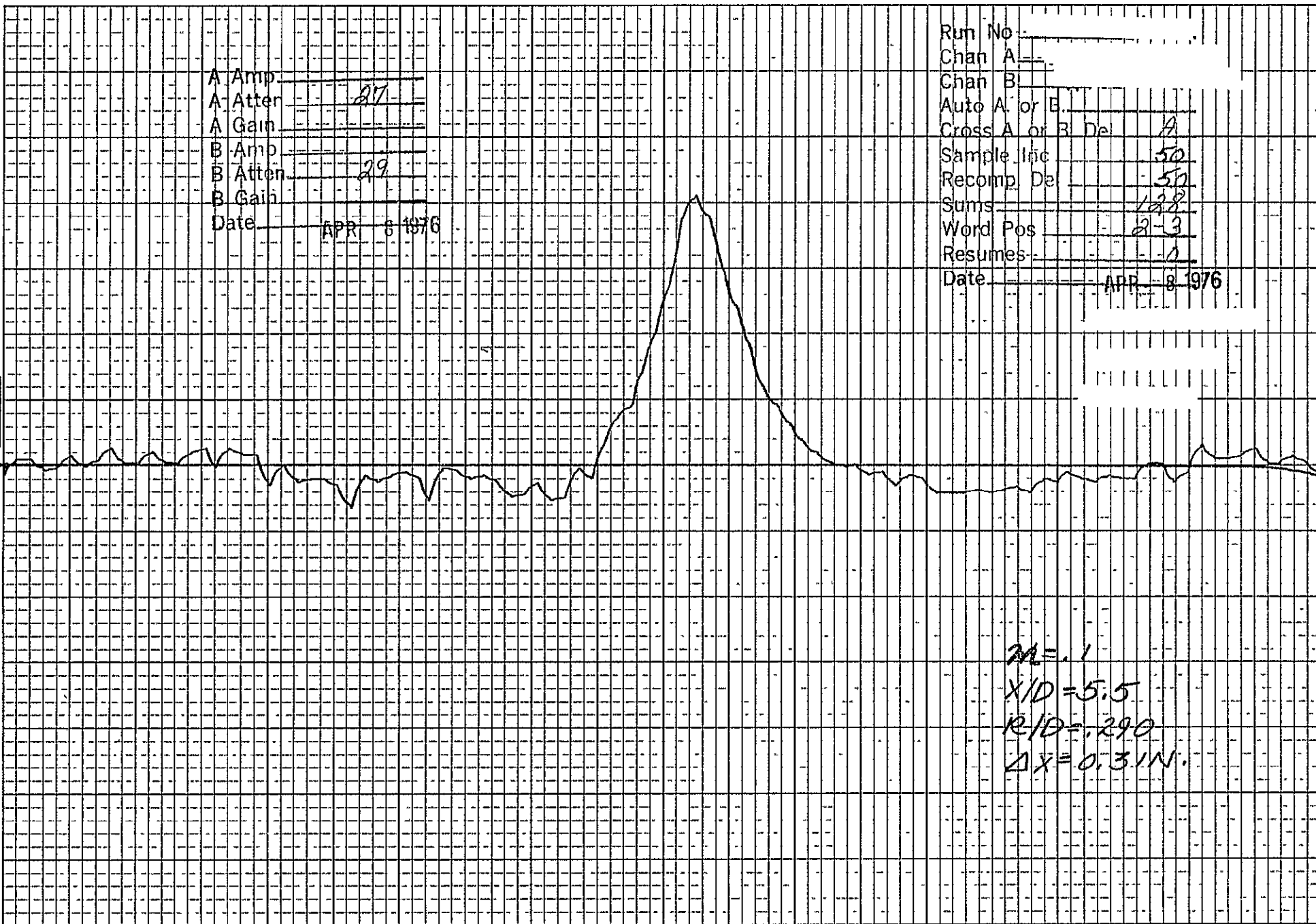
$M = .1$   
 $X/D = 5.5$   
 $R/D = .290$   
 $\Delta X = 0.31 \text{ IN.}$

D-56

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 29  
B Gain \_\_\_\_\_  
Date APR 8 1976

Run No \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B De A  
Sample Inc 50  
Recomp De 50  
Sums 128  
Word Pos 213  
Resumes 1  
Date APR 8 1976

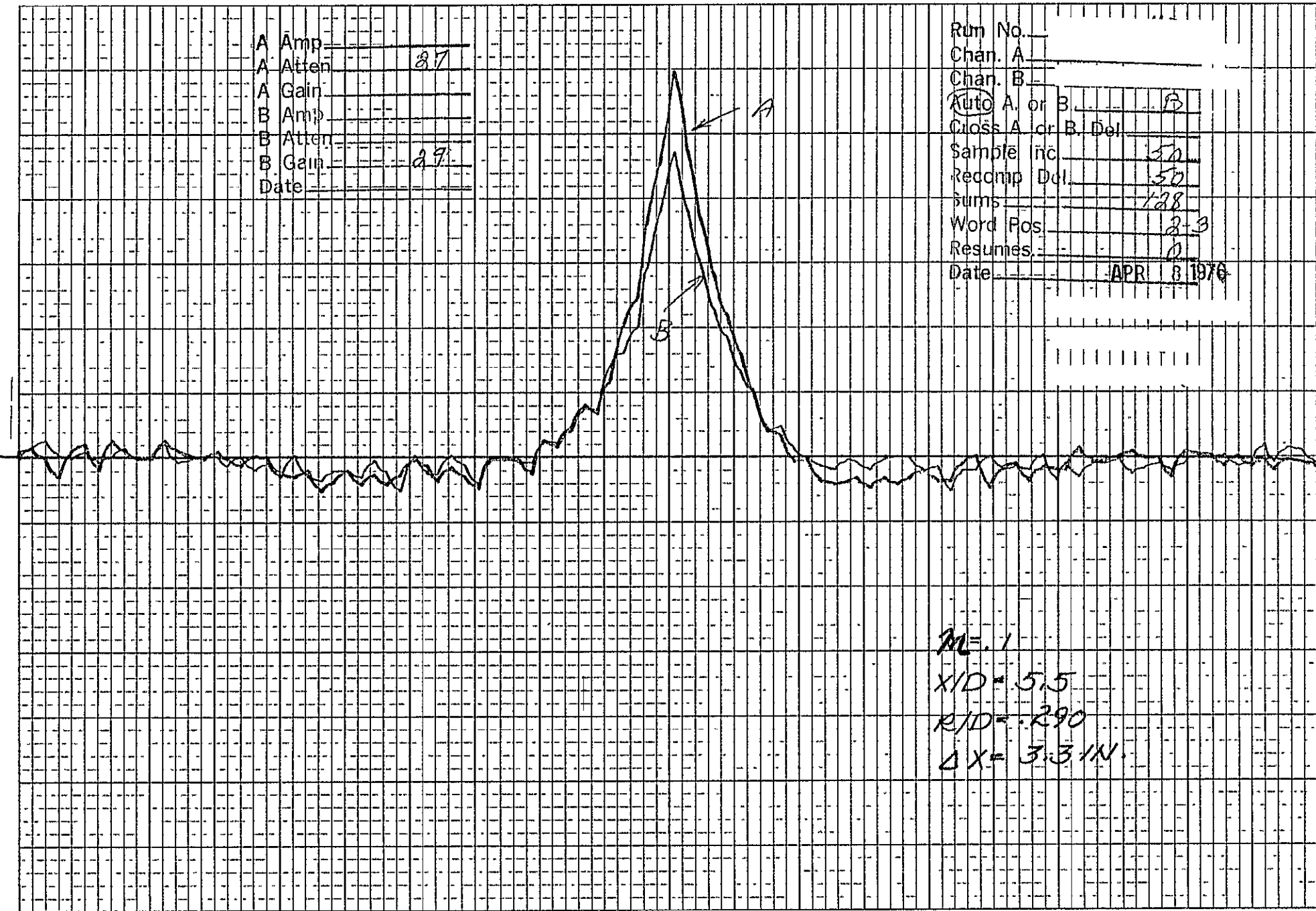
D-57



$M = 1$   
 $X/D = 5.5$   
 $R/D = .290$   
 $\Delta X = 0.31N$

A Amp \_\_\_\_\_  
 A Atten 87  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten \_\_\_\_\_  
 B Gain 27  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A. or B. B  
 Cross A. or B. Del. \_\_\_\_\_  
 Sample Inc. 50  
 Recomp Del. 50  
 Burns 128  
 Word Pos. 2-3  
 Resumes. 0  
 Date APR 8 1970



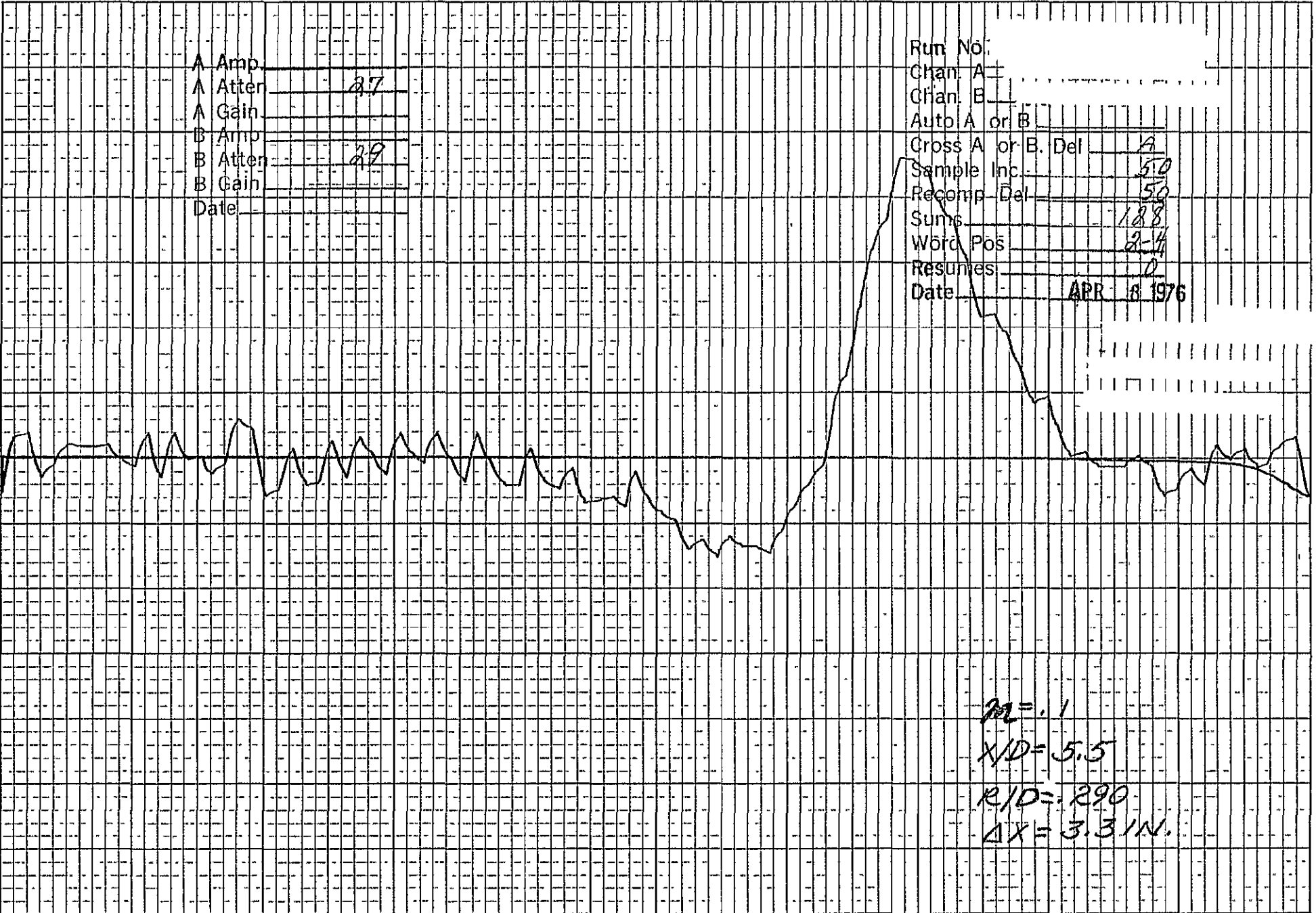
D-58

M=1  
 X/D = 5.5  
 R/D = .290  
 ΔX = 3.3 IN.

A Amp \_\_\_\_\_  
A Atter 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atter 29  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No: \_\_\_\_\_  
Chan: A \_\_\_\_\_  
Chan: B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B. Del A  
Sample Inc. 50  
Recomp Del 50  
Sums 128  
Word Pos 2-4  
Resumes 0  
Date APR 8 1976

D-59

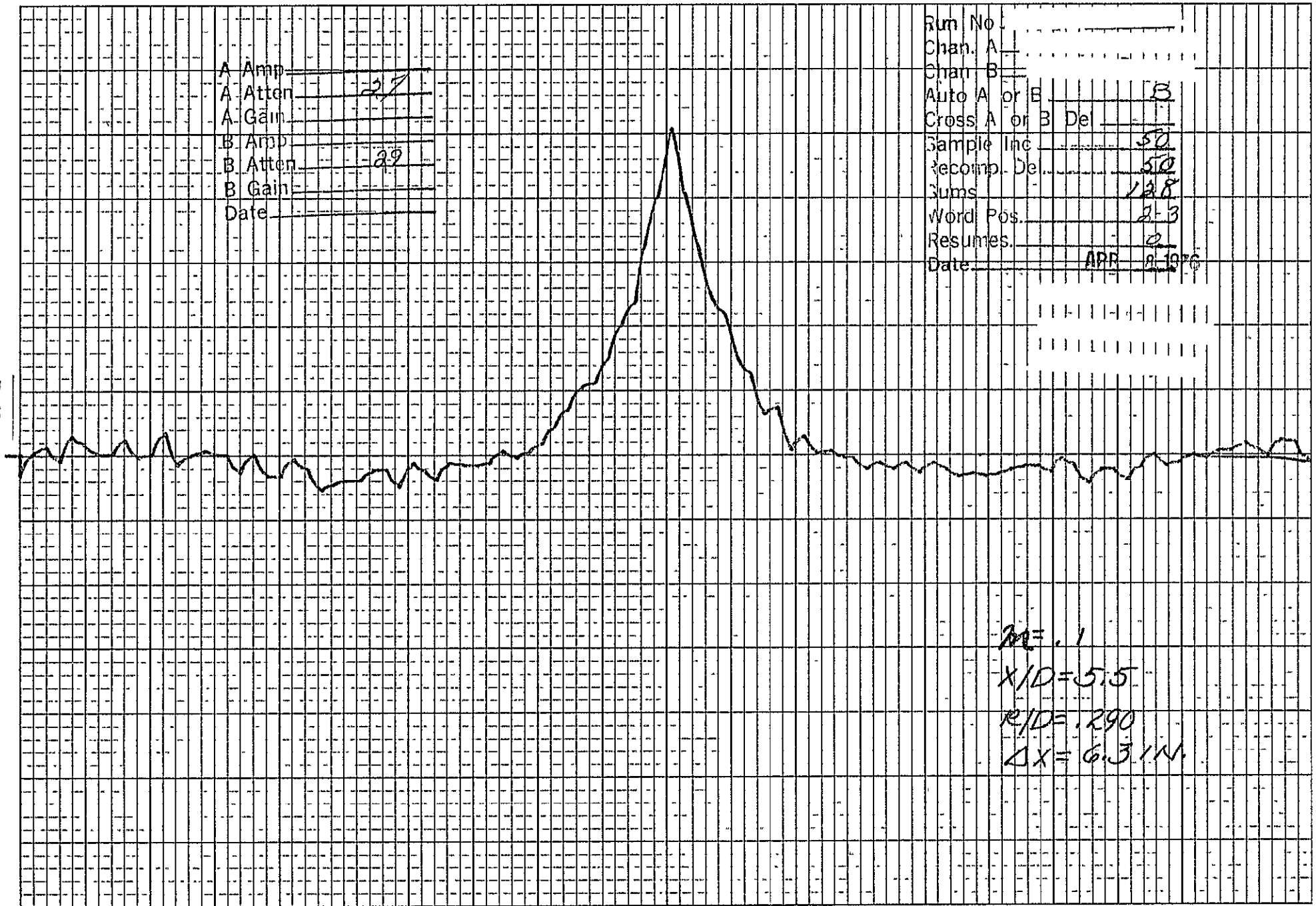


$M = .1$   
 $X/D = 5.5$   
 $R/D = .290$   
 $\Delta X = 3.31N.$

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 29  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross A or B Del \_\_\_\_\_  
Sample Inc 50  
Recomp. De 50  
Sums 128  
Word Pos. 2-3  
Resumes. 0  
Date APR 8 1976

D-60

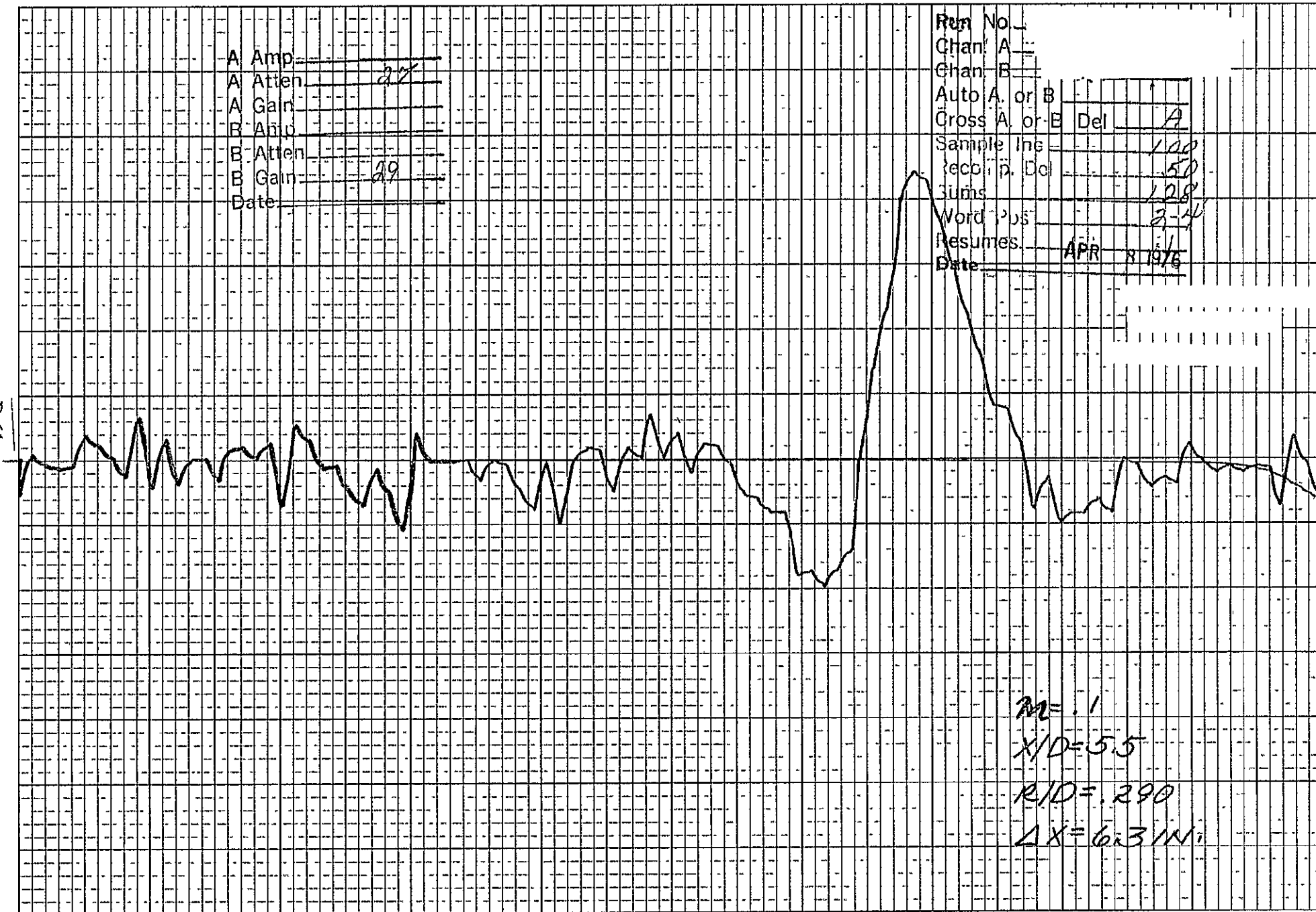


$M = 1$   
 $X/D = 5.5$   
 $R/D = .290$   
 $\Delta X = 6.3 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten \_\_\_\_\_  
B Gain 29  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan: A \_\_\_\_\_  
Chan: B \_\_\_\_\_  
Auto A. or B \_\_\_\_\_  
Cross A. or B Del A  
Sample Inc \_\_\_\_\_  
Recor. p. Del 1.00  
Sum 50  
Word p. 128  
Resumes \_\_\_\_\_  
Date APR 8 1976

D-61

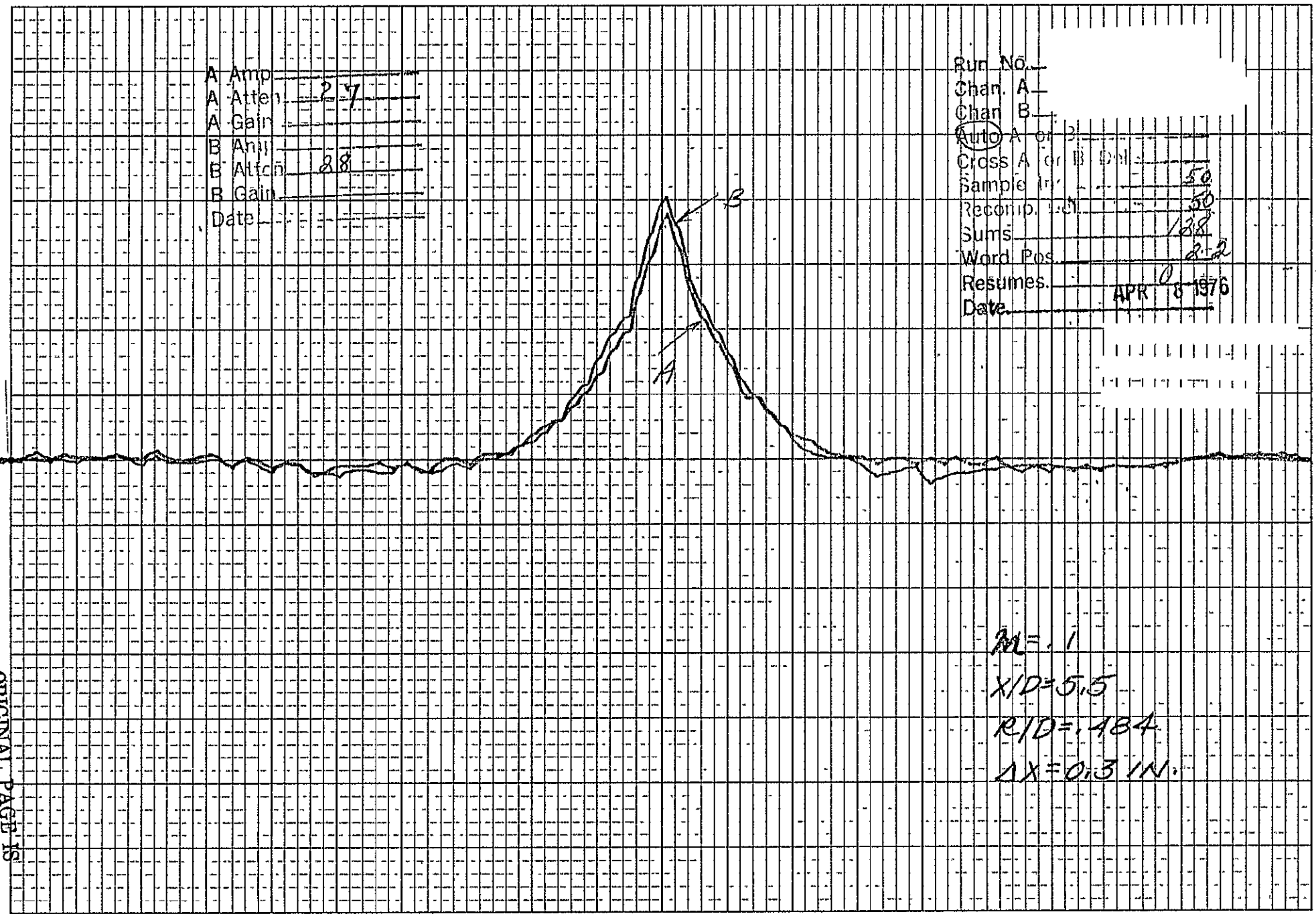


$M = 1$   
 $X/D = 5.5$   
 $R/D = .290$   
 $\Delta X = 6.31 W_i$

A Amp \_\_\_\_\_  
A Atten. 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 28  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Dial \_\_\_\_\_  
Sample Int. 50  
Recon. Int. 50  
Sums 128  
Word Pos. 2-2  
Resumes. \_\_\_\_\_  
Date APR 8 1976

D-62



M = .1  
X/D = 5.5  
R/D = .484  
ΔX = 0.3 IN.

ORIGINAL PAGE IS  
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A Amp  
A Atten: 27  
A Gain  
B Amps  
B Atten: 28  
B Gain  
Date

Run No. 111  
Chan A  
Chan B  
Auto A or B  
Cross A: 18.1 A  
Sample In: 5.0  
Comp Level: 3.0  
Sums: 128  
Word Pos: 2-3  
Resumes: 2  
Date: APR 8 1975

D-63



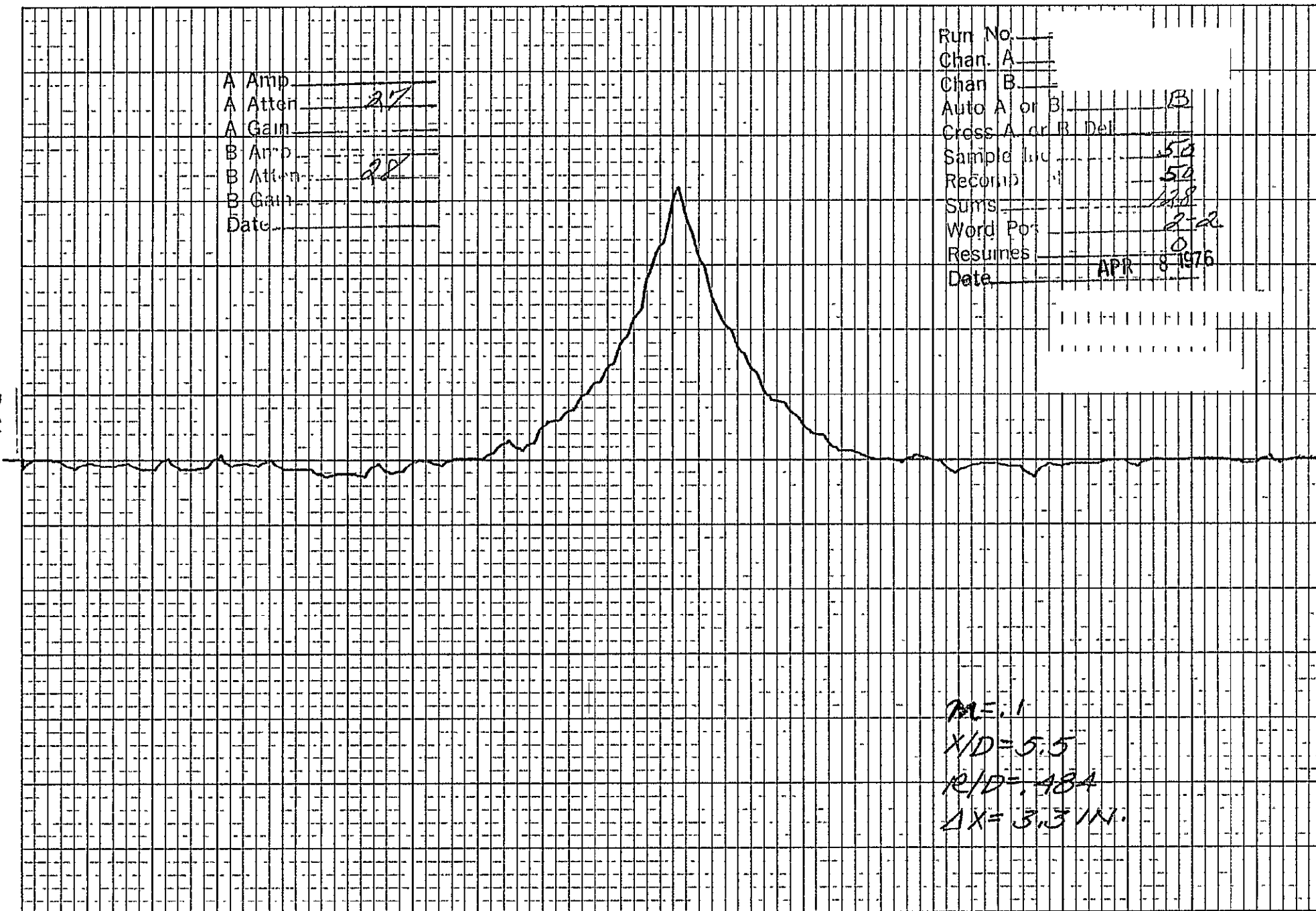
ME-1  
X/D=5.5  
R/D=484  
 $\Delta X=0.3 \text{ IN.}$



A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 22  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_ B  
Cross A or B Del \_\_\_\_\_  
Sample In \_\_\_\_\_ 50  
Record \_\_\_\_\_ 50  
Sum \_\_\_\_\_ 138  
Word Pos \_\_\_\_\_ 2-2  
Resumes \_\_\_\_\_ 0  
Date \_\_\_\_\_ APR 8 1976

D-64



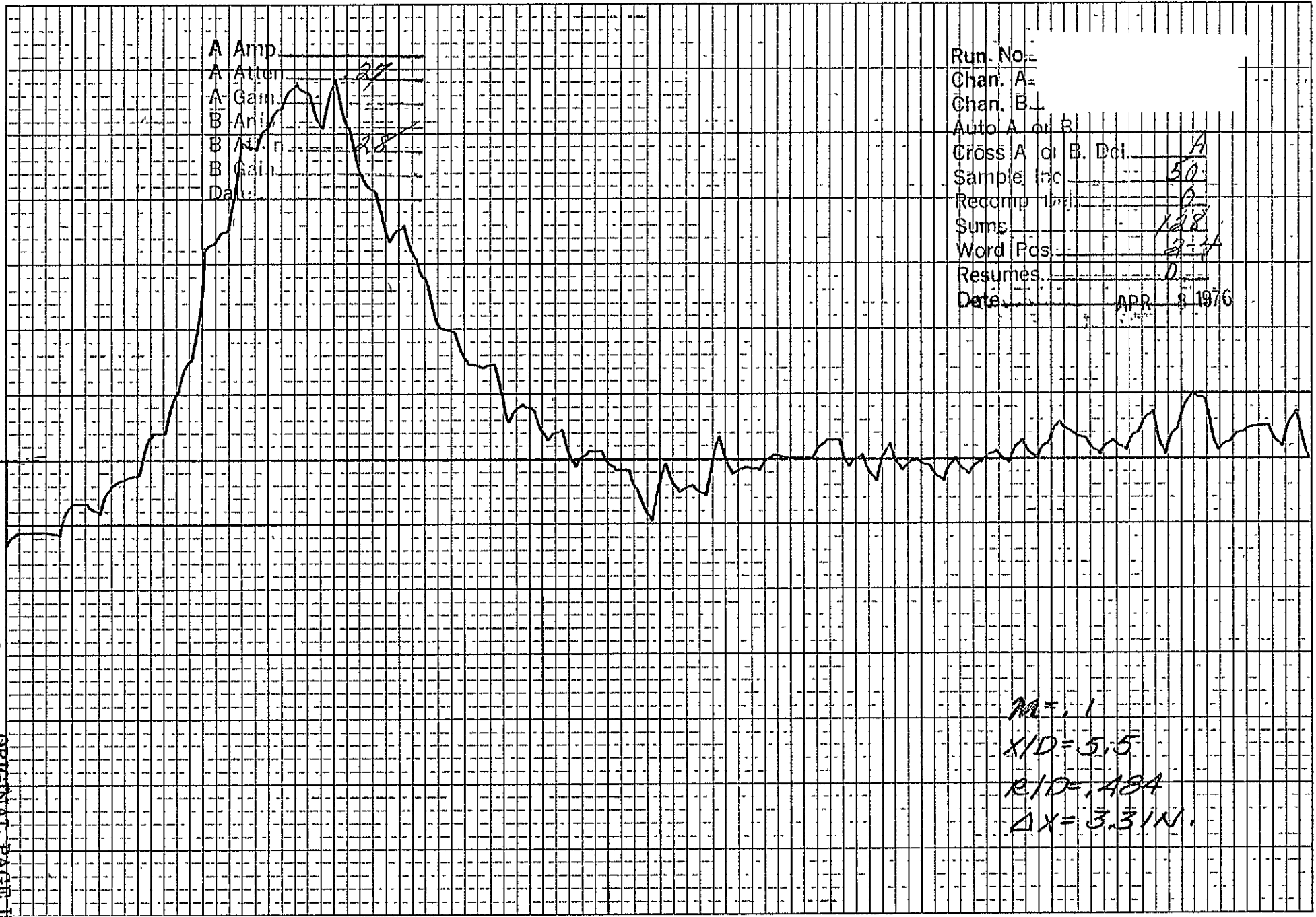
ME. 1  
X/D = 5.5  
R/D = 484  
ΔX = 3.3 IN.

C-2

A Amp  
 A Atten 24  
 A Gain  
 B Att  
 B Gain 25  
 B Gain  
 Date

Run. No.  
 Chan. A  
 Chan. B  
 Auto A. or B.  
 Cross A. or B. Dcl. A  
 Sample Inc. 50  
 Recomp. Int. 0  
 Sums 128  
 Word Pcs. 2-7  
 Resumes 0  
 Date APR 8 1976

D-65



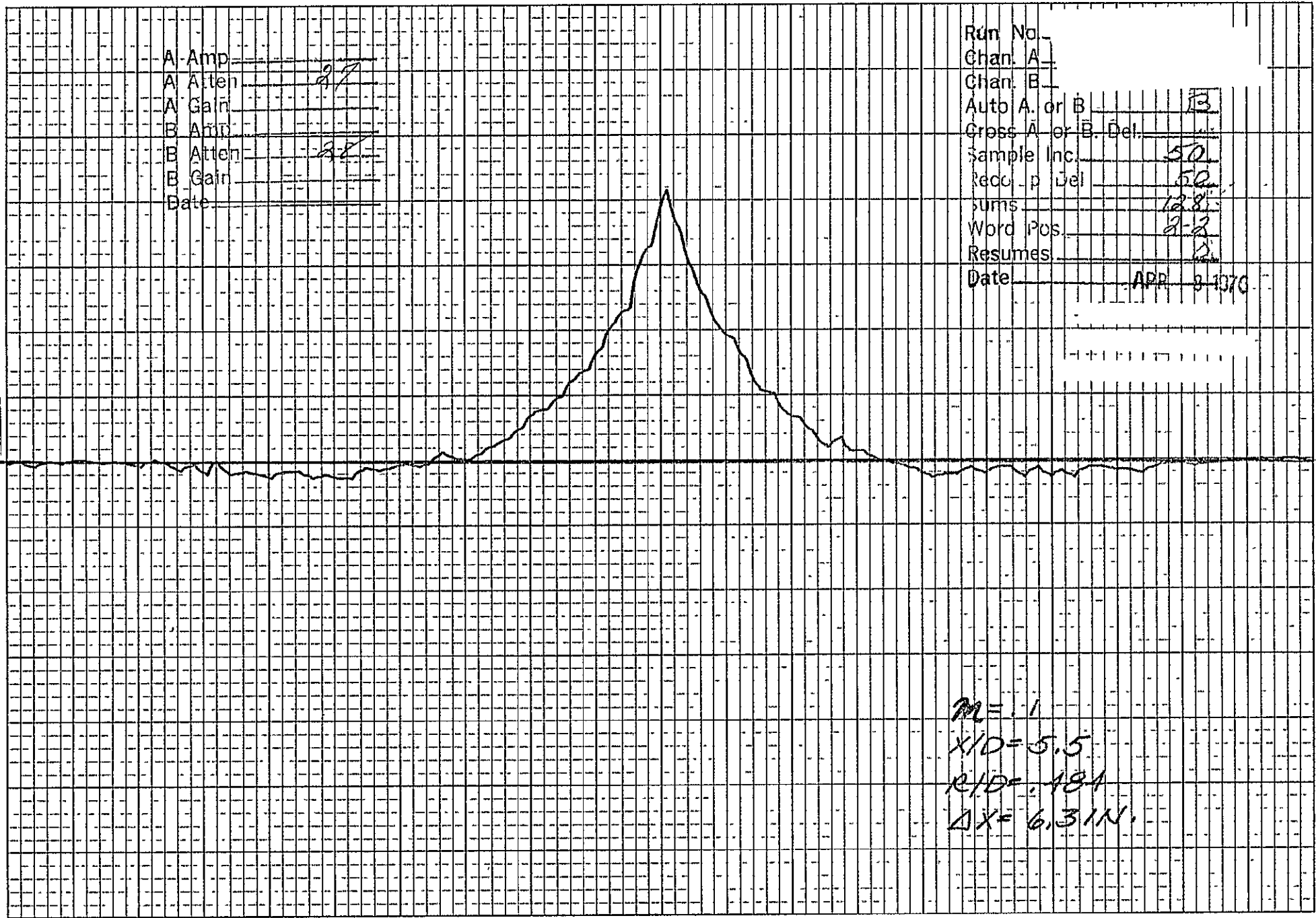
M = 1  
 X/D = 5.5  
 R/D = 484  
 $\Delta X = 3.31N$

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Atten \_\_\_\_\_  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 50  
Recd. p. Del. 50  
Sums 128  
Word Pos. 2-2  
Resumes 0  
Date APR 3 1970

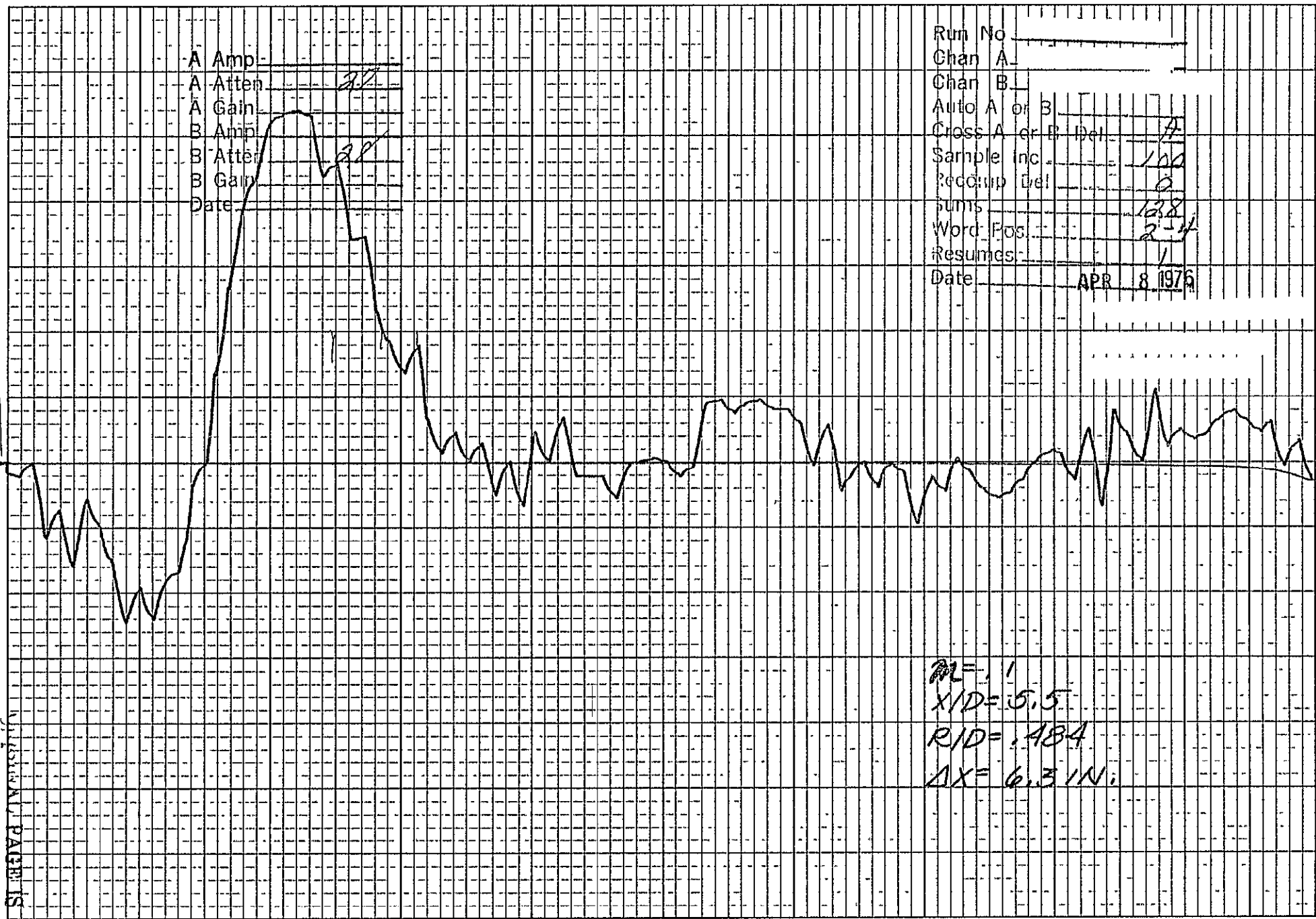
D-66



$M = 1$   
 $X/D = 5.5$   
 $R/D = 184$   
 $\Delta X = 6.31N$

A Amp \_\_\_\_\_  
 A Atten 20  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 20  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No \_\_\_\_\_  
 Chan A \_\_\_\_\_  
 Chan B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_  
 Cross A or B Del A  
 Sample Inc 100  
 Record Del 0  
 Sum 128  
 Word Pos 2-4  
 Resumes 1  
 Date APR 8 1976



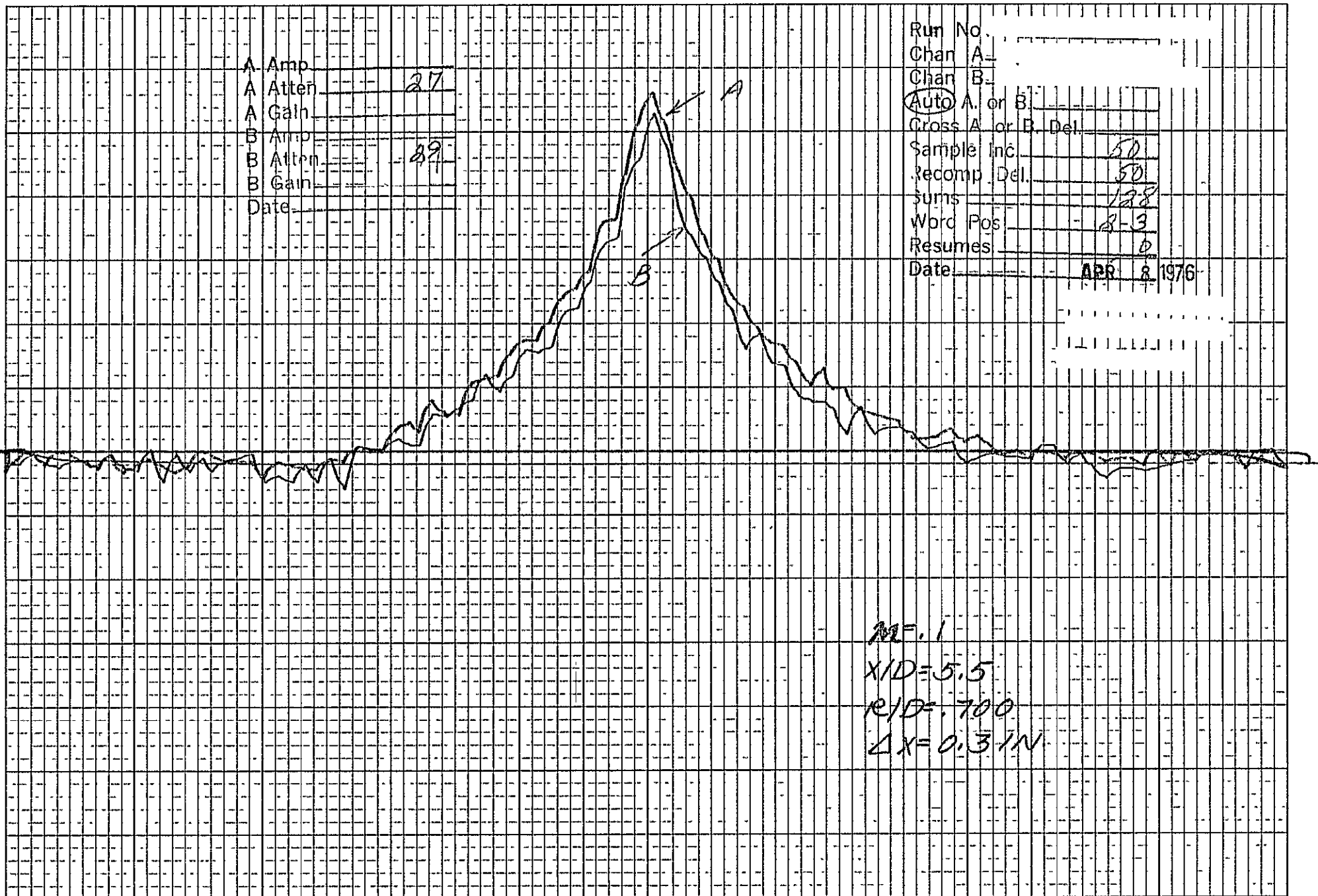
D-67

OF POOR QUALITY  
 PATENTS

$M = 1$   
 $X/D = 5.5$   
 $R/D = .484$   
 $\Delta X = 6.3 IN.$

A Amp  
A Atten 27  
A Gain  
B Amp  
B Atten 29  
B Gain  
Date

Run No.  
Chan A  
Chan B  
Auto A. or B.  
Cross A. or B. Del.  
Sample Inc 50  
Recomp Del 50  
Sums 128  
Word Pos 8-3  
Resumes 0  
Date APR 8 1976



MF. 1  
X/D = 5.5  
R/D = 700  
 $\Delta x = 0.3 \text{ IN}$

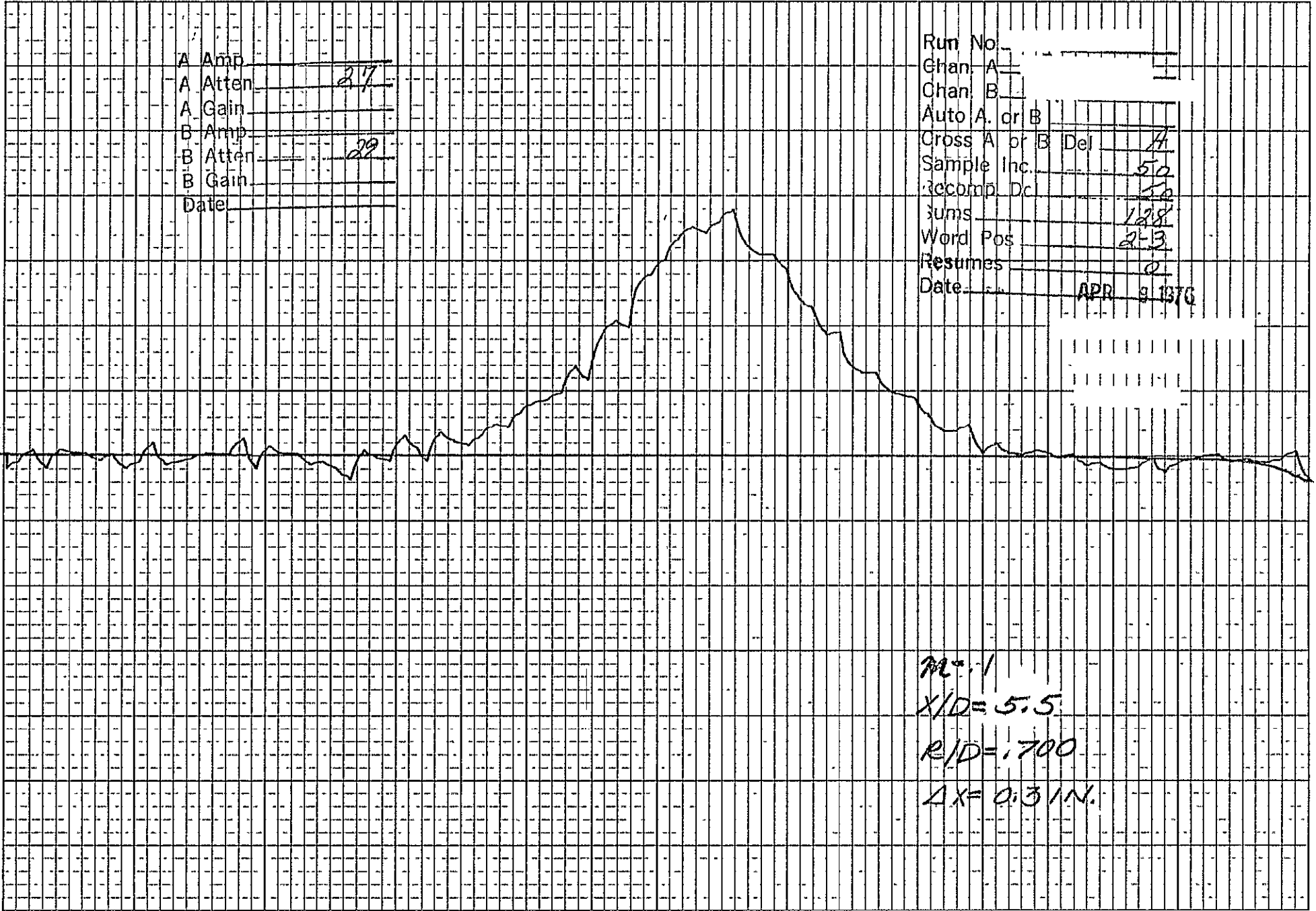
D-68

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NOT FOR DISTRIBUTION

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 29  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B \_\_\_\_\_  
Cross A or B Del A  
Sample Inc. 50  
Recomp. Dc 20  
Xms 128  
Word Pos 2-3  
Resumes 0  
Date APR 9 1970

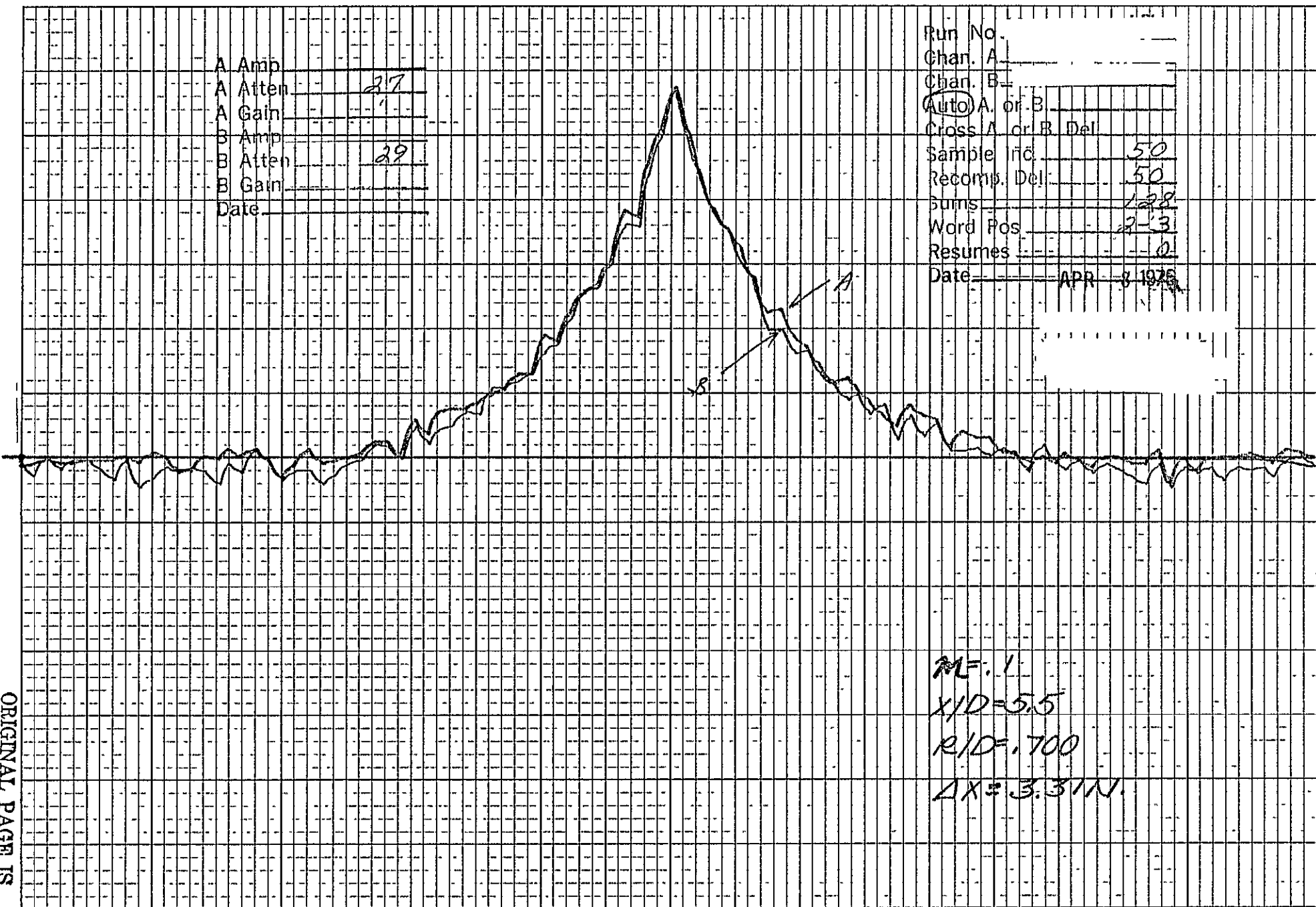
D-69



M=1  
X/D=5.5  
R/D=1.700  
 $\Delta X = 0.31N.$

A Amp \_\_\_\_\_  
A Atten: 27  
A Gain: 1  
B Amp \_\_\_\_\_  
B Atten: 29  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
(Auto) A. or B. \_\_\_\_\_  
Cross A. or B. Del. \_\_\_\_\_  
Sample r/c: 50  
Recomp. Del.: 50  
Sums: 128  
Word Pos: 2-3  
Resumes: 0  
Date: APR 8 1975



ME: 1  
X/D = 5.5  
R/D = .700  
 $\Delta X = 3.31 \mu$

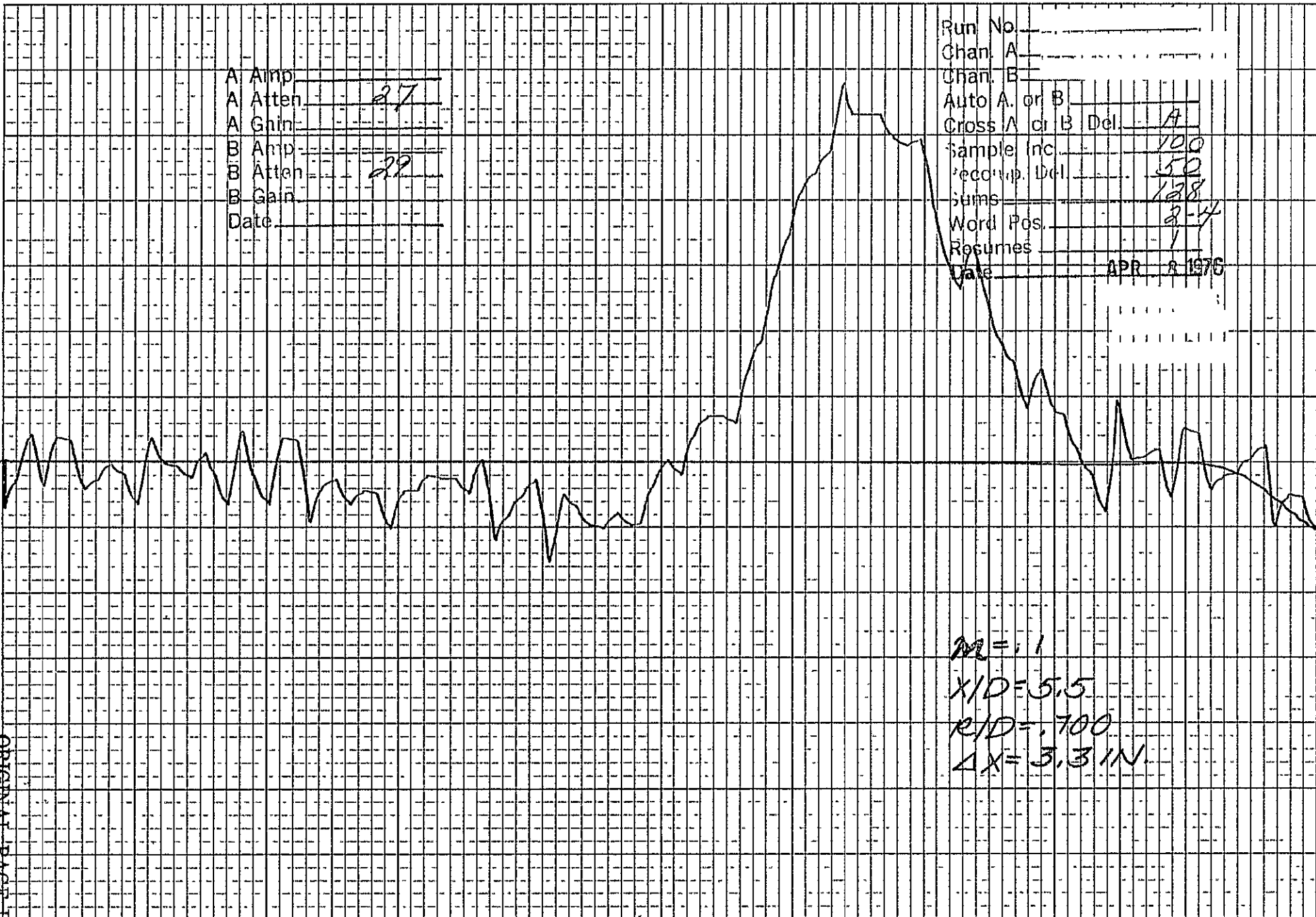
D-70

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 22  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B \_\_\_\_\_  
Cross A or B Del. A  
Sample Inc. 100  
Rec'd. p. Del. 50  
Sums 128  
Word Pos. 3-4  
Resumes 1  
Date APR 8 1976

D-71



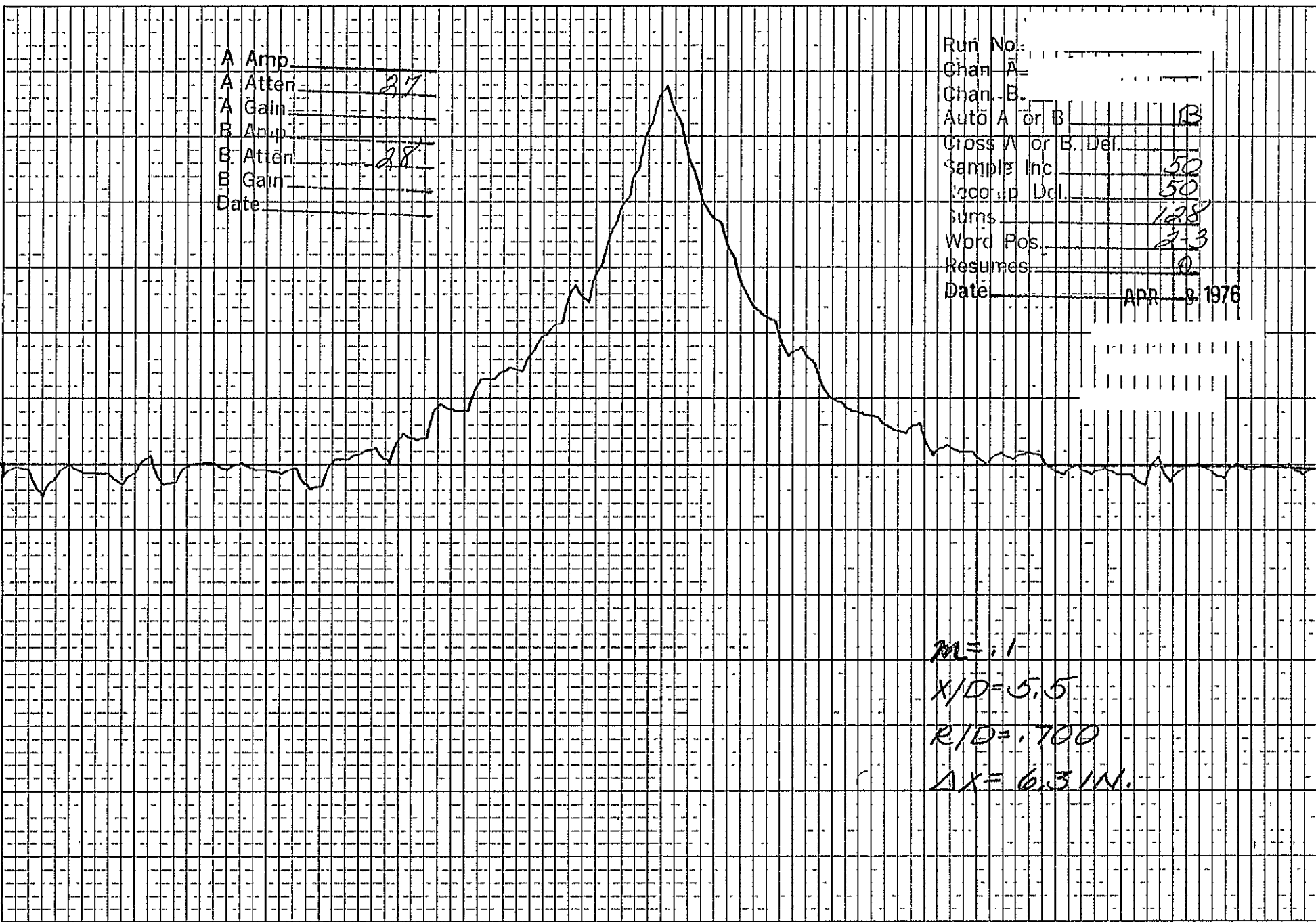
$M = 1$   
 $X/D = 5.5$   
 $R/D = .700$   
 $\Delta X = 3.3 IN$



A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 28  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No: \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross W or B. Del. \_\_\_\_\_  
Sample Inc. 50  
Record Dcl. 50  
Sums 128  
Word Pos. 23  
Resumes 0  
Date APR 8, 1976

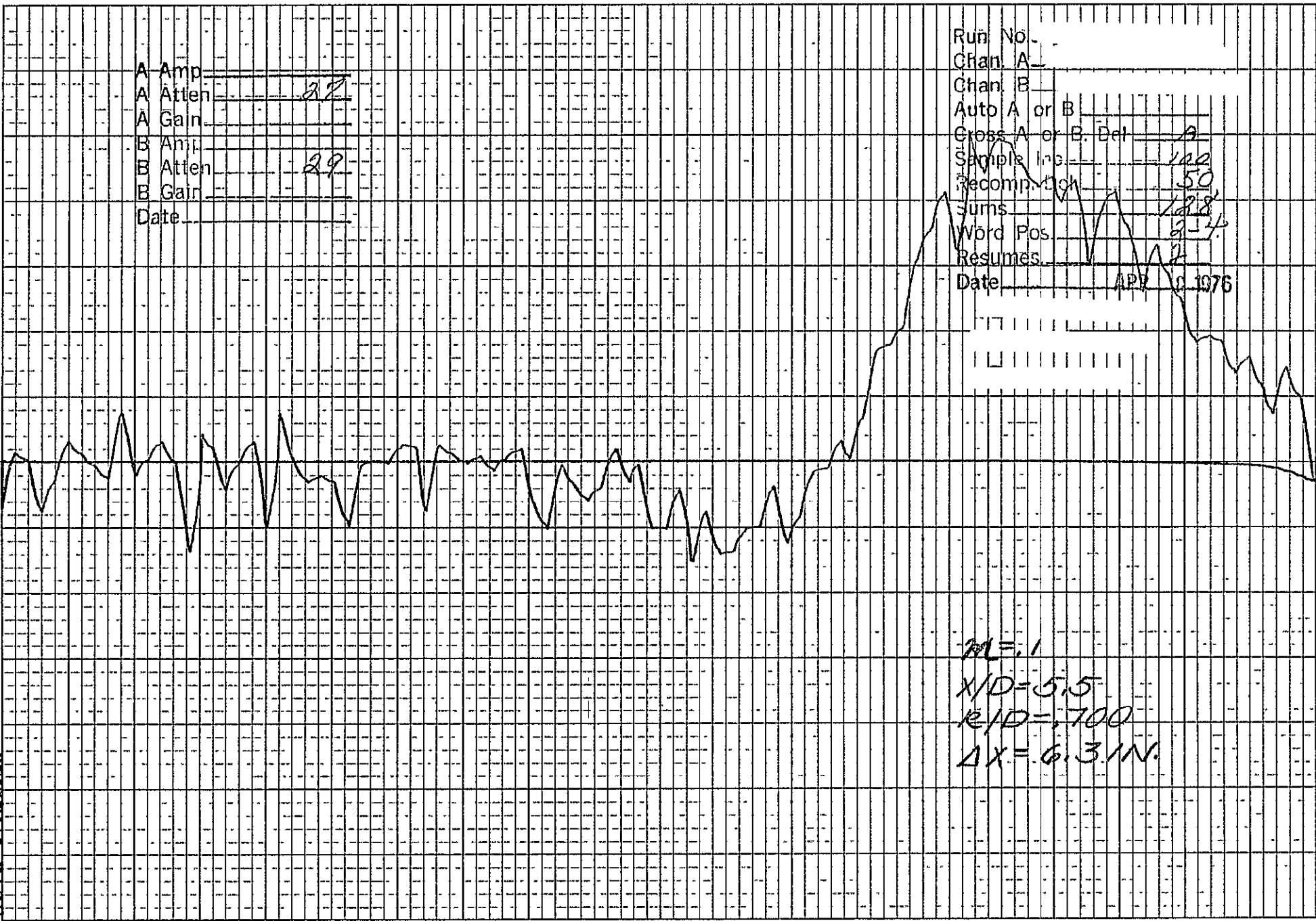
D-72



$M = .1$   
 $X/D = 5.5$   
 $R/D = .700$   
 $\Delta X = 6.3 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 29  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B. Del A  
Sample Inc. 122  
Recomp. Chk 50  
Sums 128  
Word Pos. 2-7  
Resumes 2  
Date APR 10 1976



D-73

ORIGINAL PAGE IS  
OF POOR QUALITY

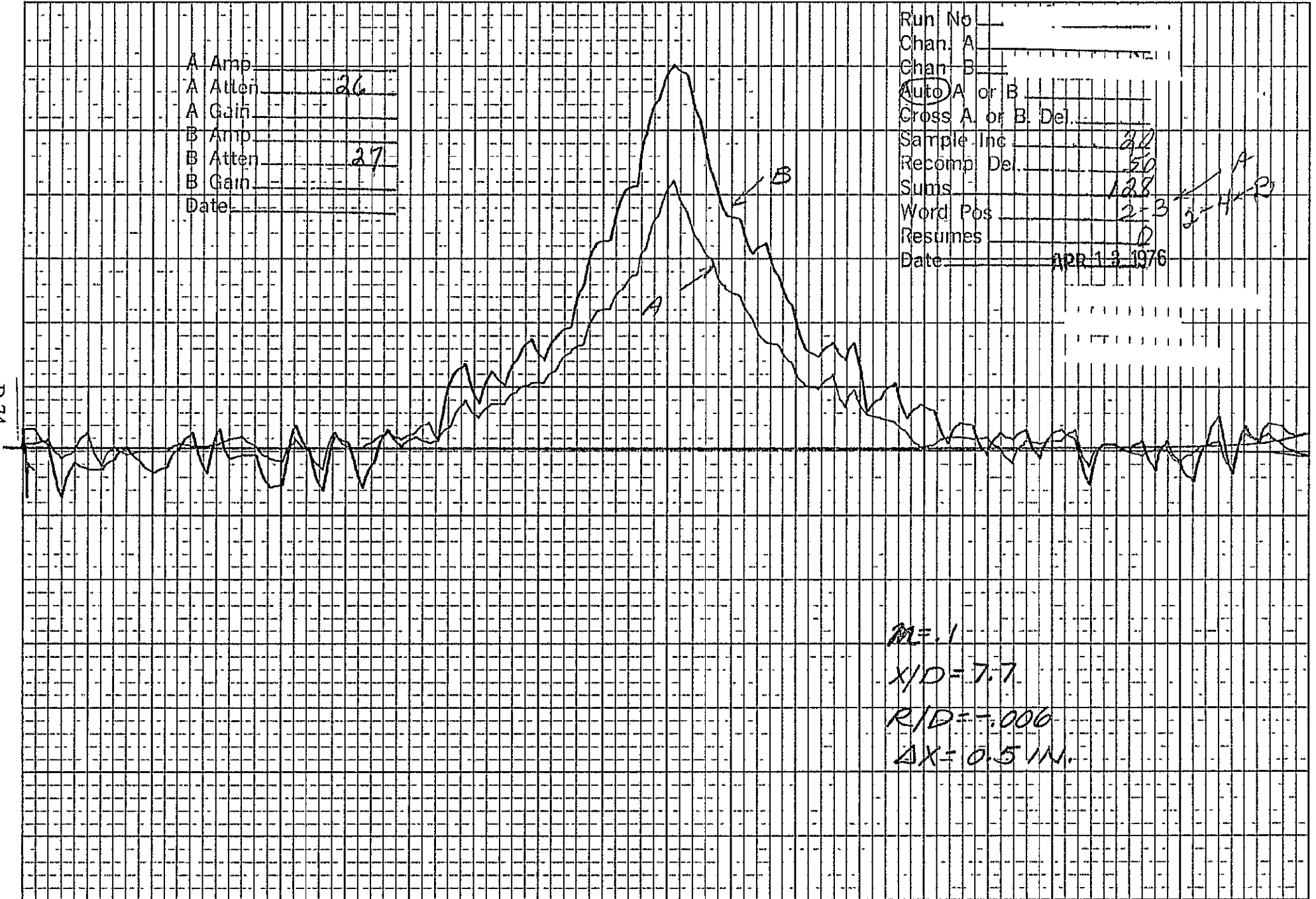
$ML = .1$   
 $X/D = 5.5$   
 $R/D = .700$   
 $\Delta X = 6.31N.$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc 30  
Recomp. Del. 50  
Sums 128  
Word Pos 2-3  
Resumes D  
Date APR 13 1976

A  
B  
C

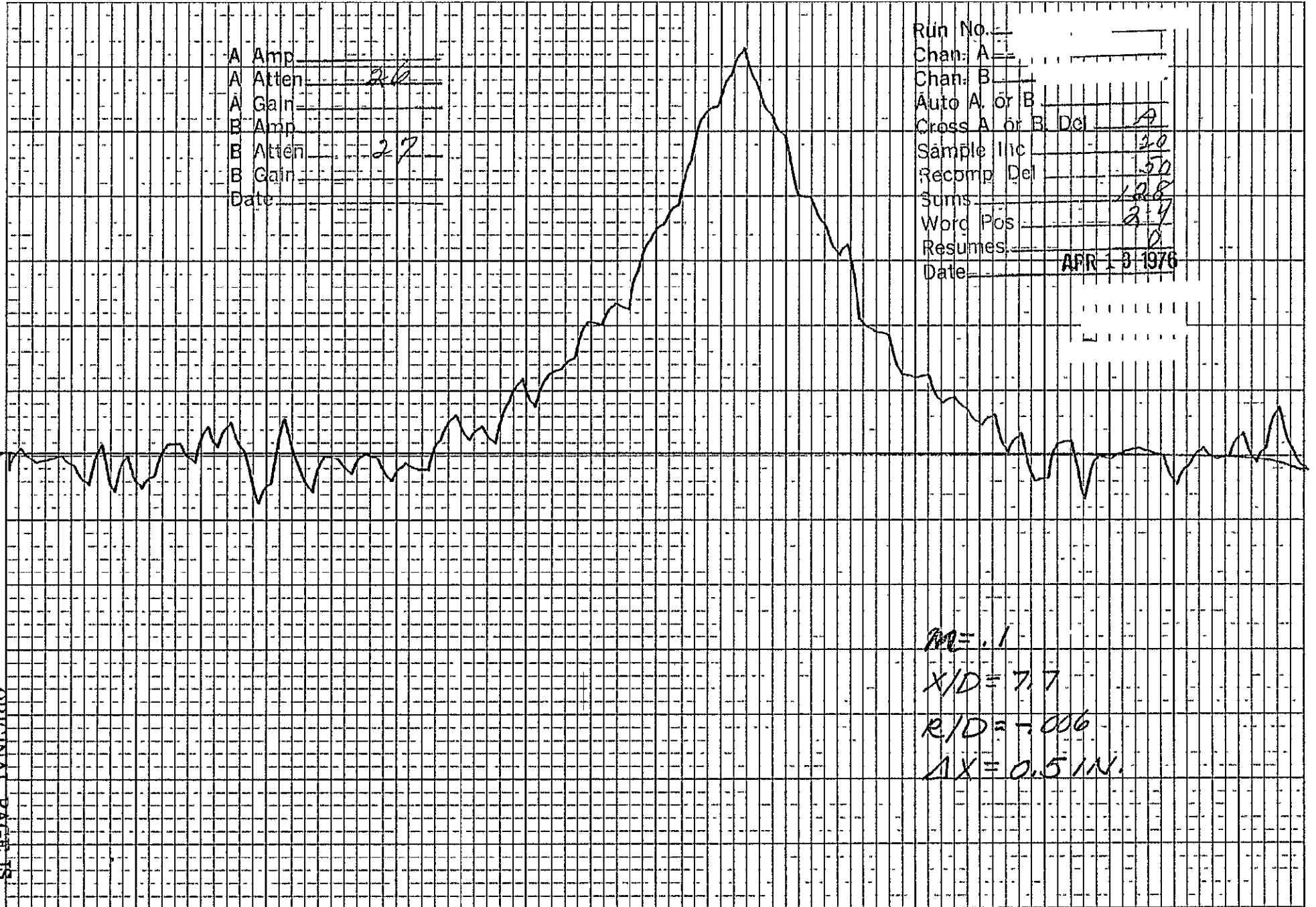
D-74



$M = 1$   
 $X/D = 7.7$   
 $R/D = -.006$   
 $\Delta X = 0.5 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten \_\_\_\_\_ 26 \_\_\_\_\_  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten \_\_\_\_\_ 27 \_\_\_\_\_  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan: A \_\_\_\_\_  
Chan: B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del \_\_\_\_\_ A \_\_\_\_\_  
Sample Inc \_\_\_\_\_ 20 \_\_\_\_\_  
Recomp Del \_\_\_\_\_ 50 \_\_\_\_\_  
Sums \_\_\_\_\_ 128 \_\_\_\_\_  
Word Pos \_\_\_\_\_ 214 \_\_\_\_\_  
Resumes \_\_\_\_\_ 0 \_\_\_\_\_  
Date \_\_\_\_\_ APR 13 1976



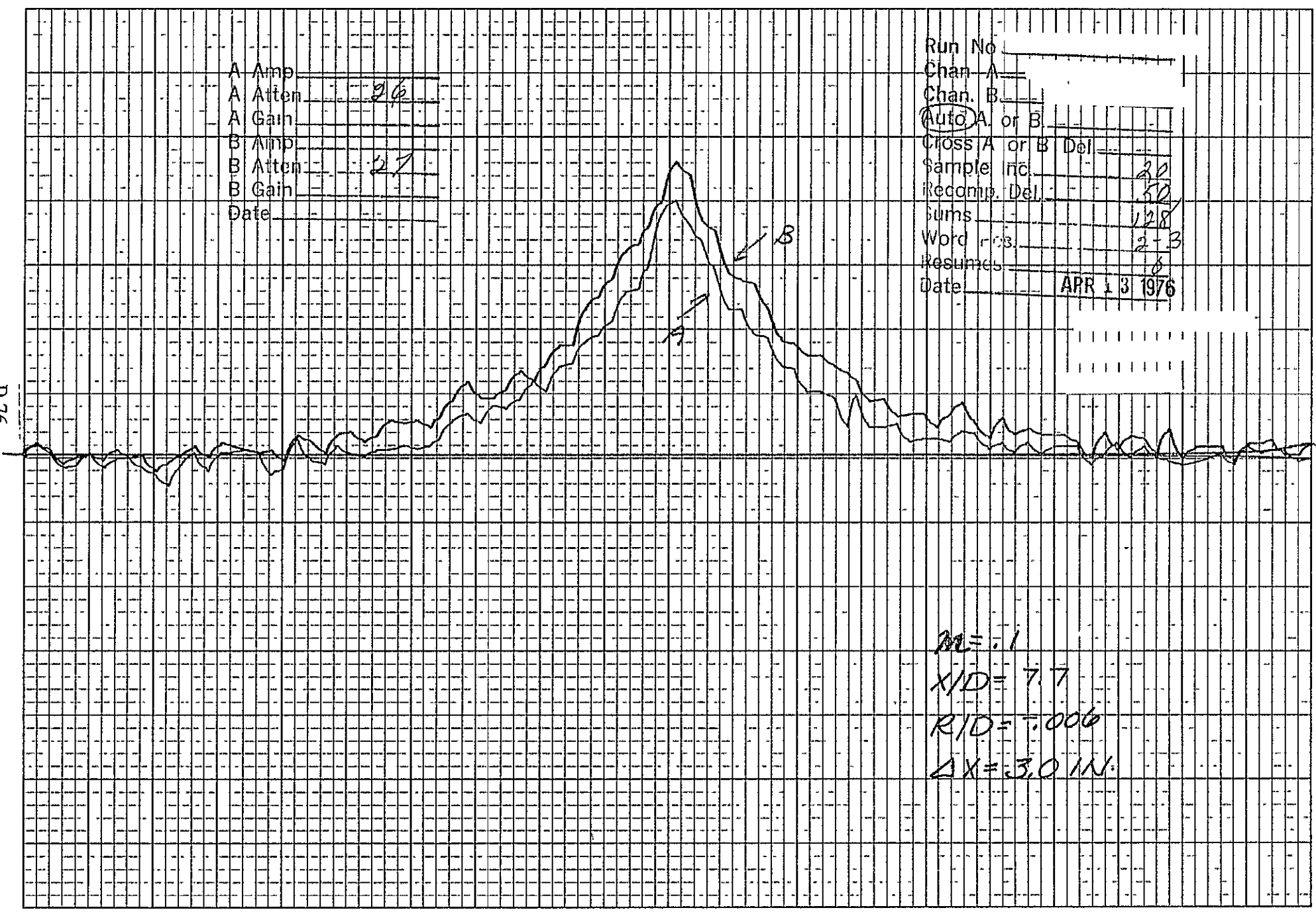
$m = .1$   
 $X/D = 7.7$   
 $R/D = -.006$   
 $\Delta X = 0.51N.$

D-75  
ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del \_\_\_\_\_  
Sample no. 20  
Recomp. Del. 50  
Sums 128  
Word res. 2-3  
Resumes 0  
Date APR 13 1976

D-76

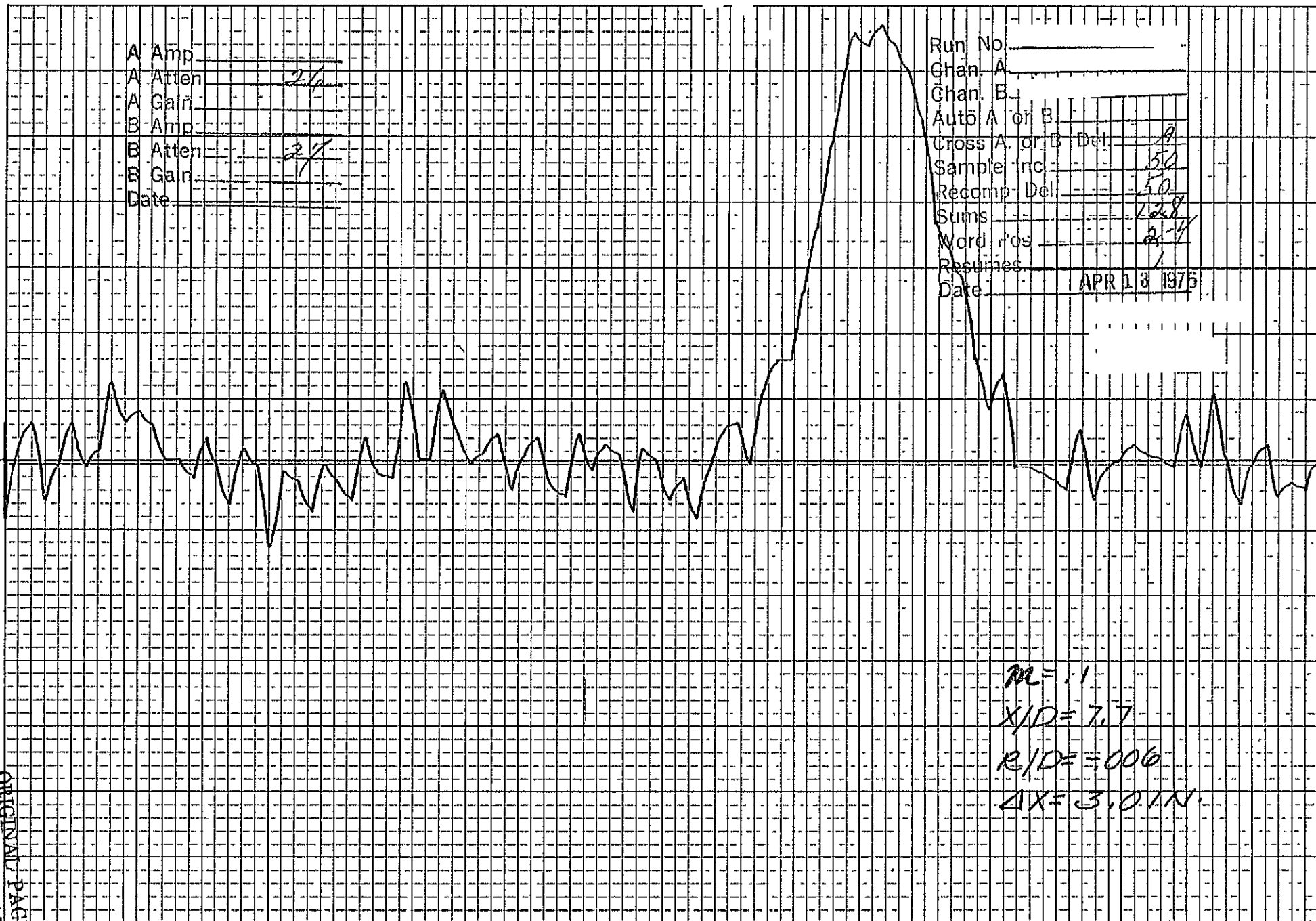


$M = .1$   
 $X/D = 7.7$   
 $R/D = .006$   
 $\Delta X = 3.0 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. or B Del. A  
Sample Inc. 50  
Recomp Del. 50  
Sums 128  
Word nos 27  
Resumes 1  
Date APR 13 1975

D-77



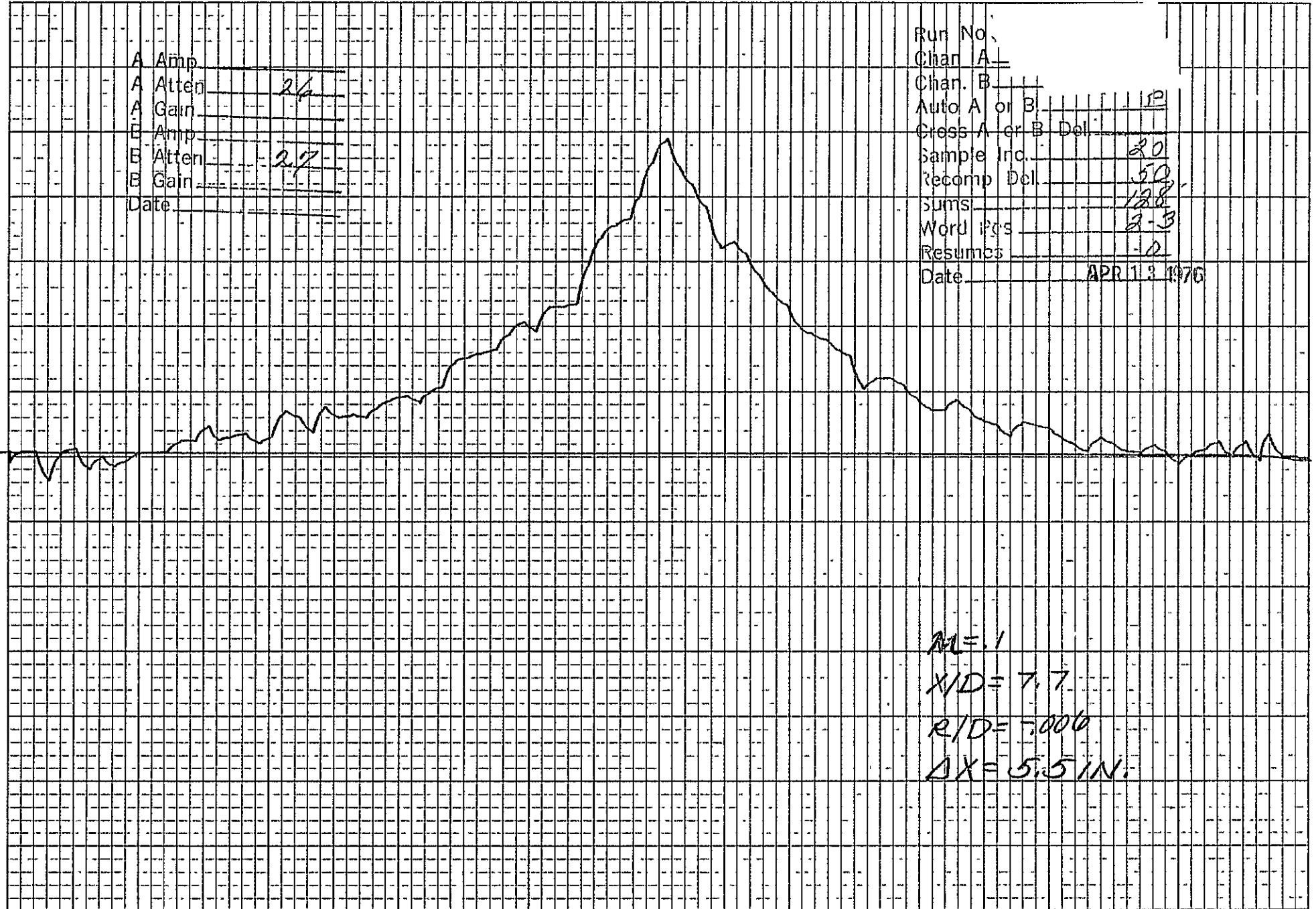
$M = 1$   
 $X/D = 7.7$   
 $R/D = 0.06$   
 $\Delta X = 3.0 IN$

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A Amp \_\_\_\_\_  
A Atten 24  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B 12  
Cross A or B Del \_\_\_\_\_  
Sample Inc. 20  
Recomp Del. 50  
Sums 128  
Word Pos 2-3  
Resumes 0  
Date APR 13 1976

D-78

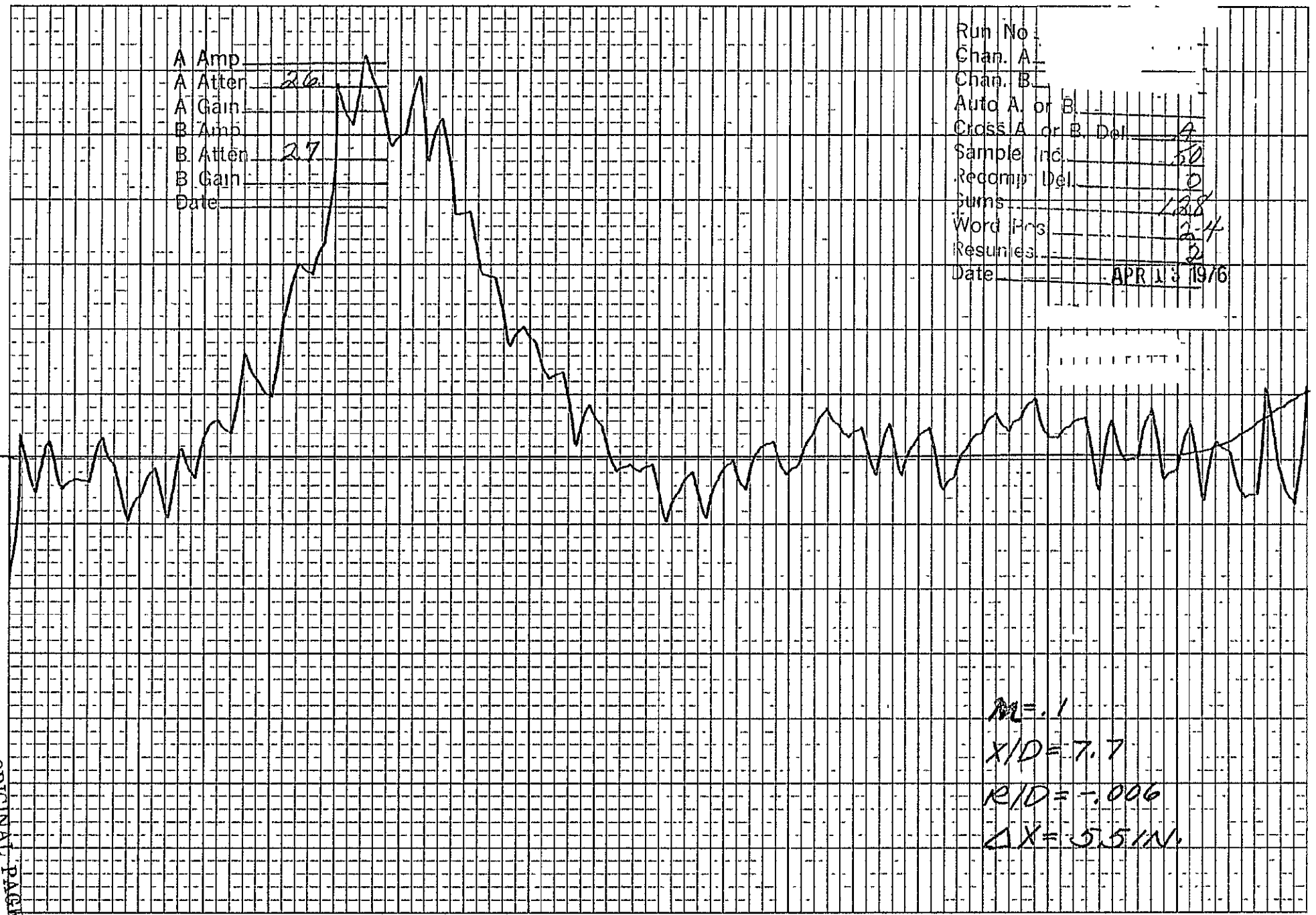


$M = 1$   
 $X/D = 7.7$   
 $R/D = 7.000$   
 $\Delta X = 5.5 \text{ IN.}$

A Amp  
A Atten 26  
A Gain  
B Amp  
B Atten 27  
B Gain  
Date

Run No  
Chan. A  
Chan. B  
Auto A. or B.  
Cross A. or B. Del 4  
Sample Inc. 50  
Recomp Del 0  
Sums 138  
Word Pns 2-4  
Resunies 2  
Date APR 13 1976

D-79



M = .1  
X/D = 7.7  
R/D = -.006  
 $\Delta X = 5.5 \text{ IN.}$

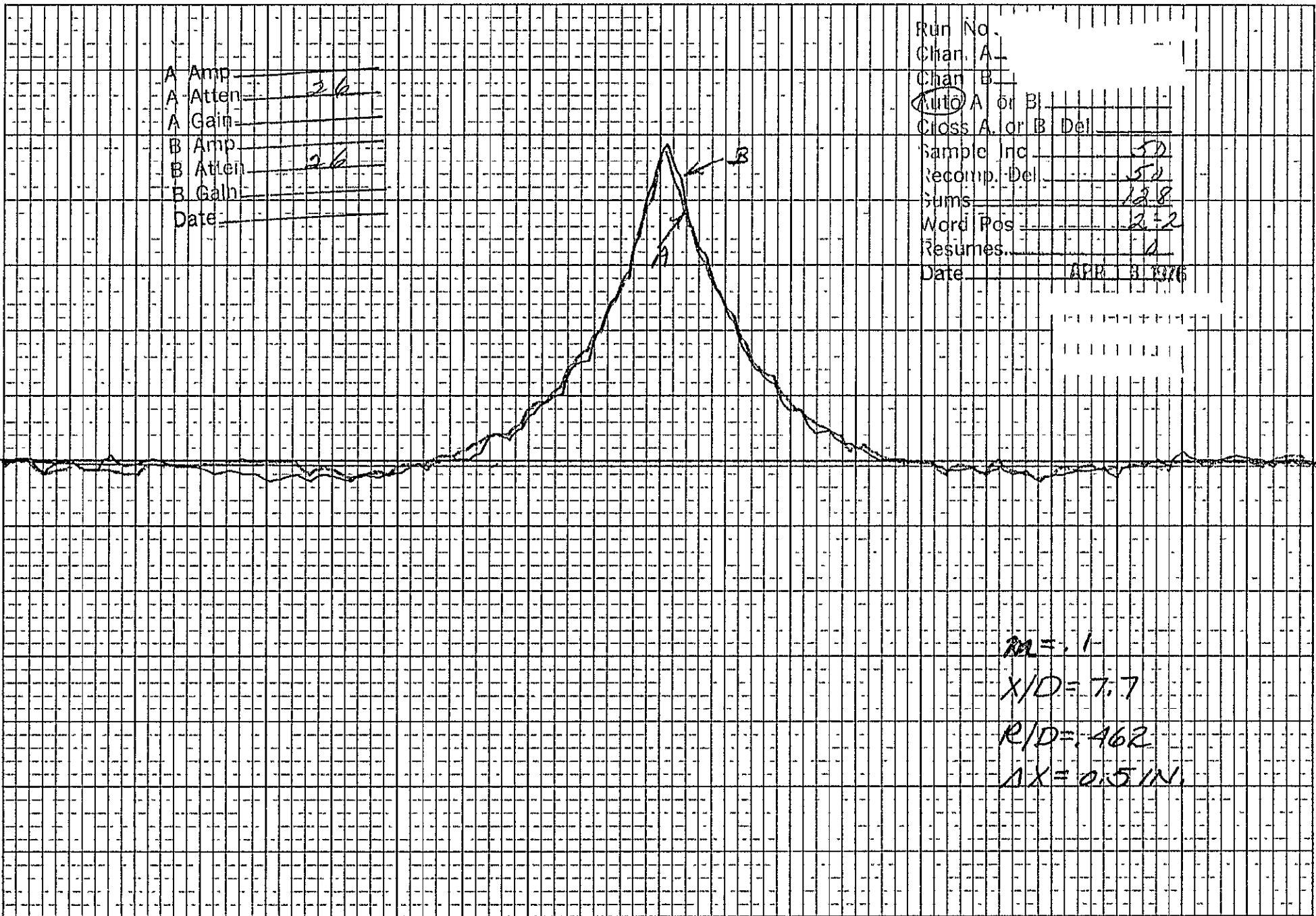
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OF POOR QUALITY



A Amp \_\_\_\_\_  
 A Atten 26  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 26  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 (Auto) A or B \_\_\_\_\_  
 Cross A. or B. Del \_\_\_\_\_  
 Sample Inc. 50  
 Recomp. Del. 50  
 Sums 128  
 Word Pos 252  
 Resumes. 0  
 Date APR 31 1976

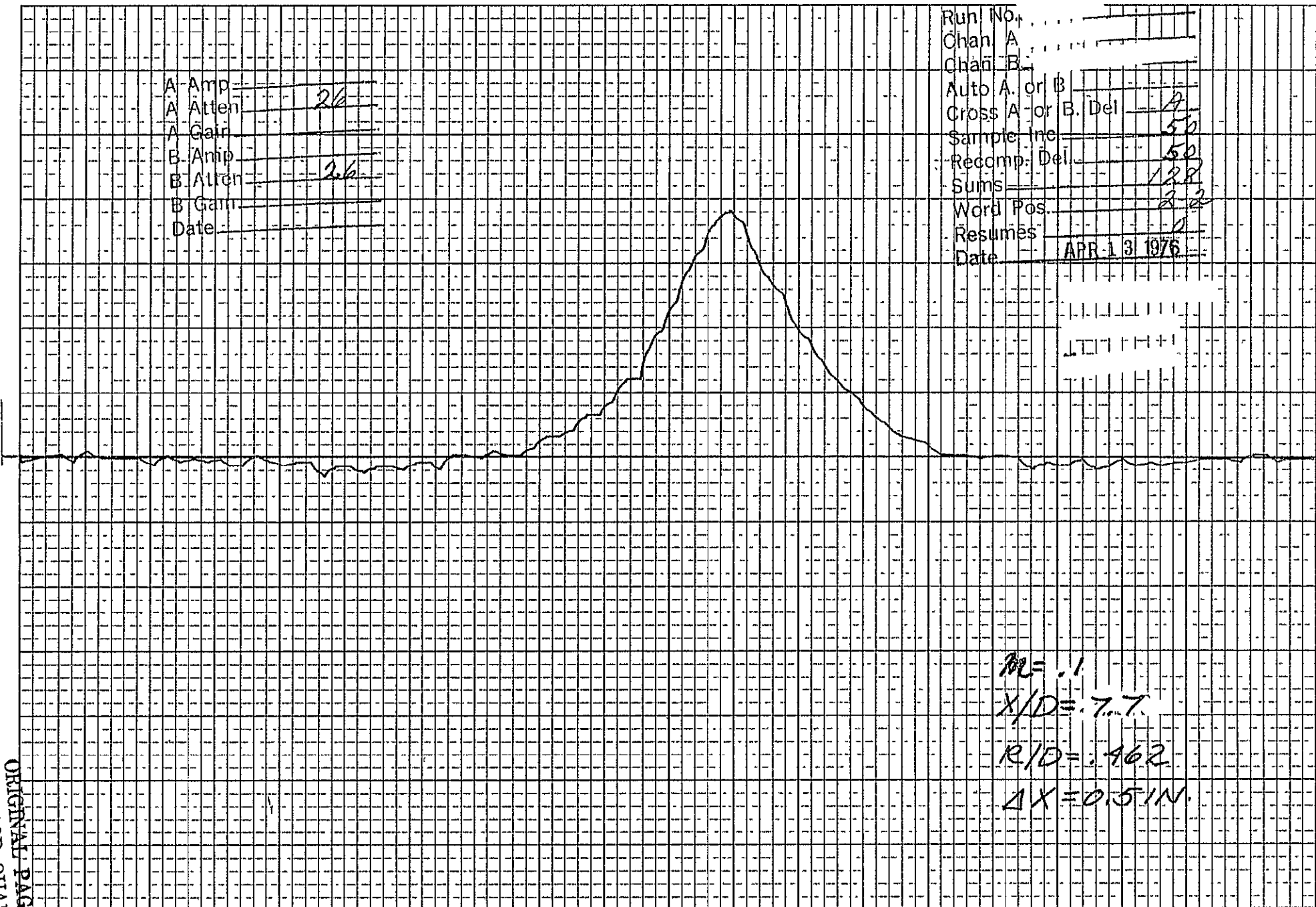
D-80



PA = 1  
 X/D = 7.7  
 R/D = 462  
 AX = 0.5 IN.

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A. or B \_\_\_\_\_  
Cross A. or B. Del 4  
Sample Inc 50  
Recamp: Del 50  
Sums 128  
Word Pos. 22  
Resumes 0  
Date APR 13 1976



$R/D = .1$   
 $X/D = 7.7$   
 $R/D = .462$   
 $\Delta X = 0.5 IN.$

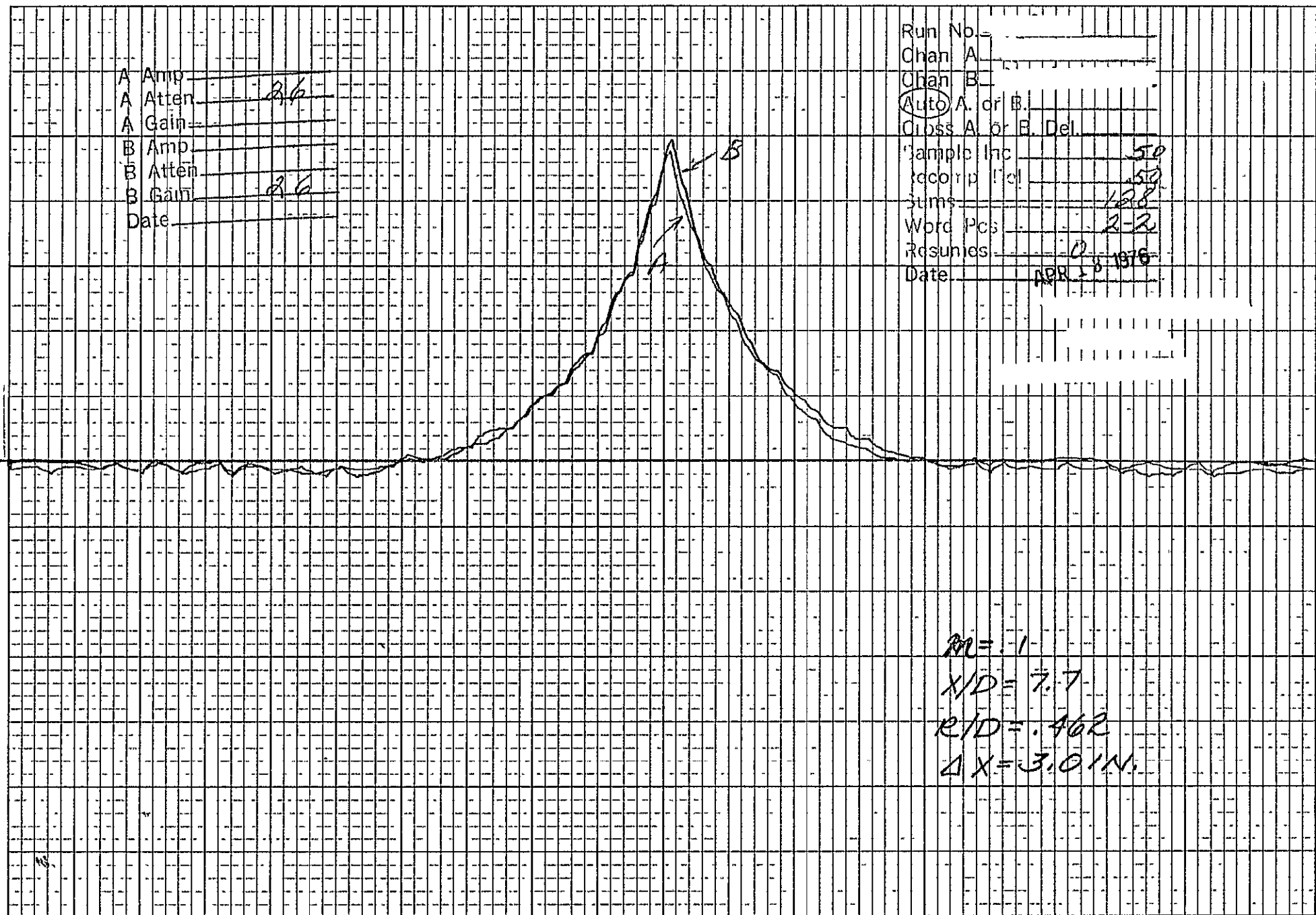
D-81

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 26  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten \_\_\_\_\_  
 B Gain 26  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan A \_\_\_\_\_  
 Chan B \_\_\_\_\_  
 (Auto) A. or B. \_\_\_\_\_  
 Cross A. or B. Del. \_\_\_\_\_  
 Sample Inc 50  
 Recorp Int 50  
 Sums 128  
 Word Pcs 2-2  
 Resumes 0  
 Date APR 28 1976

D-82

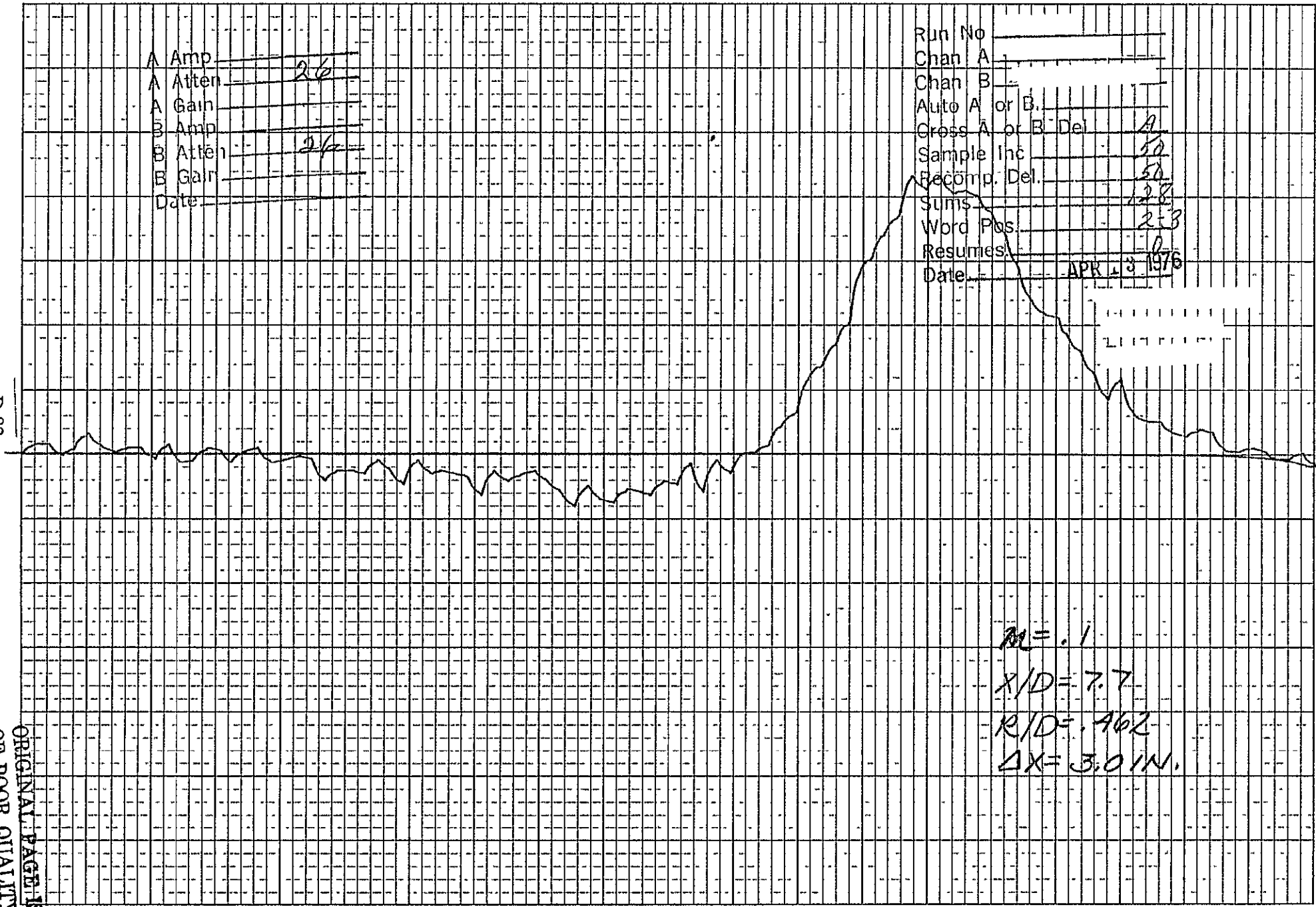


$R/D = .1$   
 $X/D = 7.7$   
 $R/D = .462$   
 $\Delta X = 3.0 IN.$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del A  
Sample Inc 50  
Recomp. Del. 50  
Summ 2.8  
Word Pos. 2.3  
Resumes 0  
Date APR 3 1976

D-83

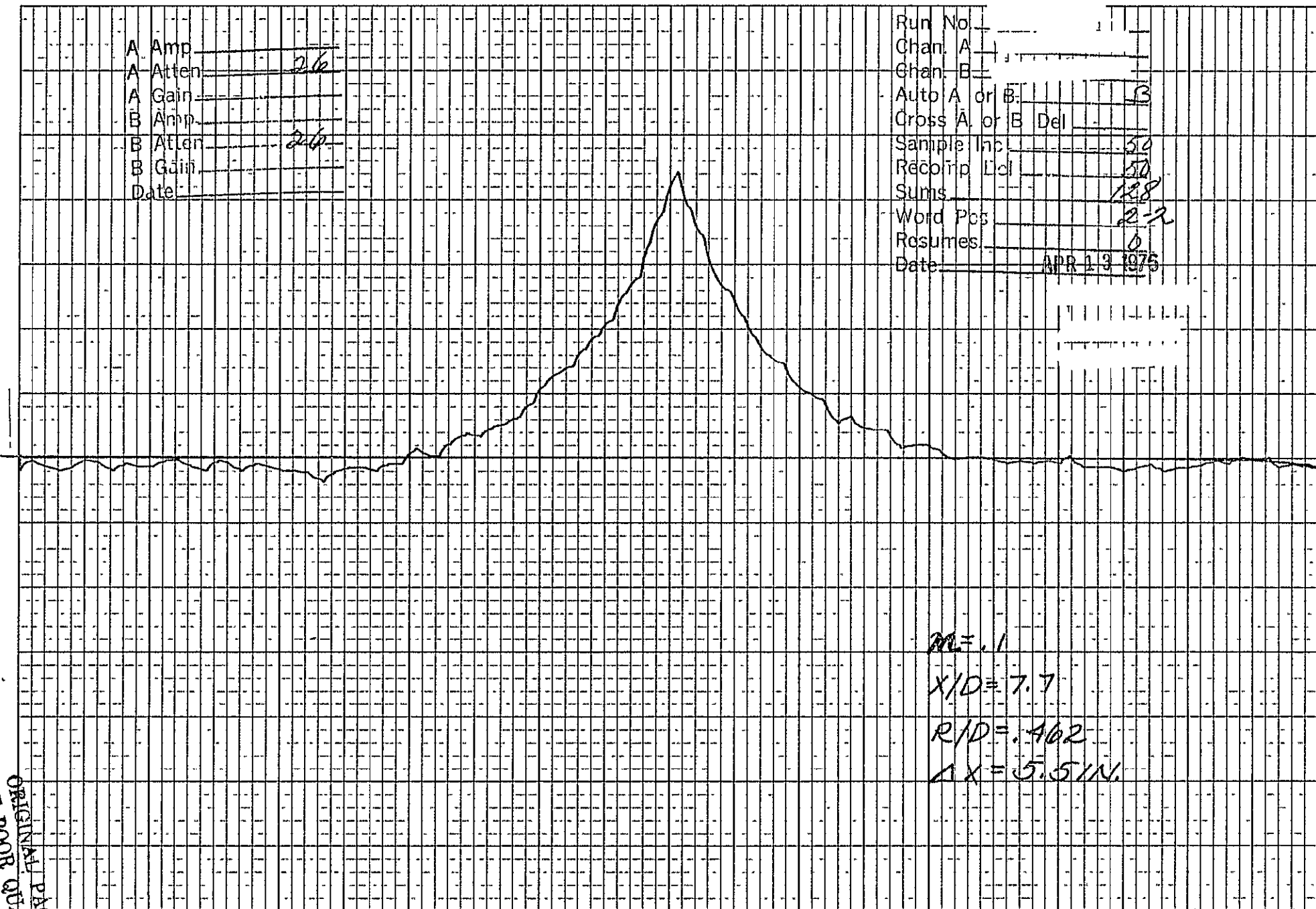


$M = .1$   
 $X/D = 7.7$   
 $R/D = .462$   
 $\Delta X = 3.0 \text{ IN.}$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 2.6  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 2.6  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B. B  
Cross A. or B Del \_\_\_\_\_  
Sample Inc. 50  
Recorip Lcl 50  
Sums 128  
Word Pos 2-2  
Resumes 0  
Date APR 13 1975



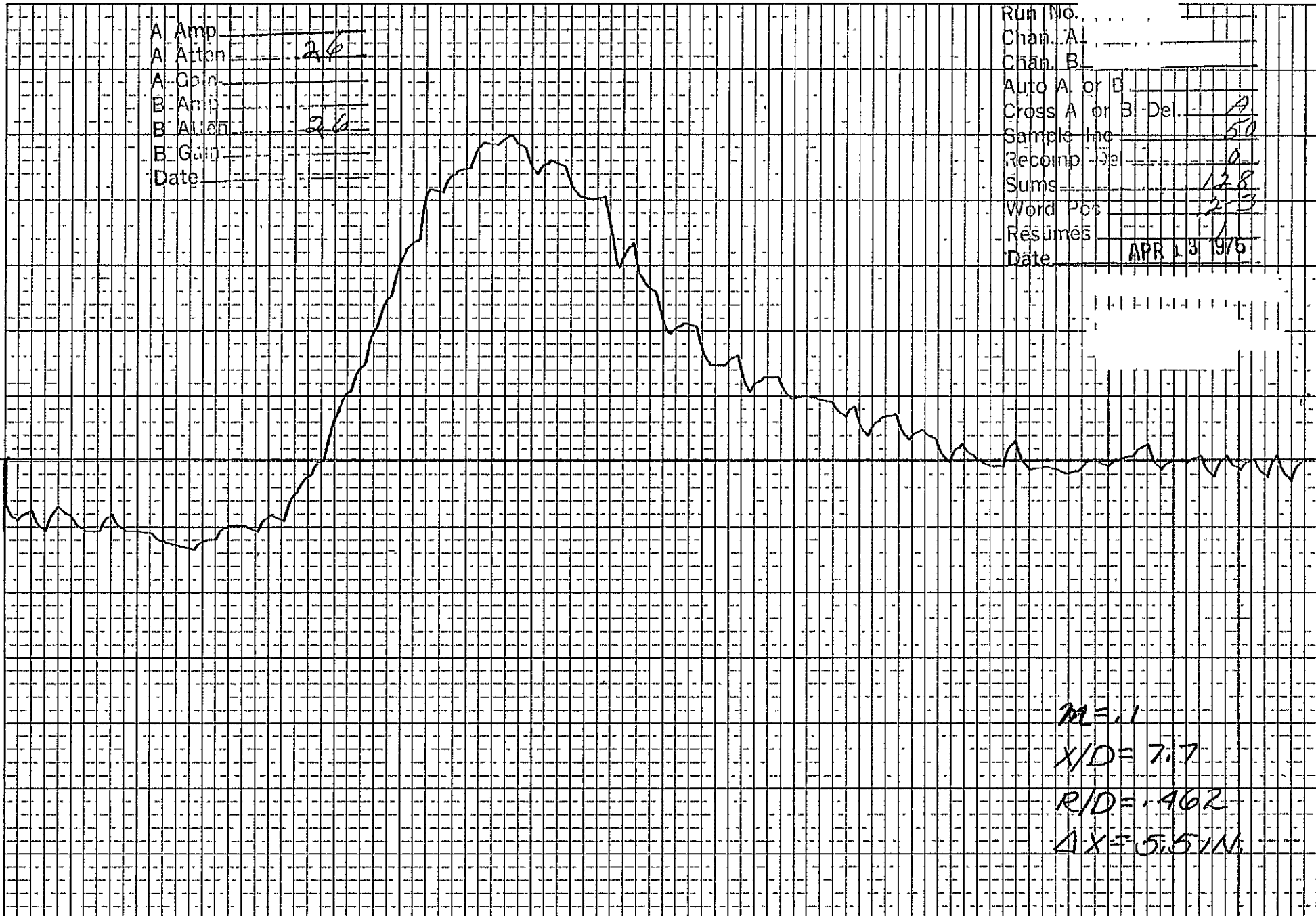
$M = 1$   
 $X/D = 7.7$   
 $R/D = .462$   
 $\Delta X = 5.51N$

D-84

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

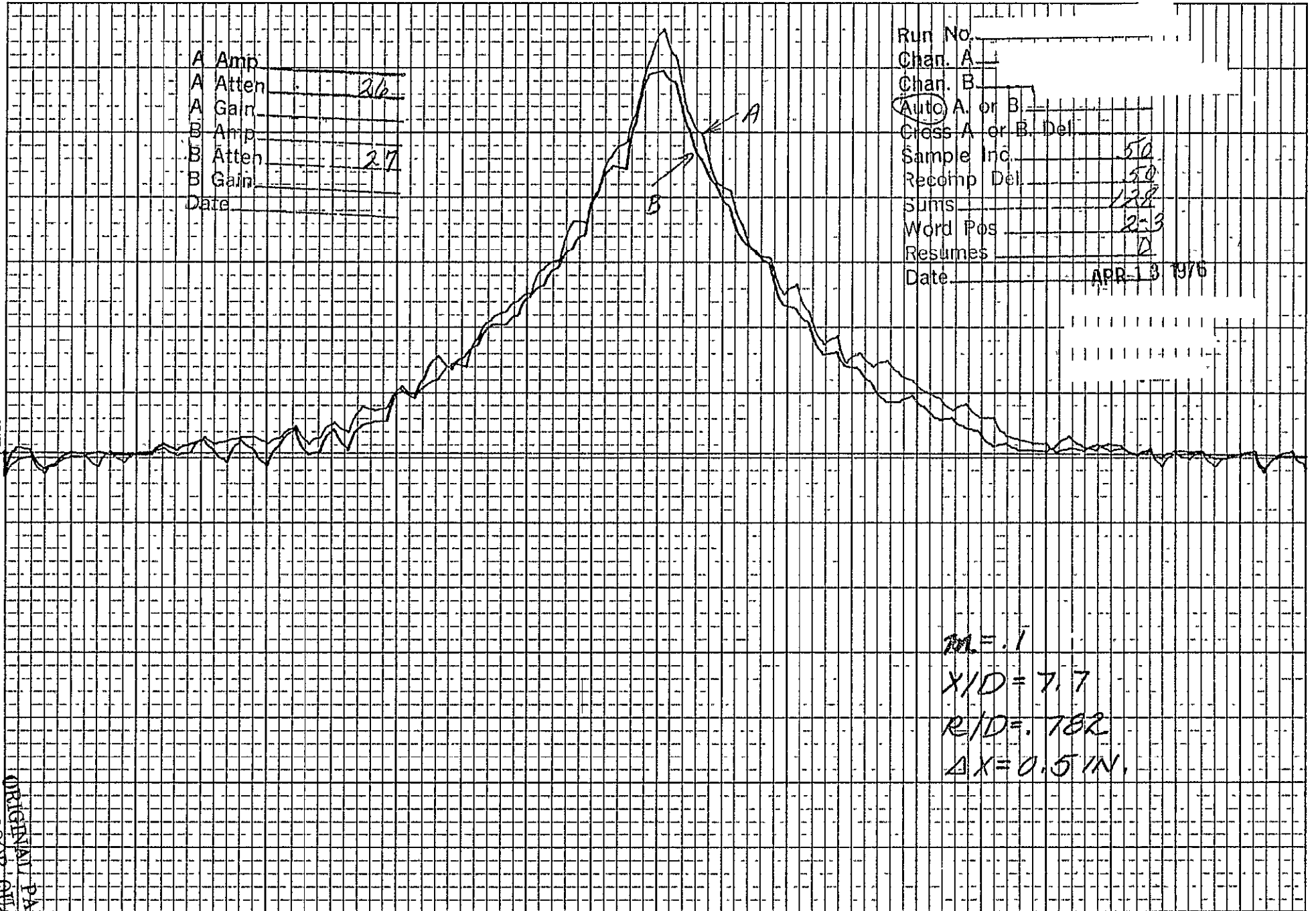
Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del. A  
Sample Inc 50  
Recomp Del \_\_\_\_\_  
Sums 128  
Word Pos 23  
Res Lines 1  
Date APR 13 1976



M=1.1  
X/D=7.7  
R/D=.462  
ΔX=5.5 IN.

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 50  
Recomp Del. 50  
SUMS 128  
Word Pos 2-3  
Resumes 2  
Date APR 13 1976



$M = .1$   
 $X/D = 7.7$   
 $R/D = .782$   
 $\Delta X = 0.5 \text{ IN.}$

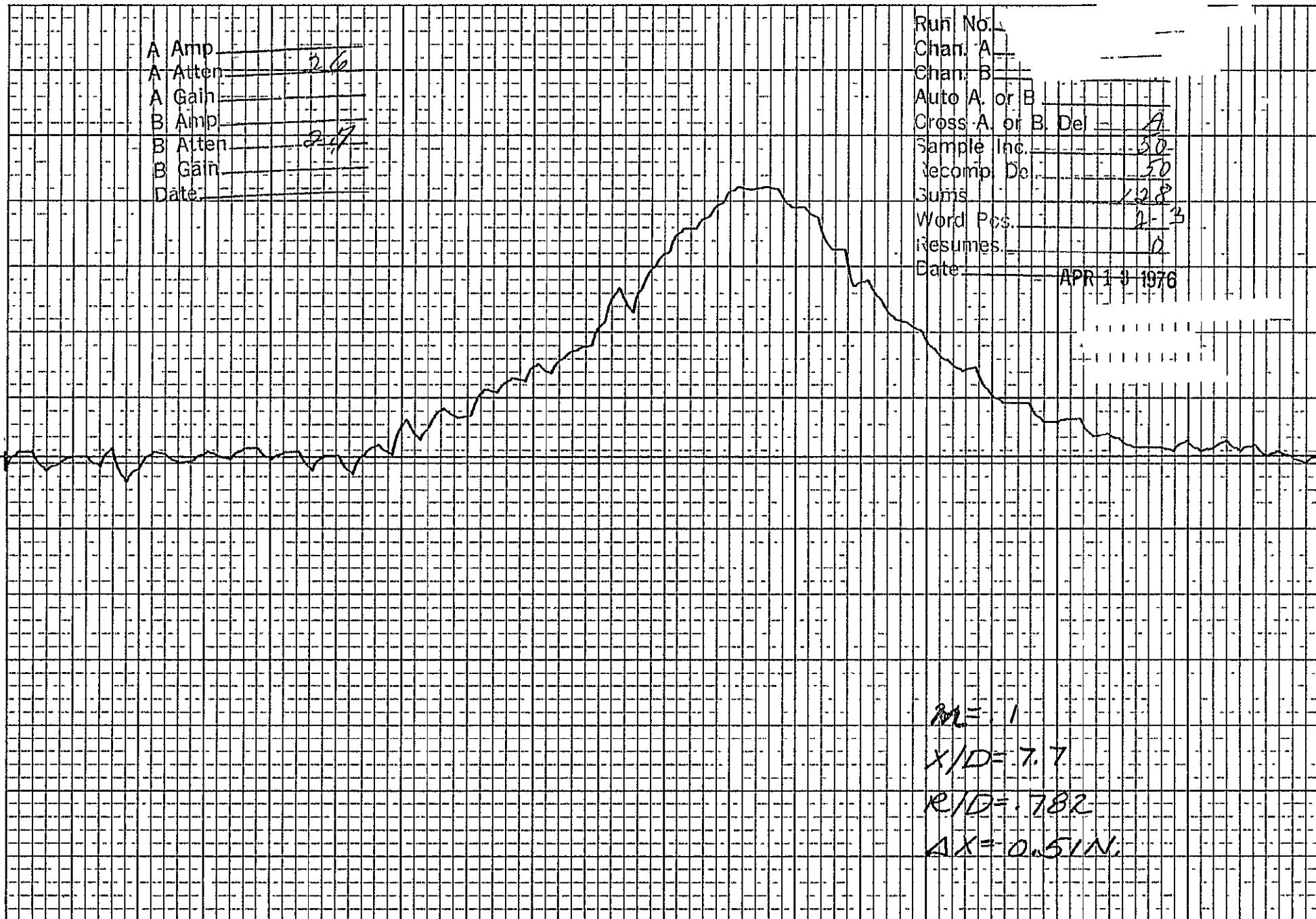
D-86

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date: \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del A  
Sample Inc. 50  
Decomp. De. 50  
Sum. 128  
Word Pcs. 2-3  
Resumes. 0  
Date: APR 10 1976

D-87

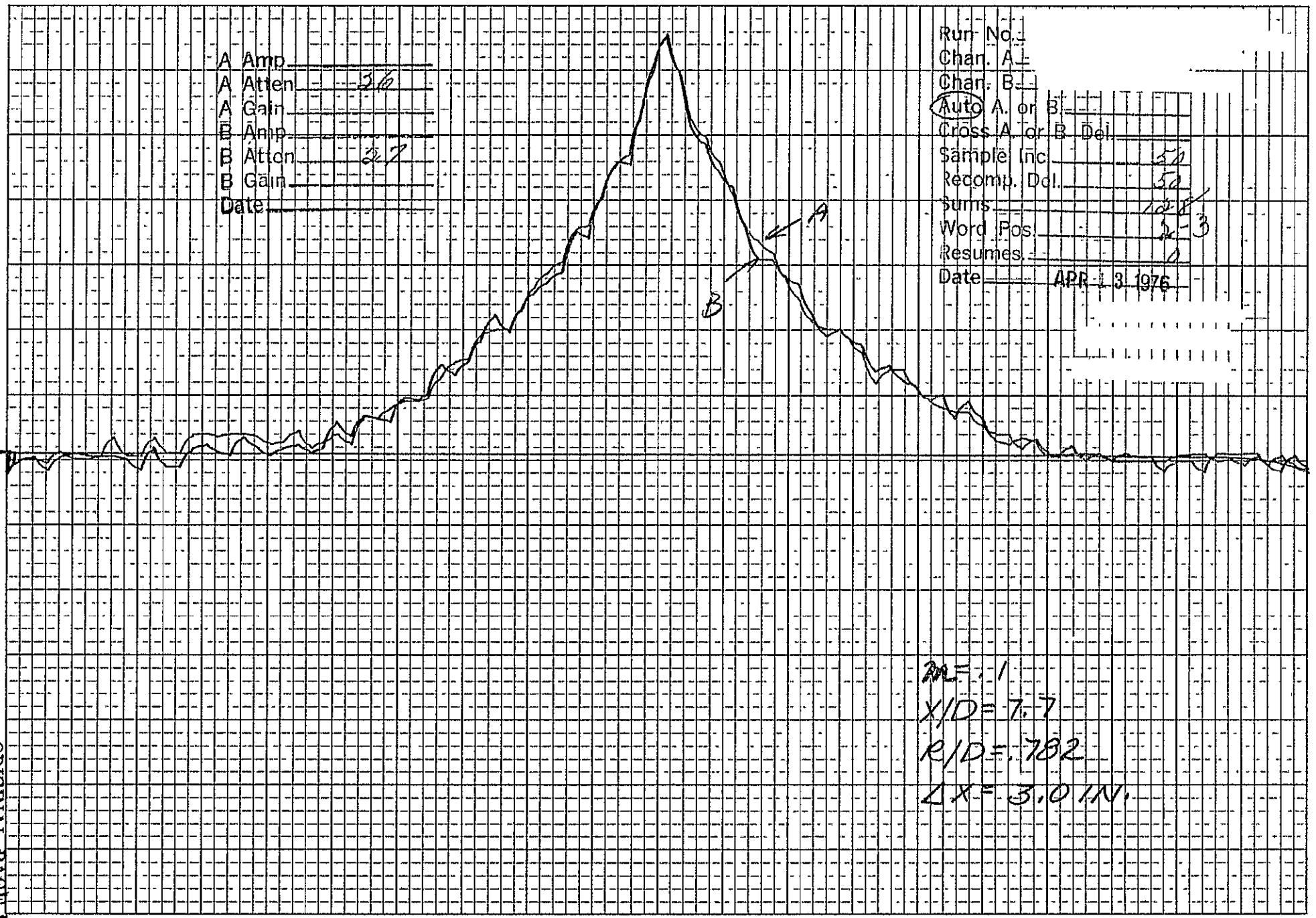


$M = 1$   
 $X/D = 7.7$   
 $R/D = .782$   
 $AX = 0.51N$



A Amp \_\_\_\_\_  
A Atten - 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten - 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. 1  
Chan. A ✓  
Chan. B ✓  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 50  
Redomp. Del. 50  
Sums 128  
Word Pos. 2-3  
Resumes. 0  
Date APR 13 1976



ME = 1  
X/D = 7.7  
R/D = .782  
 $\Delta X = 3.0 \text{ IN.}$

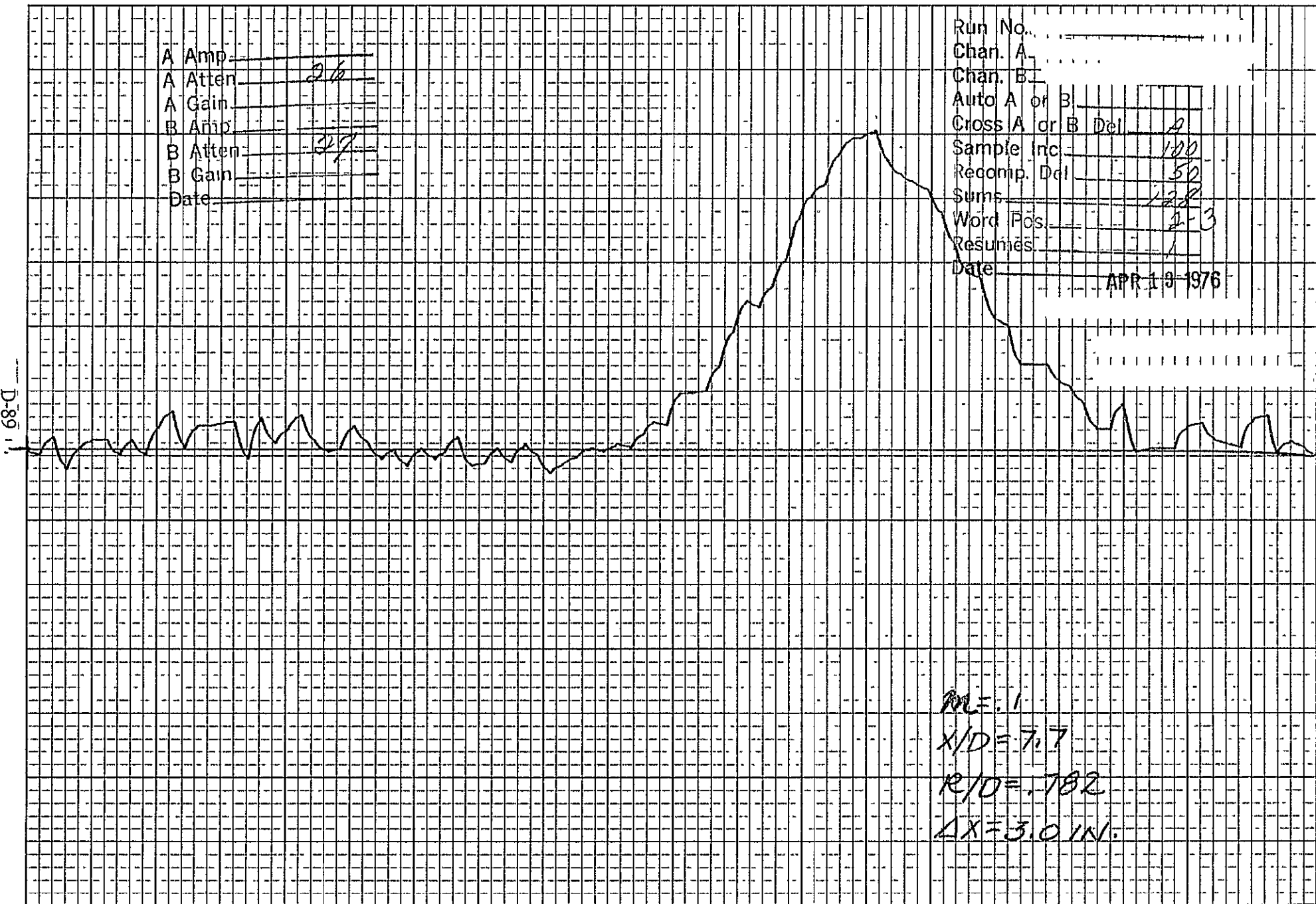
D-88

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del. 2  
Sample Inc. 100  
Recomp. Del. 50  
Sums 1228  
Word Pos. 2-3  
Resumes 1  
Date APR 19 1976

D-89

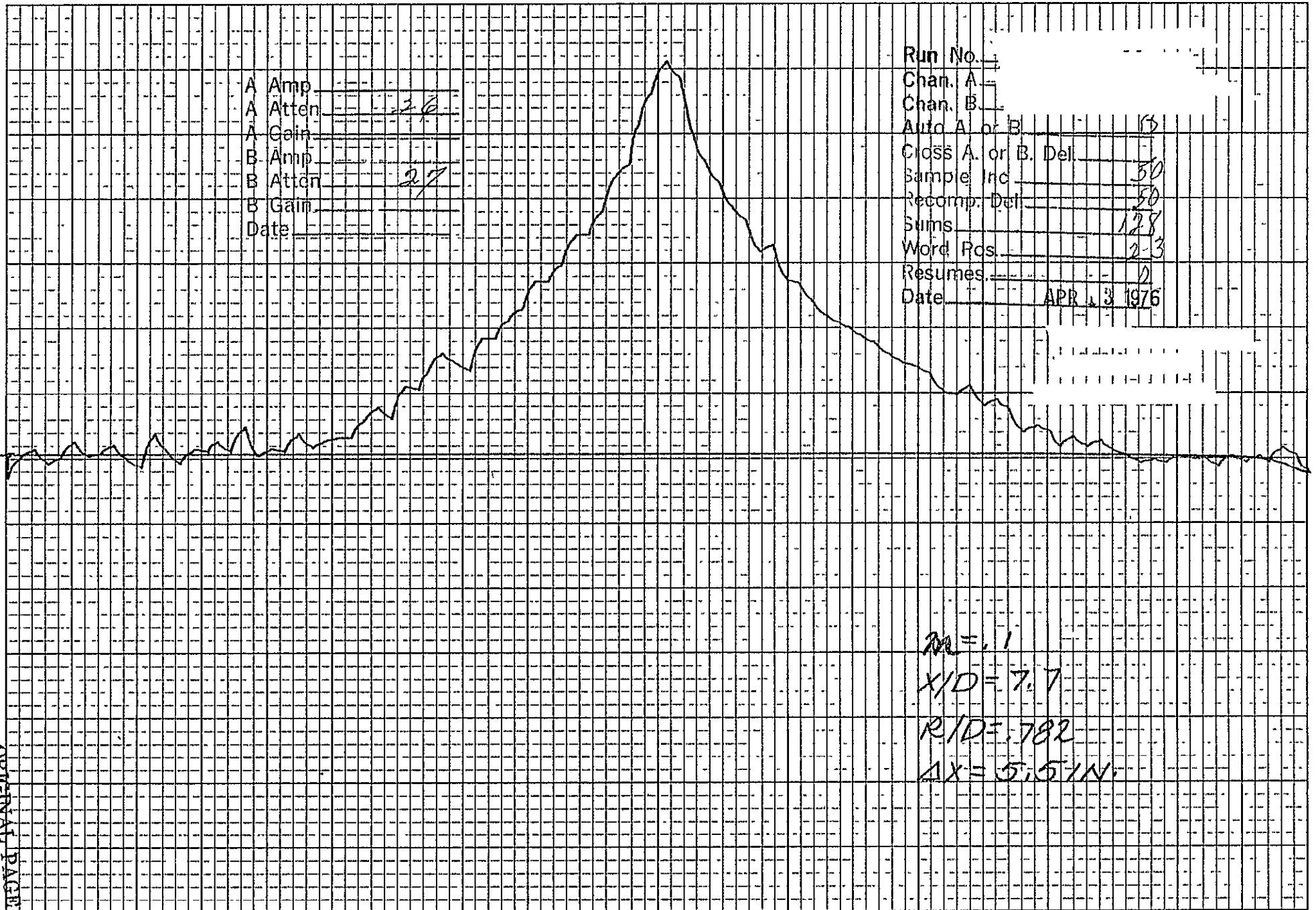


ME=1  
X/D=7.7  
R/D=.782  
ΔX=3.0 IN.

A Amp \_\_\_\_\_  
A Atten \_\_\_\_\_ 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten \_\_\_\_\_ 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_ 16  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc \_\_\_\_\_ 50  
Recomp. Del \_\_\_\_\_ 50  
Sums \_\_\_\_\_ 128  
Word Pcs. \_\_\_\_\_ 2-3  
Resumes \_\_\_\_\_ 0  
Date \_\_\_\_\_ APR 13 1976

D-90



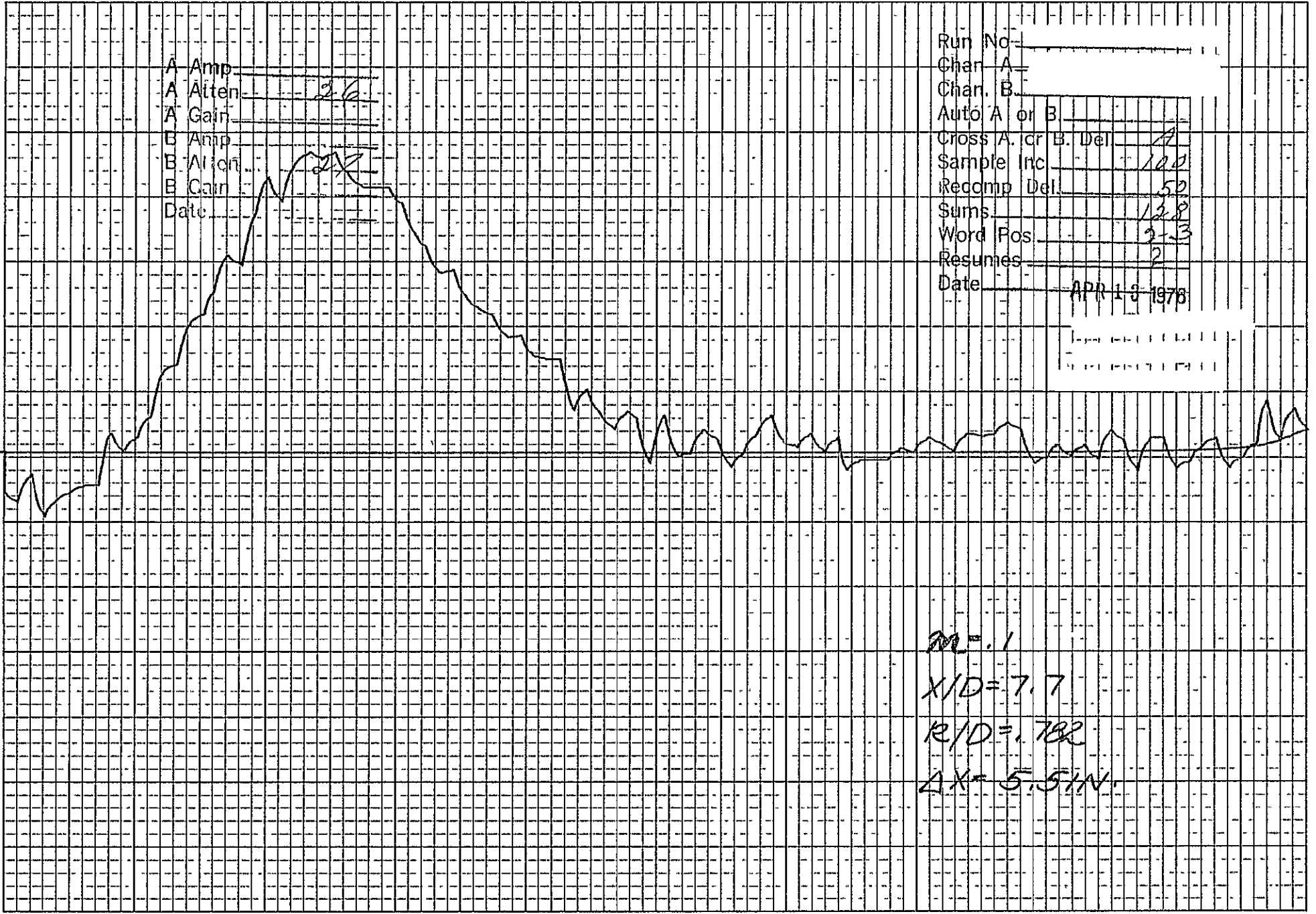
M = .1  
X/D = 7.7  
R/D = .782  
AX = 5.57N

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 26  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 27  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_  
 Cross A. or B. Del. 1  
 Sample Inc. 100  
 Recomp Del. 50  
 Sums 128  
 Word Pos. 3-3  
 Resumes 2  
 Date APR 13 1978

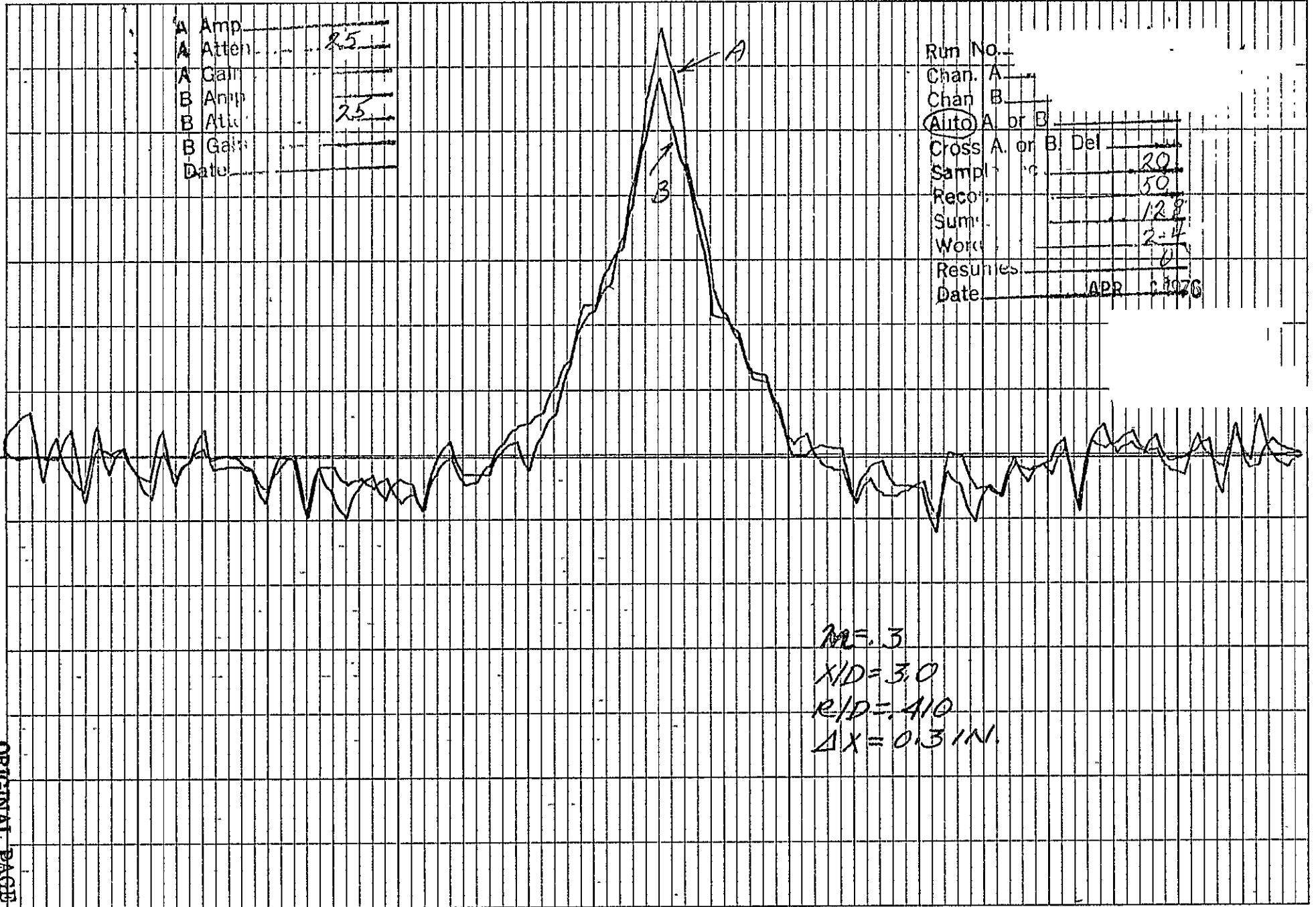
D-91



$m = .1$   
 $X/D = 7.7$   
 $R/D = .782$   
 $\Delta X = 5.514$

A Amp \_\_\_\_\_  
 A Atten. 25  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten. 25  
 B Gain \_\_\_\_\_  
 Date: \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 (Auto) A or B \_\_\_\_\_  
 Cross A. or B. Del \_\_\_\_\_  
 Sample \_\_\_\_\_ 20  
 Recorder \_\_\_\_\_ 50  
 Summ. \_\_\_\_\_ 128  
 Work \_\_\_\_\_ 2-4  
 Resumes \_\_\_\_\_ 0  
 Date APR 1 1976



M = 3  
 X/D = 3.0  
 R/D = 4.0  
 $\Delta X = 0.3 \text{ IN.}$

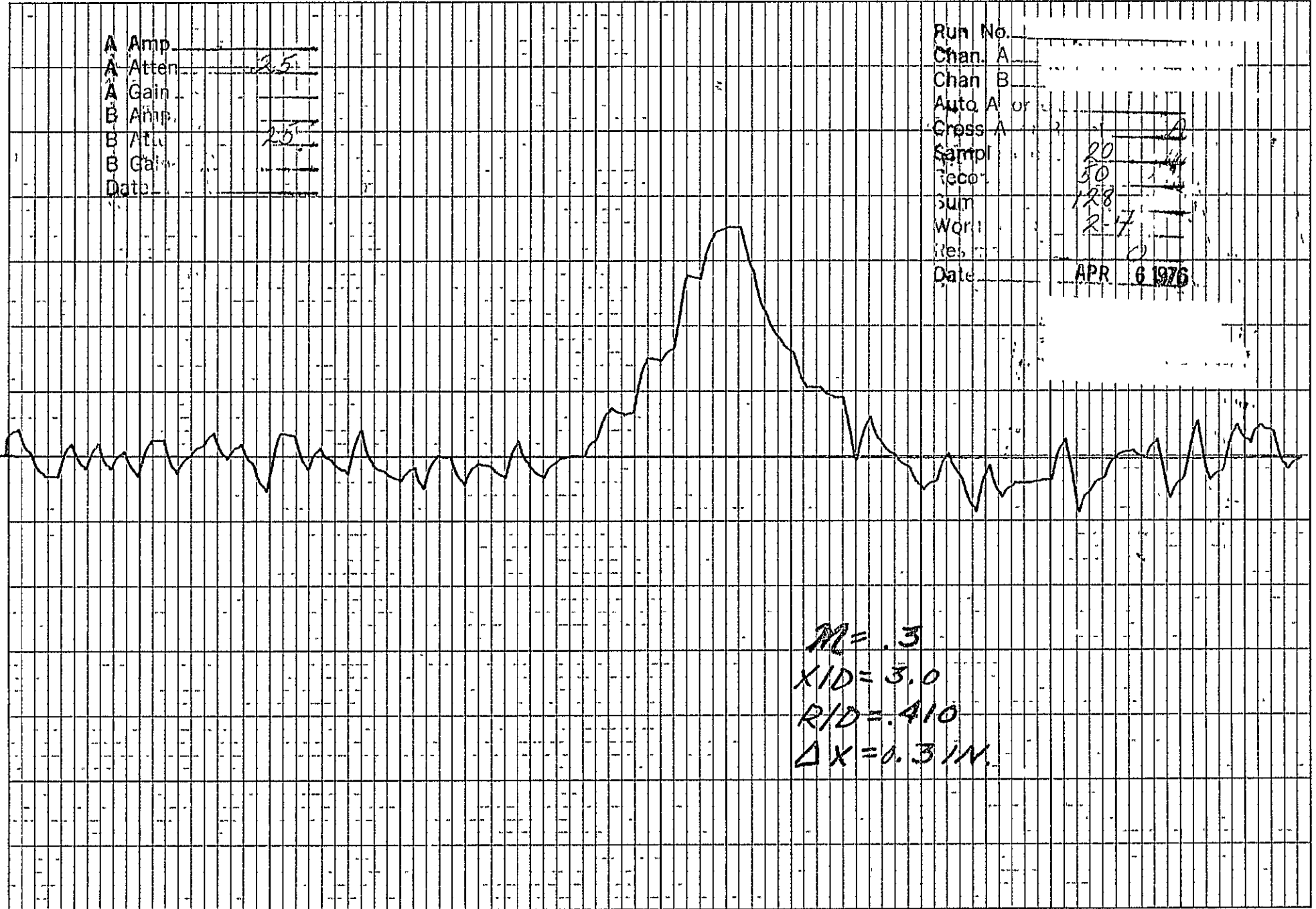
D-92

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 2.5  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 2.5  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or \_\_\_\_\_  
Cross A or \_\_\_\_\_  
Sampl \_\_\_\_\_  
Recor 20  
50  
128  
Sum \_\_\_\_\_  
Worl 2-7  
Res \_\_\_\_\_  
Date APR 6 1976

D-93



$M = .3$   
 $X/D = 3.0$   
 $R/D = .410$   
 $\Delta X = 0.3 IN.$

A Amp  
A Att: 2.5  
A Gal:  
B Att: 2.5  
B Gal:  
Date:

Run No.  
Chan. A  
Chan. B  
Auto A. 11 13  
Cross A. 1  
Sam. 20  
Rec. 50  
Sur. 128  
Writ. 2-4  
Resist. 0  
Date APR 6 1975

D-94

OF POOR QUALITY  
PAGE IS

$M = .3$   
 $X/D = 3.0$   
 $R/D = .410$   
 $\Delta X = 1.8 IN.$

A Amp  
 A Att: 2.5  
 A Gain  
 B Att: 2.5  
 B Gain  
 Date

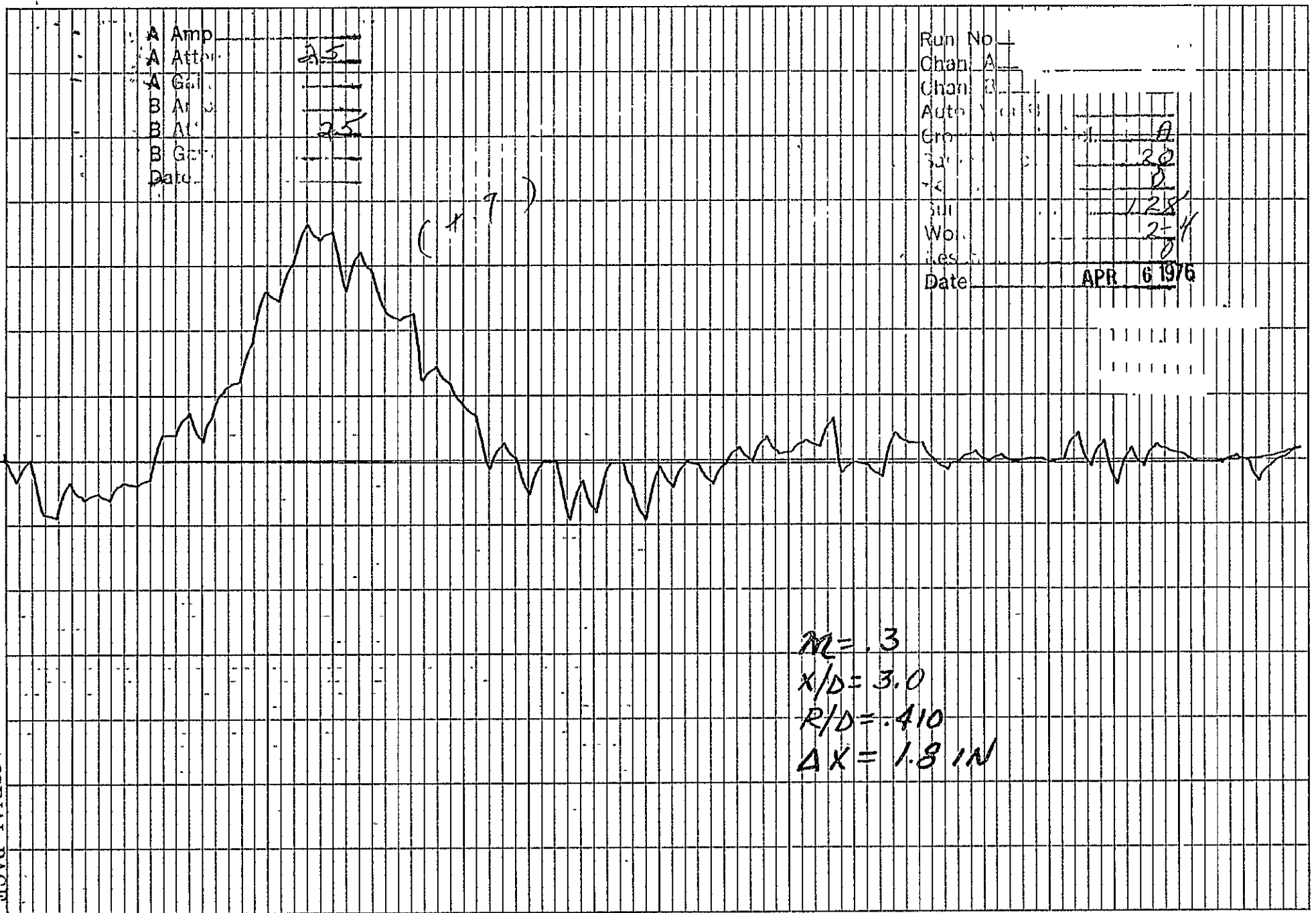
Run No. \_\_\_\_\_  
 Chan: A \_\_\_\_\_  
 Chan: B \_\_\_\_\_  
 Auth: \_\_\_\_\_  
 Gro: \_\_\_\_\_  
 Sat: \_\_\_\_\_  
 T.C.: \_\_\_\_\_  
 Stu: \_\_\_\_\_  
 Wo: \_\_\_\_\_  
 Res: \_\_\_\_\_  
 Date: APR 6 1976

(1.7)

D-95

$M = .3$   
 $X/D = 3.0$   
 $R/D = .410$   
 $\Delta X = 1.8 IN$

ORIGINAL PAGE IS  
 OF POOR QUALITY

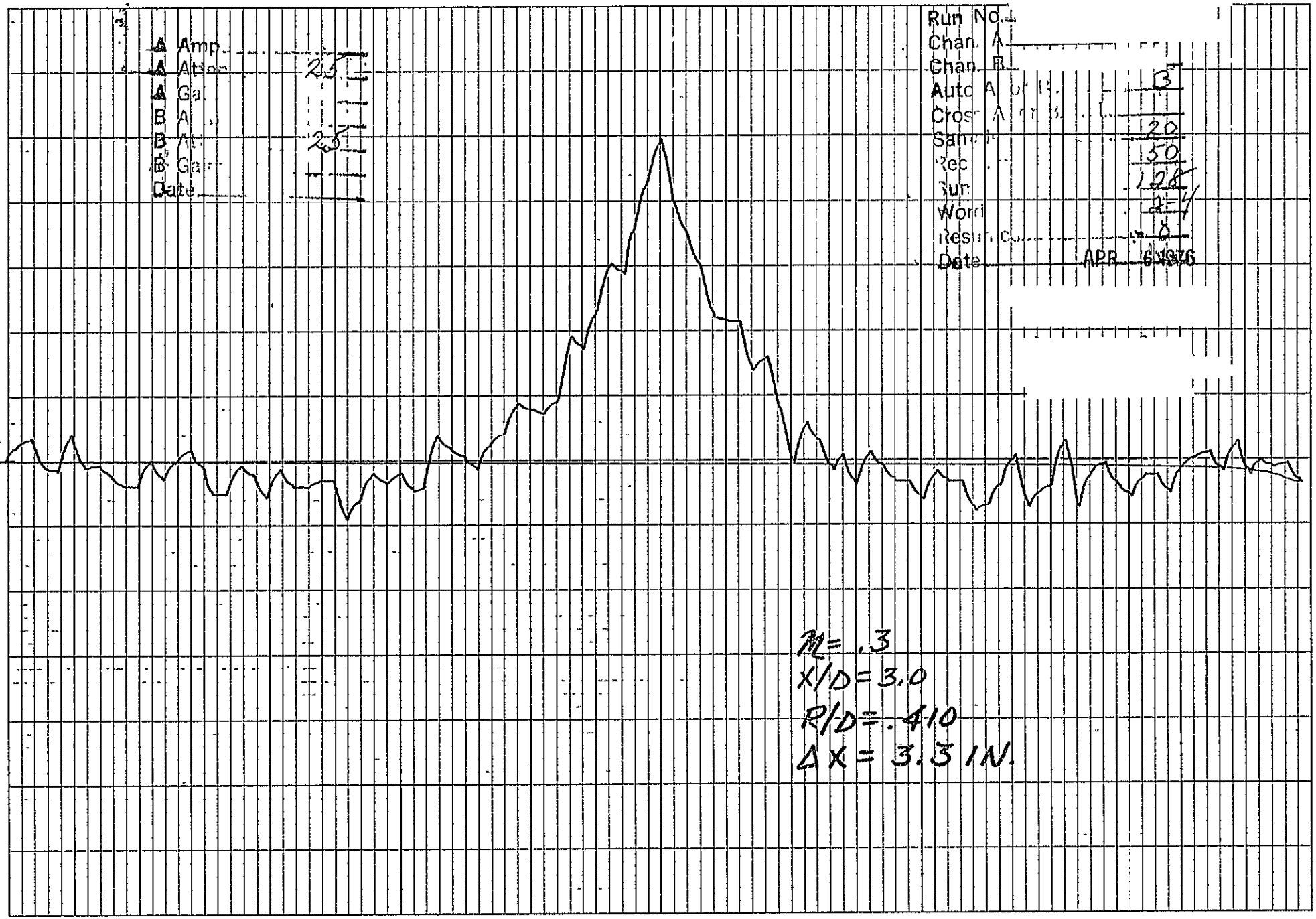




A Amp  
A Ation 25  
A Ga  
B A  
B Ation 25  
B Ga  
Date

Run No. 1  
Chan. A  
Chan. B  
Auto A. of 3  
Cross A. of 120  
Sam. 50  
Rec. 128  
Sur. 2-4  
Word 8  
Resin C.  
Date APR 6 1976

D-96

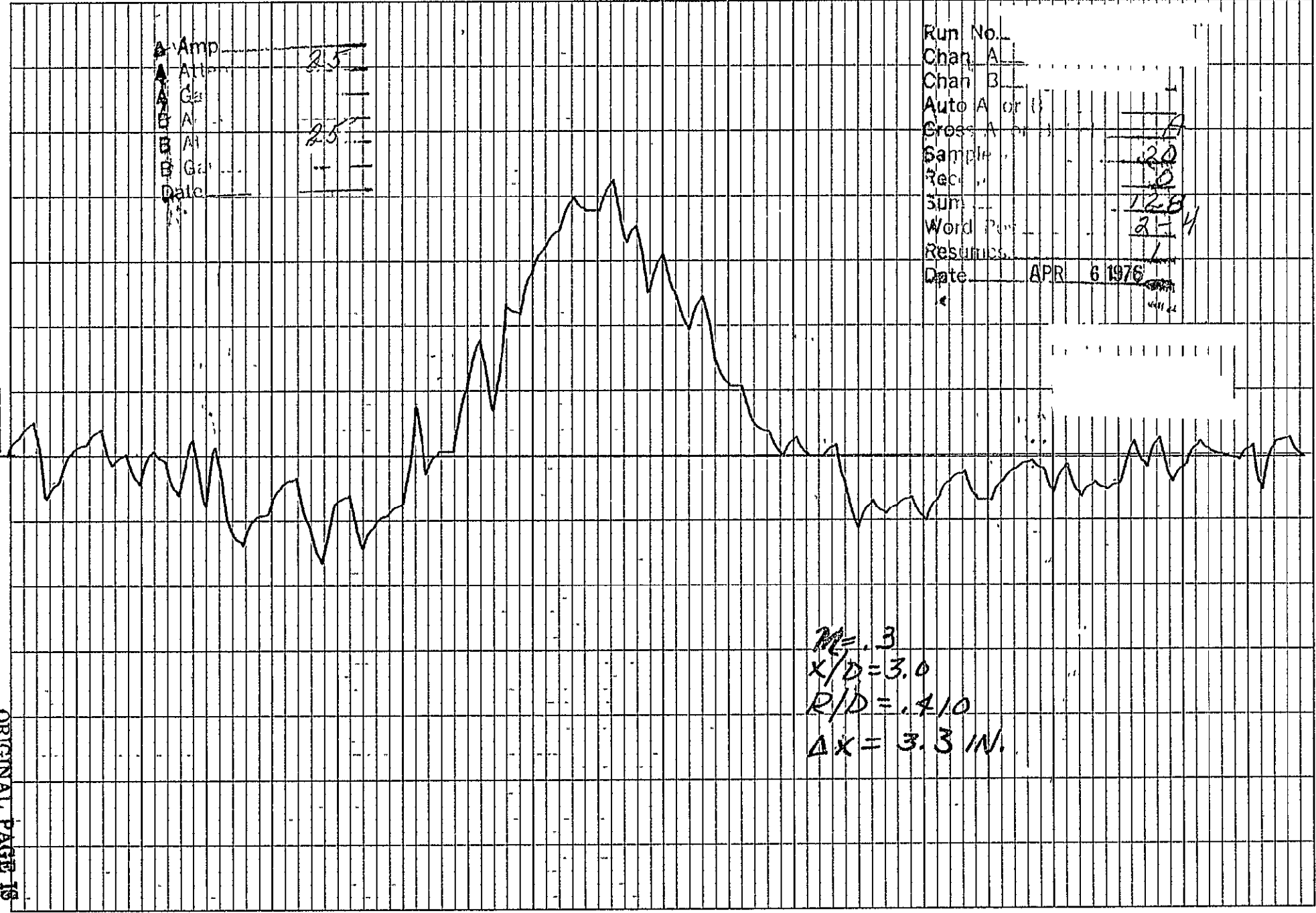


$M = .3$   
 $X/D = 3.0$   
 $R/D = .410$   
 $\Delta X = 3.3 \text{ IN.}$

Amp 2.5  
Att. 2.5  
Gain 2.5  
Date

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B \_\_\_\_\_  
Sample \_\_\_\_\_  
Rec. \_\_\_\_\_  
Sum \_\_\_\_\_  
Word Per \_\_\_\_\_  
Resumes \_\_\_\_\_  
Date APR 6 1976

D-97



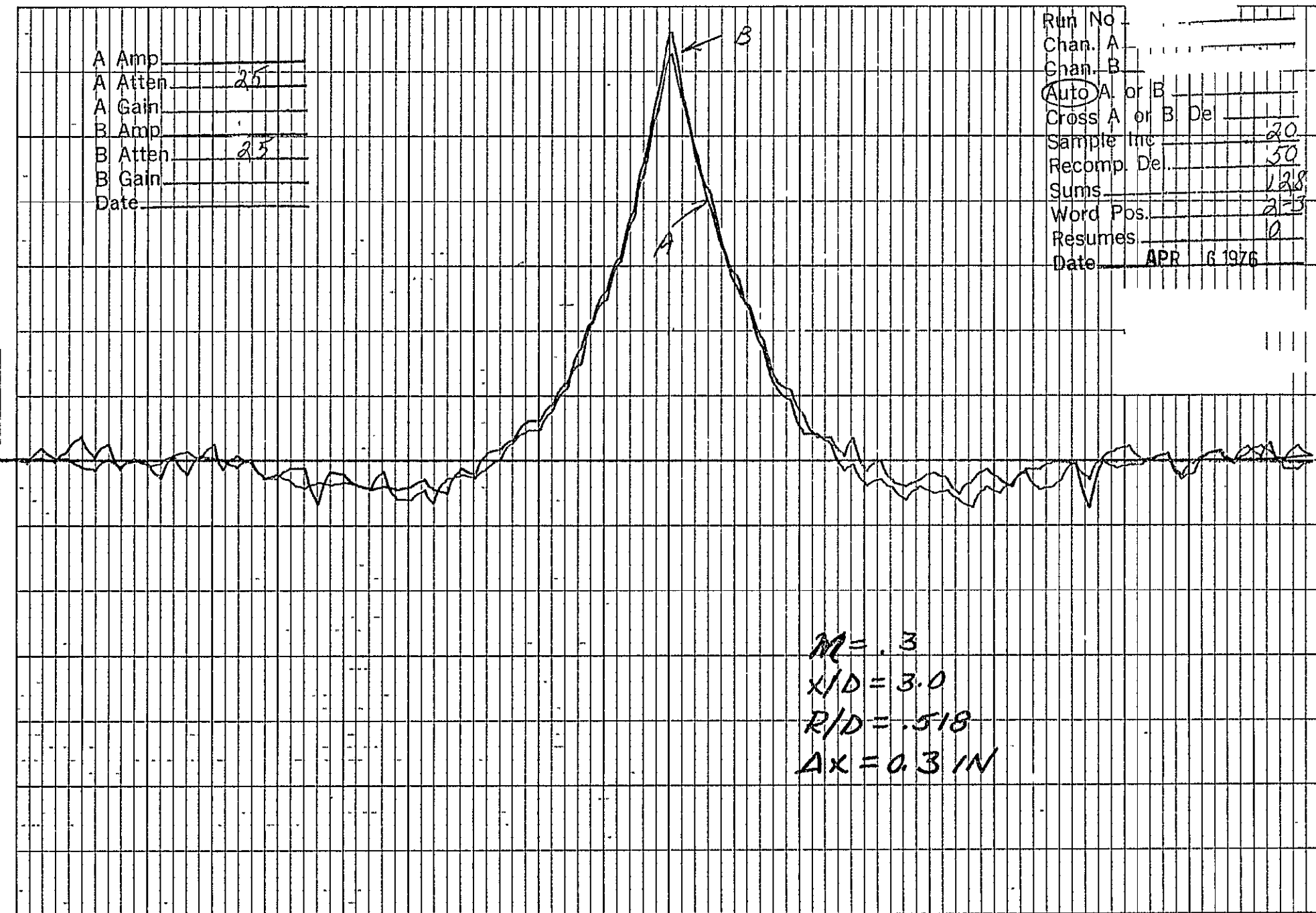
$M = .3$   
 $X/D = 3.0$   
 $R/D = .410$   
 $\Delta X = 3.3 \text{ IN.}$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 25  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B De \_\_\_\_\_  
Sample Inc 20  
Recomp. De. 50  
Sums 128  
Word Pos. 213  
Resumes 0  
Date APR 6 1976

D-98

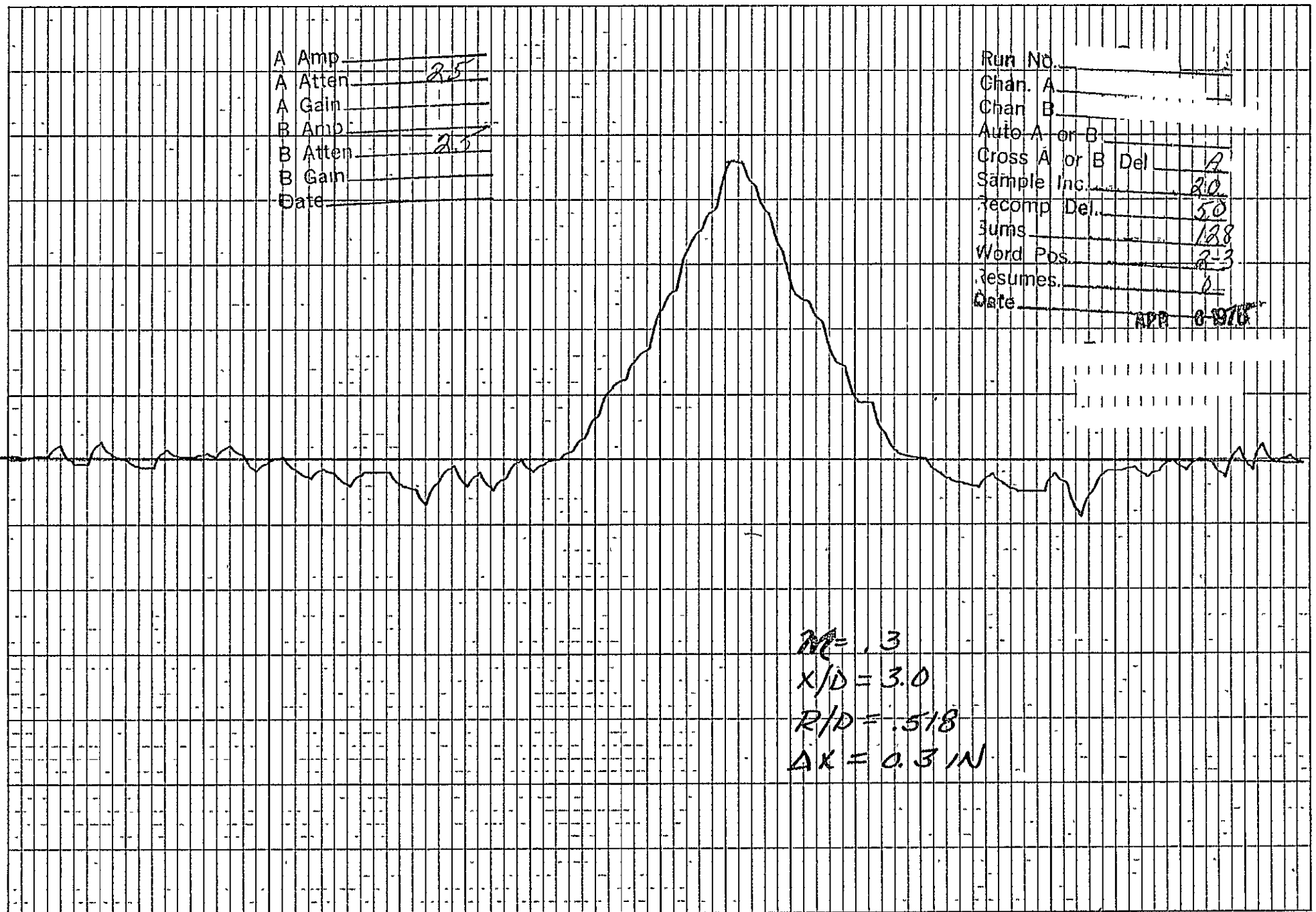


$M = .3$   
 $X/D = 3.0$   
 $R/D = .518$   
 $\Delta X = 0.3 IN$

A Amp \_\_\_\_\_  
A Atten \_\_\_\_\_ 2.5  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten \_\_\_\_\_ 2.5  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del \_\_\_\_\_ A  
Sample Inc. \_\_\_\_\_ 2.0  
Recomp Del. \_\_\_\_\_ 5.0  
Sums \_\_\_\_\_ 128  
Word Pos. \_\_\_\_\_ 2-3  
Resumes \_\_\_\_\_ 0  
Date \_\_\_\_\_ APR 8 1976

D-99

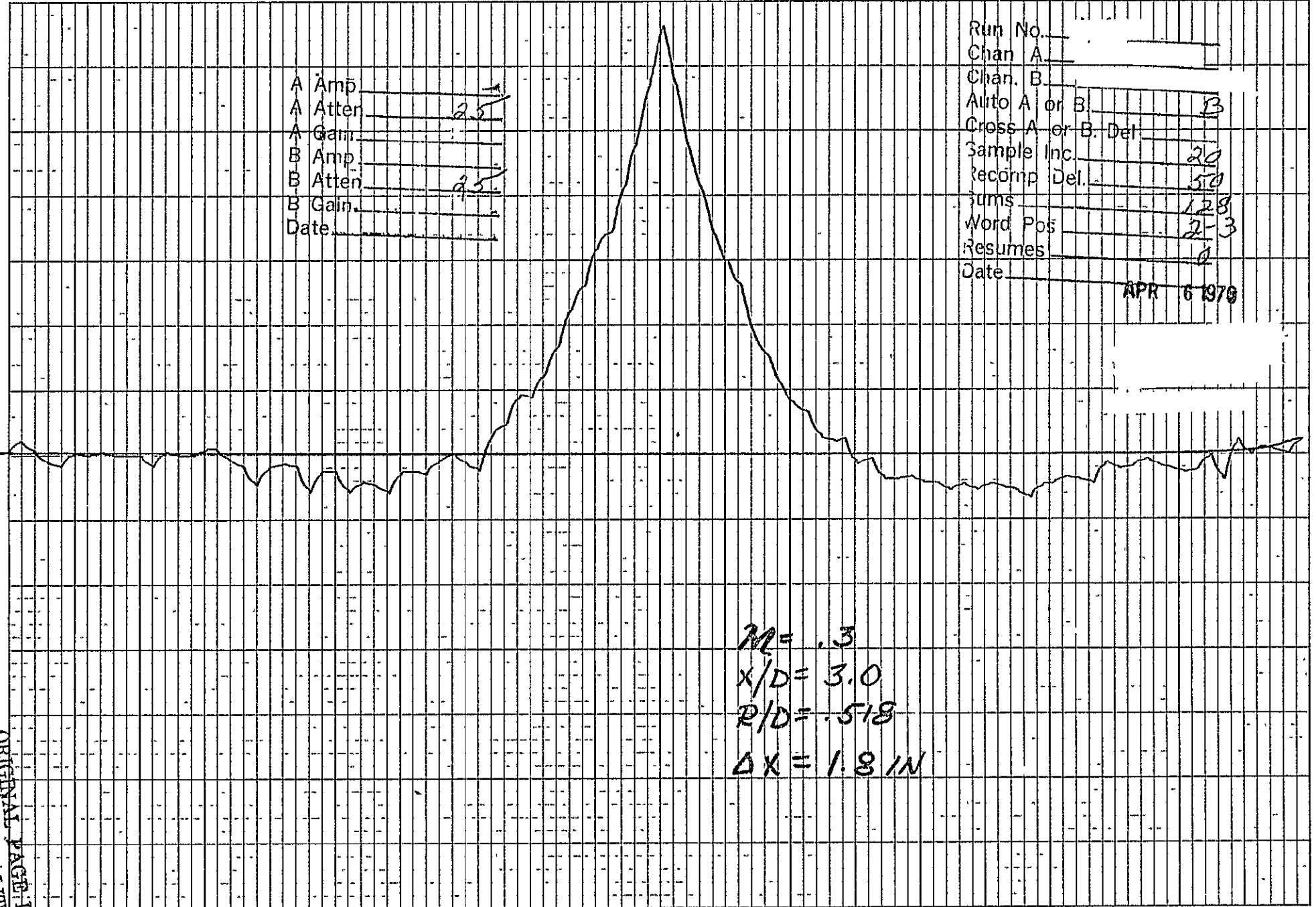


$M = .3$   
 $X/D = 3.0$   
 $R/D = .518$   
 $\Delta X = 0.3 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten \_\_\_\_\_ 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten \_\_\_\_\_ 25  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_ B  
Cross A or B Del \_\_\_\_\_  
Sample Inc. \_\_\_\_\_ 20  
Recomp Del. \_\_\_\_\_ 50  
Sums \_\_\_\_\_ 128  
Word Pos \_\_\_\_\_ 2-3  
Resumes \_\_\_\_\_ 0  
Date \_\_\_\_\_ APR 6 1970

D-100



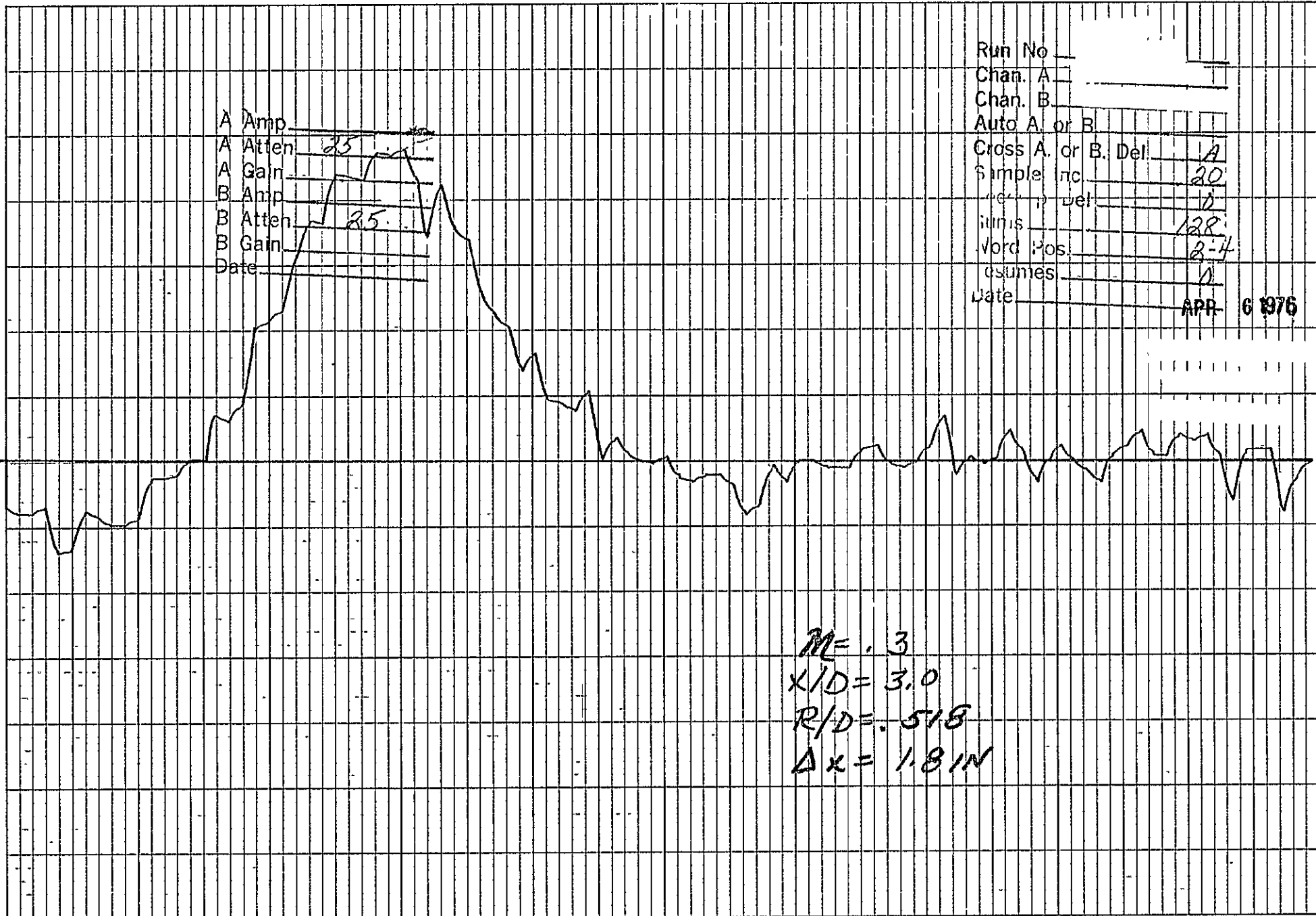
$M = .3$   
 $X/D = 3.0$   
 $R/D = .518$   
 $\Delta X = 1.8 IN$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp. \_\_\_\_\_  
A Atten. 23  
A Gain \_\_\_\_\_  
B Amp. \_\_\_\_\_  
B Atten. 25  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Def. A  
Sample Inc. 20  
Waveform Def. D  
Units 12R  
Word Pos. 2-4  
Assumes 1  
Date APR 6 1976

D-101

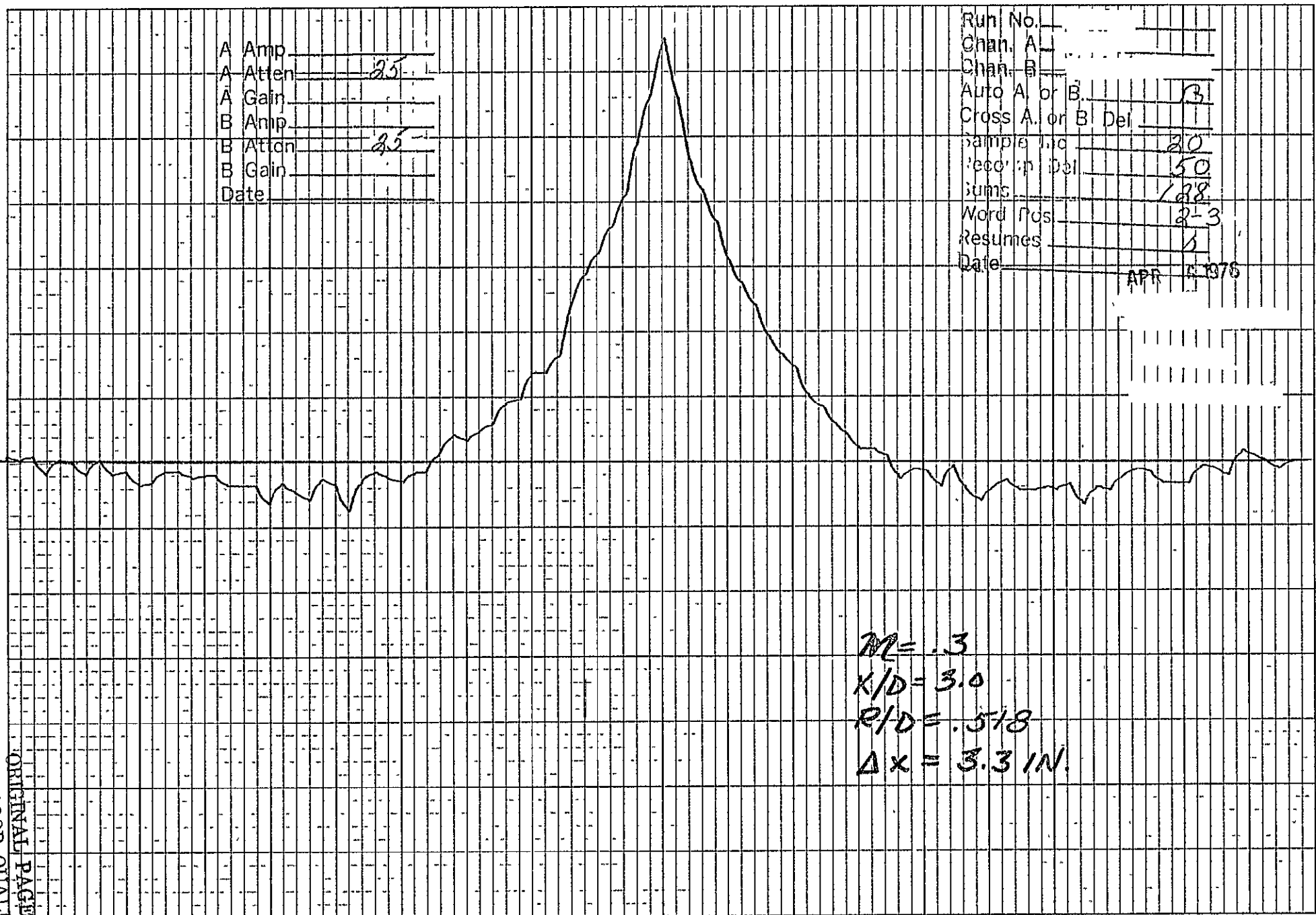


$M = .3$   
 $X/D = 3.0$   
 $R/D = .518$   
 $\Delta x = 1.8 IN$

A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 25  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross A. or B. Del \_\_\_\_\_  
Sample Inc 20  
Recor. Del 50  
Sums 128  
Word Pos. 2-3  
Resumes 1  
Date APR 5 1976

D-102



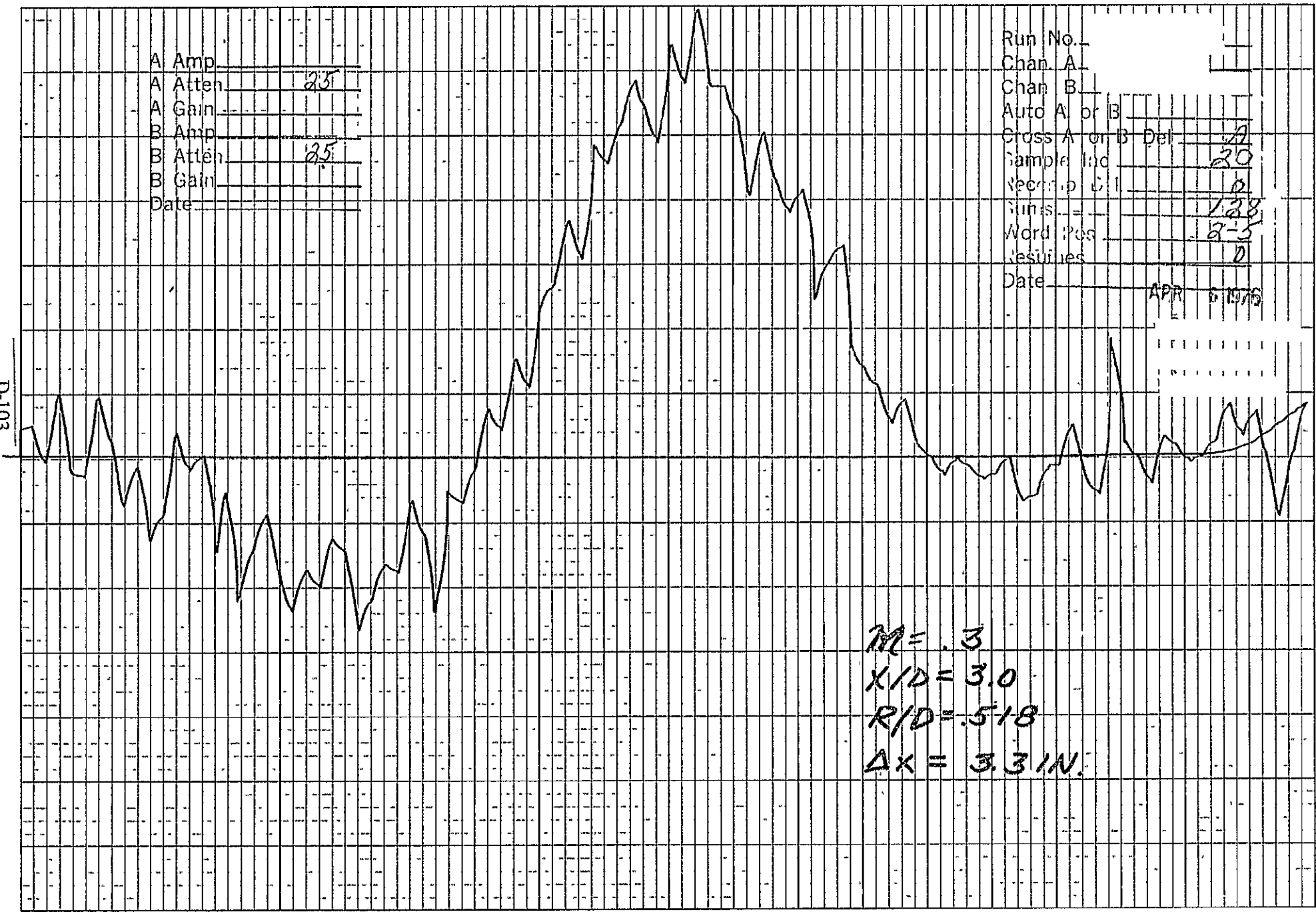
$M = .3$   
 $K/D = 3.0$   
 $R/D = .518$   
 $\Delta x = 3.3 IN.$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 25  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Def A  
Sample Inc 20  
Record Cl 0  
Lines 128  
Word Pos 2-5  
Resolves 0  
Date APR 6 1976

D-103



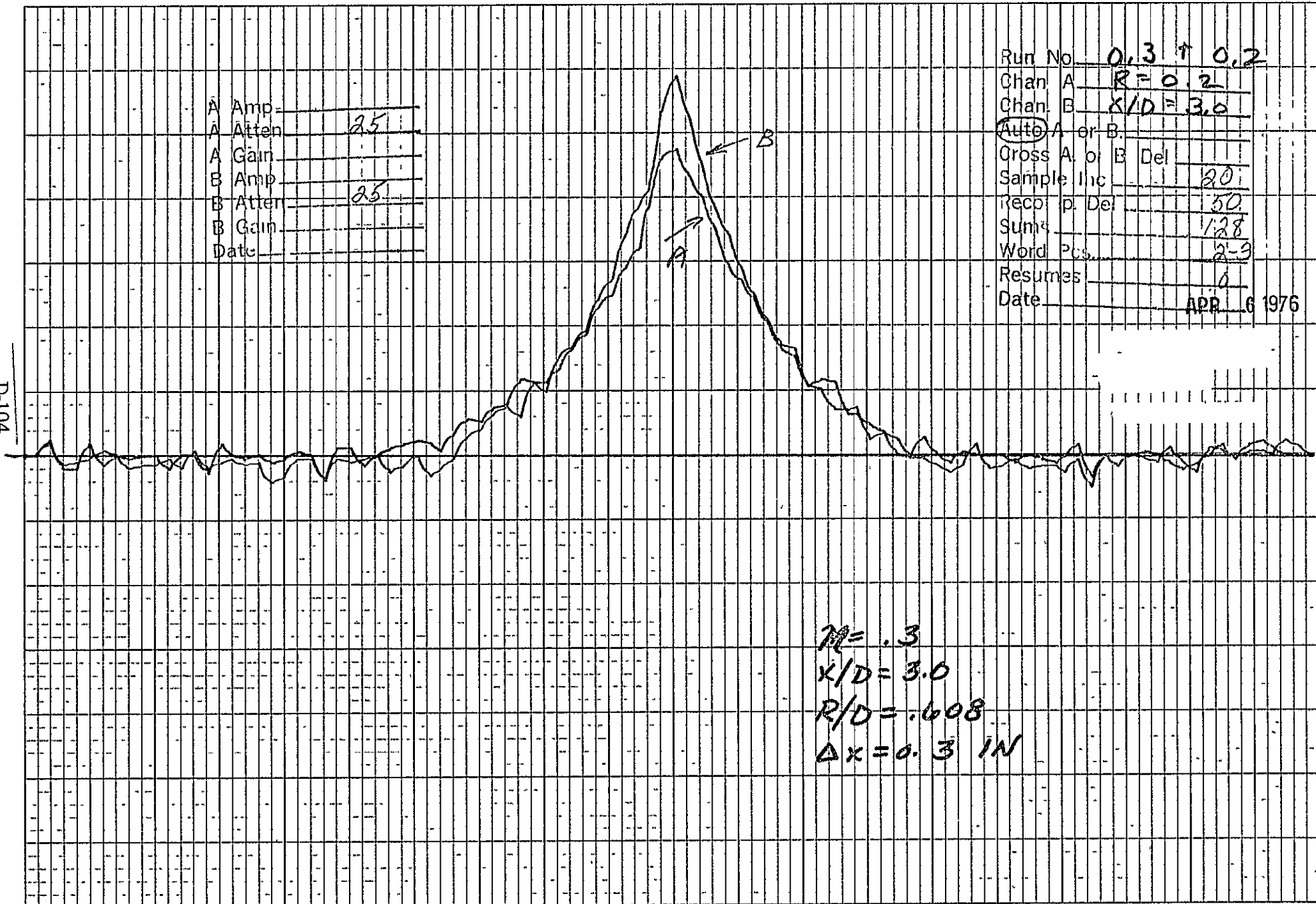
$M = 3$   
 $X/D = 3.0$   
 $R/D = 518$   
 $\Delta X = 3.3 IN.$



A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 25  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. 0.3 ↑ 0.2  
Chan. A R = 0.2  
Chan. B X/D = 3.0  
 Auto A or B \_\_\_\_\_  
Cross A. or B. Del \_\_\_\_\_  
Sample Inc. 20  
Recor. p. Del. 50  
Summ. 128  
Word Pcs. 2-9  
Resumes 0  
Date APR 6 1976

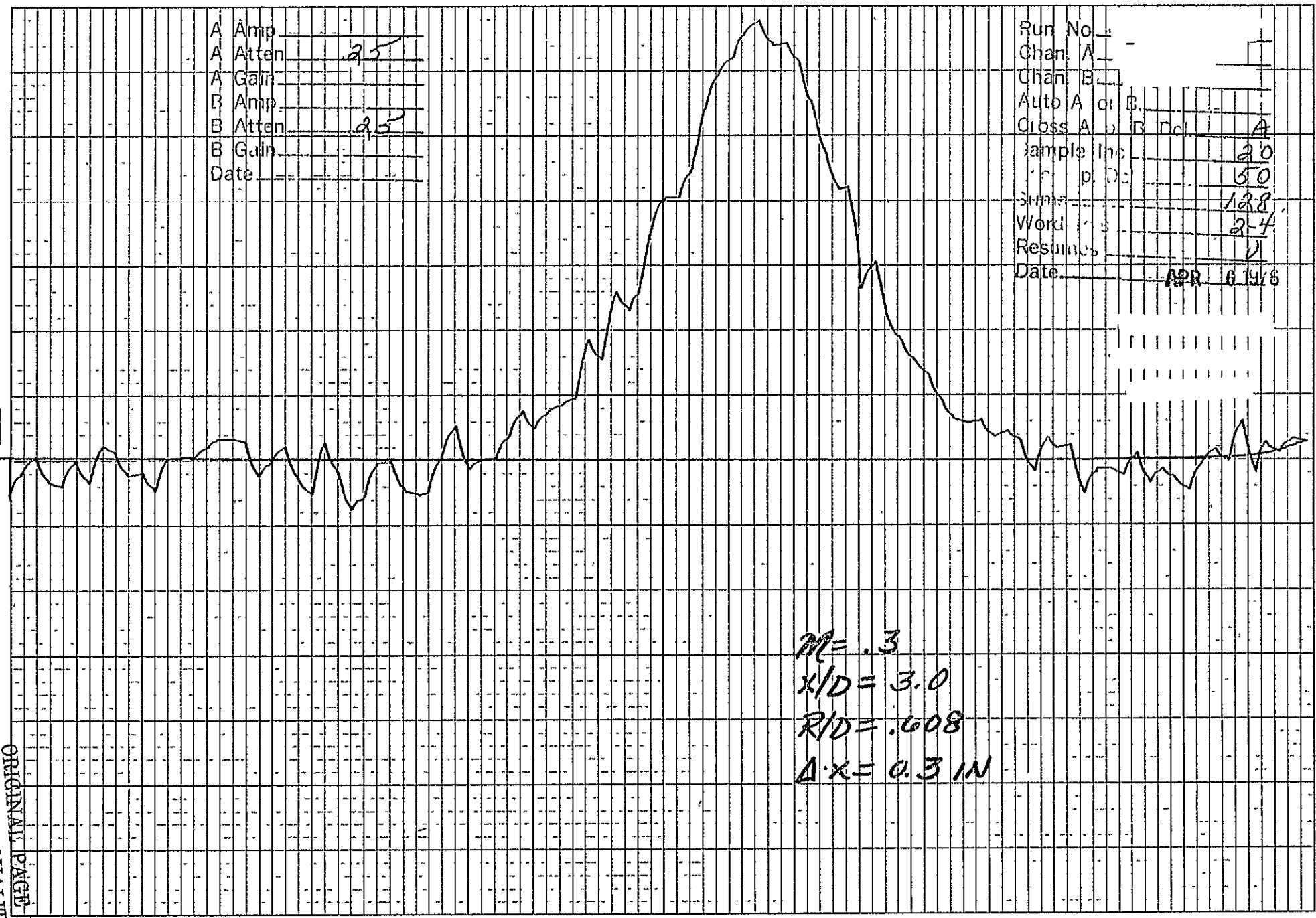
D-104



$M = .3$   
 $X/D = 3.0$   
 $R/D = .608$   
 $\Delta x = 0.3 \text{ IN}$

A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 25  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A    
Chan. B    
Auto A or B \_\_\_\_\_  
Cross A or B Def. A  
Sample Inc. 20  
Int. p. Def. 50  
Sigma 128  
Word 24  
Residuals 1  
Date APR 6 1966



$M = .3$   
 $X/D = 3.0$   
 $R/D = .608$   
 $\Delta X = 0.3 IN$

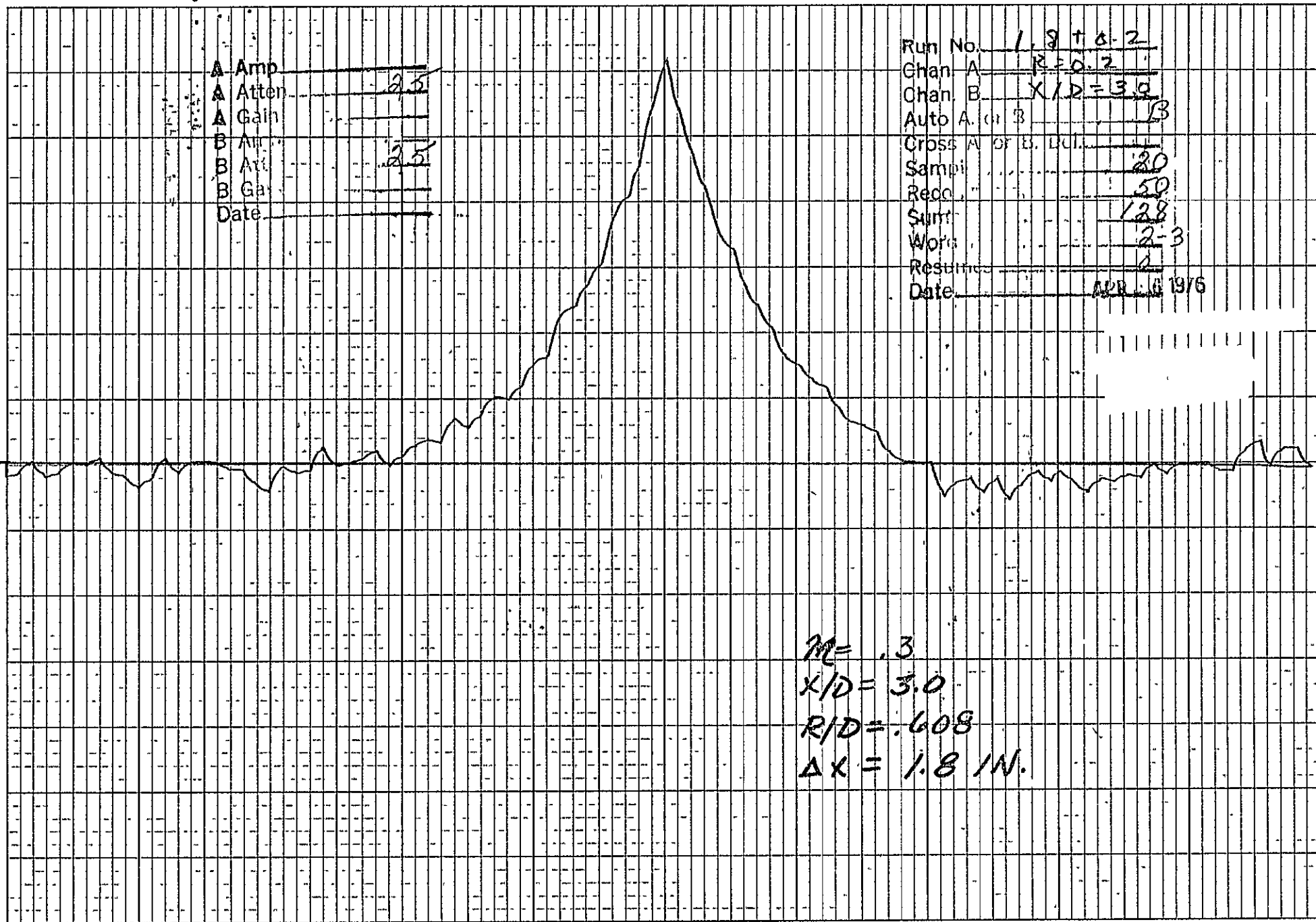
D-105

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten. 2.5  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 2.5  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. 1.9 + 0.2  
Chan. A R=0.2  
Chan. B X/D=3.0  
Auto A. or B. B  
Cross At. of B. D.U. \_\_\_\_\_  
Samp. 20  
Recc. 50  
Sum. 128  
Wor. 2-3  
Res. 2  
Date APR 16 1976

D-106



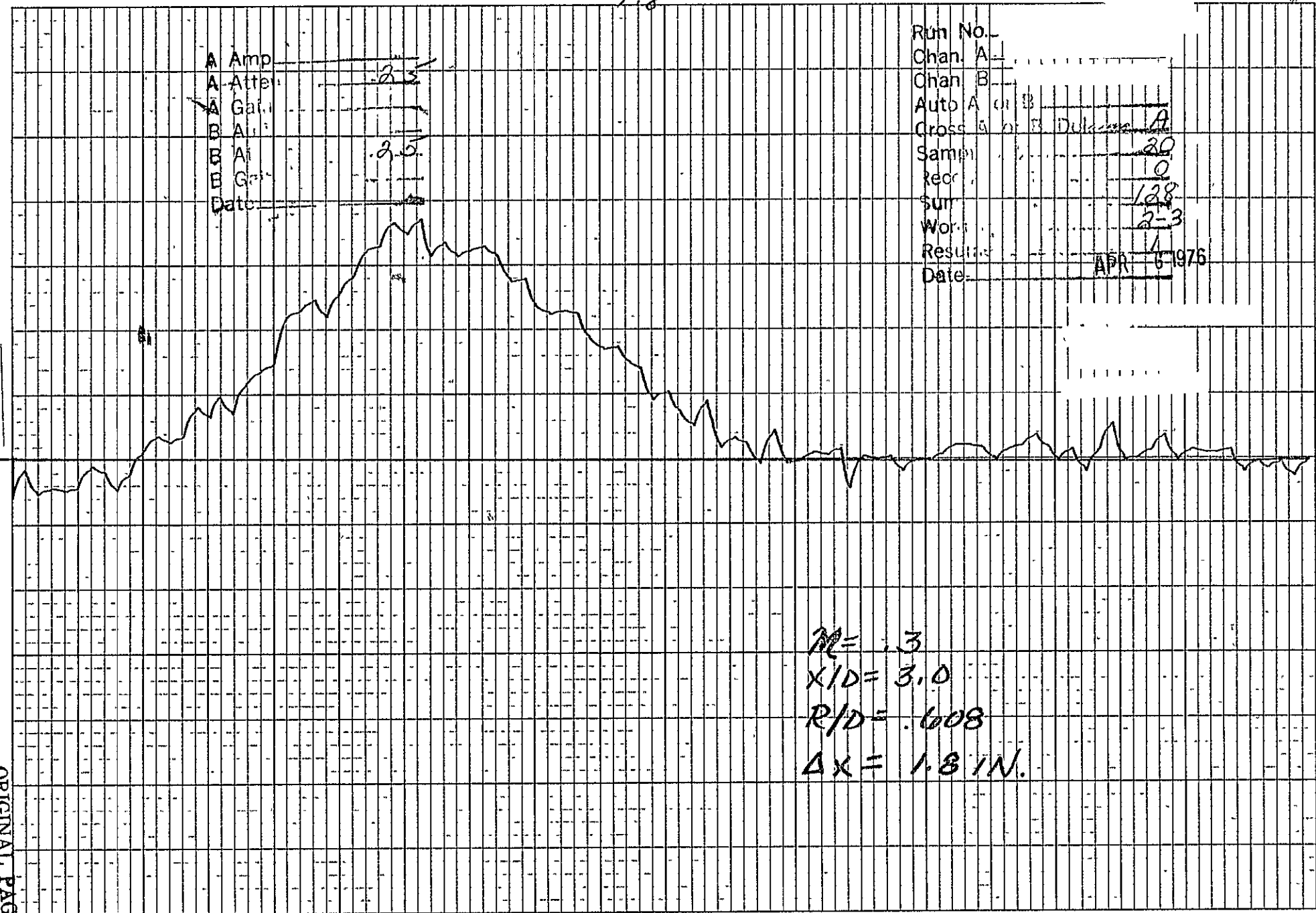
$M = .3$   
 $X/D = 3.0$   
 $R/D = .608$   
 $\Delta X = 1.8 \text{ IN.}$

1.8

1/2"

A Amp \_\_\_\_\_  
 A Attenuation 2.5  
 A Gain \_\_\_\_\_  
 B Attenuation 2.5  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_  
 Cross A or B A  
 Sample \_\_\_\_\_ 20  
 Recorder \_\_\_\_\_ 0  
 Sum \_\_\_\_\_ 128  
 Work \_\_\_\_\_ 2-3  
 Result \_\_\_\_\_ 1  
 Date \_\_\_\_\_ APR 6 1976



$M = .3$   
 $X/D = 3.0$   
 $R/D = .608$   
 $\Delta X = 1.8 \text{ IN.}$

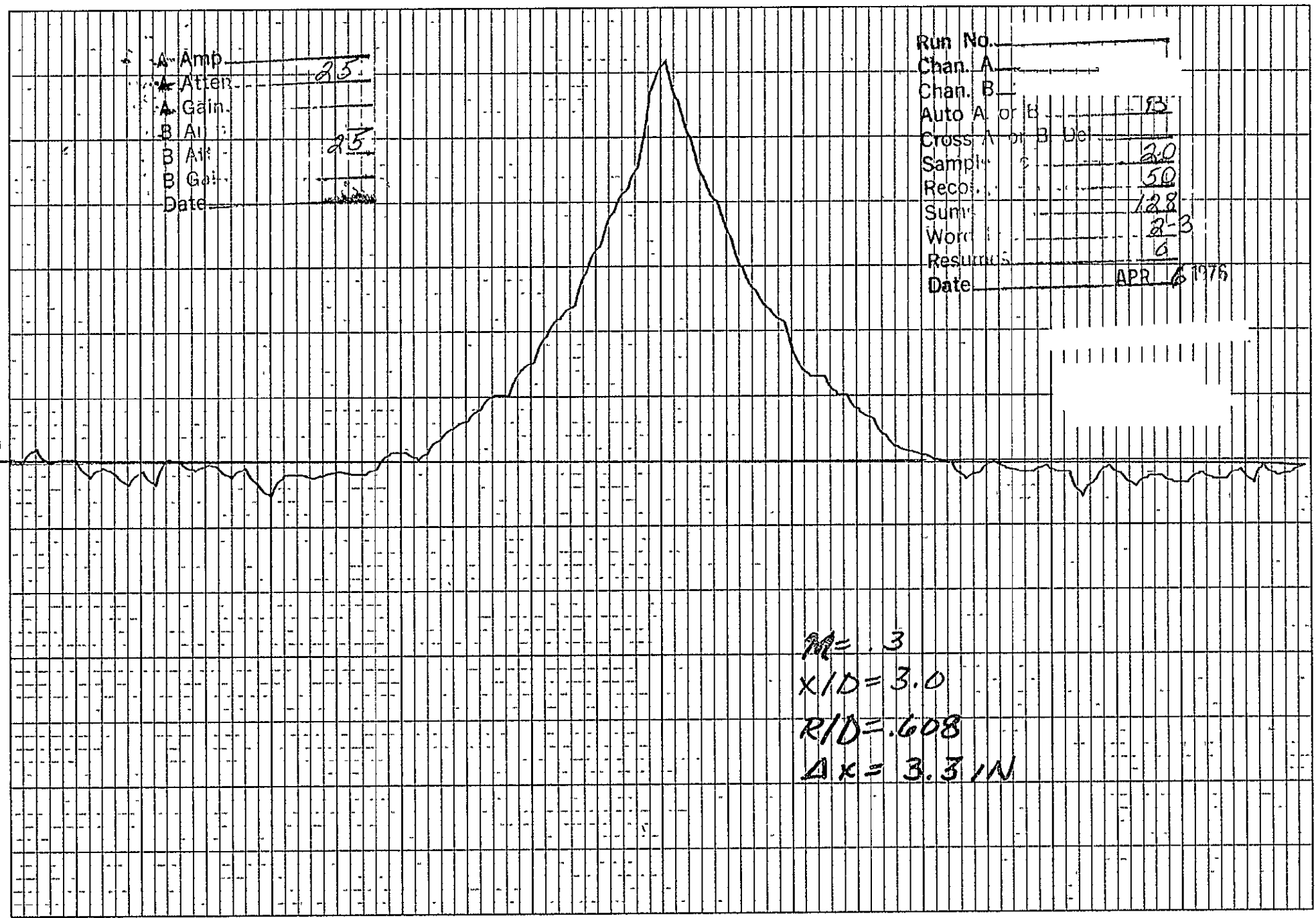
D-107

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten. 25  
A Gain. \_\_\_\_\_  
B At: 25  
B Gain. \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B 75  
Cross A or B De \_\_\_\_\_  
Sample 2.0  
Recol. 50  
Summ. 128  
Word 2-3  
Resolut. 6  
Date APR 6 1976

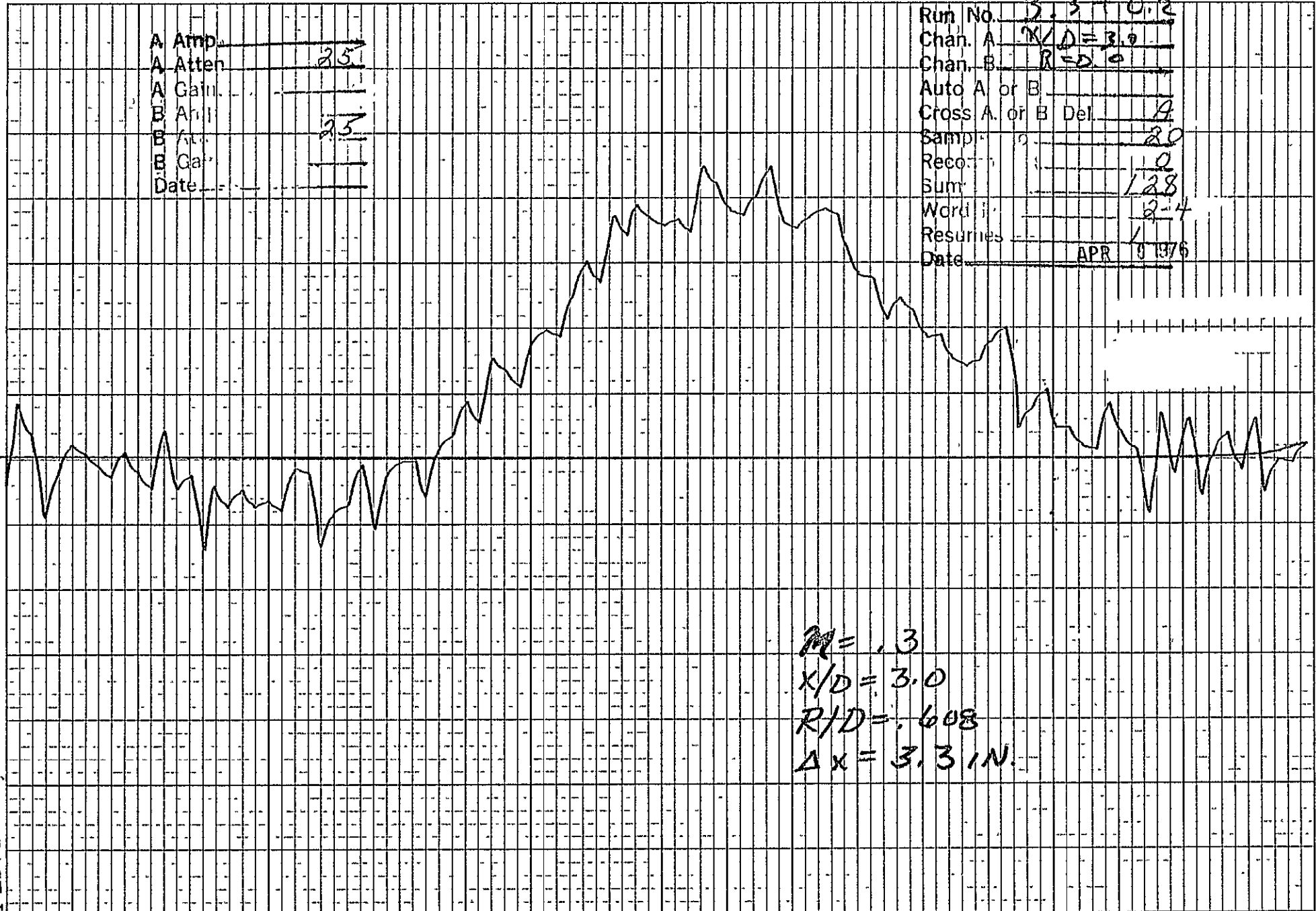
D-108



$M = .3$   
 $X/D = 3.0$   
 $R/D = .608$   
 $\Delta X = 3.3 IN$

A Amp. \_\_\_\_\_  
A Atten. 25  
A Gain. \_\_\_\_\_  
B Att. 25  
B Gain. \_\_\_\_\_  
Date \_\_\_\_\_

Run No. 3.3-0.2  
Chan. A X/D=3.0  
Chan. B R/D=0  
Auto A or B \_\_\_\_\_  
Cross A. or B Del. 8  
Sample No. 20  
Recording \_\_\_\_\_  
Sum 128  
Words 2-4  
Resumes \_\_\_\_\_  
Date APR 10 1976



$M = 1.3$   
 $X/D = 3.0$   
 $R/D = .608$   
 $\Delta x = 3.3 \text{ IN.}$

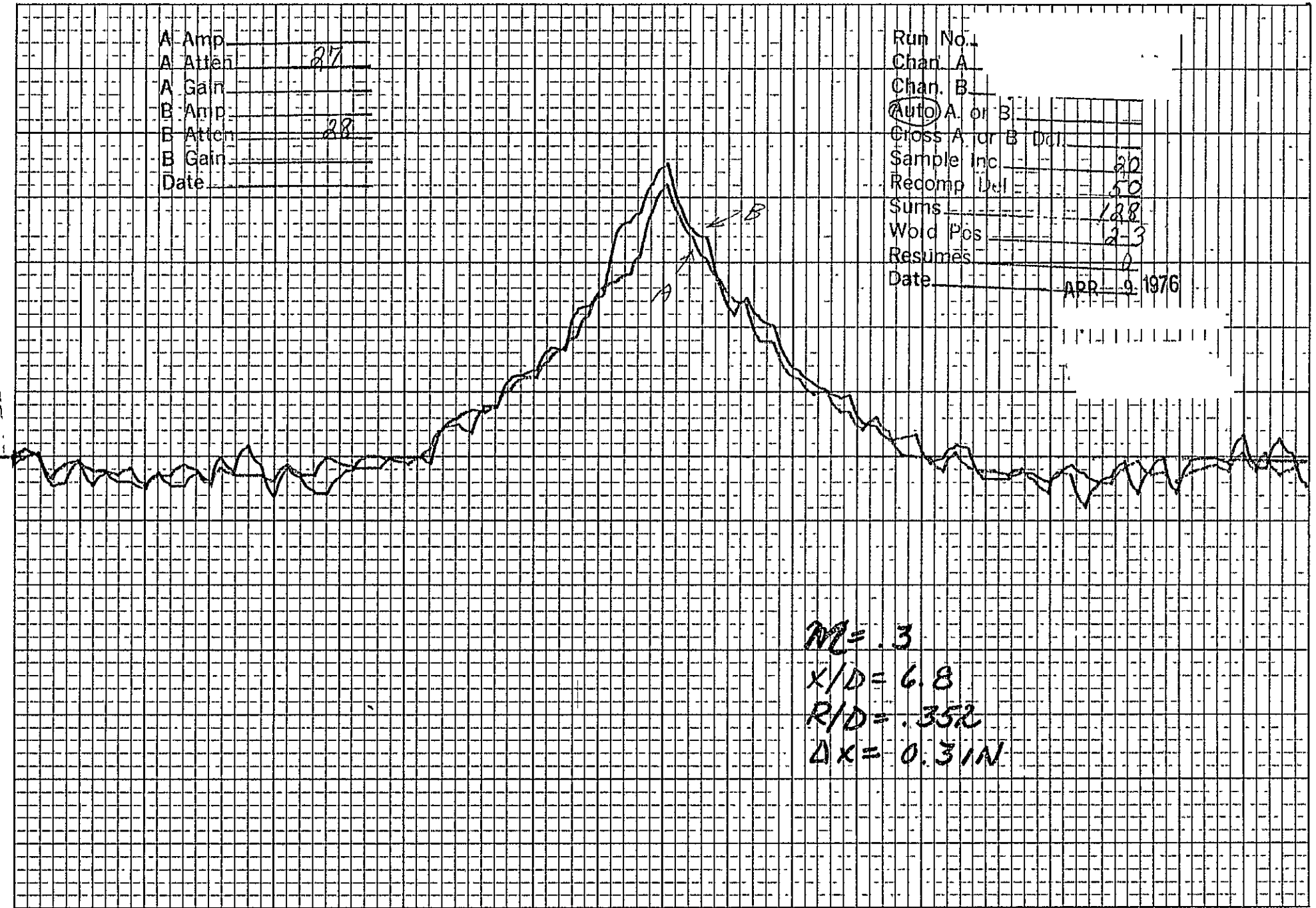
D-109

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 27  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 28  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 (Auto) A. or B. \_\_\_\_\_  
 Cross A. or B. Del. \_\_\_\_\_  
 Sample Inc. 30  
 Recomp Del. 50  
 Sums 128  
 Word Pcs 2-3  
 Resumes 0  
 Date APR 9 1976

D-110

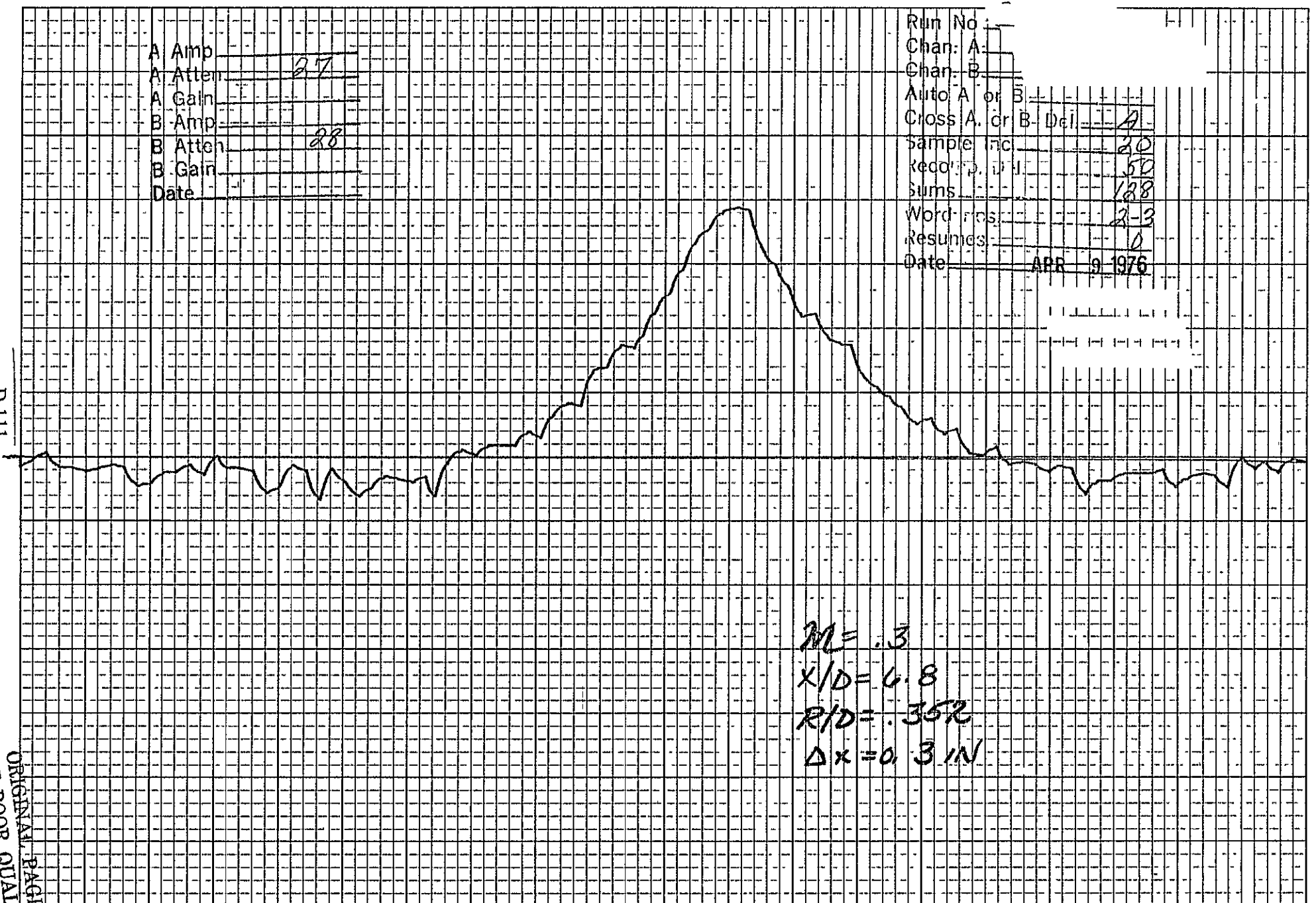


$M = .3$   
 $X/D = 6.8$   
 $R/D = .352$   
 $\Delta X = 0.3 IN$

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 28  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No: \_\_\_\_\_  
Chan: A: \_\_\_\_\_  
Chan: B: \_\_\_\_\_  
Auto A or B: \_\_\_\_\_  
Cross A. or B. Del: 1  
Sample Inc: 20  
Recor. P. U. I.: 50  
Sums: 128  
Word. res: 2-3  
Resumes: 0  
Date: APR 9 1976

D-111



$M = .3$   
 $X/D = 6.8$   
 $R/D = .352$   
 $\Delta x = 0.3 IN$

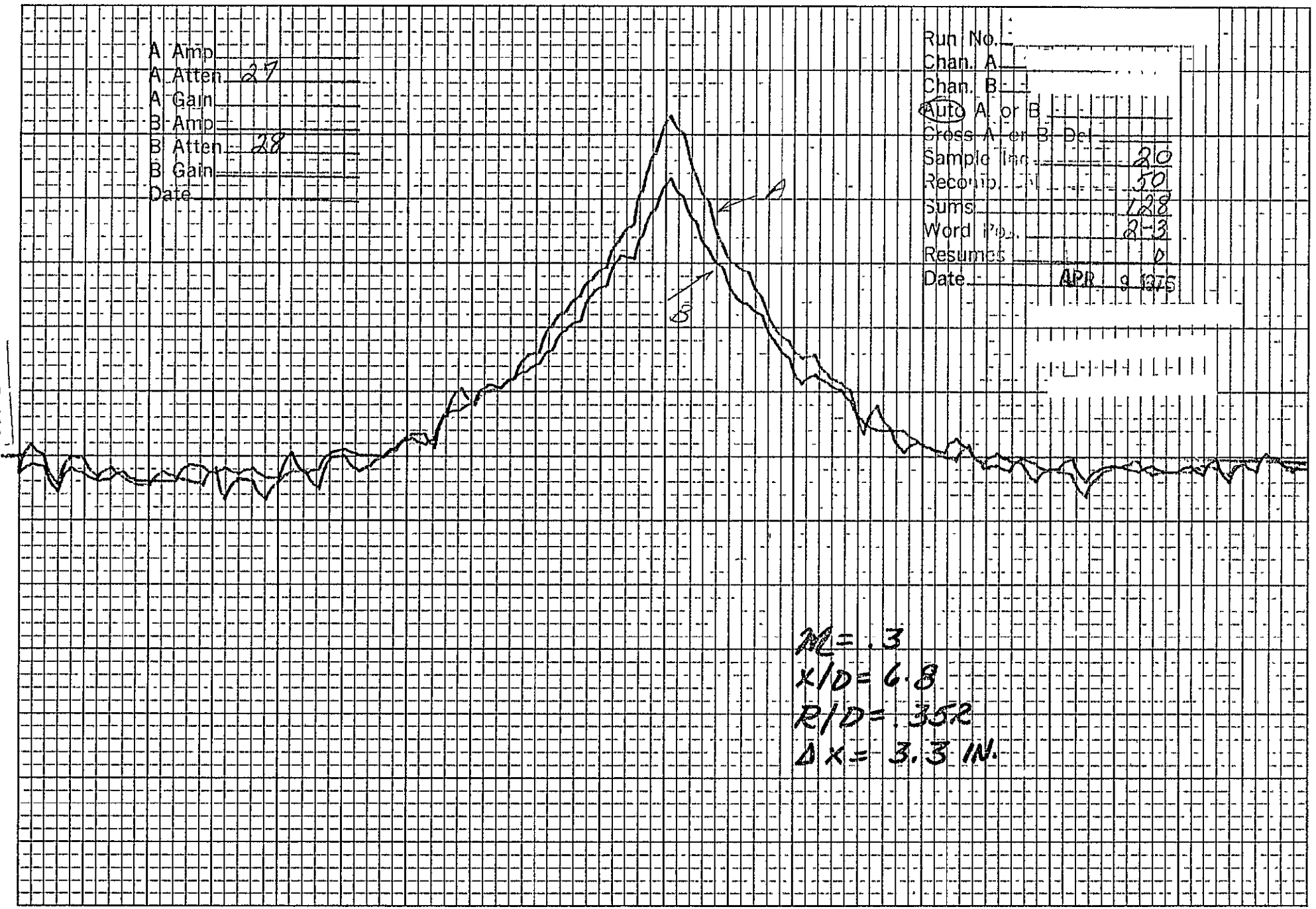
ORIGINAL PAGE IS  
OF POOR QUALITY



A Amp  
A Atten 27  
A Gain  
B Amp  
B Atten 28  
B Gain  
Date

Run No.  
Chan. A  
Chan. B  
Auto A or B  
Cross A or B Def  
Sample Int 20  
Recomp 50  
Sums 128  
Word 2-3  
Resumes 0  
Date APR 9 1975

D-112

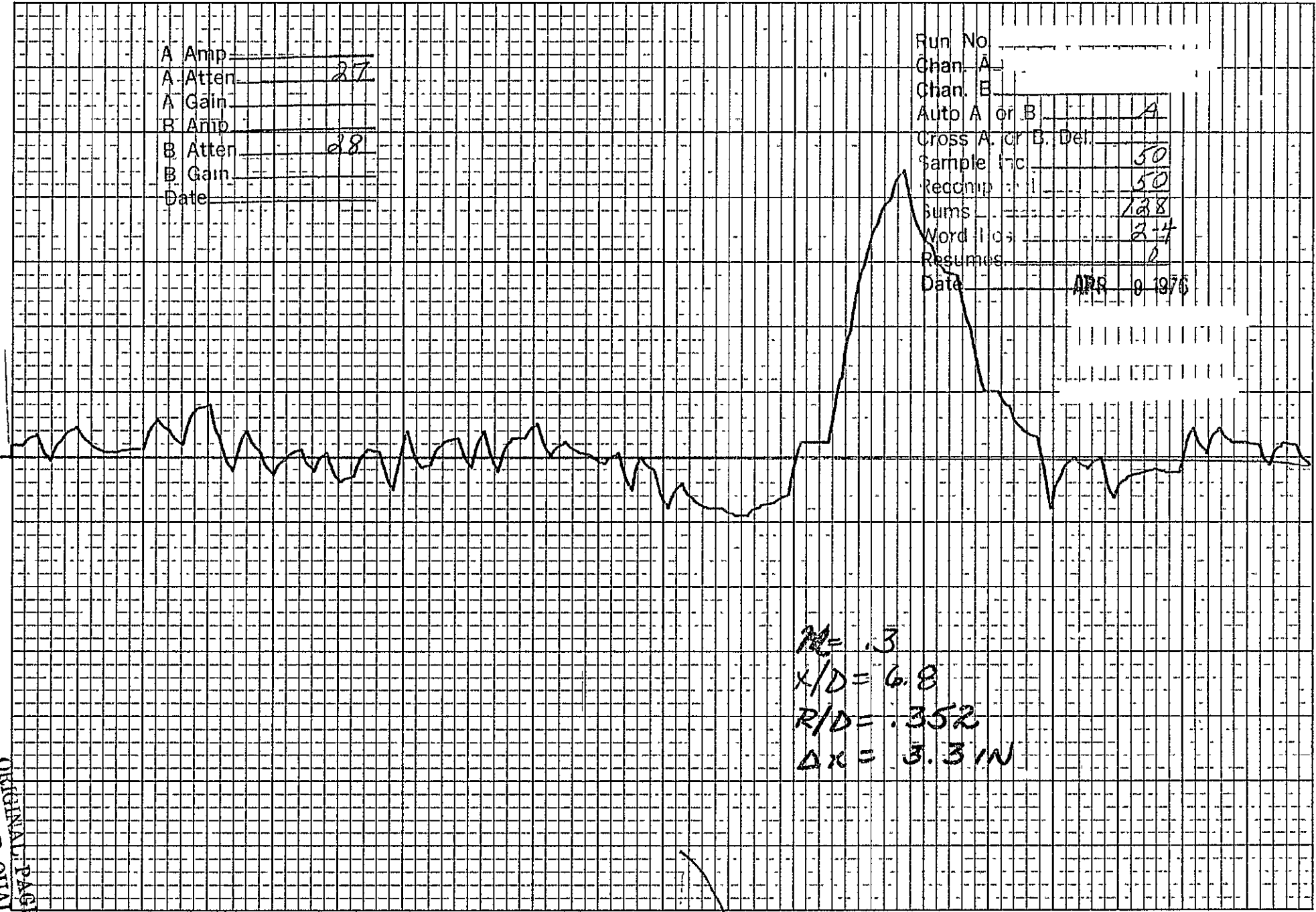


M=3  
X/D=6.8  
R/D=.352  
ΔX=3.3 IN.

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 28  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B A  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 50  
Recomp. 50  
Burns 128  
Word No. 24  
Resumes 0  
Date APR 9 1976

D-113



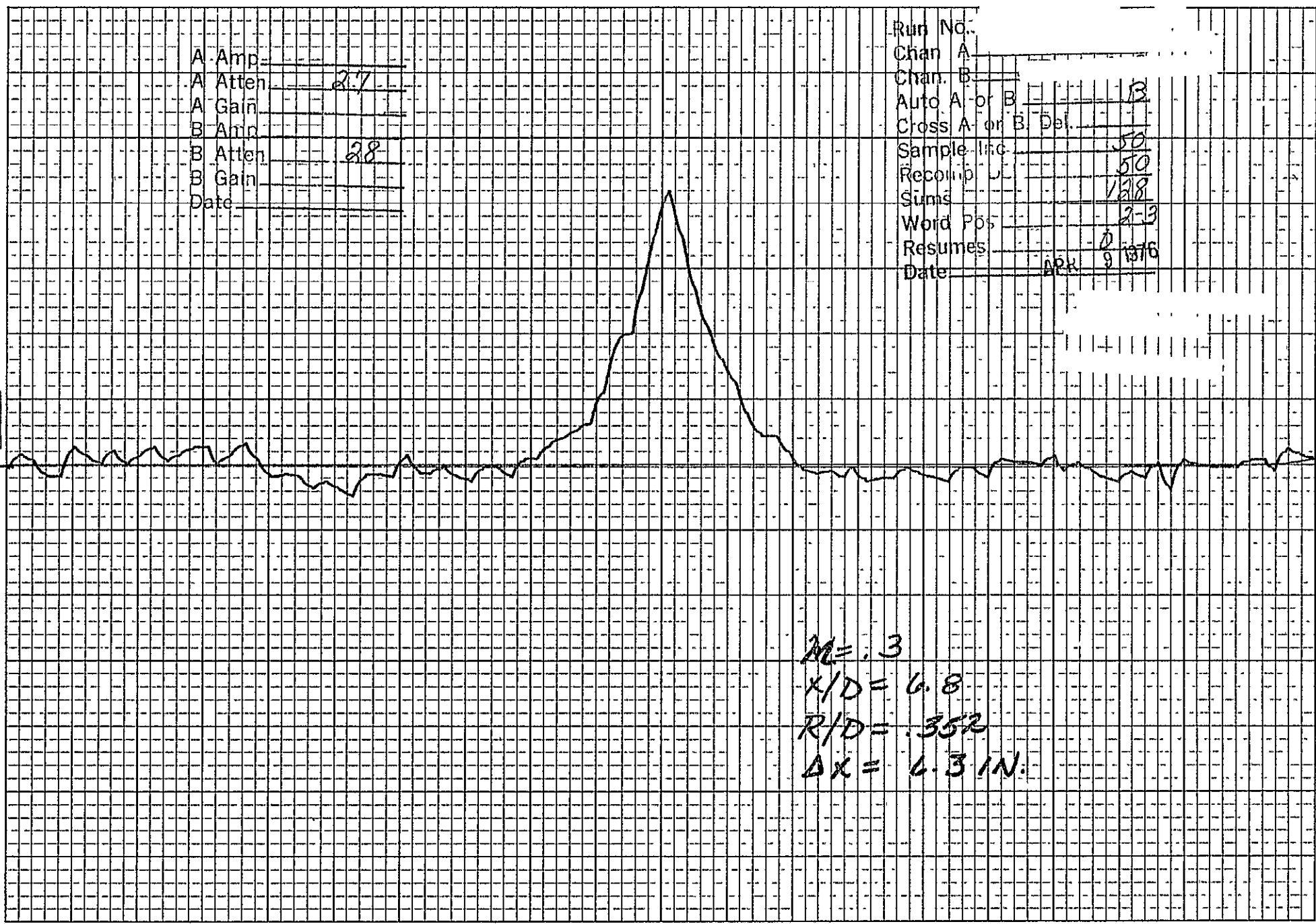
$M = .3$   
 $X/D = 6.8$   
 $R/D = .352$   
 $\Delta X = 3.3 IN$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten. 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 28  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross A or B Del. \_\_\_\_\_  
Sample Inc. 50  
Recomp. J. 50  
Sums 1218  
Word Pos. 2-3  
Resumes 0  
Date APR 9 1976

D-114

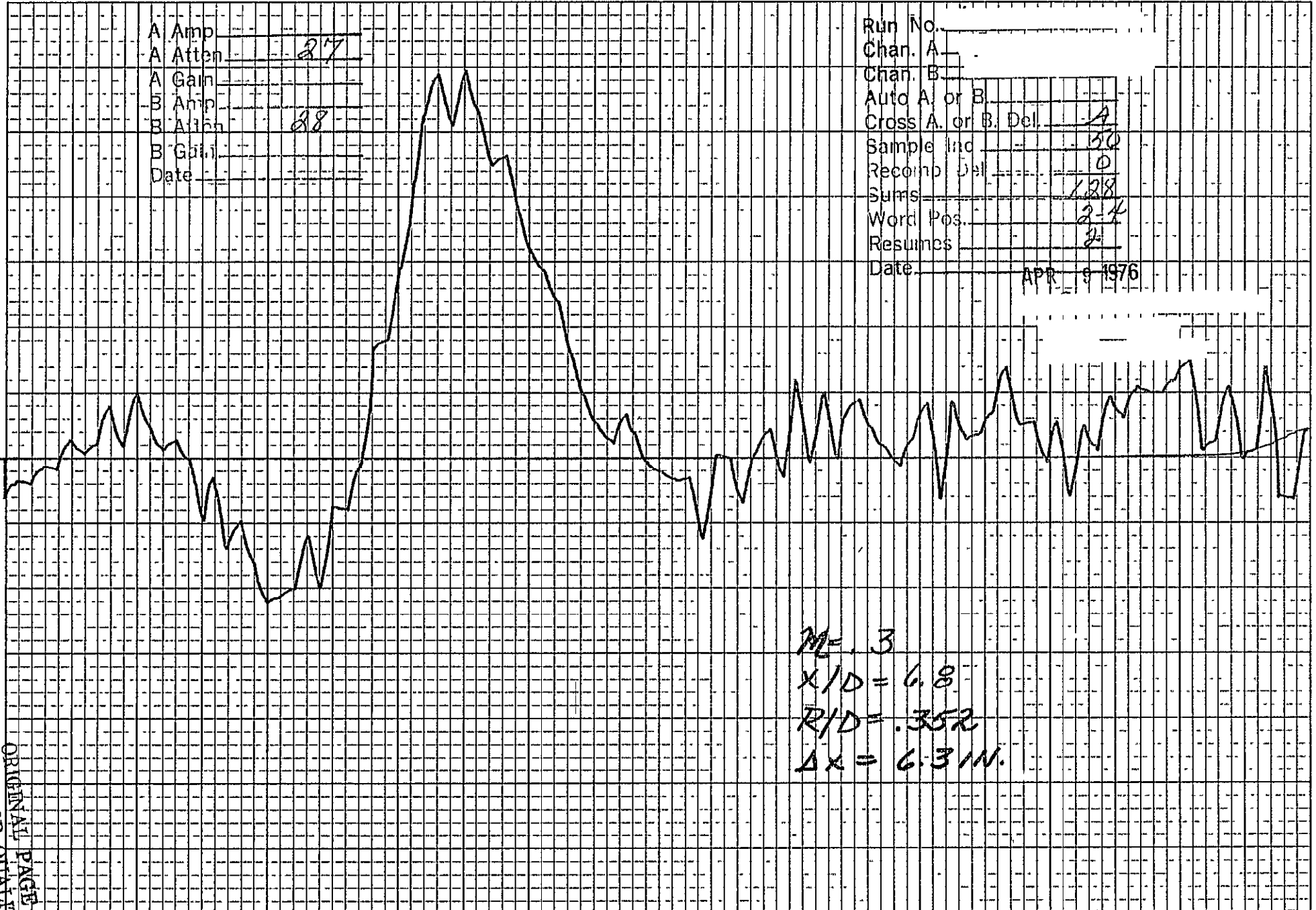


$M = .3$   
 $X/D = 4.8$   
 $R/D = .352$   
 $\Delta X = 4.3 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 28  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. or B. Del. A  
Sample Inc. 30  
Record Del. 0  
Sums 128  
Word Pos. 2-4  
Resumes 2  
Date APR 9 1976

D-115



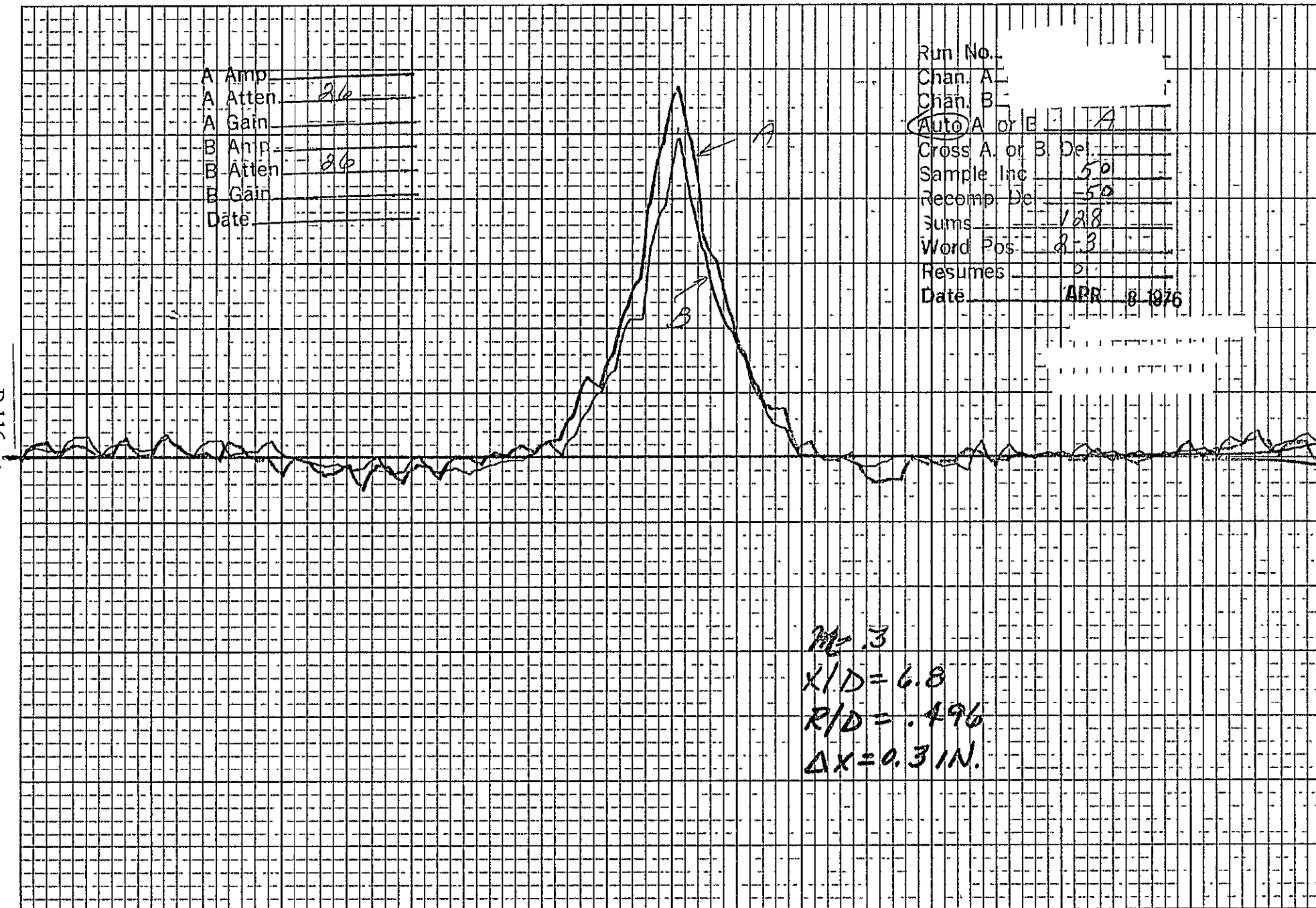
$M = 3$   
 $X/D = 6.8$   
 $R/D = .352$   
 $\Delta x = 6.3 \text{ IN.}$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B A  
Cross A. or B. De. \_\_\_\_\_  
Sample Inc 50  
Recomp. De. 50  
Sums 128  
Word Pos. 2-3  
Resumes 0  
Date APR 8 1976

D-116

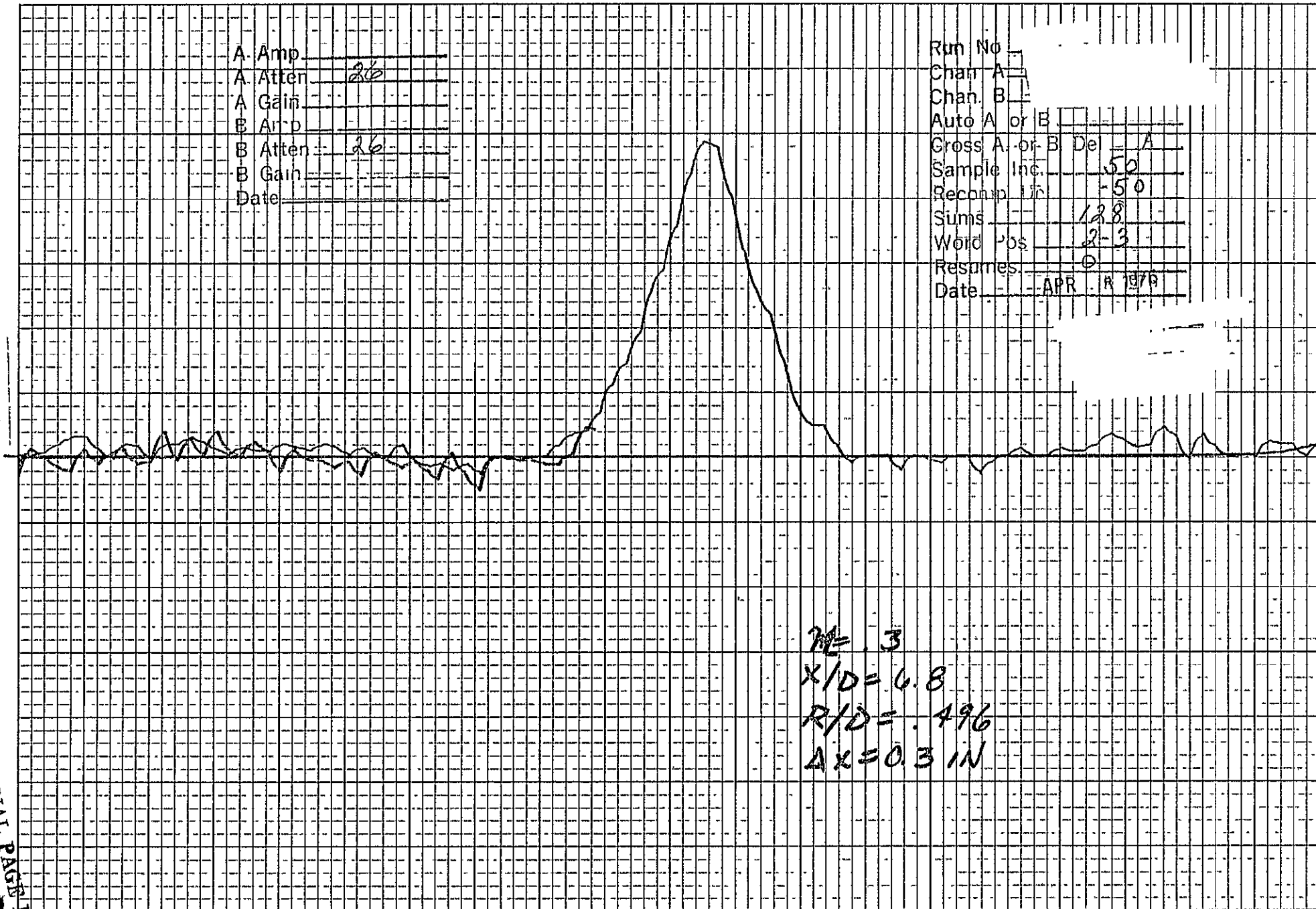


$M = .3$   
 $X/D = 6.8$   
 $R/D = .496$   
 $\Delta X = 0.3 IN.$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A   
Chan. B   
Auto A or B   
Cross A. or B. De A  
Sample Inc. 50  
Recomp. 50  
Sums 128  
Word Pos 2-3  
Resumes 0  
Date APR 18 1979

D-117



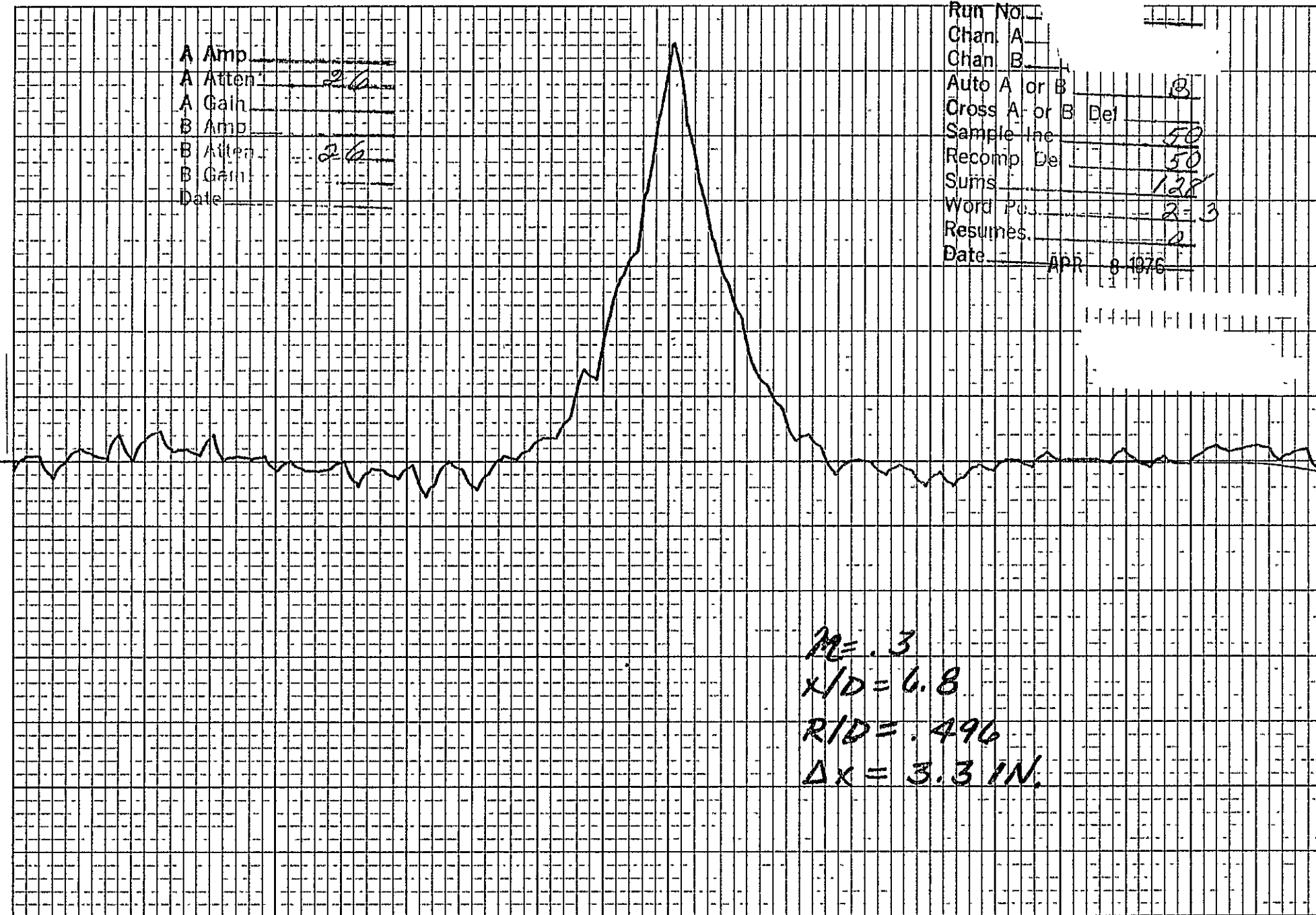
$M = 3$   
 $X/D = 6.8$   
 $R/D = .496$   
 $\Delta X = 0.3 \text{ IN}$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten: 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten: 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No.: \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross A or B Del \_\_\_\_\_  
Sample In: 50  
Recomp. Del: 50  
Sums: 128  
Word Pos: 2-3  
Results: 2  
Date: APR 8 1976

D-118

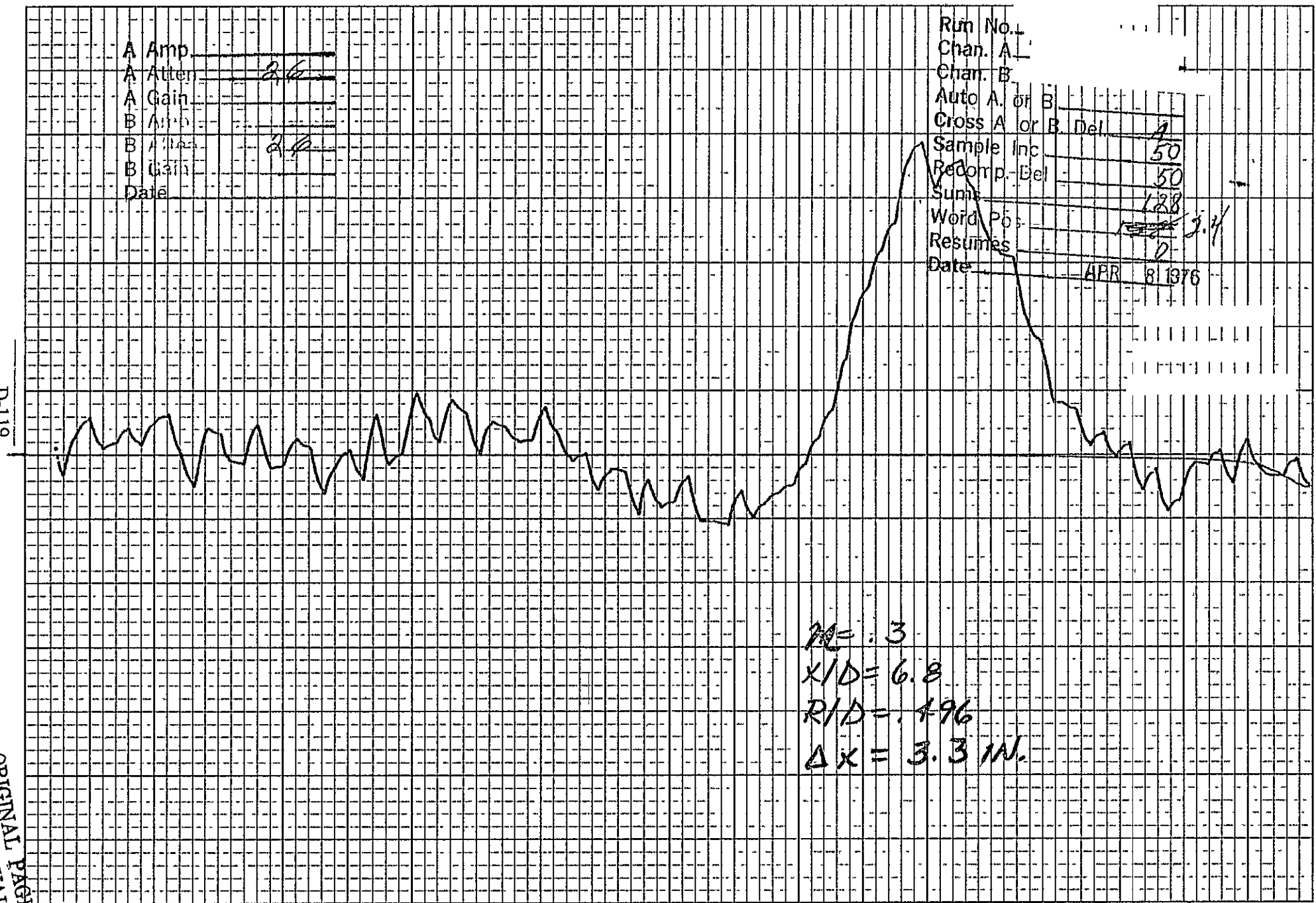


$ME = .3$   
 $x/D = 6.8$   
 $R/D = .496$   
 $\Delta x = 3.3 IN.$

A Amp \_\_\_\_\_  
 A Atten 2.6  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 2.0  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A. or B. \_\_\_\_\_  
 Cross A. or B. Del. 1  
 Sample Inc 50  
 Redomp. Del. 50  
 Summ 128  
 Word Pos. 3.4  
 Resumes 2  
 Date APR 8 1976

D-119



$M = .3$   
 $X/D = 6.8$   
 $R/D = .496$   
 $\Delta X = 3.3 IN.$

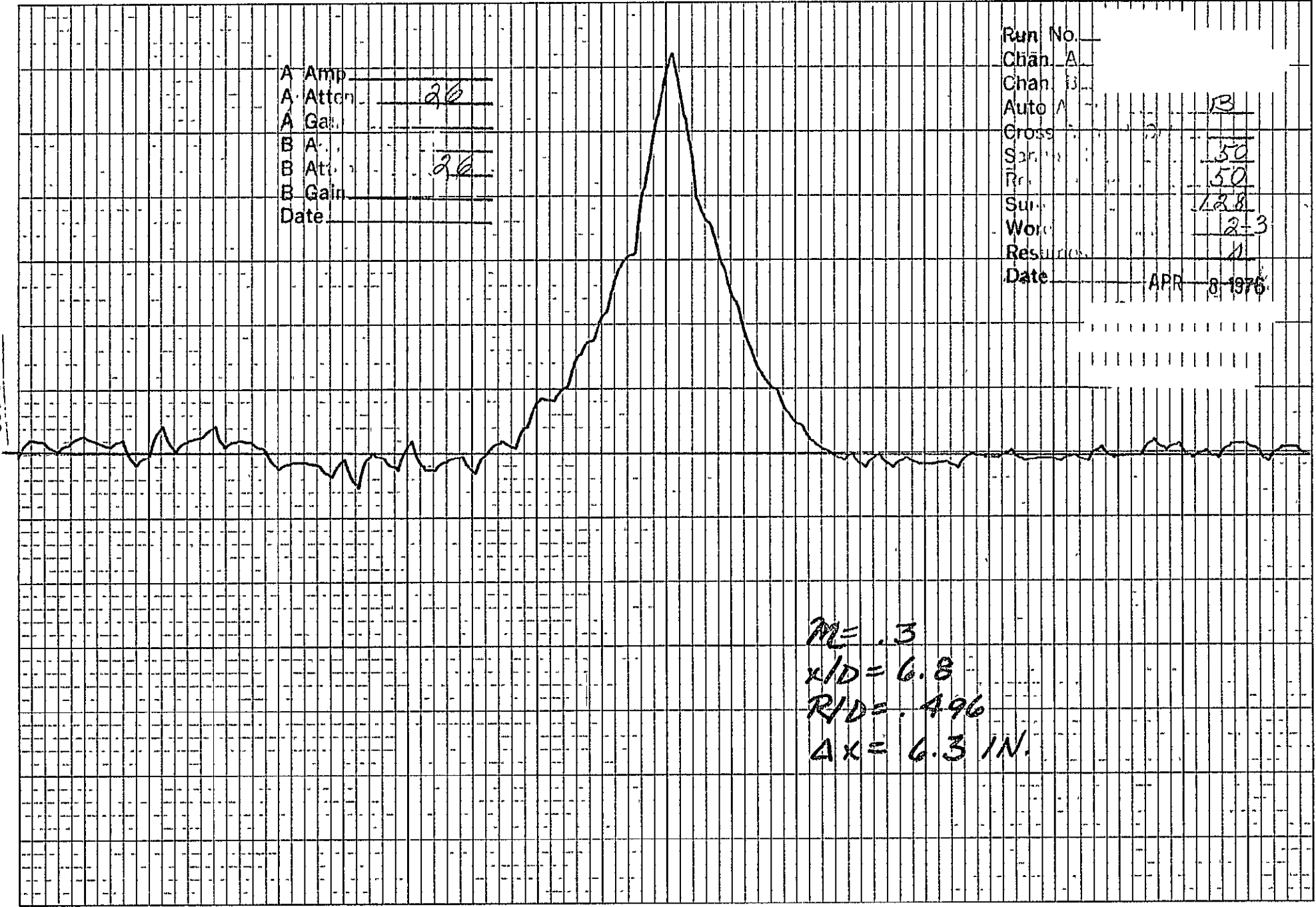
ORIGINAL PAGE IS  
 OF POOR QUALITY



A Amp \_\_\_\_\_  
A Atten. 20  
A Gain \_\_\_\_\_  
B A. \_\_\_\_\_  
B Att. 20  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A  
Chan. # \_\_\_\_\_  
Auto A  
Gross \_\_\_\_\_  
Spr. 50  
Tr. 50  
Su. 12.8  
Work 2-3  
Res. 1  
Date APR 8 1976

D-120



$M = .3$   
 $x/D = 6.8$   
 $R/D = .496$   
 $\Delta x = 6.3 \text{ IN.}$

A Amp \_\_\_\_\_  
A Attenuation 24  
A Gain \_\_\_\_\_  
B Attenuation 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A  B   
Cross 4  
S 50  
R 2  
Su 128  
Wor 2-4  
Res 1  
Date APR 8 1978

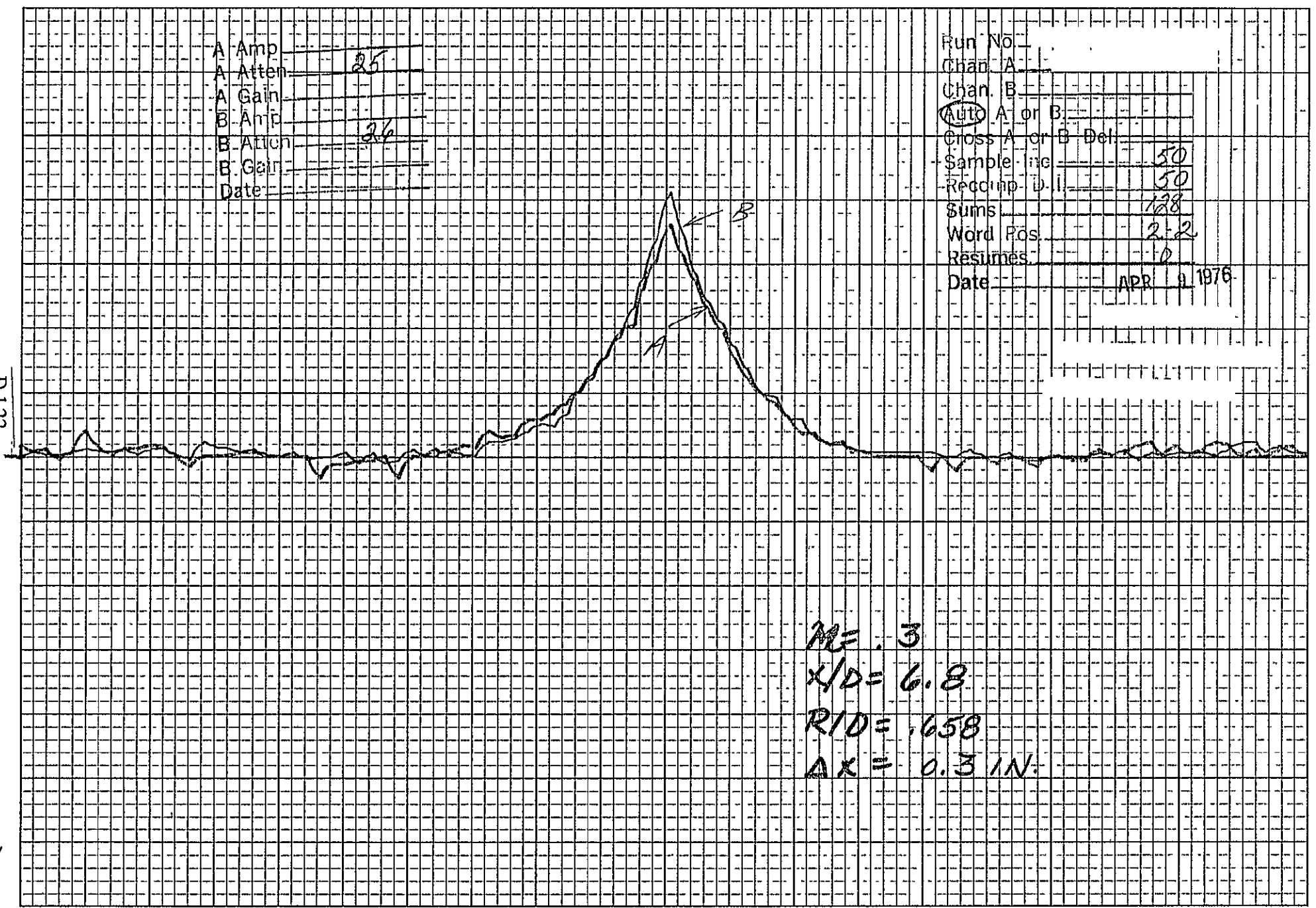
D-121

$M = 3$   
 $x/D = 6.8$   
 $R/D = .496$   
 $\Delta x = 6.31N.$

A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 3/4  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_  
Cross A or B Del. \_\_\_\_\_  
Sample Inc. 50  
Recomp. D.I. 50  
Sums 128  
Word Pos. 2-2  
Resumes 0  
Date APR 9 1976

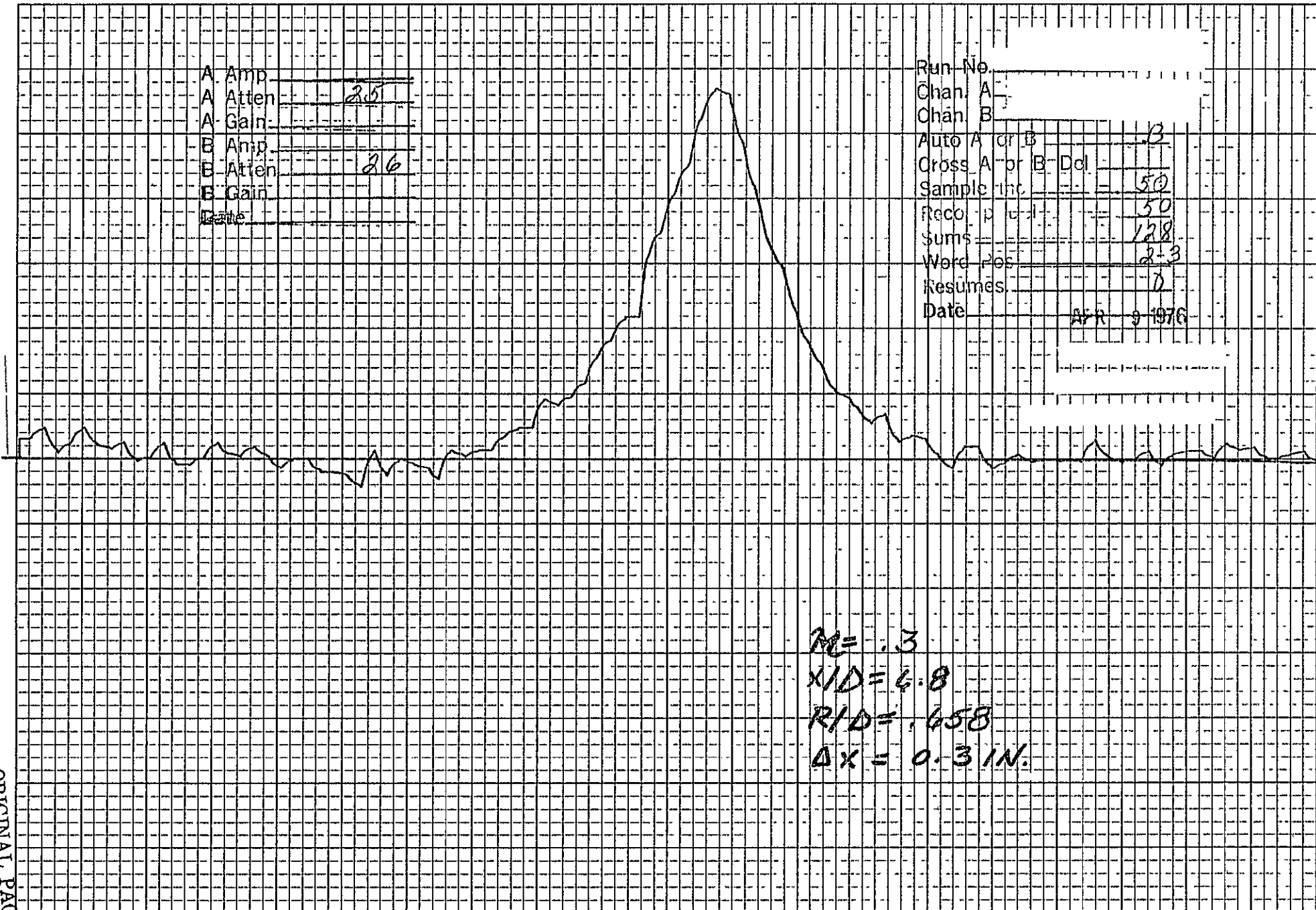
D-122



ME. 3  
X/D = 6.8  
R/D = .658  
ΔX = 0.3 IN.

A. Amp \_\_\_\_\_  
A. Atten 25  
A. Gain \_\_\_\_\_  
B. Amp \_\_\_\_\_  
B. Atten 26  
B. Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross A or B Del \_\_\_\_\_  
Sample Inc 50  
Rec. p. Int. 50  
Sums 128  
Word Pos 2+3  
Resumes 0  
Date APR 9 1976



M = .3  
X/D = 6.8  
R/D = .658  
ΔX = 0.3 IN.

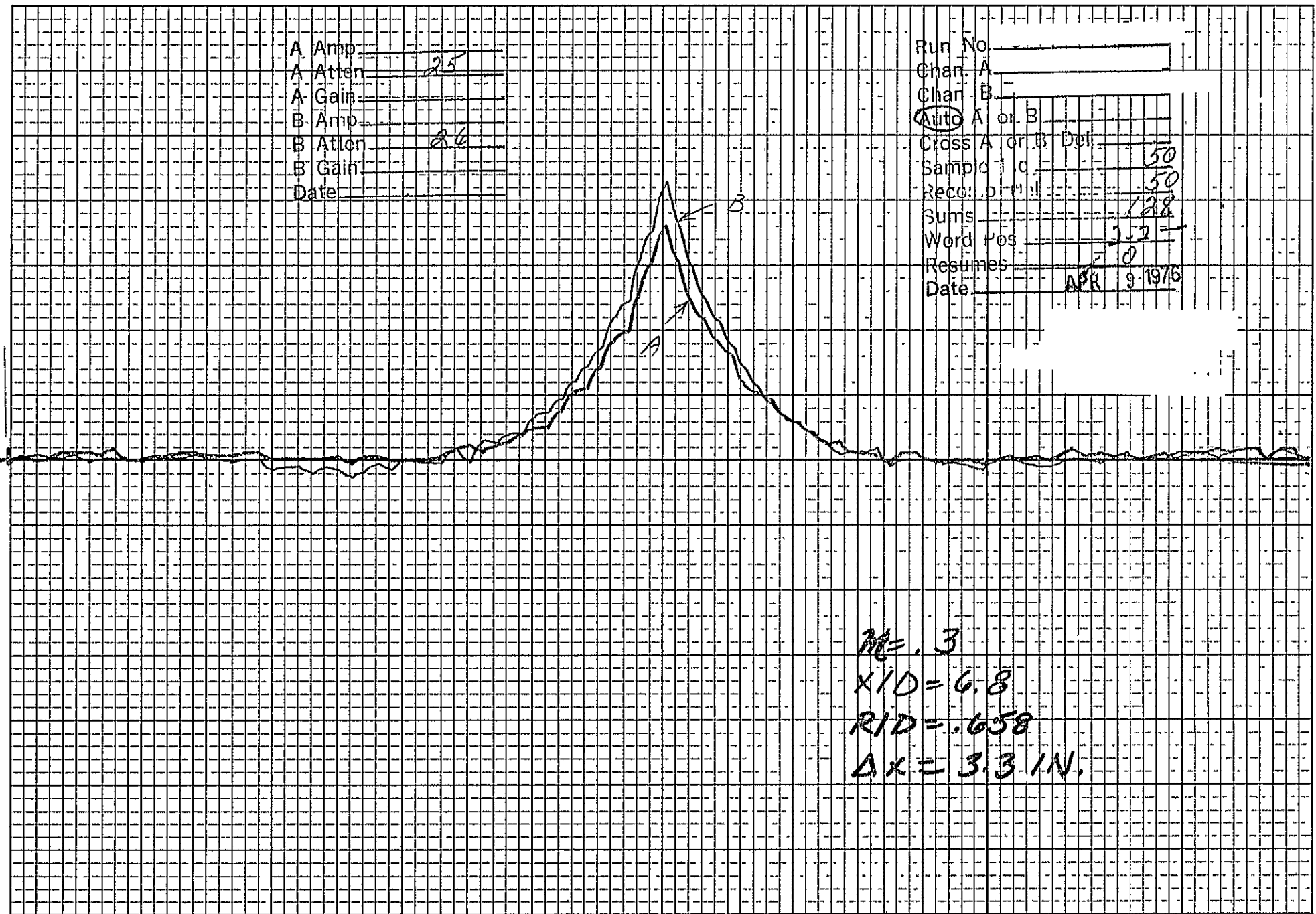
D-123

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del. \_\_\_\_\_  
Sample C. 50  
Rec: or Int. 50  
Sums 128  
Word Pos 252  
Resumes 0  
Date APR 9 1976

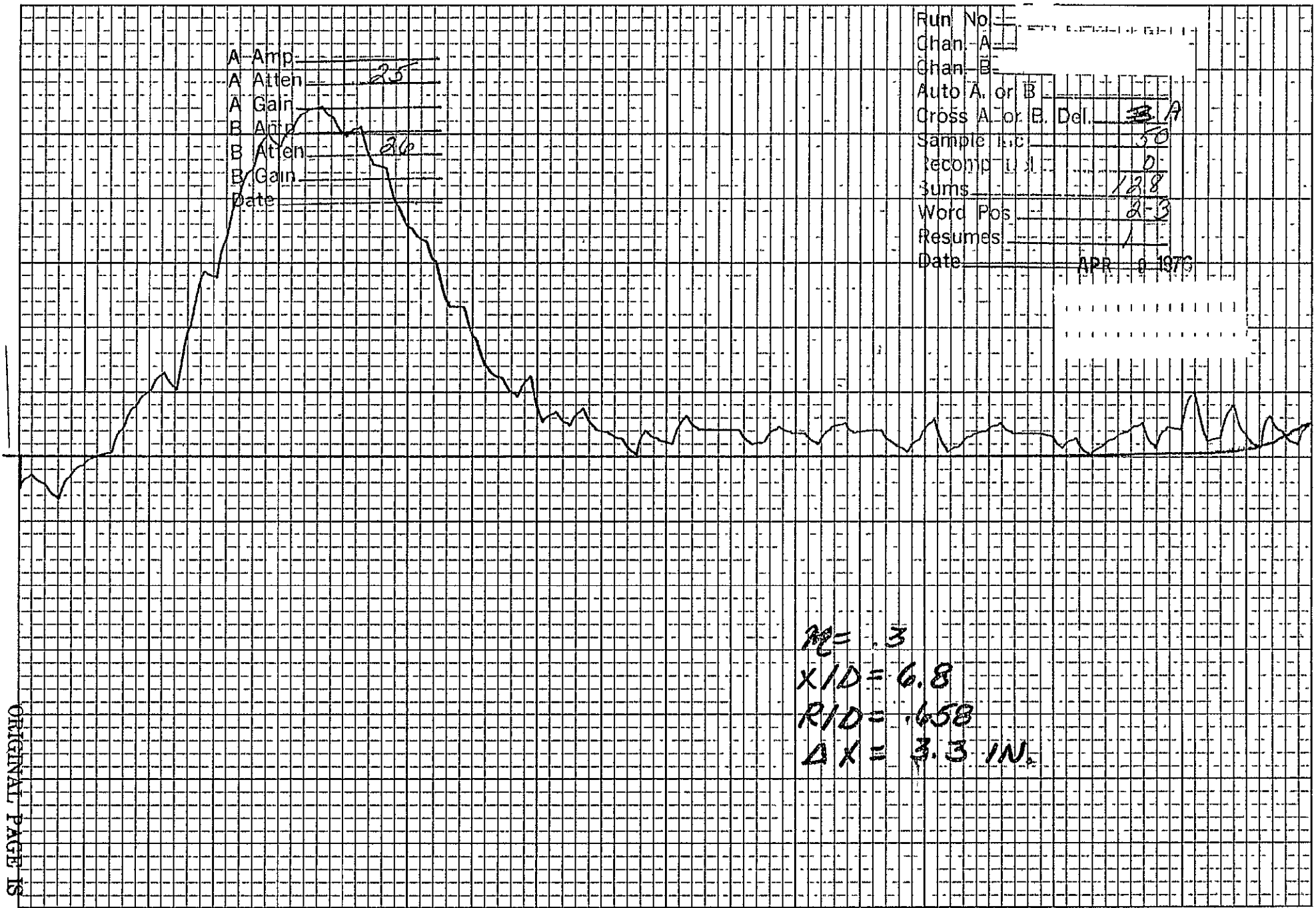
D-124



$M = 3$   
 $XID = 6.8$   
 $RID = .658$   
 $\Delta X = 3.3 IN.$

A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A  \_\_\_\_\_  
Chan. B  \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del. 3 A  
Sample Int. 50  
Recomp. U.I. 0  
Sums 128  
Word Pos. 2-3  
Resumes 1  
Date APR 8 1976



$ME = 3$   
 $XID = 6.8$   
 $RID = 6.58$   
 $\Delta X = 3.3 \text{ IN.}$

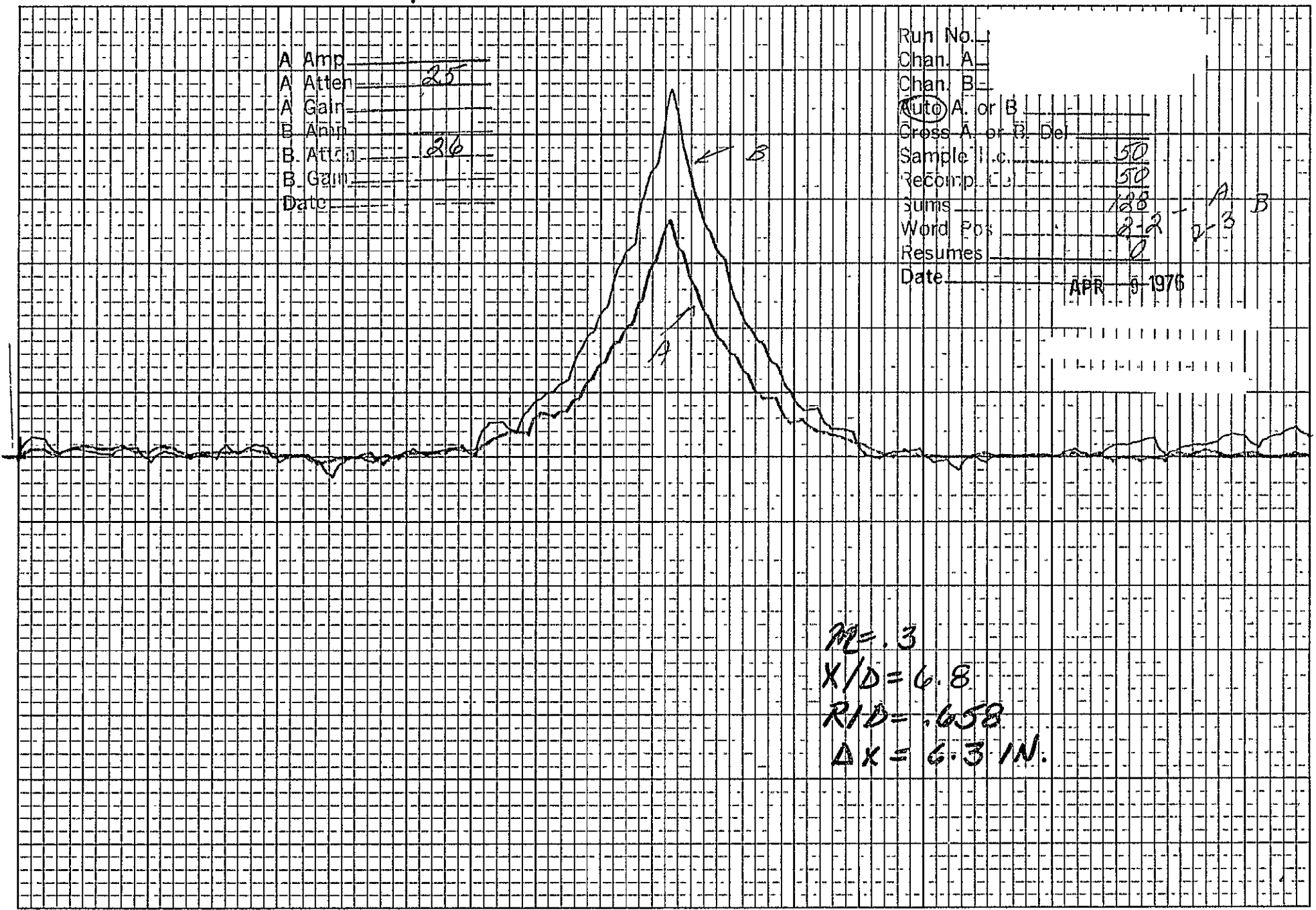
D-125

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
 Auto A. or B \_\_\_\_\_  
Cross A. or B. Del \_\_\_\_\_  
Sample I.c. 50  
Recomp. C. 50  
Sums 128 - A B  
Word Pos 2-2 - 2-3  
Resumes 0  
Date APR 9 1976

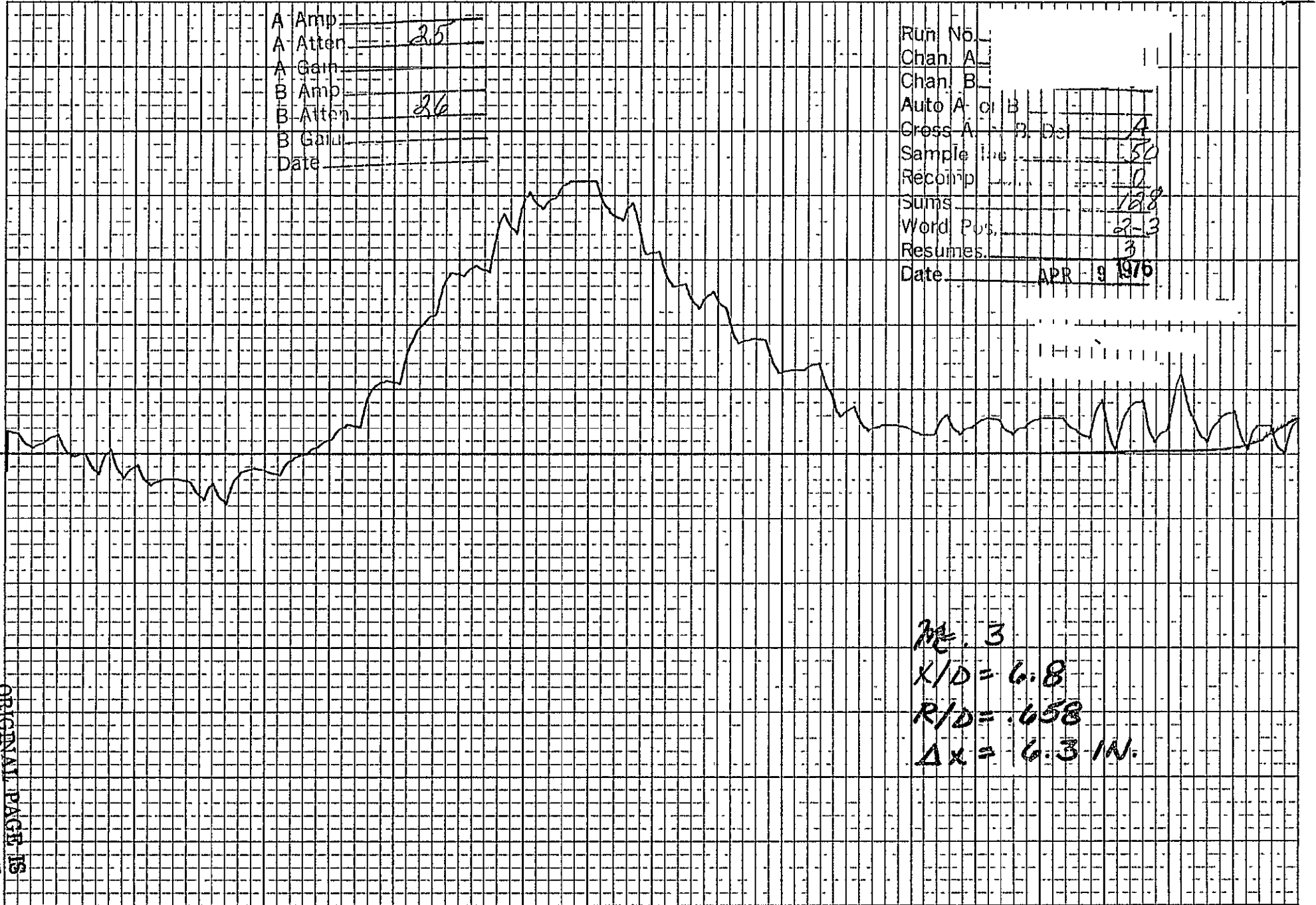
D-126



$M = .3$   
 $X/D = 6.8$   
 $R/D = .658$   
 $\Delta X = 6.3 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 36  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del A  
Sample No. 50  
Recomp 0  
Sums 128  
Word Pos. 2-3  
Resumes 3  
Date APR 9 1976



$M = 3$   
 $X/D = 6.8$   
 $R/D = 658$   
 $\Delta x = 6.3 IN.$

D-127

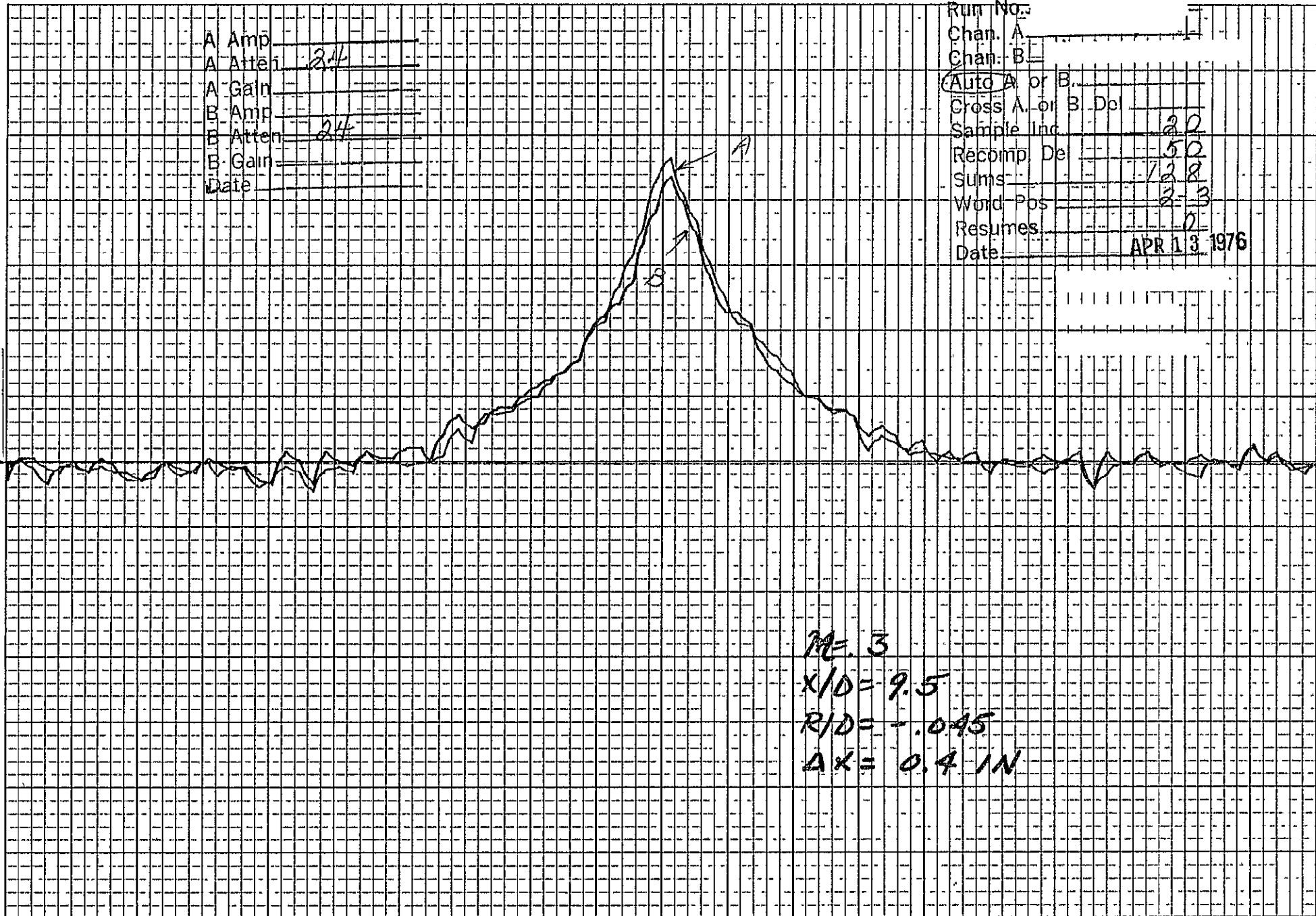
ORIGINAL PAGE IS  
OF POOR QUALITY



A Amp \_\_\_\_\_  
 A Atten 24  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 24  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_  
 Cross A. or B. Del \_\_\_\_\_  
 Sample Inc. 20  
 Recomp. Del. 50  
 Sums 728  
 Word Pos 2-3  
 Resumes 0  
 Date APR 13 1976

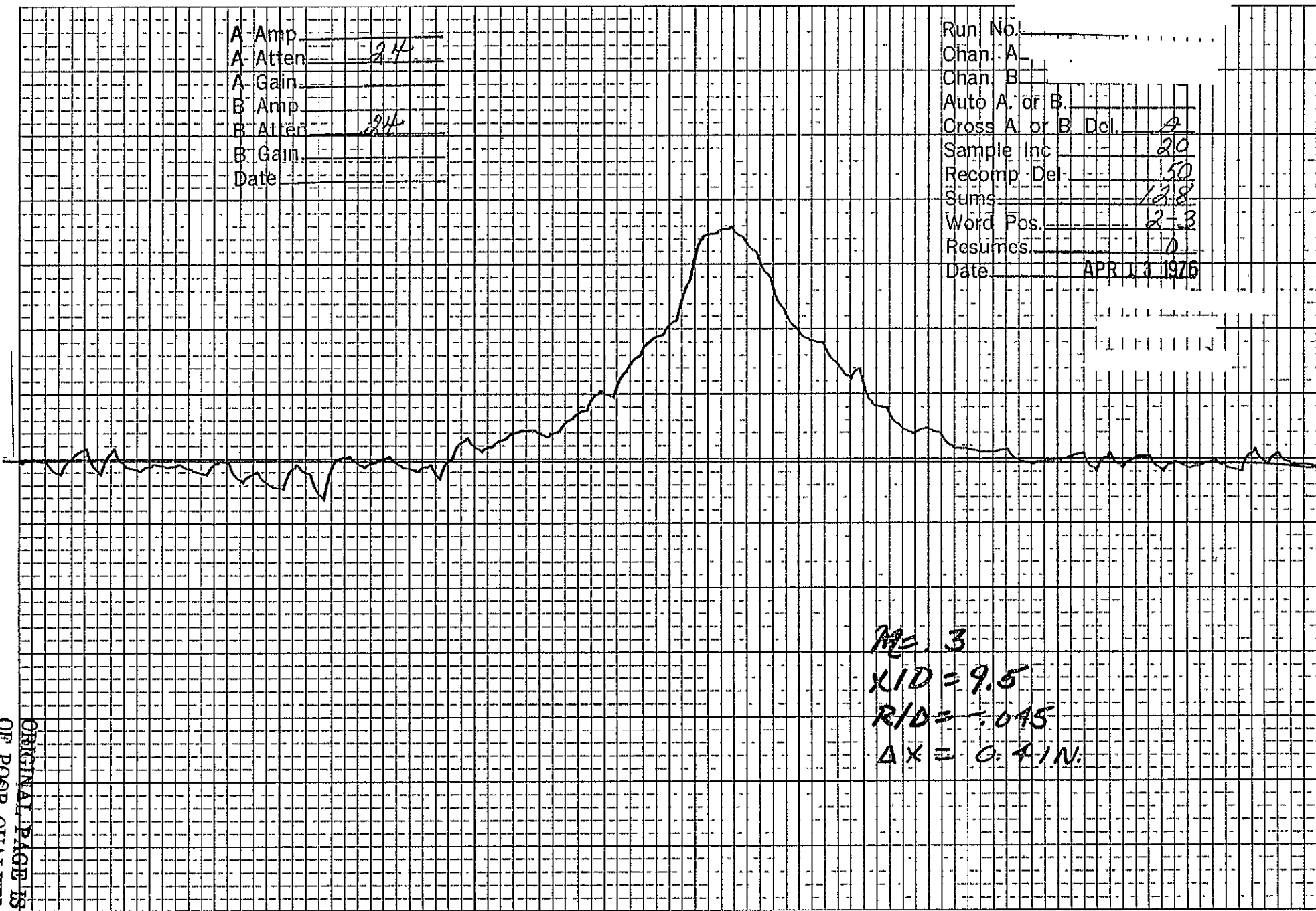
D-128



ME. 3  
 X/D = 9.5  
 R/D = -.045  
 ΔX = 0.4 IN

A Amp \_\_\_\_\_  
A Atten = 24  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten = 24  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A or B Del. = 4  
Sample Inc = 20  
Recomp Del. = 50  
Sums = 128  
Word Pos. = 2-3  
Resumes = 0  
Date = APR 13 1976



ME 3  
XID = 9.5  
RID = 1.045  
ΔX = 0.7 IN.

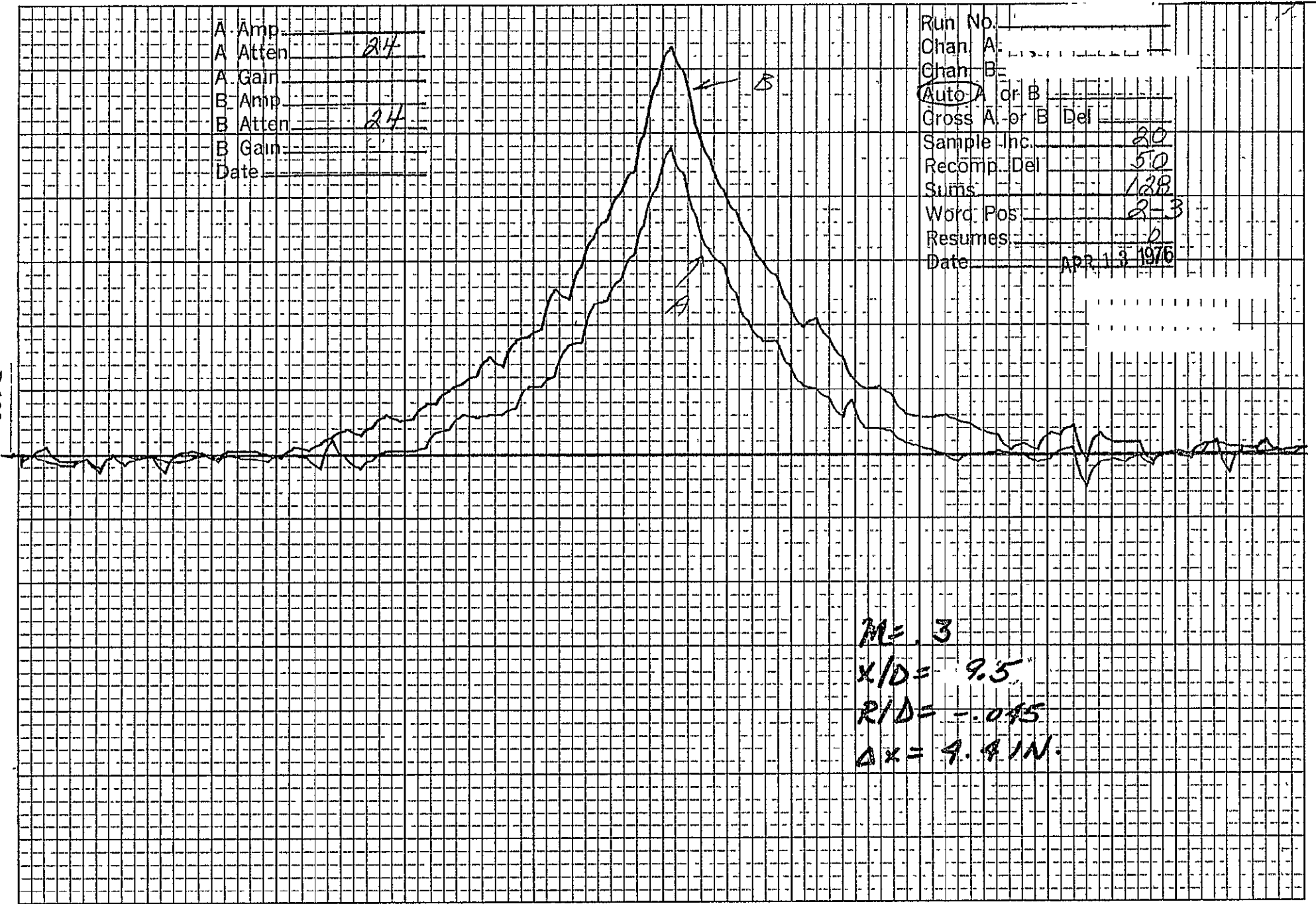
D-129

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 24  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 24  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A: \_\_\_\_\_  
Chan. B: \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. or B Del \_\_\_\_\_  
Sample Inc. 20  
Recomp. Del 50  
Sums 128  
Word Pos 2-3  
Resumes 0  
Date APR 13 1976

D-130

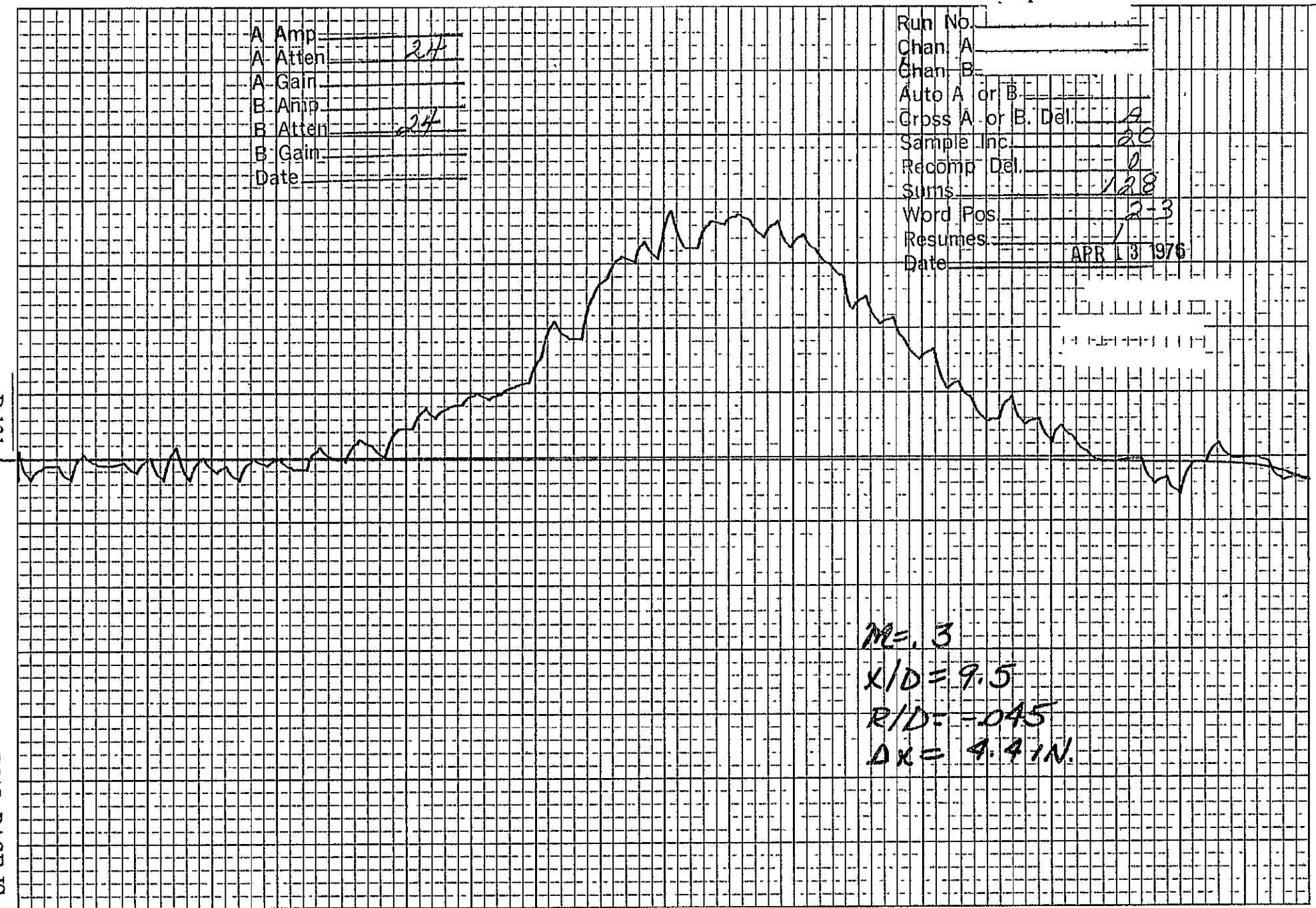


M = 3  
x/D = 9.5  
R/D = -.045  
 $\Delta x = 9.91N.$

A Amp \_\_\_\_\_  
A Atten 27  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Gross A. or B. Del. A  
Sample Inc. 20  
Recomp Del. 0  
Sums 128  
Word Pos 2-3  
Resumes 1  
Date APR 13 1976

D-131



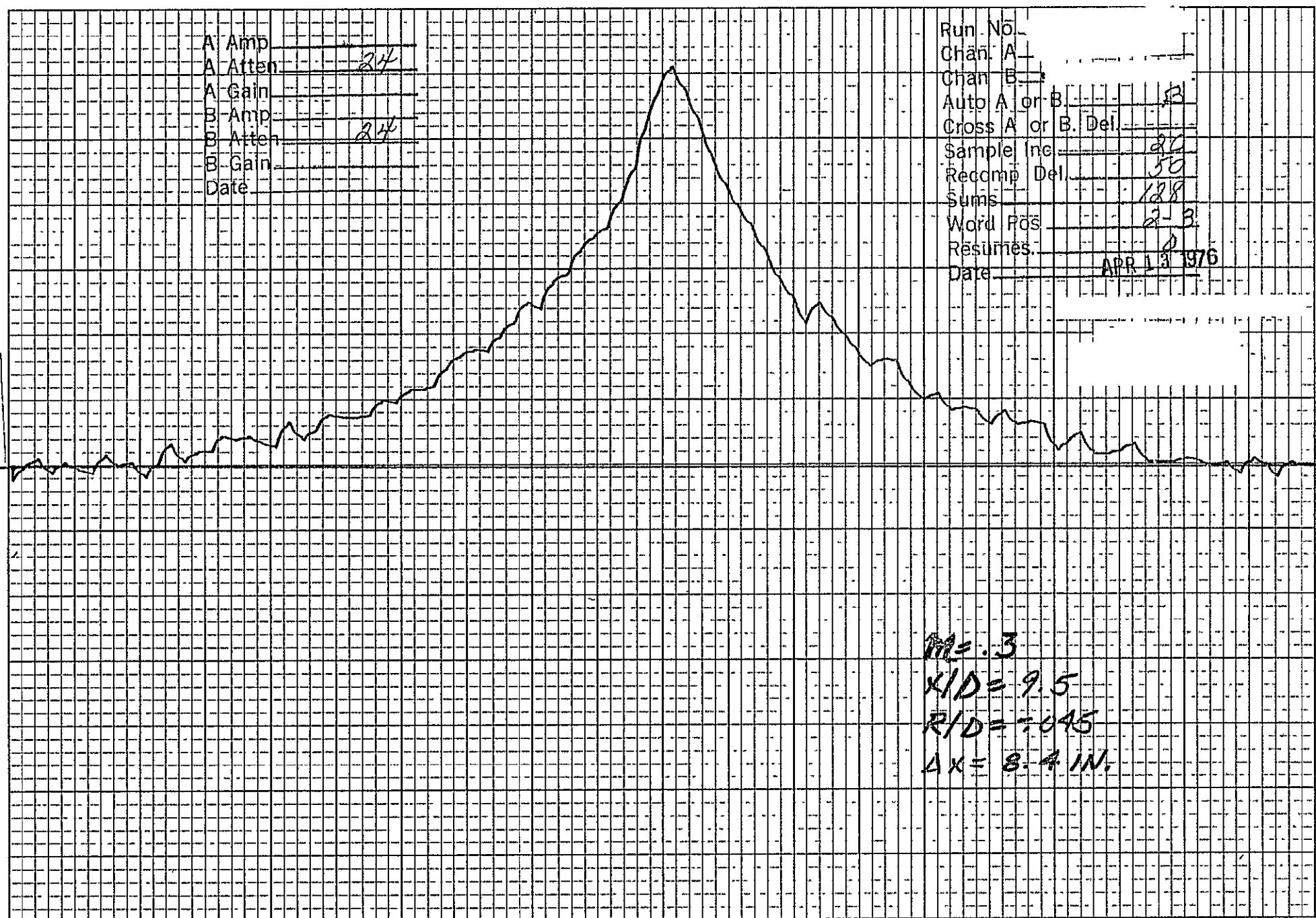
ME. 3  
X/D = 9.5  
R/D = -045  
ΔK = 4.4 IN.

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 24  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 24  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run. No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B. B  
Cross A or B. Del. \_\_\_\_\_  
Sample Inc. 20  
Recamp Del. 50  
Sums 188  
Word Pos. 2-3  
Resumes. 0  
Date APR 13 1976

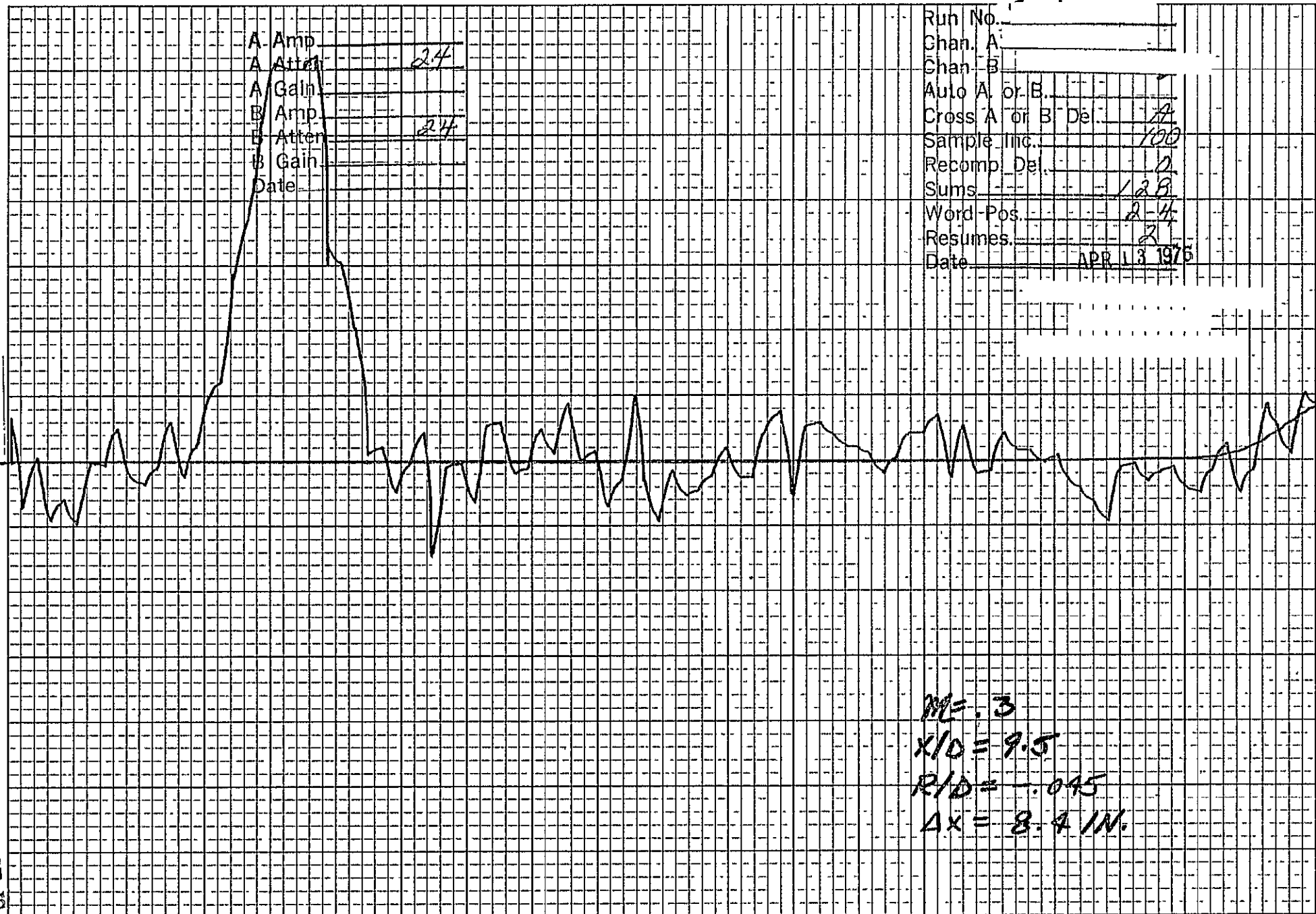
D-132



$M = .3$   
 $X/D = 9.5$   
 $R/D = 7.045$   
 $\Delta X = 8.4 \text{ IN.}$

A Amp  
A Atten 24  
A Gain  
B Amp  
B Atten 24  
B Gain  
Date

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A or B Del. A  
Sample Inc. 100  
Recomp. Del. 0  
Sums 128  
Word Pos. 2-4  
Resumes. 2  
Date APR 13 1975



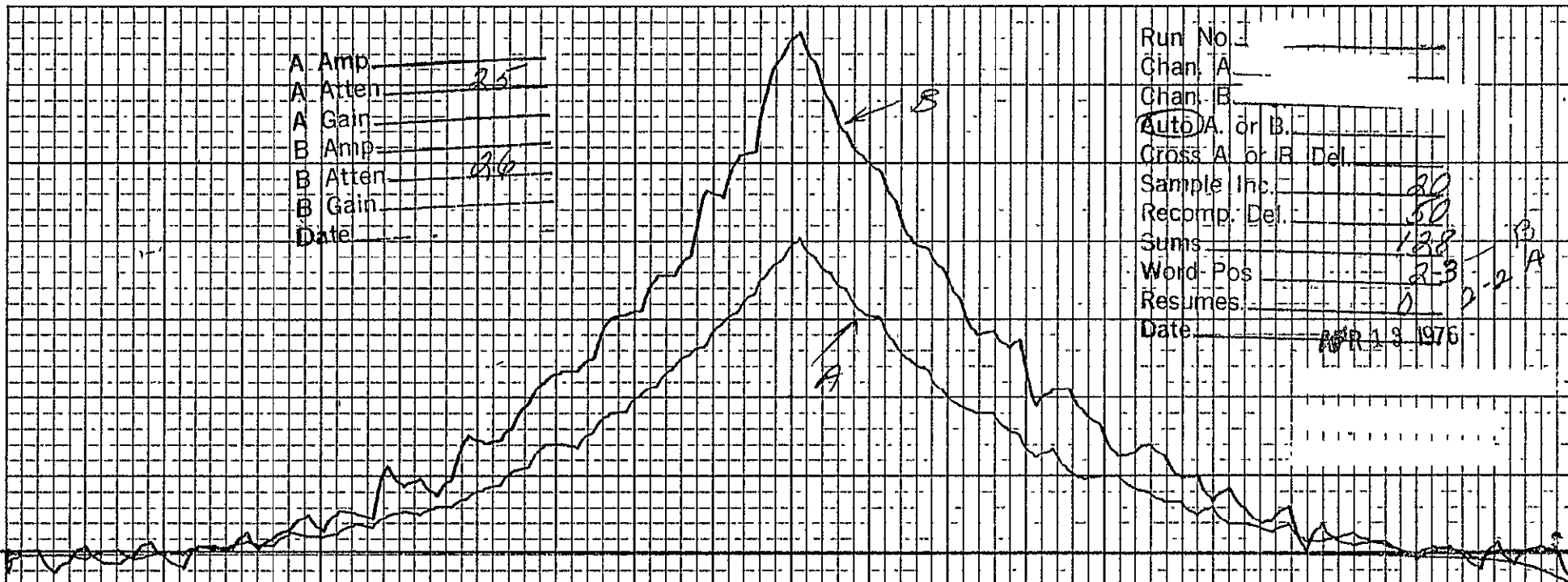
$M = .3$   
 $X/D = 9.5$   
 $R/D = -.045$   
 $\Delta x = 8.4 \text{ IN.}$

D-133

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 2.5  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 2.6  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A. or B. \_\_\_\_\_  
 Cross A. or B. Del. \_\_\_\_\_  
 Sample Inc. 20  
 Recomp. Del. 50  
 Sums 128  
 Word Pos 2-3  
 Resumes 1 2-2  
 Date APR 13 1976



$M = 3$   
 $X/D = 9.5$   
 $R/D = .450$   
 $\Delta X = 0.4 \text{ IN.}$

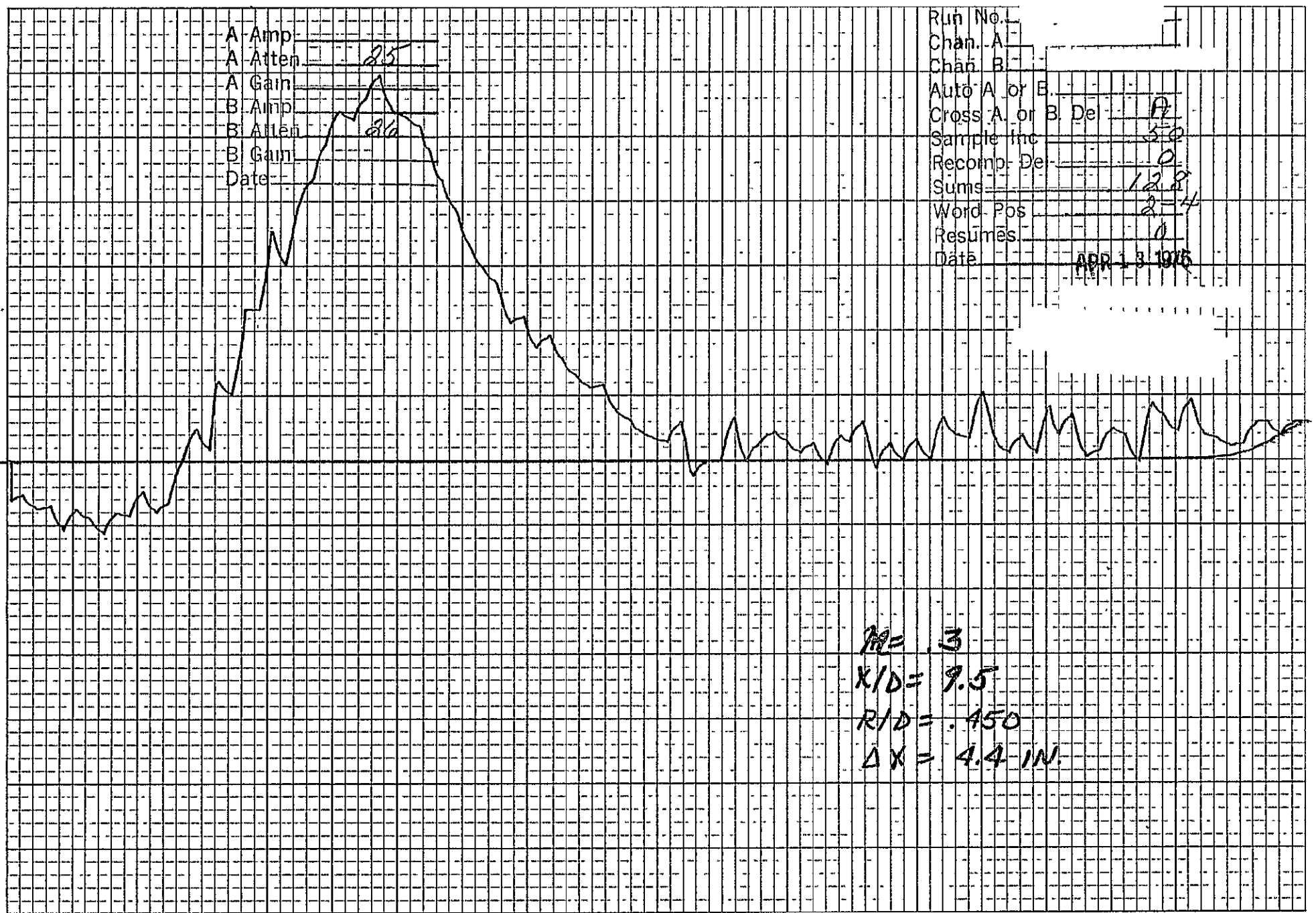
D-134





A Amp  
 A Atten 25  
 A Gain  
 B Amp  
 B Atten 26  
 B Gain  
 Date

Run No.  
 Chan. A  
 Chan. B  
 Auto A or B  
 Cross A or B De A  
 Sample Inc 50  
 Recomp. De 0  
 Sums 12.8  
 Word Pos 274  
 Resumes 0  
 Date APR 13 1975



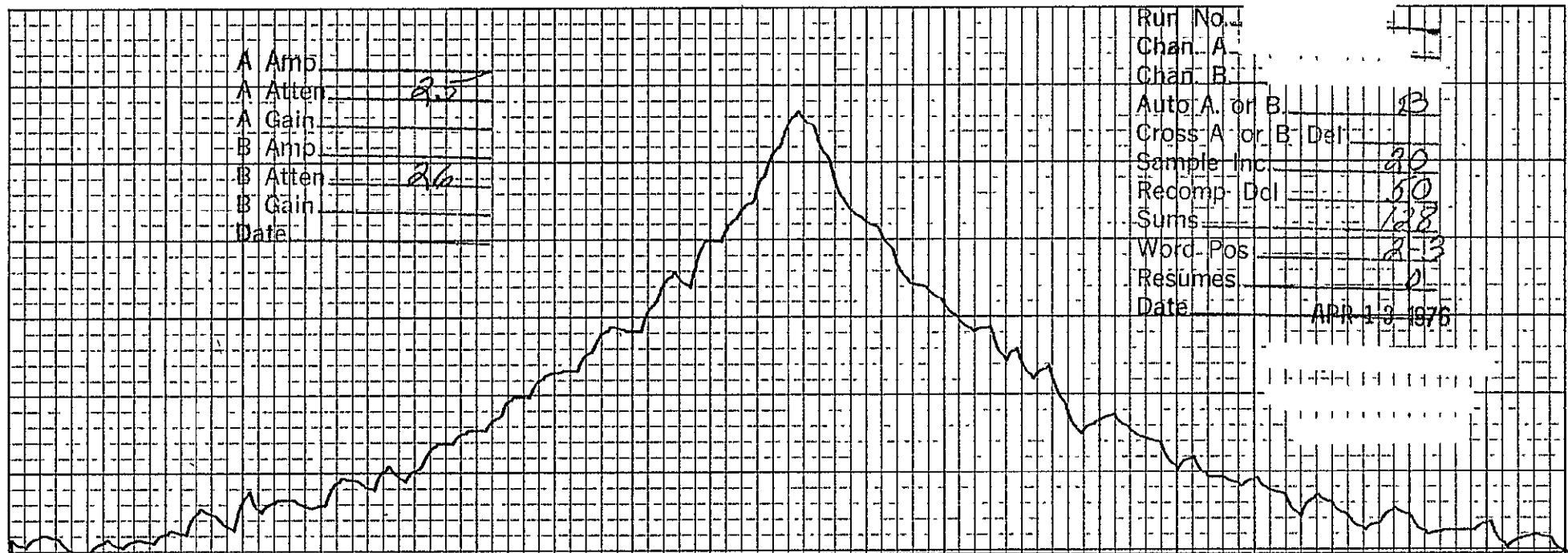
D-137

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$M = 3$   
 $X/D = 9.5$   
 $R/D = .450$   
 $\Delta X = 4.4 \text{ IN.}$

A Amp  
 A Atten 2.5  
 A Gain  
 B Amp  
 B Atten 2.6  
 B Gain  
 Date

Run No. 1  
 Chan. A  
 Chan. B  
 Auto. A. or B. B  
 Cross. A. or B. Del.  
 Sample Inc. 20  
 Recomp. Del. 50  
 Sums 128  
 Word. Pos. 2-3  
 Resumes 0  
 Date APR 19 1976



Pe. 3  
XID = 9.5  
RID = .450  
ΔX = 8.4 IN.

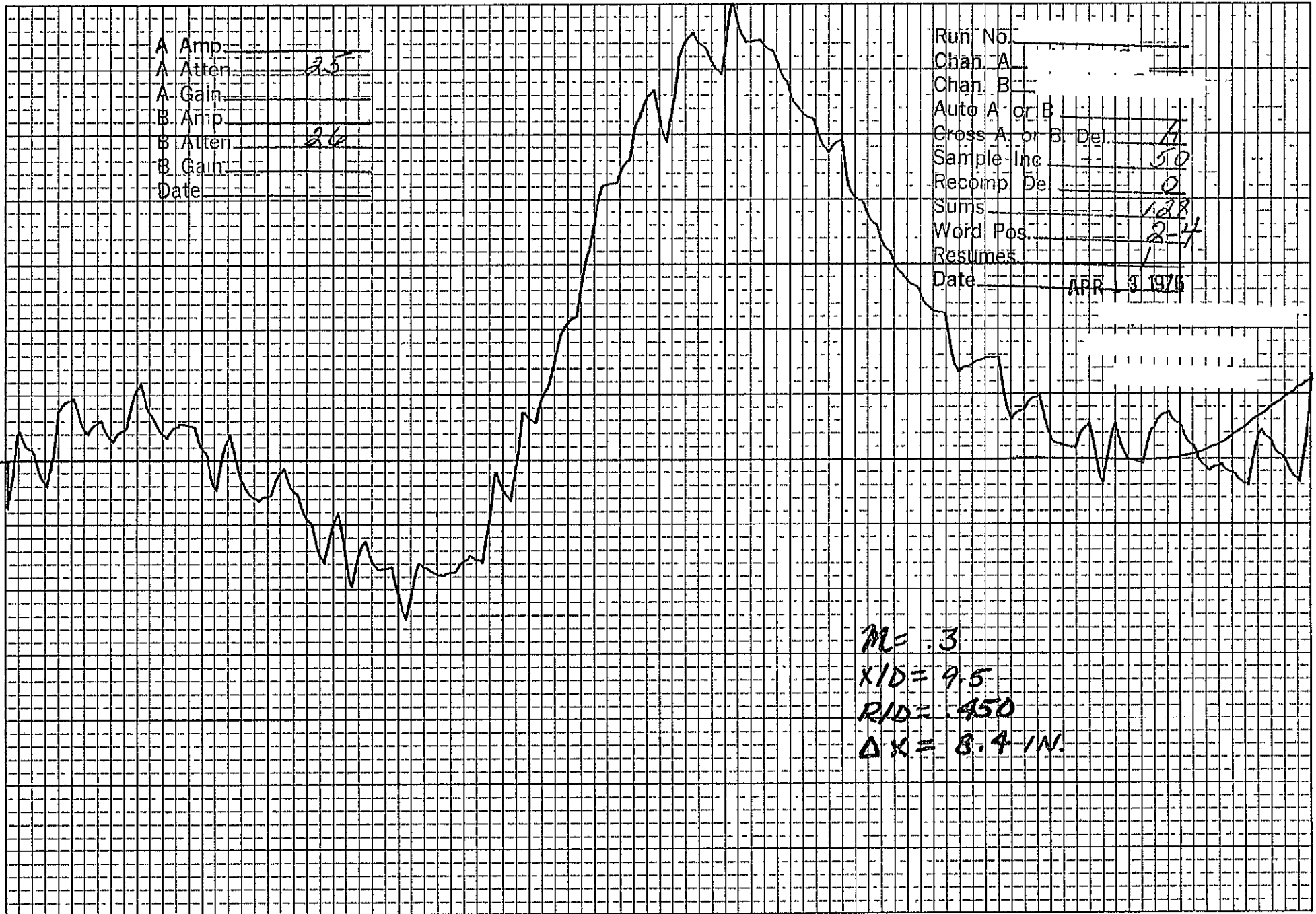
D-138

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 25  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del. A  
Sample Inc 50  
Recomp Del 0  
Sums 128  
Word Pos. 2-4  
Reslines 1  
Date APR 3 1976

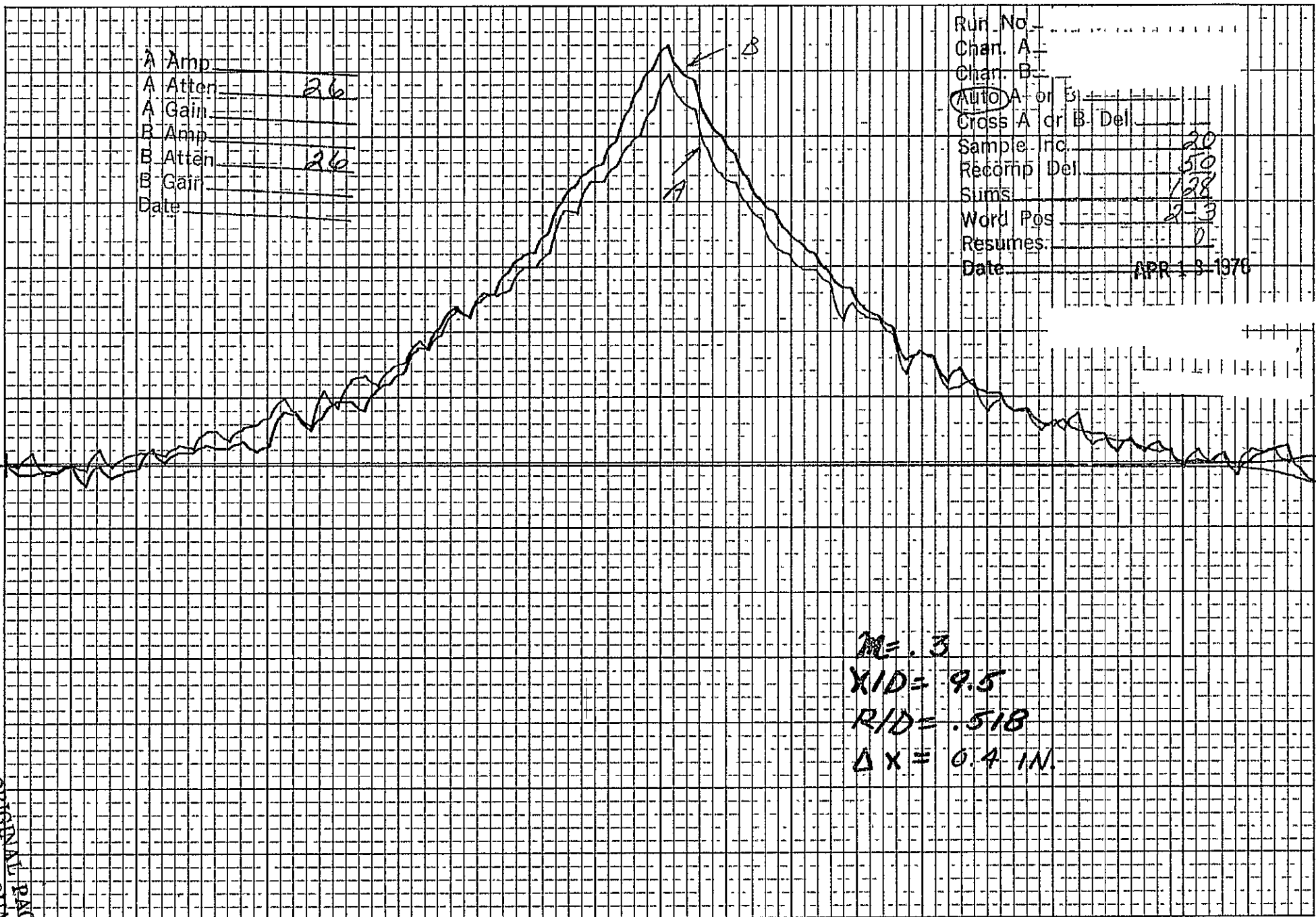
D-139



$M = .3$   
 $XID = 9.5$   
 $RID = .450$   
 $\Delta X = 8.4 IN.$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or Es \_\_\_\_\_  
Cross A or B Del \_\_\_\_\_  
Sample Inc. 20  
Record Del. 50  
Sums 128  
Word Pos 2-3  
Resumes: 0  
Date APR 13 1970



$M = .3$   
 $X/D = 9.5$   
 $R/D = .518$   
 $\Delta X = 0.4 \text{ IN.}$

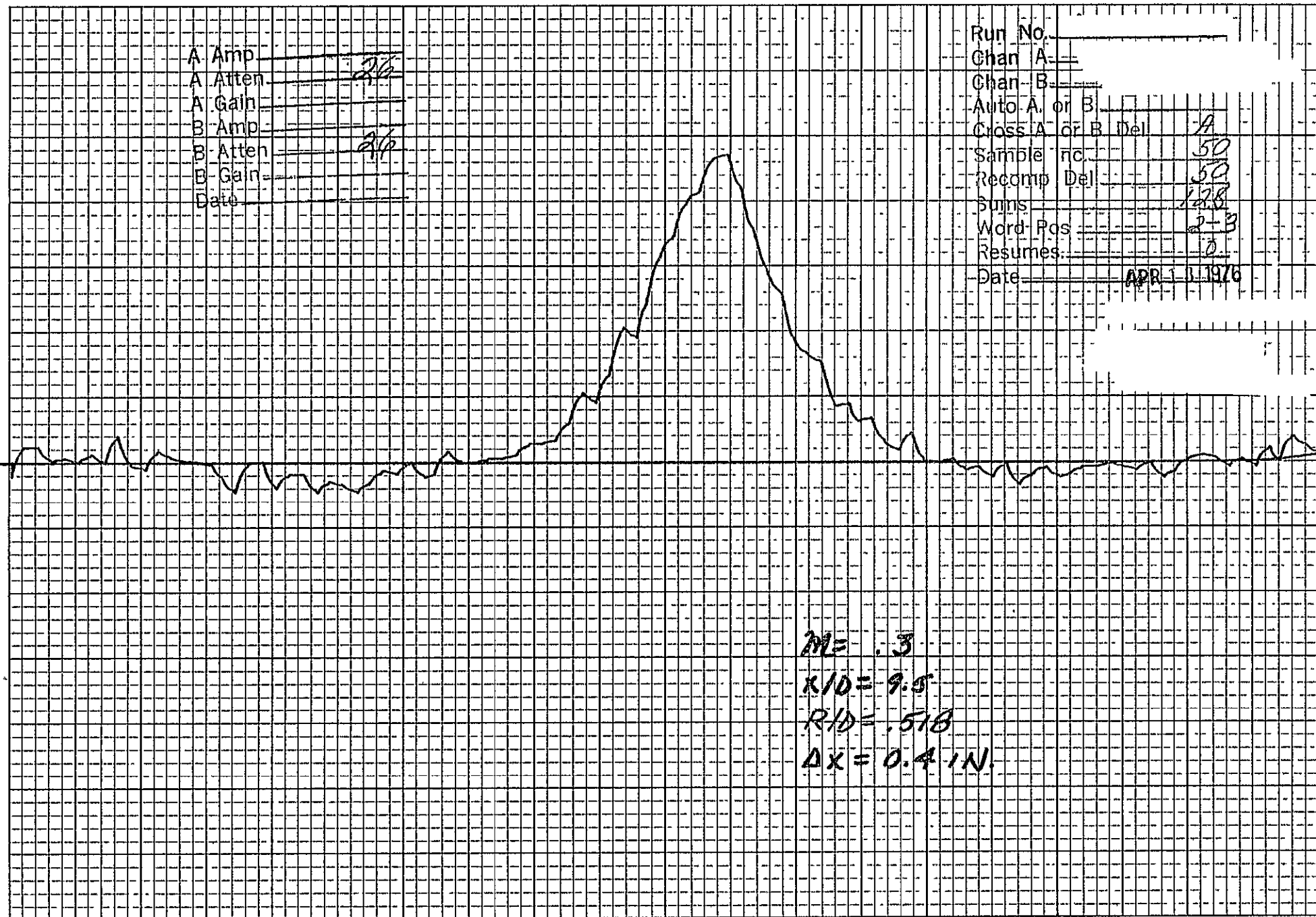
D-140

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten \_\_\_\_\_ 2/6  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten \_\_\_\_\_ 2/6  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del. A  
Sample no. 50  
Recomp Del. 50  
Summs 128  
Word Pos 2-B  
Resumes: 0  
Date APR 10 1976

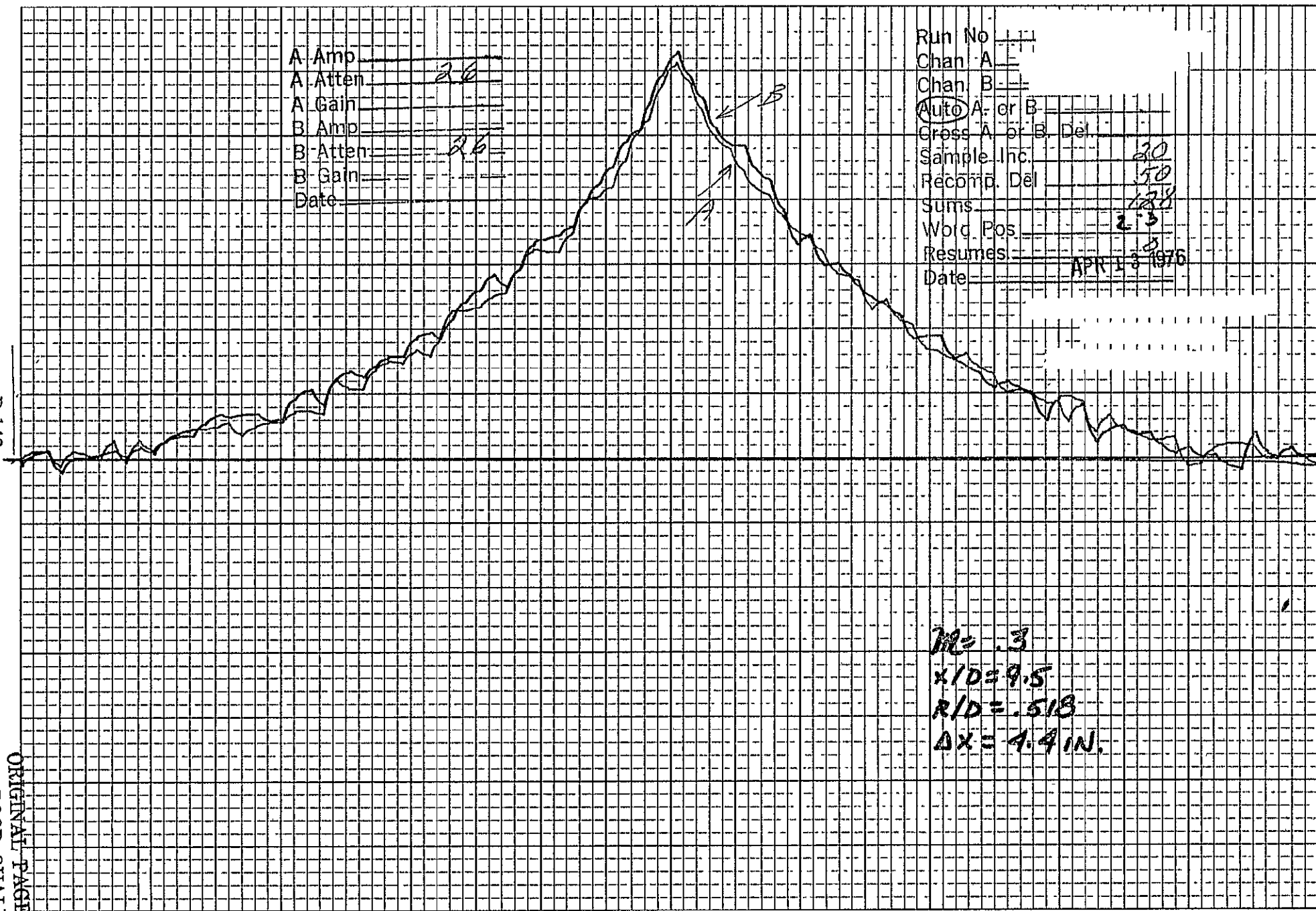
D-141



ME = .3  
K/D = 9.5  
R/D = .518  
 $\Delta X = 0.4 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten: 2.6  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten: 2.6  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No 111  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del \_\_\_\_\_  
Sample Inc. 30  
Recorp. Del 50  
Sums 128  
Word Pos. 2.3  
Resumes \_\_\_\_\_  
Date APR 13 1976



$M = .3$   
 $X/D = 9.5$   
 $R/D = .518$   
 $\Delta X = 4.4 \text{ IN.}$

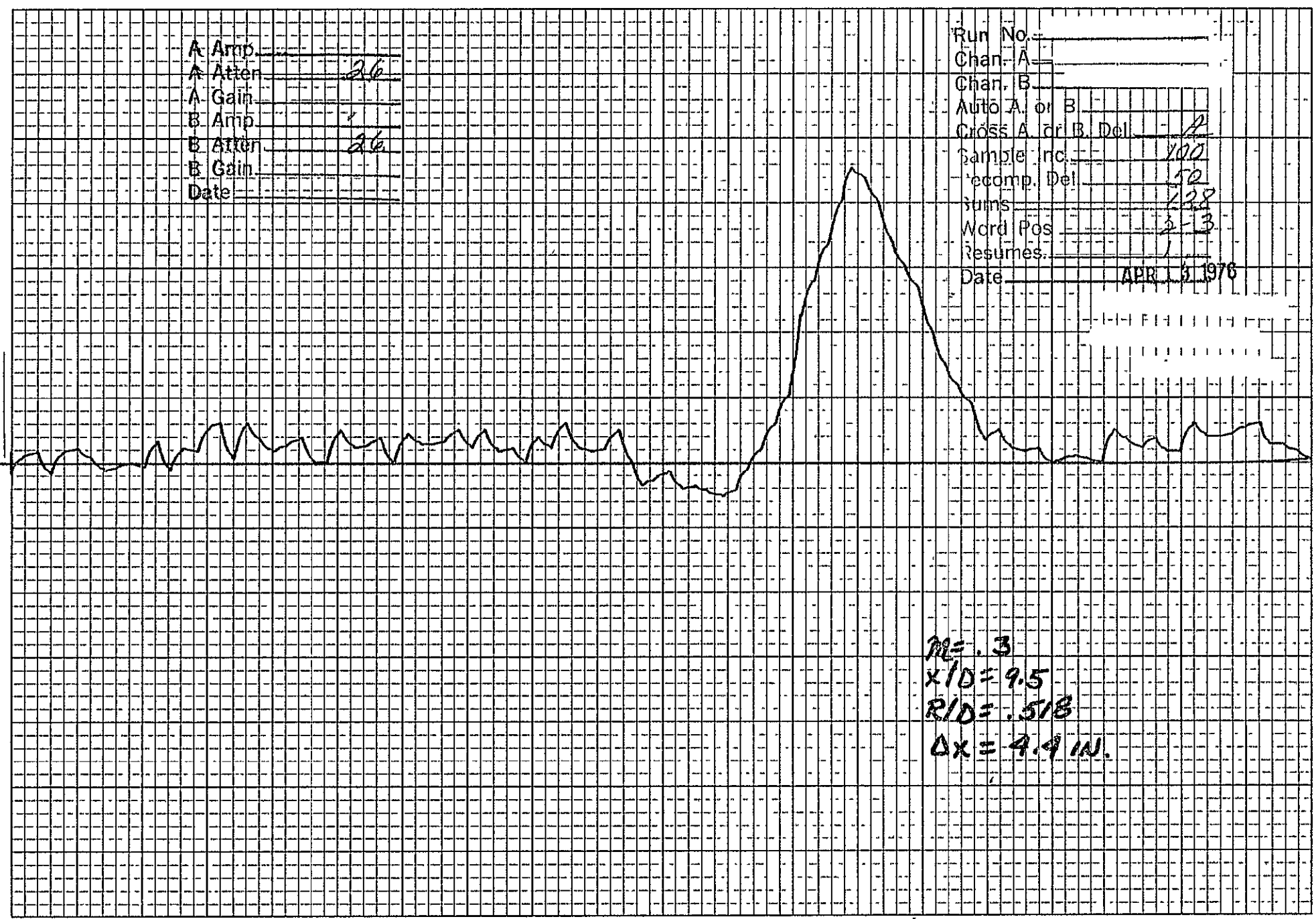
D-142

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp. \_\_\_\_\_  
A Atten. 26  
A Gain. \_\_\_\_\_  
B Amp. \_\_\_\_\_  
B Atten. 26  
B Gain. \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del. 2  
Sample Inc. 100  
Decomp. Del. 10  
Sums 128  
Word Pos. 2-3  
Resumes. 1  
Date APR 13 1976

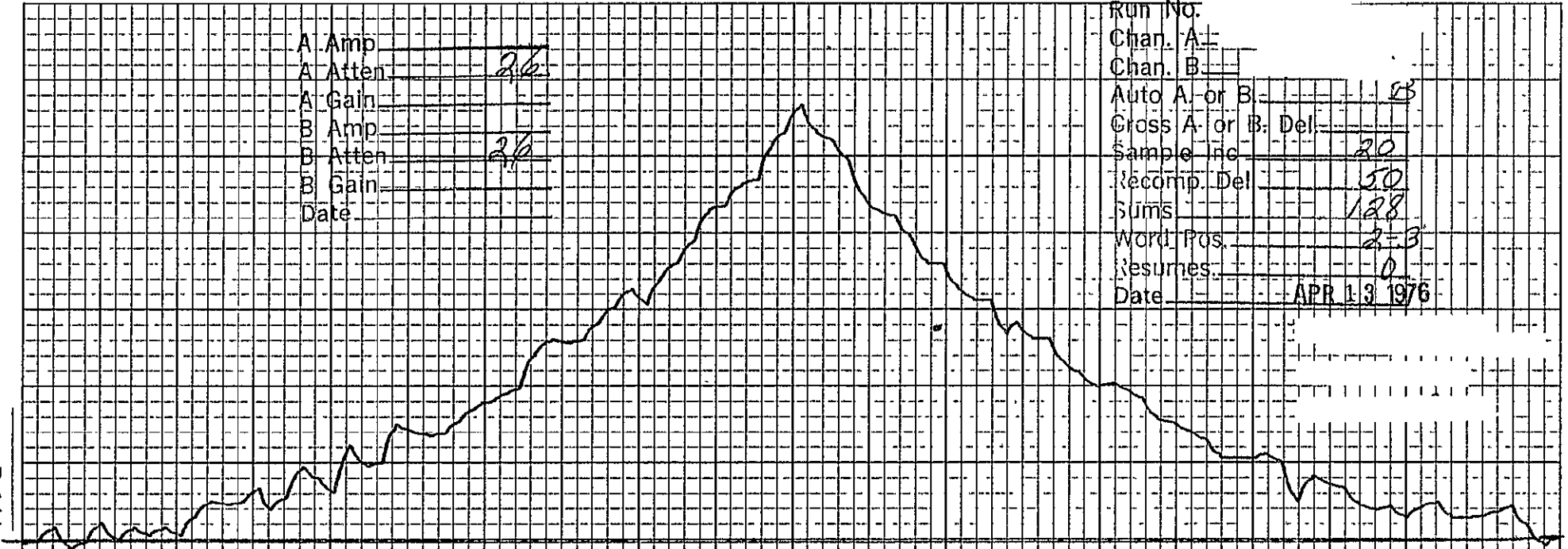
D-143



$RE = .3$   
 $X/D = 9.5$   
 $R/D = .518$   
 $\Delta X = 4.9 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_ 25  
Cross A or B Del \_\_\_\_\_  
Sample Inc \_\_\_\_\_ 20  
Recomp. Del \_\_\_\_\_ 50  
Sums \_\_\_\_\_ 128  
Word Pos \_\_\_\_\_ 2-3  
Resumes \_\_\_\_\_ 0  
Date \_\_\_\_\_ APR 13 1976



M = 3  
K/D = 9.5  
R/D = .518  
 $\Delta X = 8.4 \text{ IN.}$

D-144

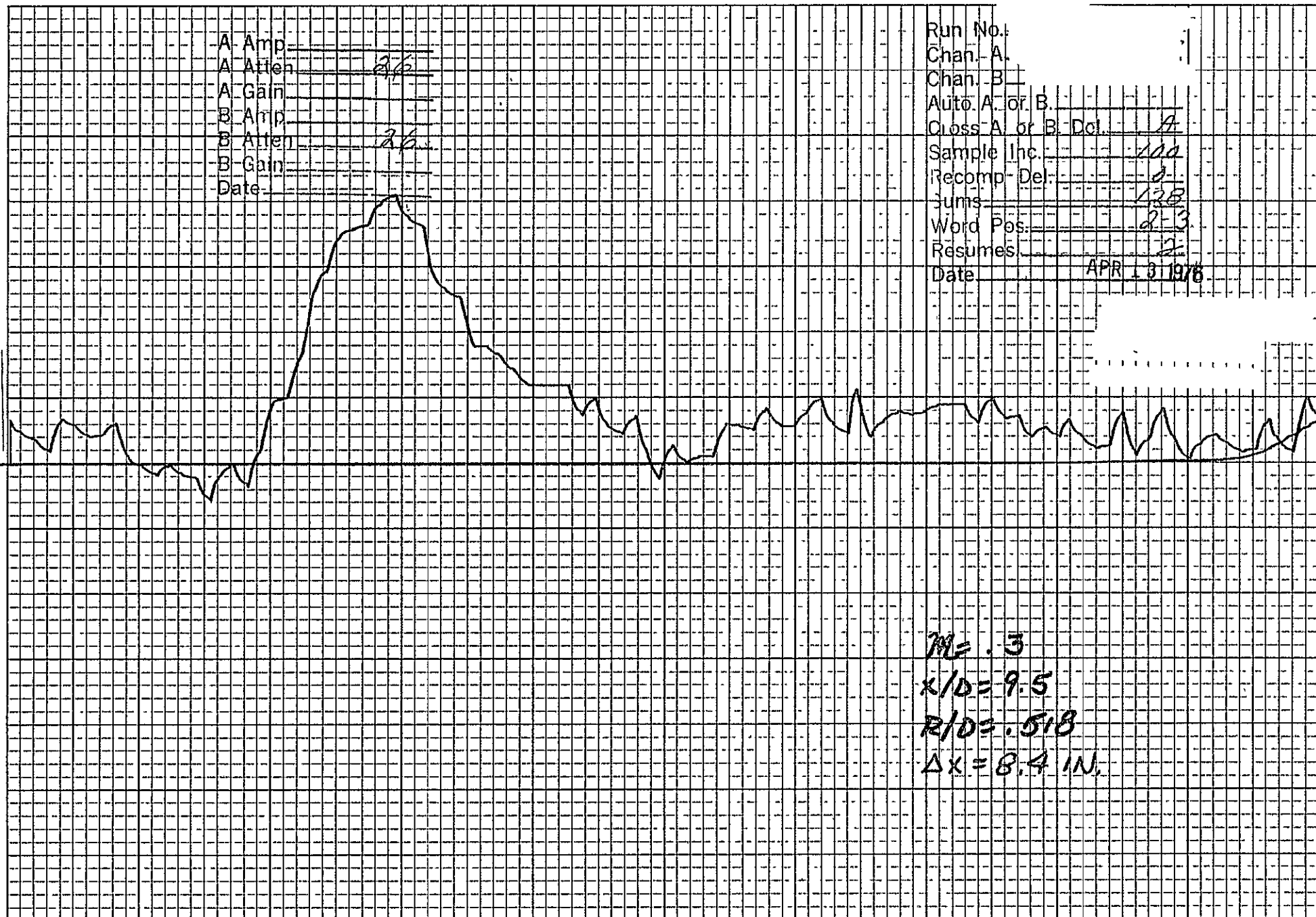
ORIGINAL PAGE IS  
OF POOR QUALITY.



A Amp \_\_\_\_\_  
A Atten 26  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 26  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No.: \_\_\_\_\_  
Chan. A. \_\_\_\_\_  
Chan. B. \_\_\_\_\_  
Auto. A. or B. \_\_\_\_\_  
Cross A. or B. Del. A  
Sample Inc. 100  
Recomp. Del. 0  
Sums 128  
Word Pos. 2-3  
Resumes 2  
Date APR 13 1976

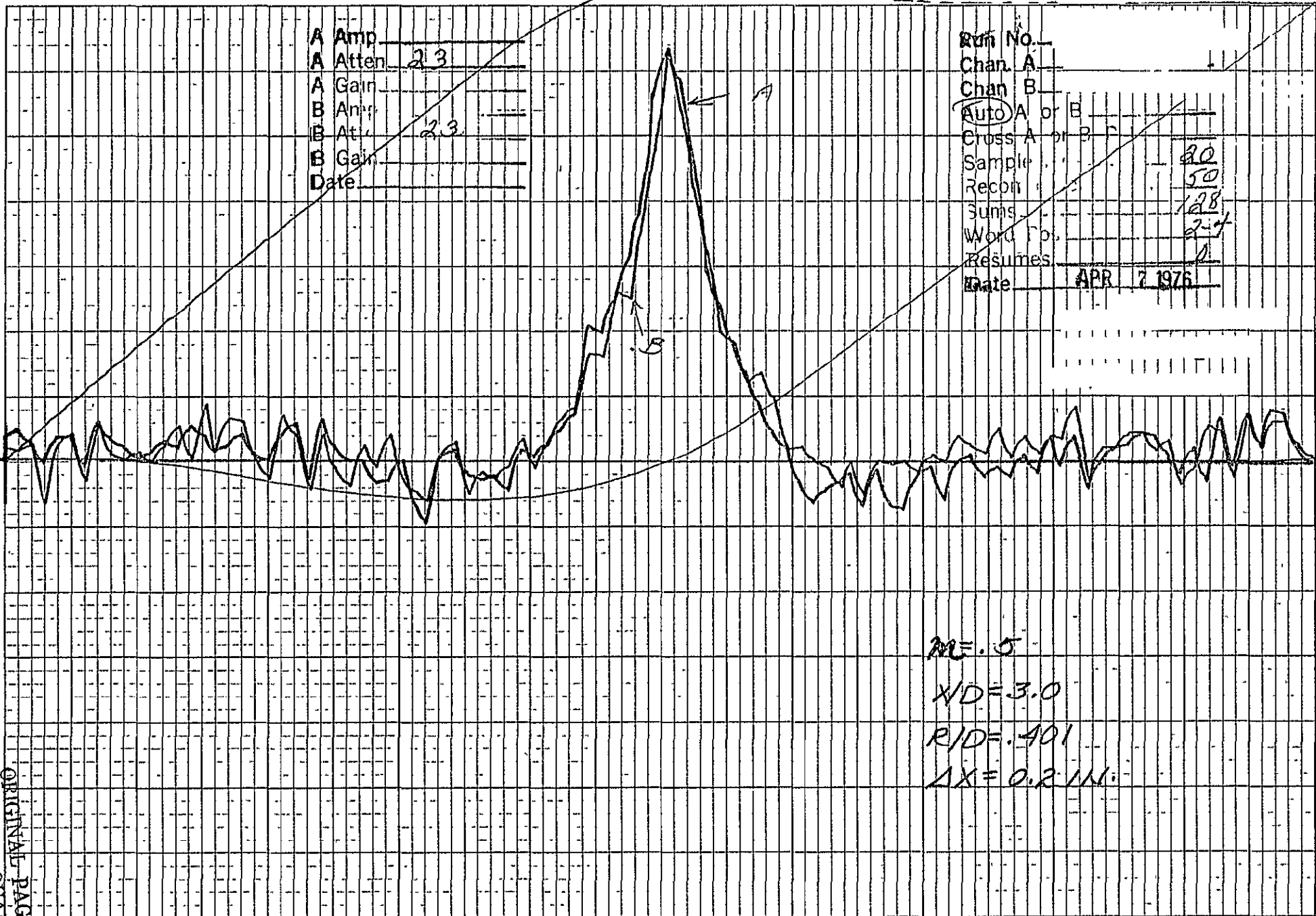
D-145



$M = .3$   
 $X/D = 9.5$   
 $R/D = .518$   
 $\Delta X = 8.4 \text{ IN.}$

A Amp \_\_\_\_\_  
 A Atten 2.3  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 2.3  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 (Auto) A or B \_\_\_\_\_  
 Cross A or B \_\_\_\_\_  
 Sample \_\_\_\_\_ 20  
 Recon \_\_\_\_\_ 50  
 Sums \_\_\_\_\_ 128  
 Word Fb. \_\_\_\_\_ 2-4  
 Resumes \_\_\_\_\_ 0  
 Date APR 7 1976



$ME = .5$   
 $XD = 3.0$   
 $R/D = .401$   
 $\Delta X = 0.2 IN.$

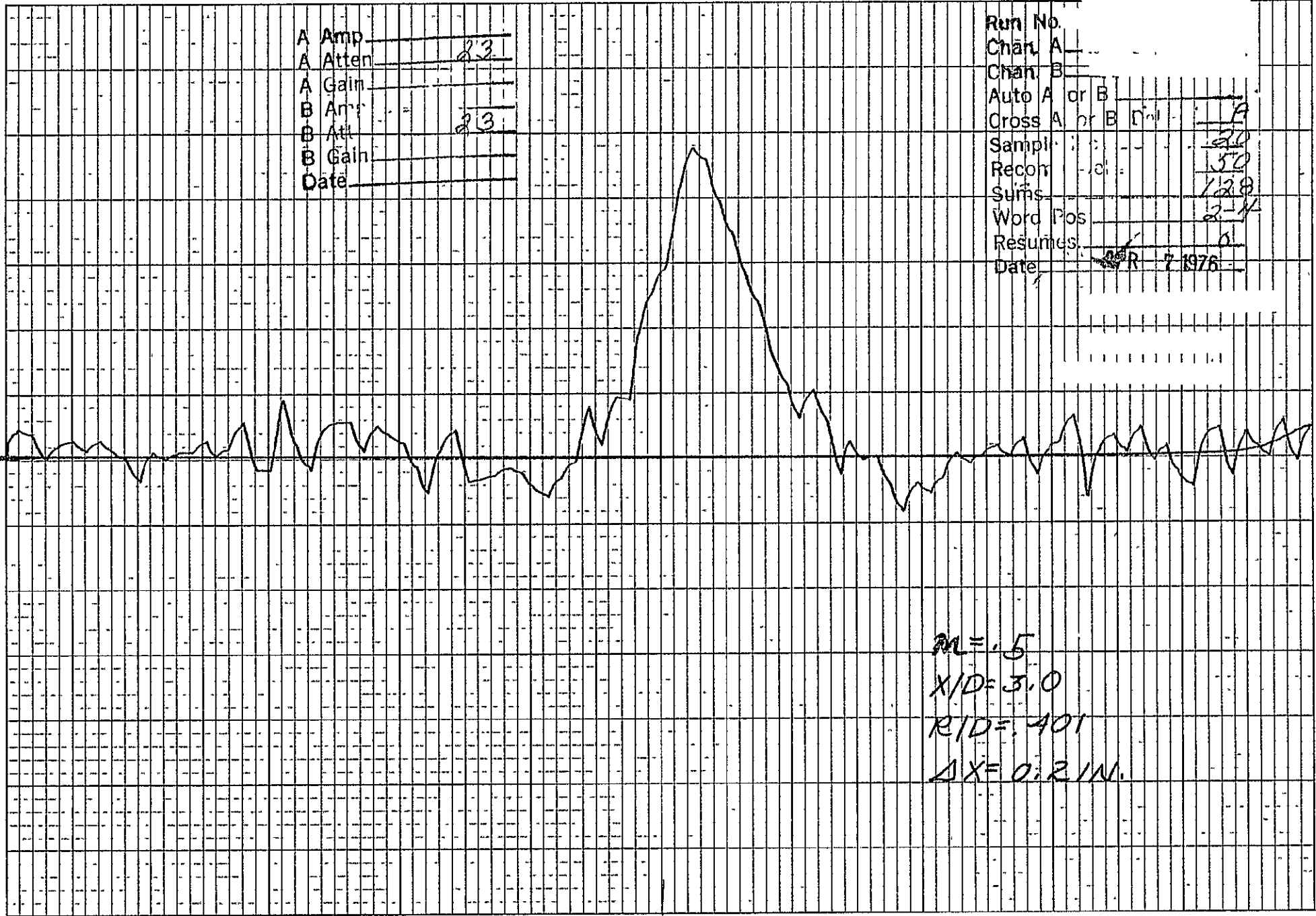
D-146

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Att 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B A  
Sampl. \_\_\_\_\_  
Recon. \_\_\_\_\_  
Summ. \_\_\_\_\_  
Word Pos 2-14  
Resumes 0  
Date APR 7 1976

D-147

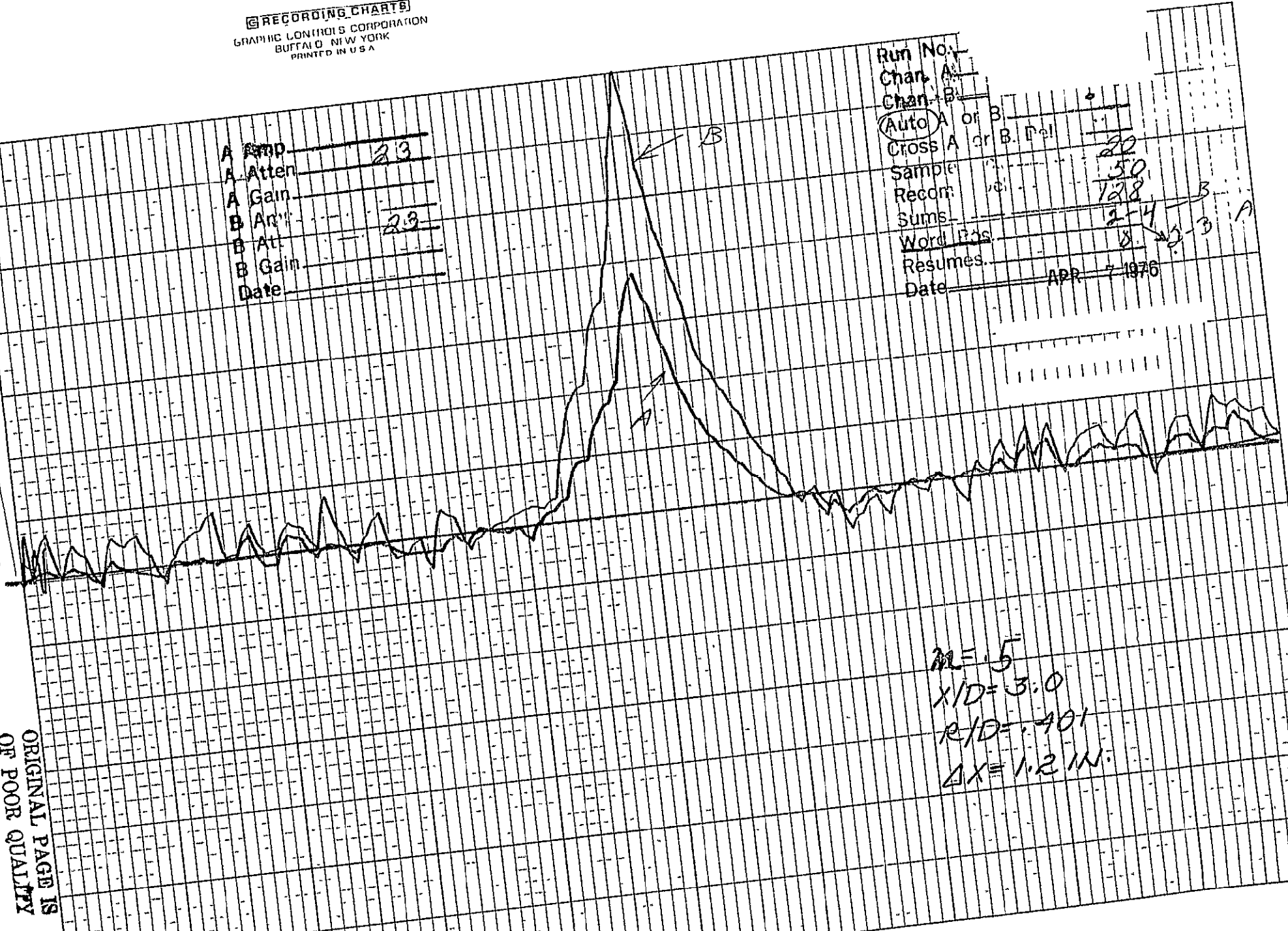


$M = 1.5$   
 $X/D = 3.0$   
 $R/D = 401$   
 $\Delta X = 0.2 \text{ IN.}$

RECORDING CHARTS  
GRAPHIC CONTROLS CORPORATION  
BUFFALO, N.Y. 14202  
PRINTED IN U.S.A.

A Amp	2.3
A Atten	
A Gain	
B Amp	2.3
B Att	
B Gain	
Date	

Run No.	
Chan. A	
Chan. B	
(Auto) A or B	
Cross A or B. Del	20
Sample	50
Recon	128
Sums	2-4
Word Pts	8
Resumes	
Date	APR 7 1976



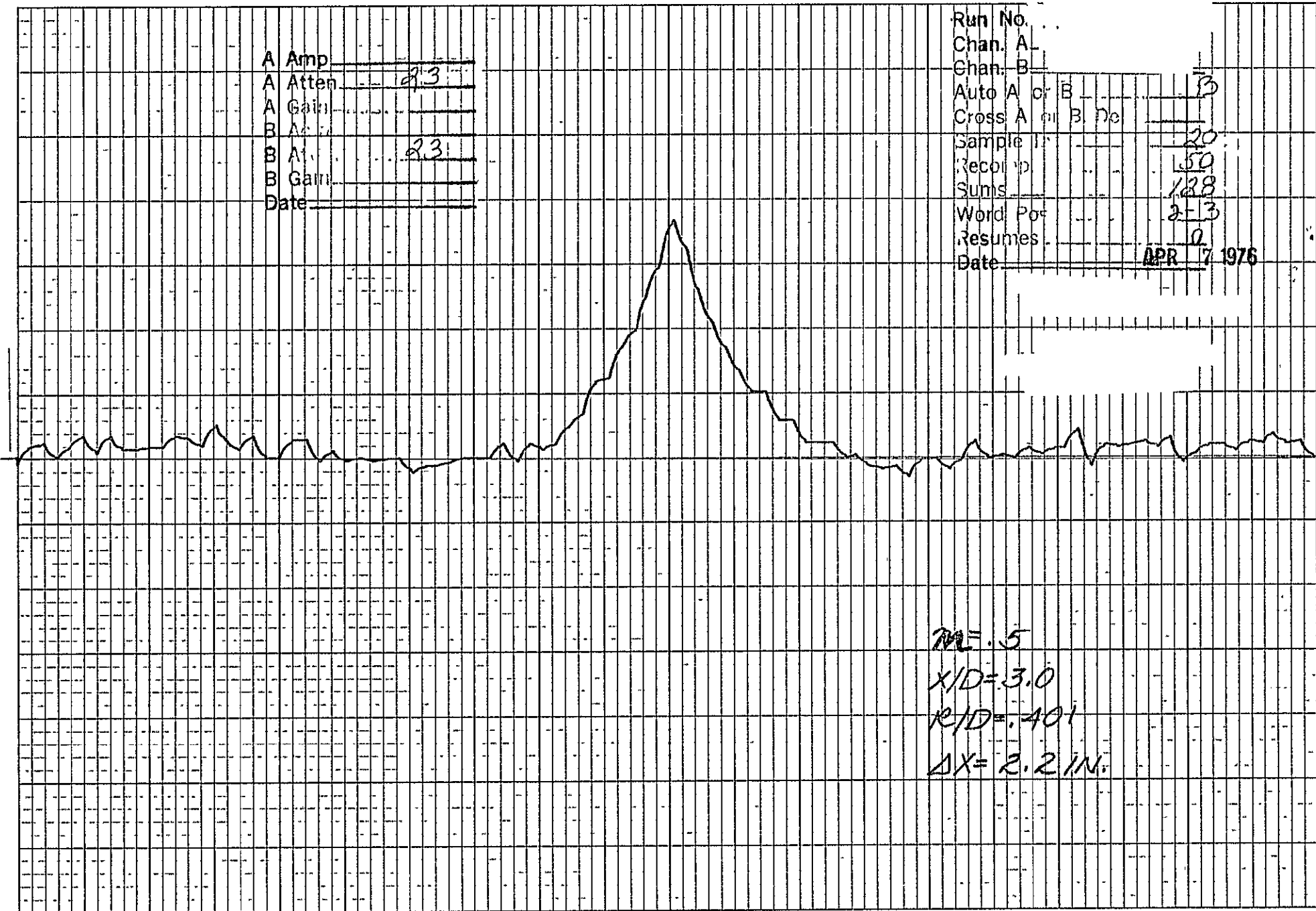
D-148

ORIGINAL PAGE IS  
OF POOR QUALITY

M=1.5  
 X/D=3.0  
 R/D=.401  
 ΔX=1.2 IN.

A Amp \_\_\_\_\_  
A Atten. 2.3  
A Gain \_\_\_\_\_  
B Atten. \_\_\_\_\_  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross A or B No \_\_\_\_\_  
Sample Int. 20  
Recol. Int. 150  
Sums 128  
Word Pos. 2-3  
Resumes 0  
Date APR 7 1976



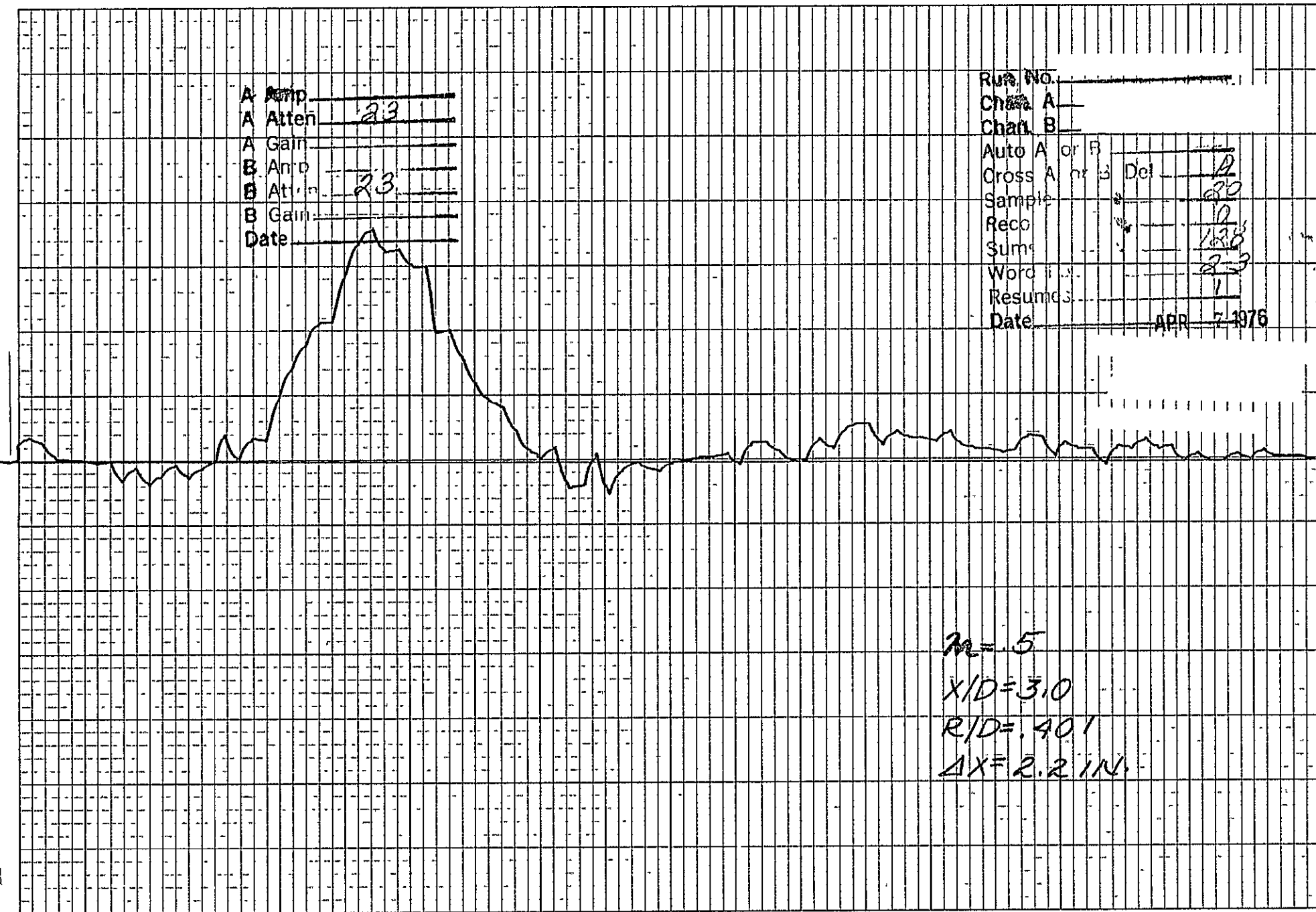
$M = .5$   
 $X/D = 3.0$   
 $R/D = .401$   
 $\Delta X = 2.2 \text{ IN.}$

D-150

PRECEDING PAGE BLANK NOT FILLED

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A nr B Del 2  
Sample 20  
Reco 10  
Sum 130  
Word 23  
Resumes 1  
Date APR 7 1976



$M = 5$   
 $X/D = 3.0$   
 $R/D = .401$   
 $\Delta X = 2.2 \text{ IN.}$

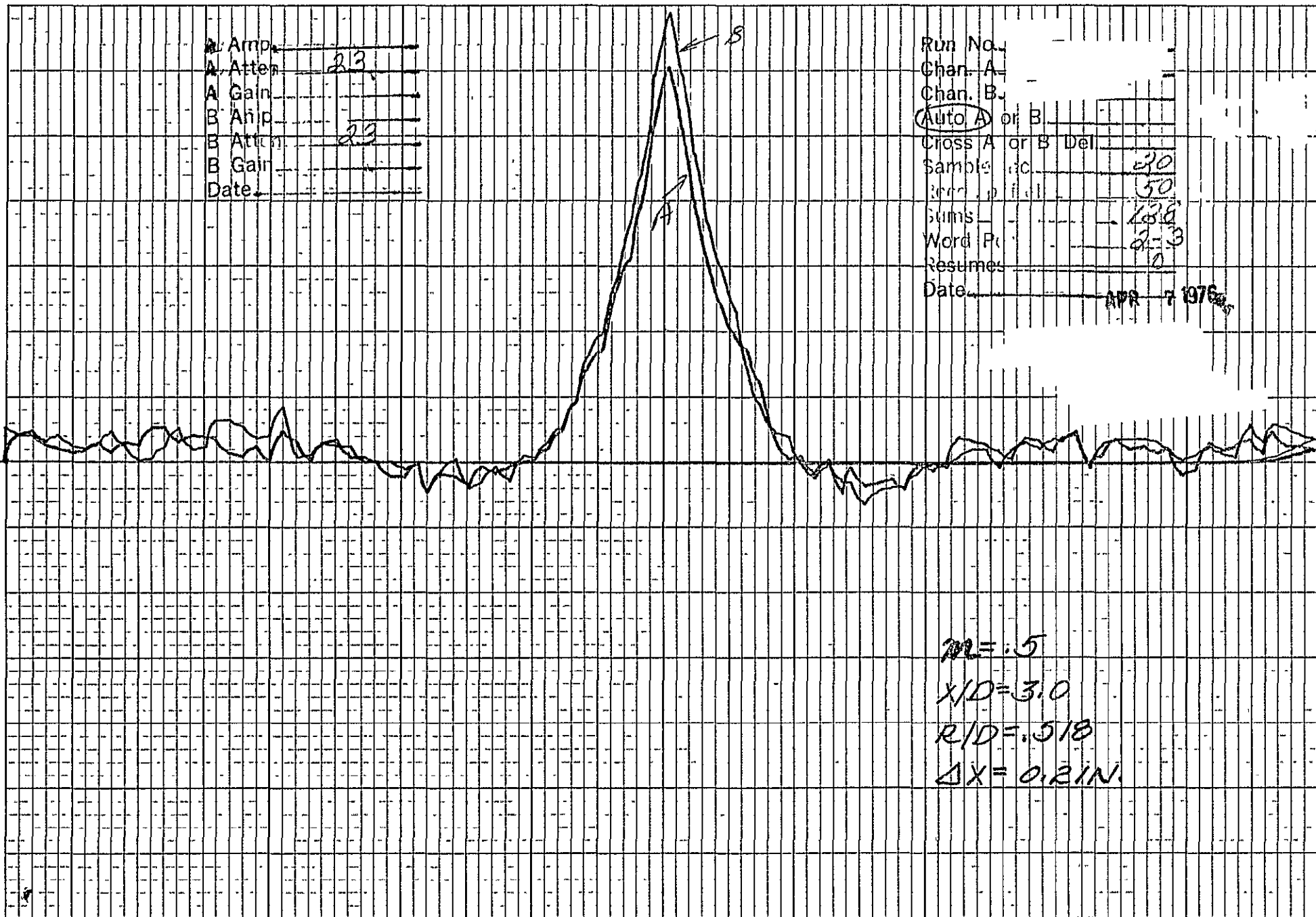
D-151

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp. \_\_\_\_\_  
 A Atten. 23  
 A Gain \_\_\_\_\_  
 B Amp. \_\_\_\_\_  
 B Atten. 29  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 (Auto A) or B \_\_\_\_\_  
 Cross A or B Del. \_\_\_\_\_  
 Sample c.c. 20  
 Temp. p. f. 50  
 Stims \_\_\_\_\_  
 Word Pt. 2-3  
 Resumes 0  
 Date APR 7 1976

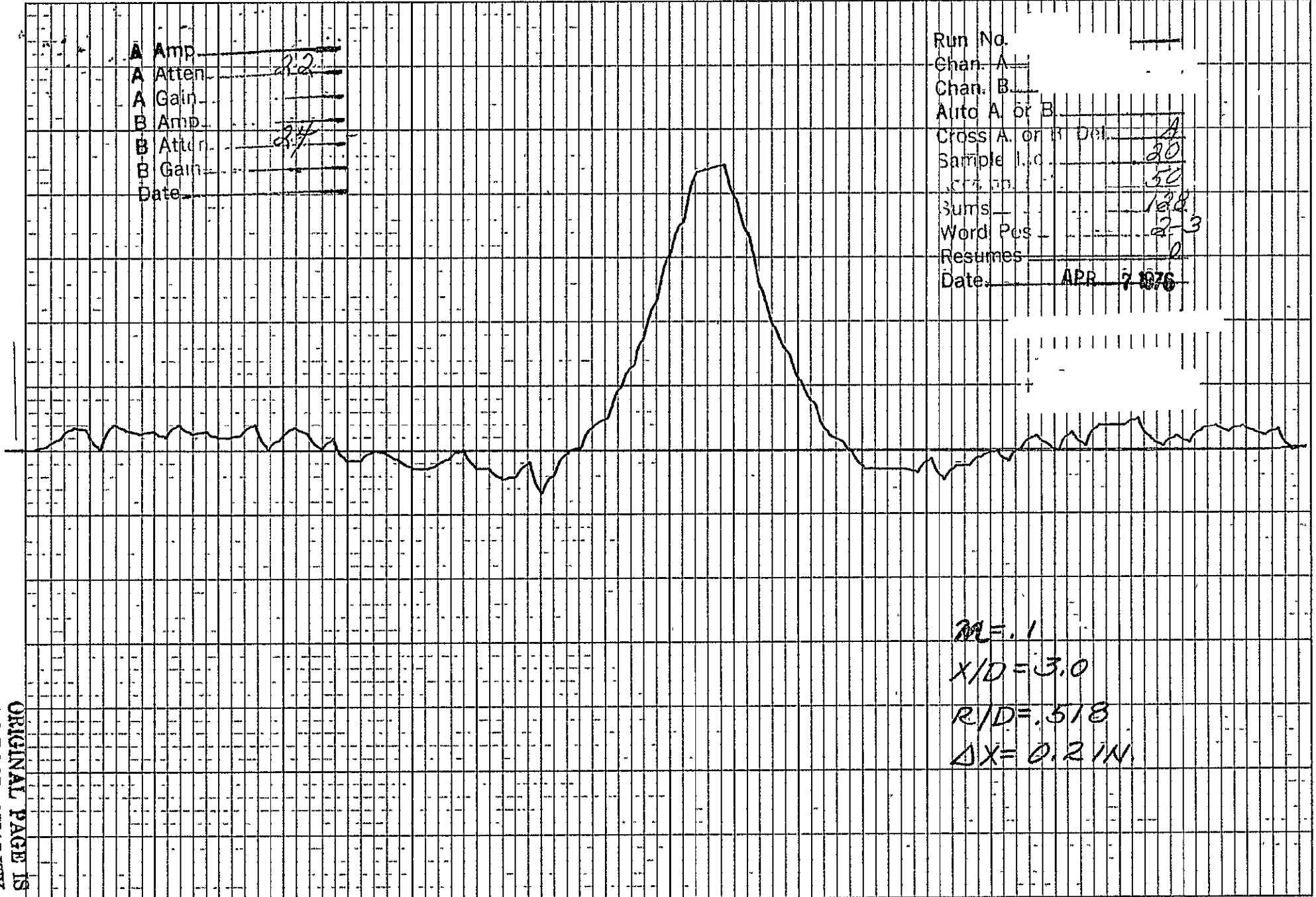
D-152



$m = .5$   
 $X/D = 3.0$   
 $R/D = .518$   
 $\Delta X = 0.2 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten. 2.2  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 2.4  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. or B. Det. A  
Sample I.C. 20  
C.C. 50  
Sums 138  
Word Pos 2-3  
Resumes 0  
Date APR 7 1976



$M = 1$   
 $X/D = 3.0$   
 $R/D = .518$   
 $\Delta X = 0.2 \text{ IN.}$

D-153

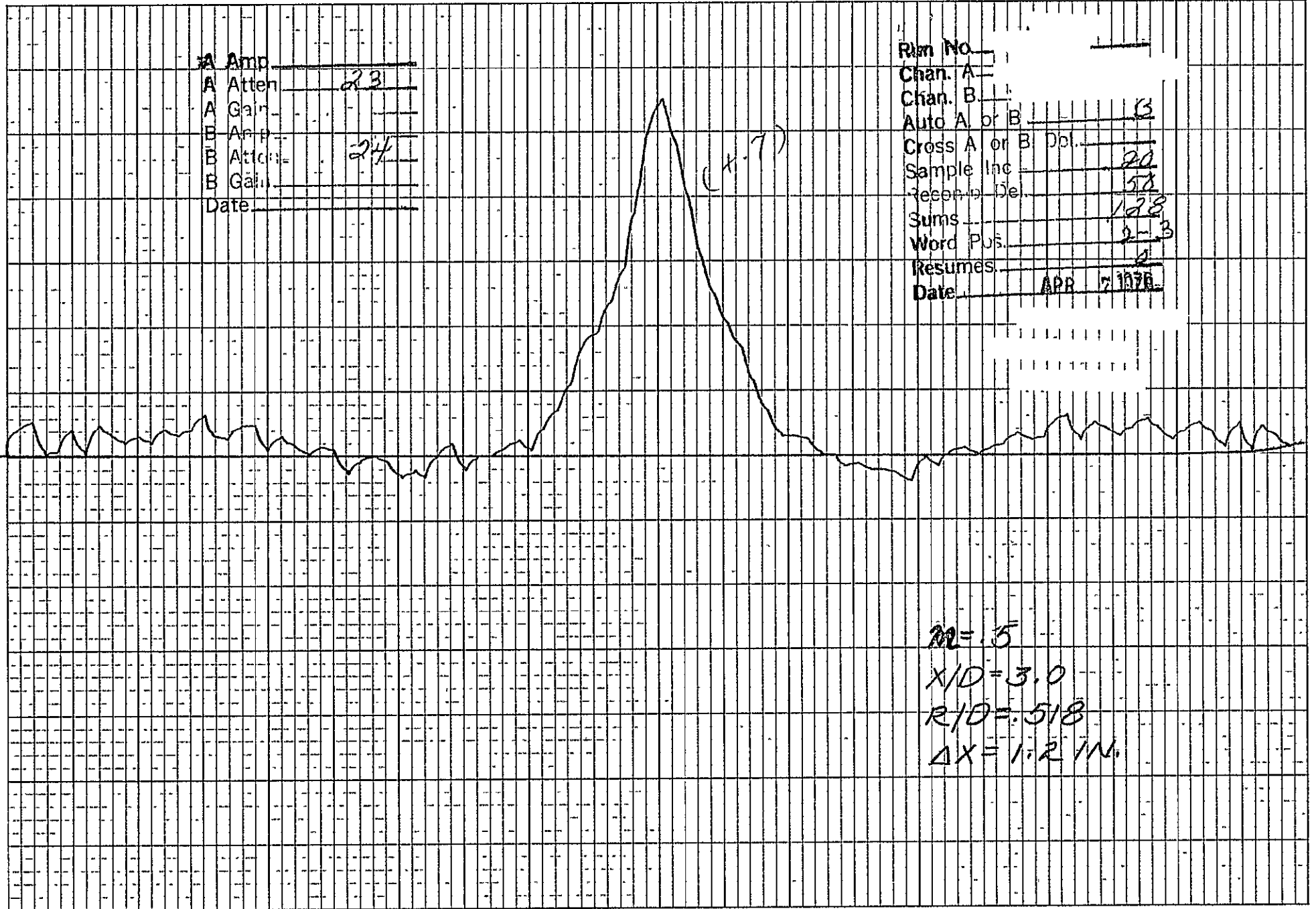
ORIGINAL PAGE IS  
OF POOR QUALITY



A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 24  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Rin No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B 3  
Cross A or B Dpt. \_\_\_\_\_  
Sample Inc 20  
Record Del. 52  
Sums 128  
Word Pos. 2-3  
Resumes 2  
Date APR 7 1976

D-154

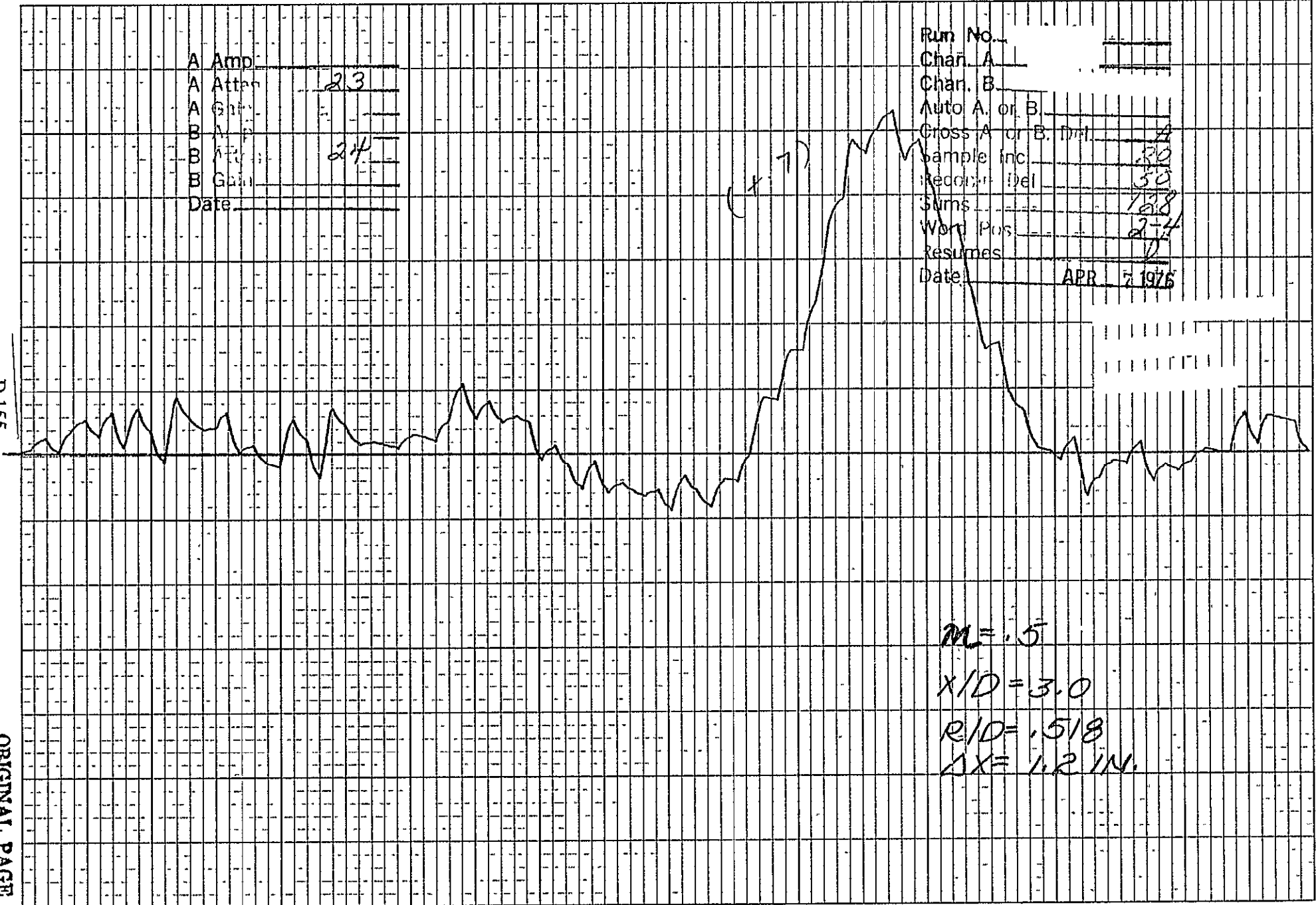


$M = .5$   
 $X/D = 3.0$   
 $R/D = .518$   
 $\Delta X = 1.2 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 24  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A or B. (mm) 2  
Sample Inc. 30  
Record Int. 50  
Sums 728  
Word Pos. 2-4  
Resumes 0  
Date APR 7 1976

D-155

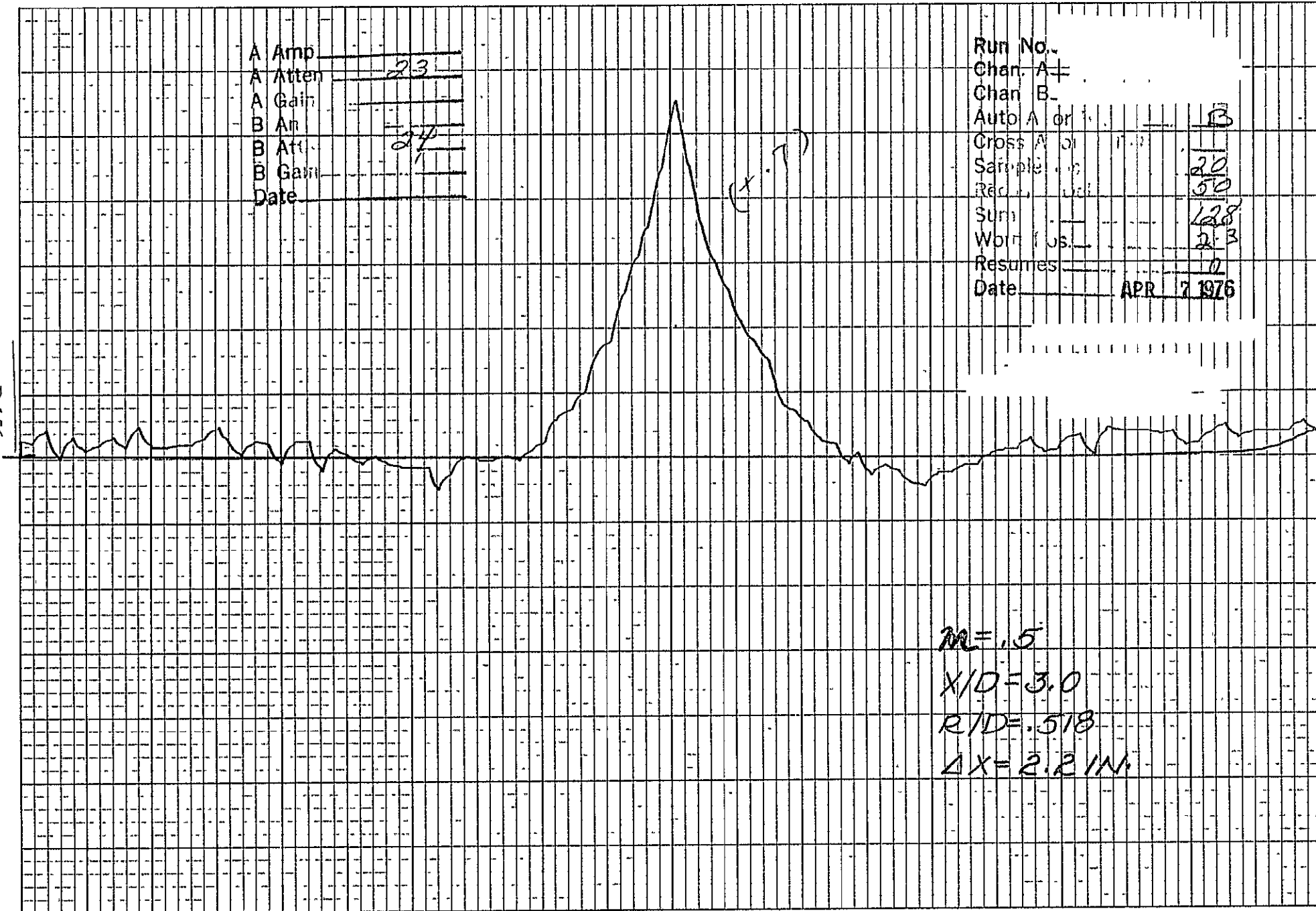


$M = .5$   
 $X/D = 3.0$   
 $R/D = .518$   
 $\Delta X = 1.2 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Am \_\_\_\_\_  
B Att. 27  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A   
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross At. of \_\_\_\_\_  
Sample No. 20  
Rec. No. 50  
Sum \_\_\_\_\_  
Worn (us) 2.3  
Resumes 0  
Date APR 7 1976

D-156



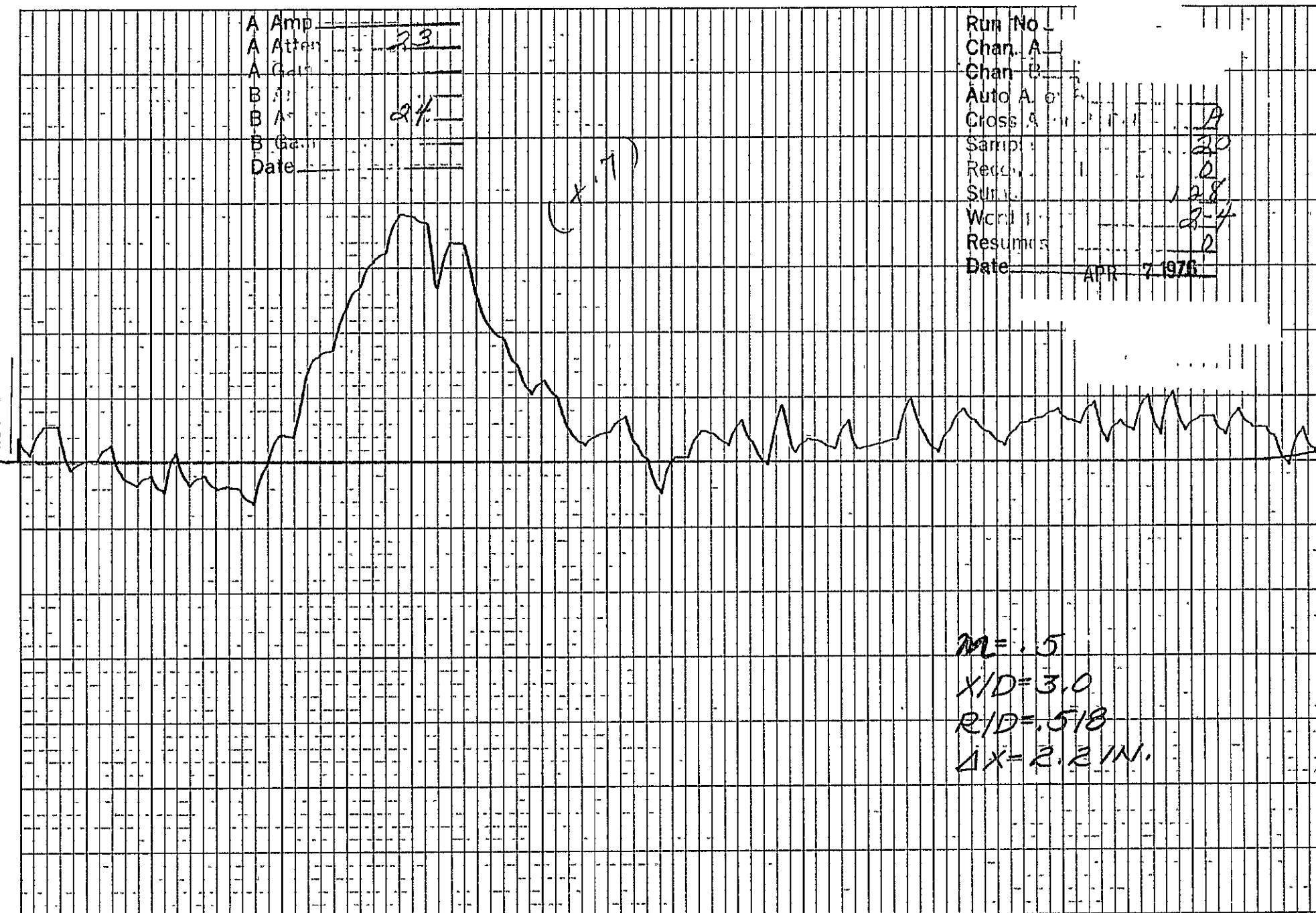
$M = 1.5$   
 $X/D = 3.0$   
 $R/D = .518$   
 $\Delta X = 2.2 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B A \_\_\_\_\_  
B A 24  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. 0 \_\_\_\_\_  
Cross A \_\_\_\_\_  
Samp. \_\_\_\_\_  
Recl. \_\_\_\_\_  
Surr. \_\_\_\_\_  
Word \_\_\_\_\_  
Resum. \_\_\_\_\_  
Date APR 7 1976

D-157

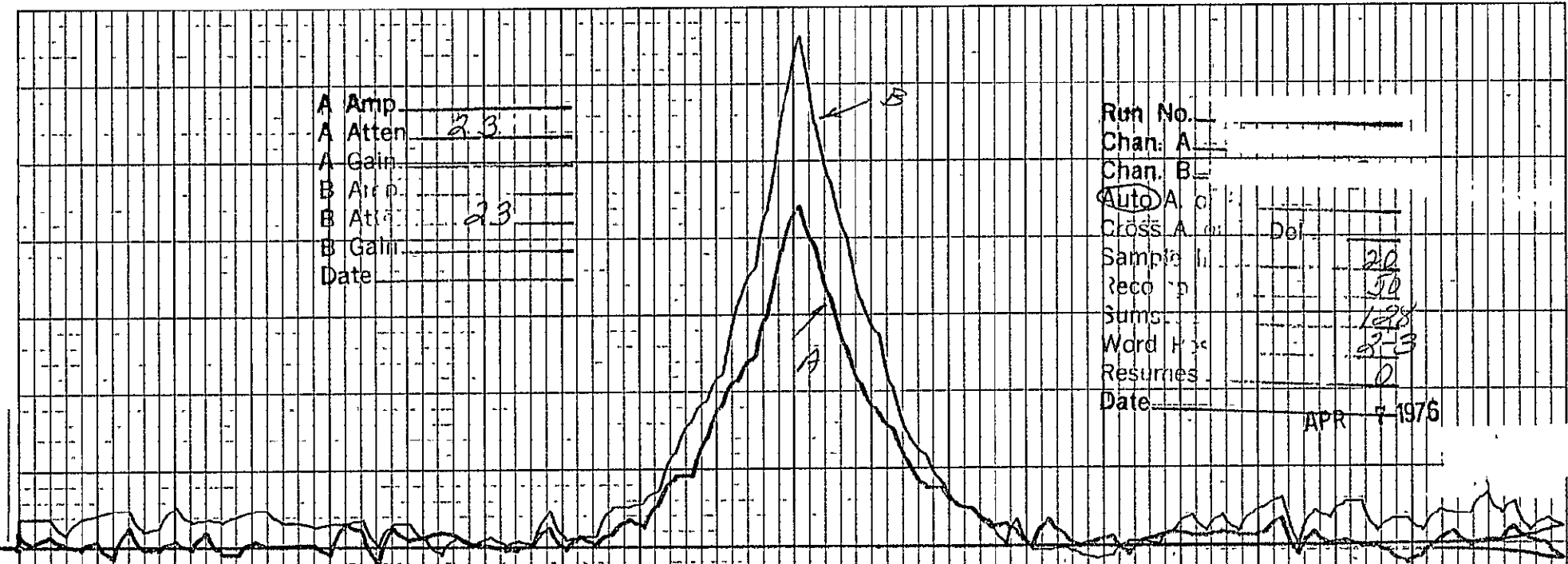
(X.7)



M = .5  
X/D = 3.0  
R/D = .518  
ΔX = 2.2 IN.

A Amp \_\_\_\_\_  
 A Atten 2.3  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 2.3  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 (Auto) A of \_\_\_\_\_  
 Cross A of Def \_\_\_\_\_  
 Samples In 20  
 Reco 50  
 Sums 128  
 Word H 3  
 Resumes 0  
 Date APR 7 1975



$M = .5$   
 $X/D = 3.0$   
 $R/D = .586$   
 $\Delta X = 0.2 \text{ IN.}$

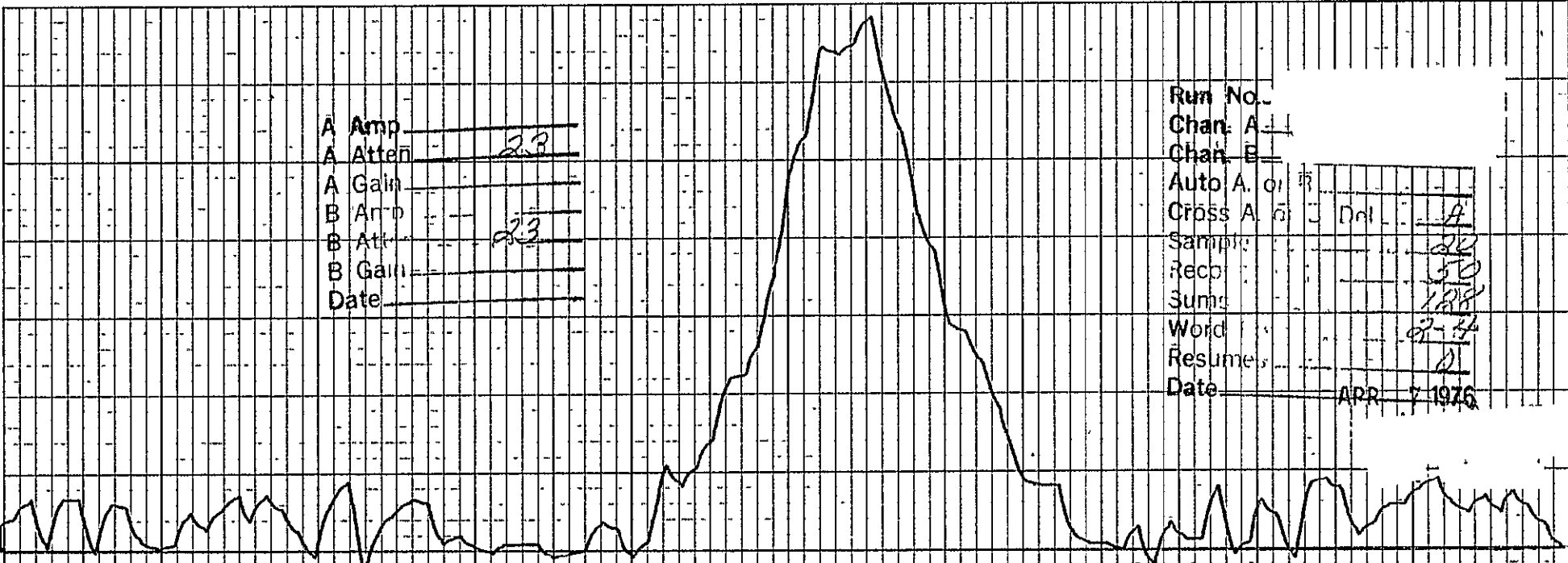
D-158

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 2.8  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 2.3  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A 1  
Chan. B \_\_\_\_\_  
Auto. A. of 1  
Cross A. of 1 Del. A  
Sample \_\_\_\_\_  
Recd. 30  
Sum. 128  
Word 2-34  
Resume 1  
Date APR 7 1976

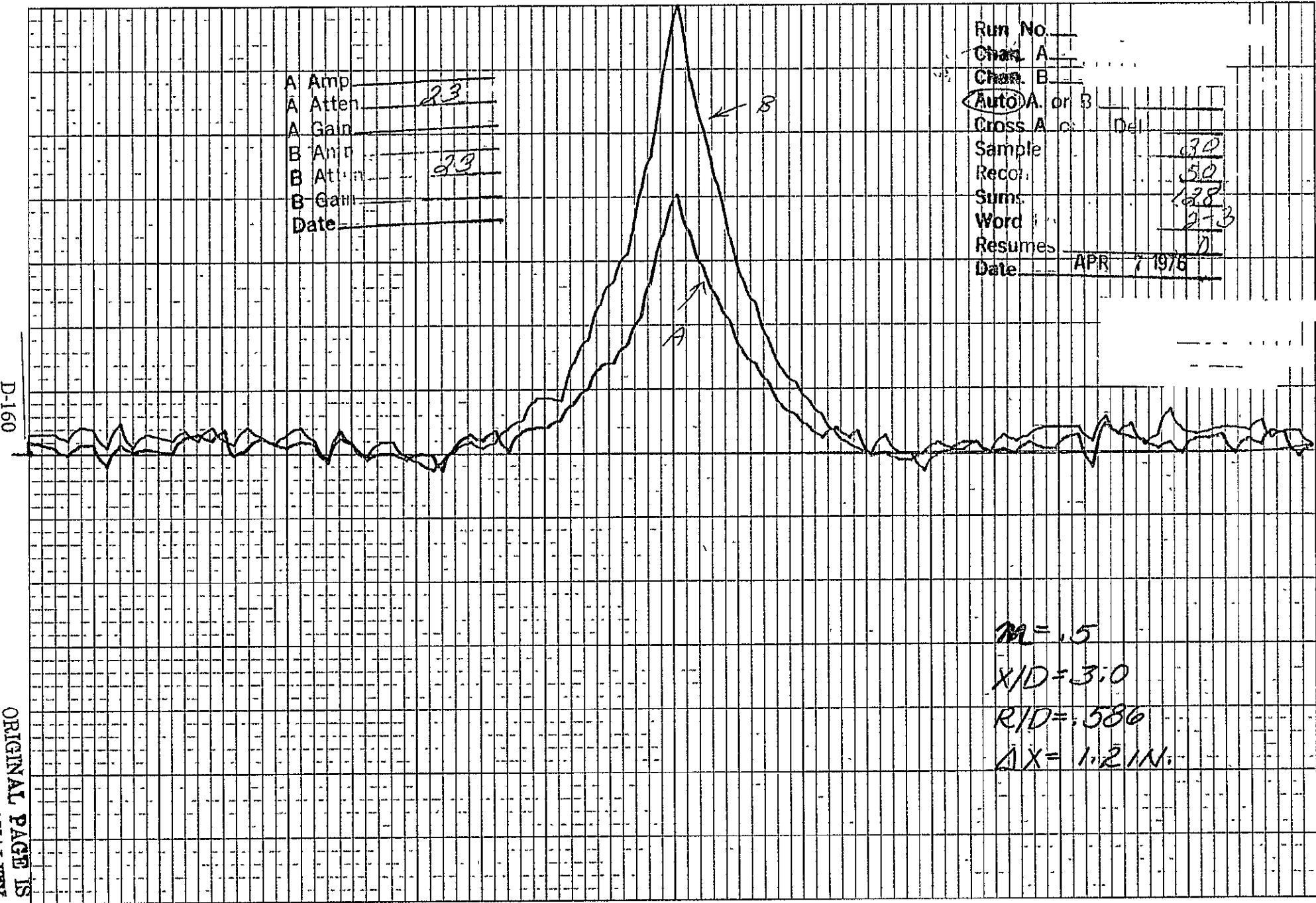
D-159



$M = .5$   
 $X/D = 3.0$   
 $R/D = .586$   
 $\Delta X = 0.2 \text{ IN.}$

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan A \_\_\_\_\_  
 Chan B \_\_\_\_\_  
 (Auto) A or B \_\_\_\_\_  
 Cross A or B Del \_\_\_\_\_  
 Sample \_\_\_\_\_ 30  
 Recon \_\_\_\_\_ 50  
 Sums \_\_\_\_\_ 128  
 Word \_\_\_\_\_ 213  
 Resumes \_\_\_\_\_ 0  
 Date APR 7 1976



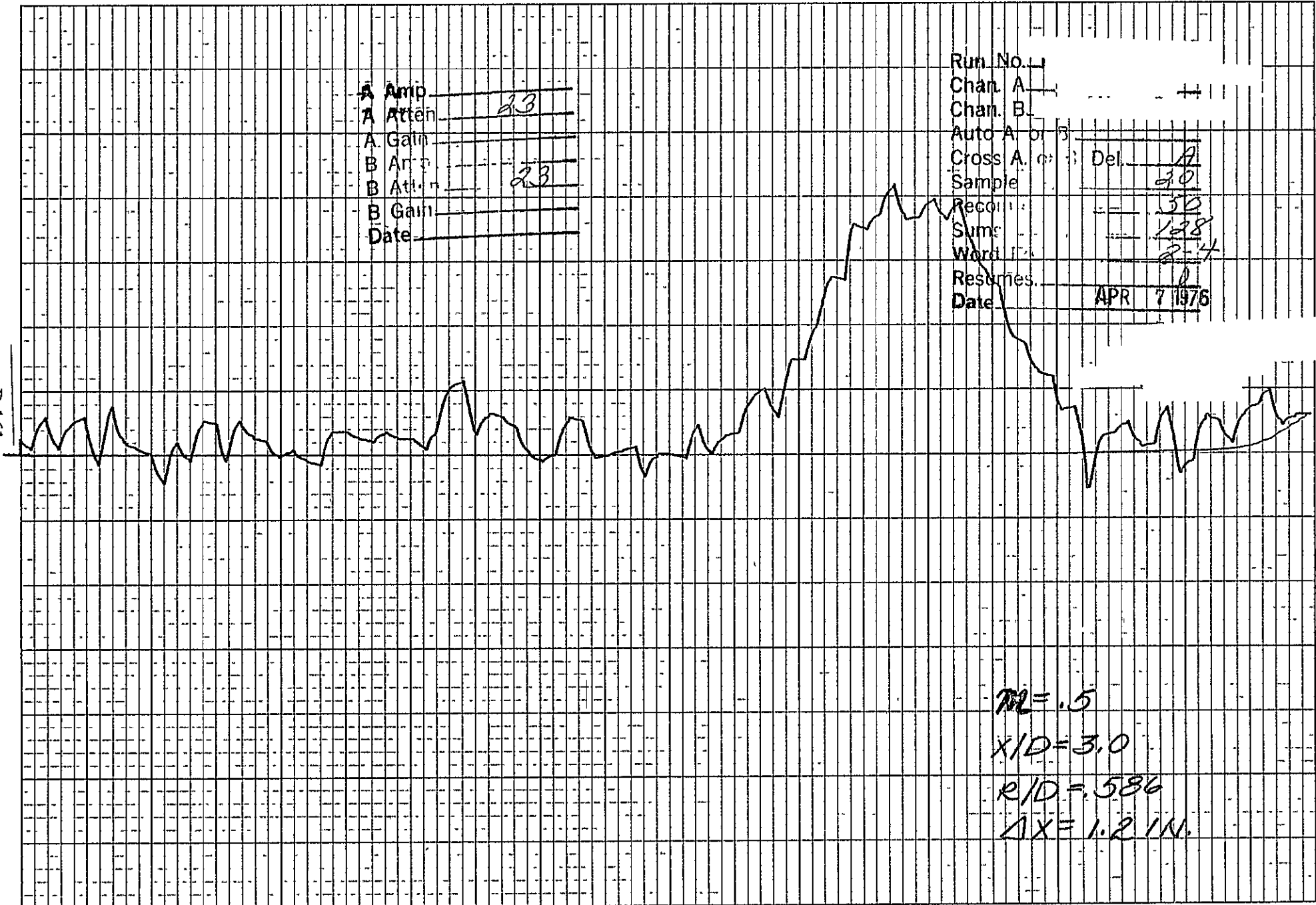
$M = 1.5$   
 $X/D = 3.0$   
 $R/D = .586$   
 $\Delta X = 1.21 \text{ IN.}$

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Atten \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B \_\_\_\_\_  
Sample Del. A  
Sample 20  
Recoil 30  
Sum 128  
Word 2-4  
Resumes. \_\_\_\_\_  
Date APR 7 1976

D-161

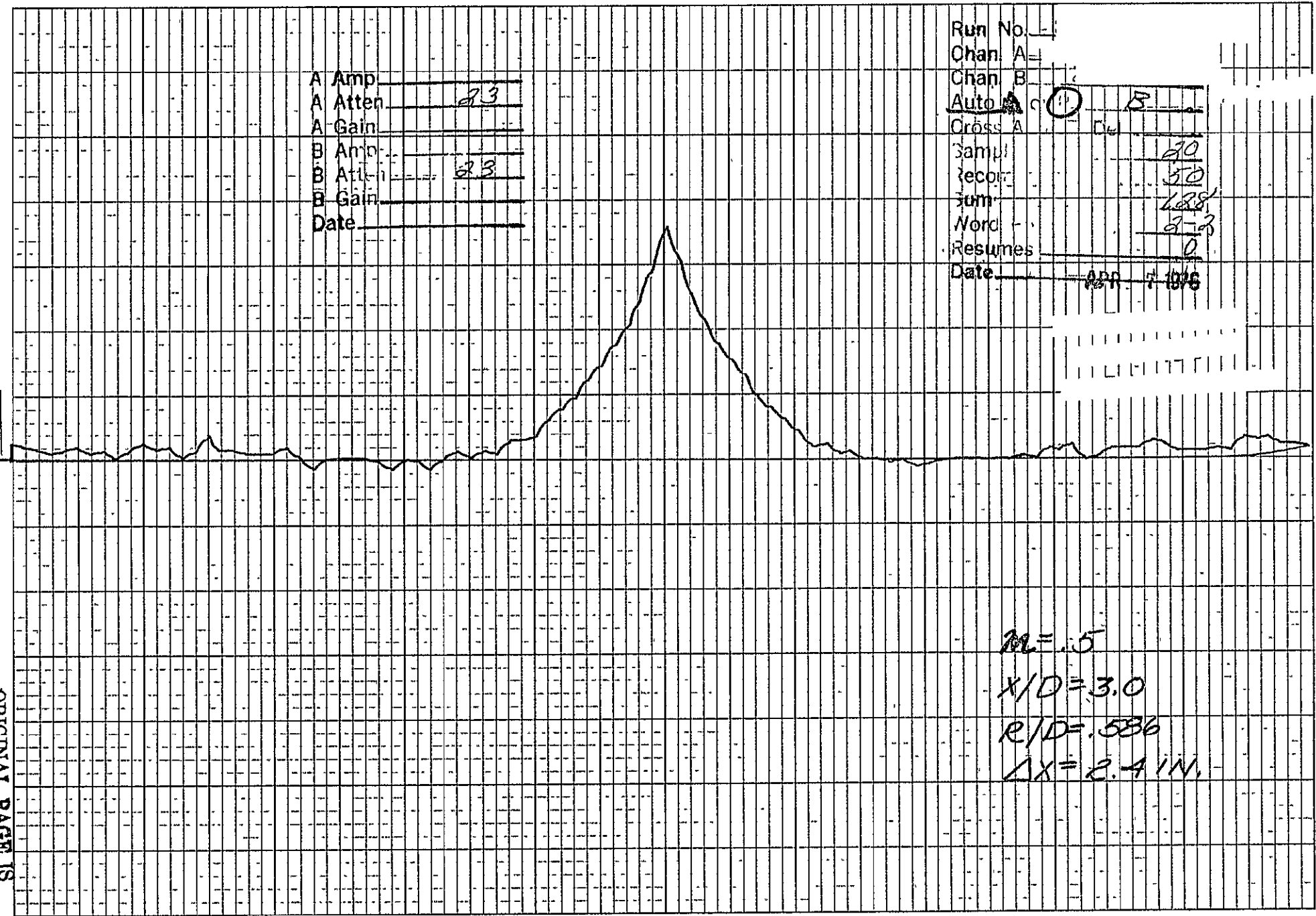


$M = 1.5$   
 $X/D = 3.0$   
 $R/D = 5.86$   
 $\Delta X = 1.2 \text{ IN.}$



A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto  C  B  A  
Cross A \_\_\_\_\_  
Sample 20  
Record 50  
Sum 128  
Word 2-3  
Resumes 0  
Date APR 7 1976



$M = .5$   
 $X/D = 3.0$   
 $R/D = .586$   
 $\Delta X = 2.4 \text{ IN.}$

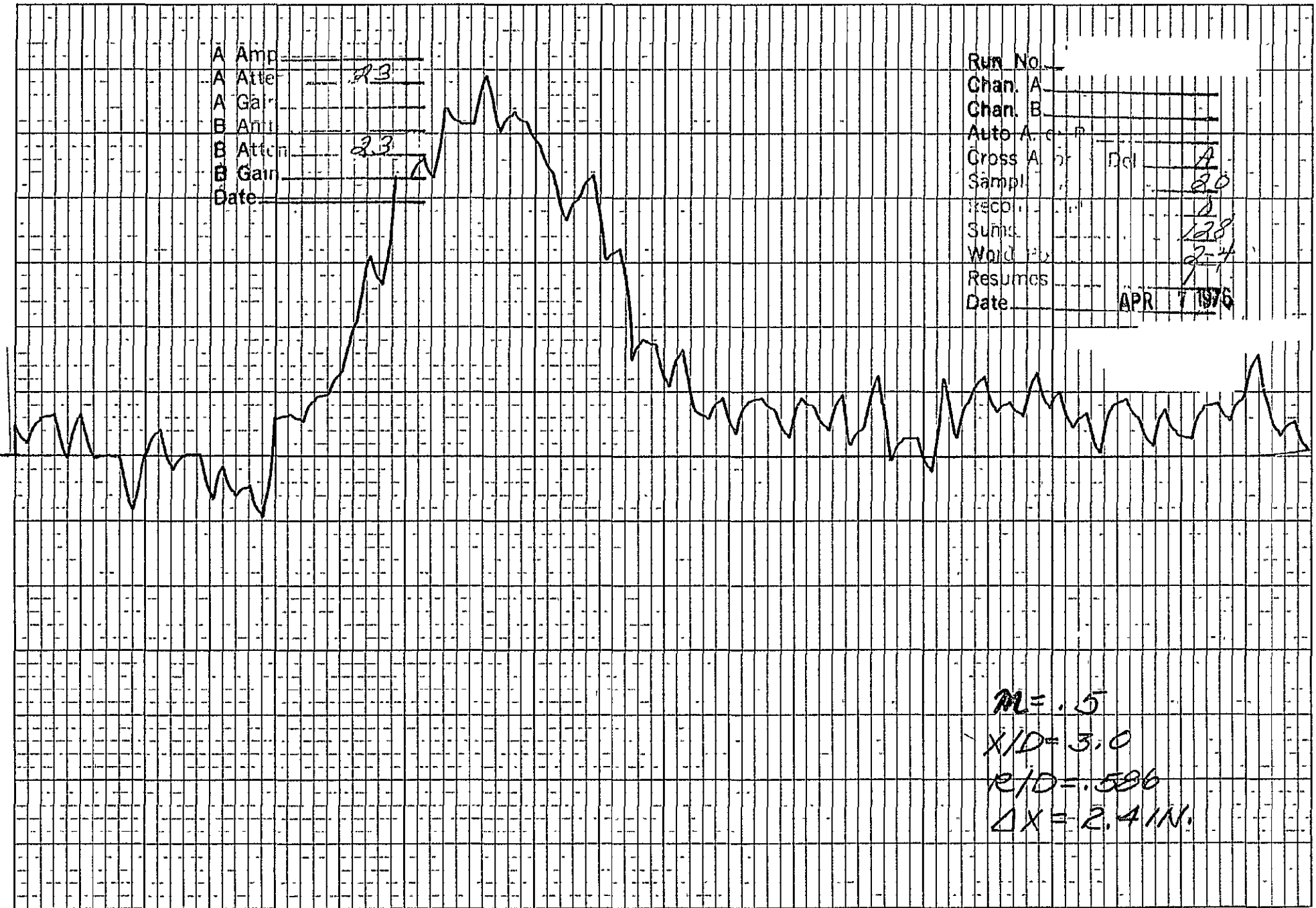
D-162

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp  
 A Attenuation 23  
 A Gain  
 B Anti  
 B Attenuation 23  
 B Gain  
 Date

Run No.  
 Chan. A  
 Chan. B  
 Auto A. C. P.  
 Gross A. C. P. A  
 Sample 20  
 Recs. 2  
 Summ. 128  
 Word 2-4  
 Resumes 1  
 Date APR 7 1976

D-163

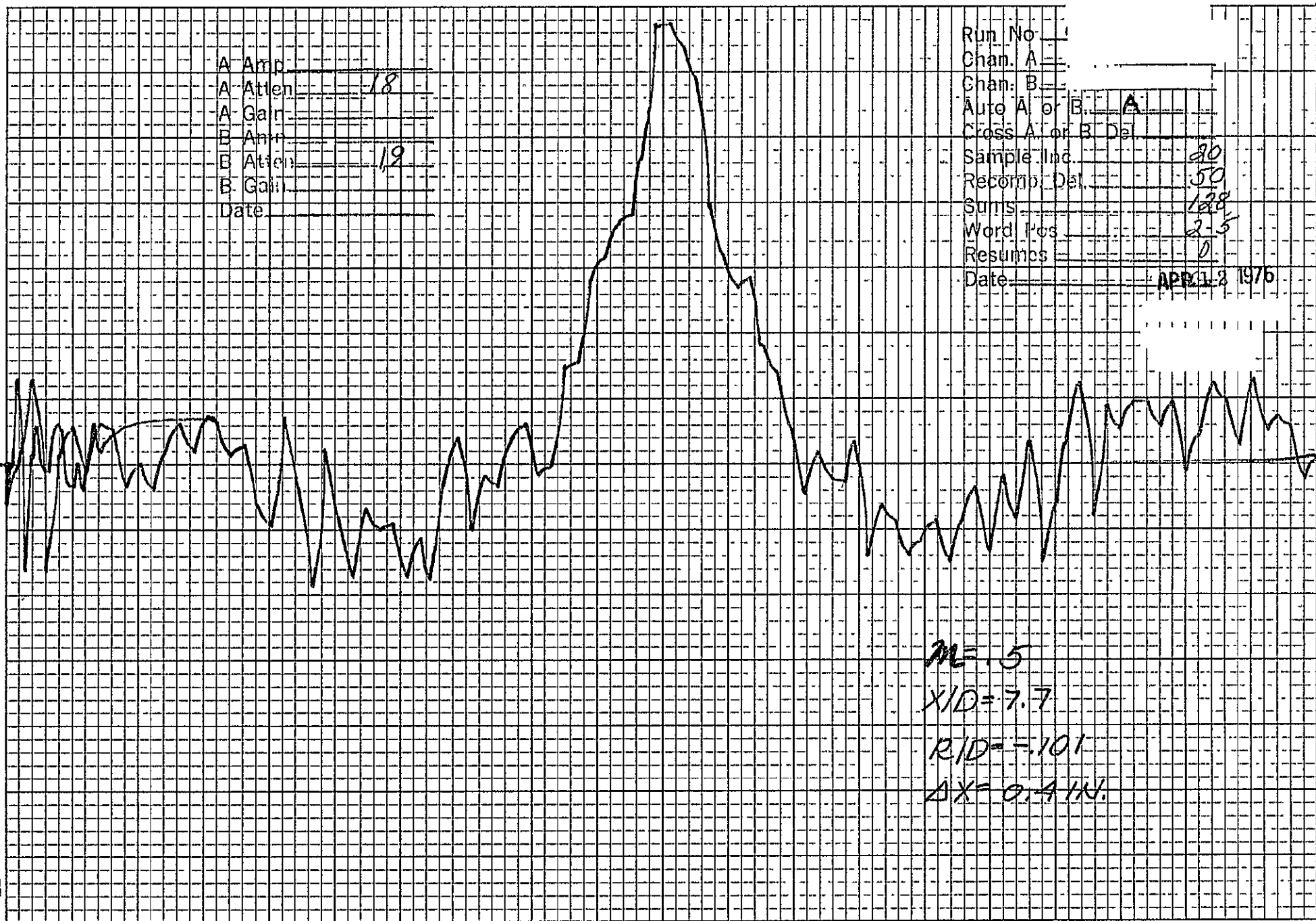


$M = .5$   
 $X/D = 3.0$   
 $R/D = .586$   
 $\Delta X = 2.4 IN.$

C-3

A Amp \_\_\_\_\_  
A Atten 18  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 19  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B A  
Cross A or B Del \_\_\_\_\_  
Sample Inc. 80  
Record Del 50  
Suns 128  
Word Pos 2-5  
Resumes 0  
Date APR 12 1976



ME = 5  
XID = 7.7  
RID = -101  
AX = 0.4 IN.

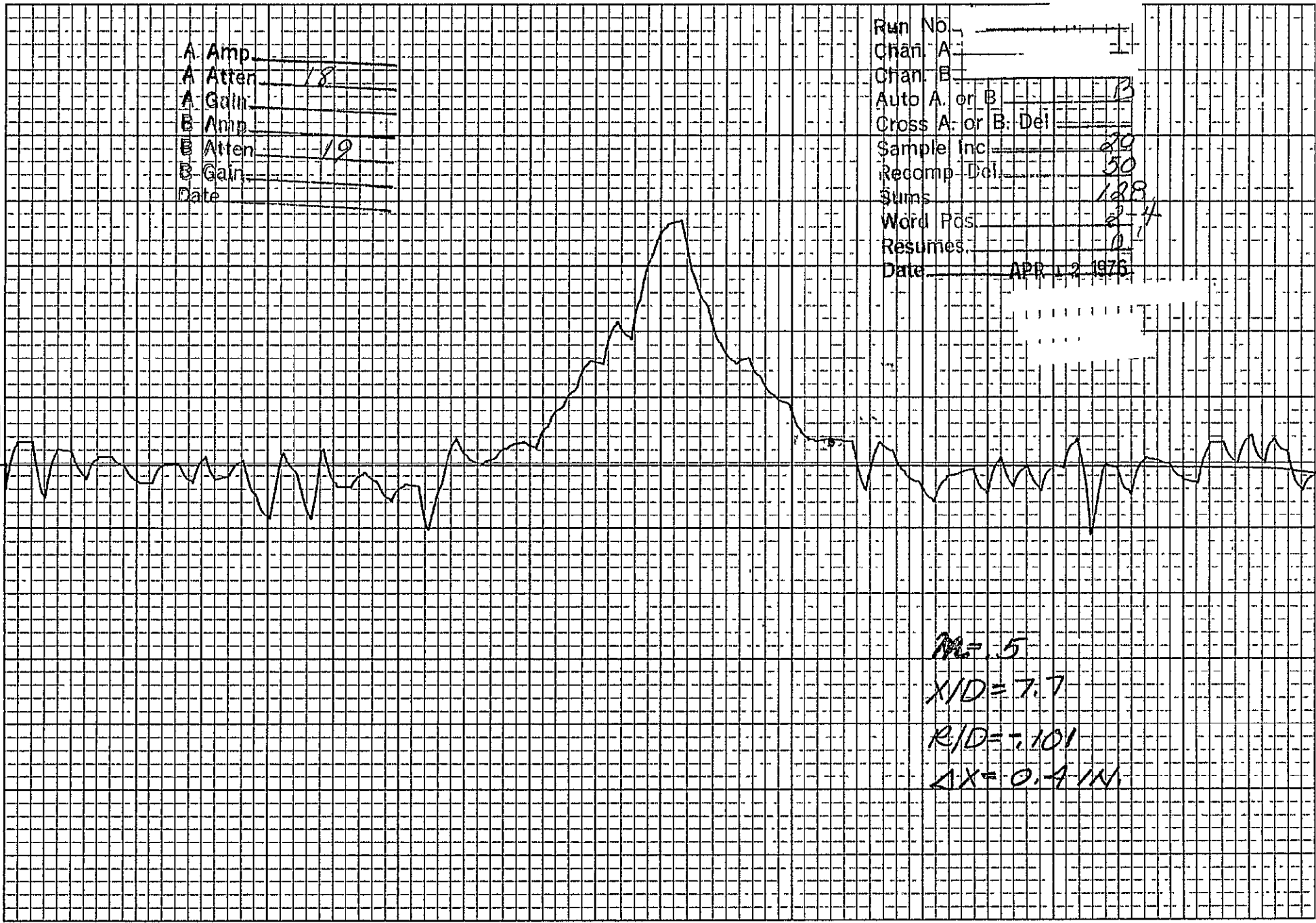
D-164

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 18  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 19  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Del \_\_\_\_\_  
Sample Inc. 20  
Recomp Del. 30  
Sums 128  
Word Pos. 2-4  
Resumes. 0  
Date APR 12 1976

D-165

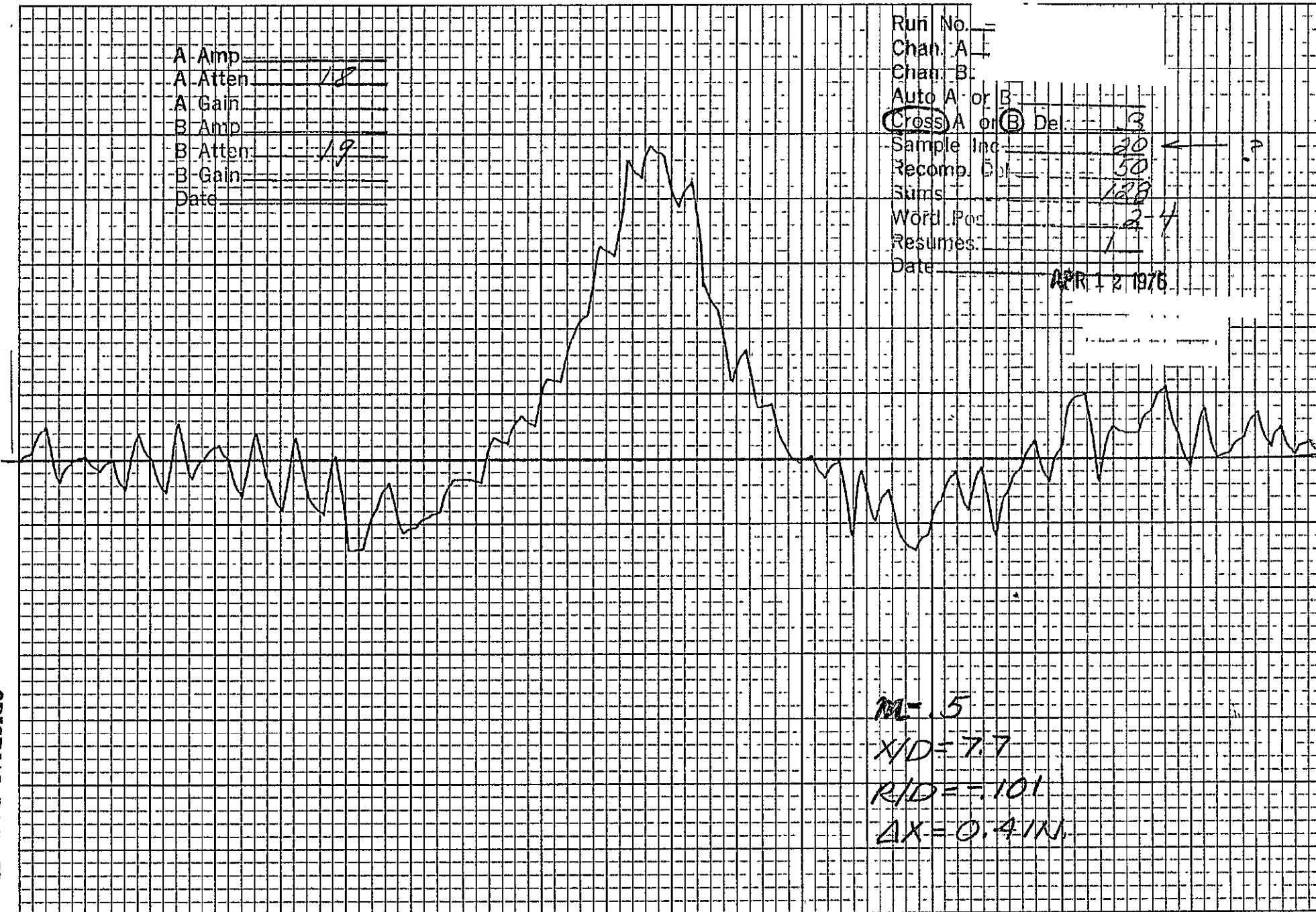


$M = .5$   
 $X/D = 7.7$   
 $R/D = 7.101$   
 $\Delta X = 0.4 IN$

A Amp \_\_\_\_\_  
A Atten: 18  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten: 19  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A   
Chan. B: \_\_\_\_\_  
Auto A or B: \_\_\_\_\_  
 Cross A or  B De: 13  
Sample Inc: 20 ← ?  
Recomp. Cl: 50  
Sums: 128  
Word Pcd: 2-4  
Resumes: 1  
Date: APR 12 1976

D-166



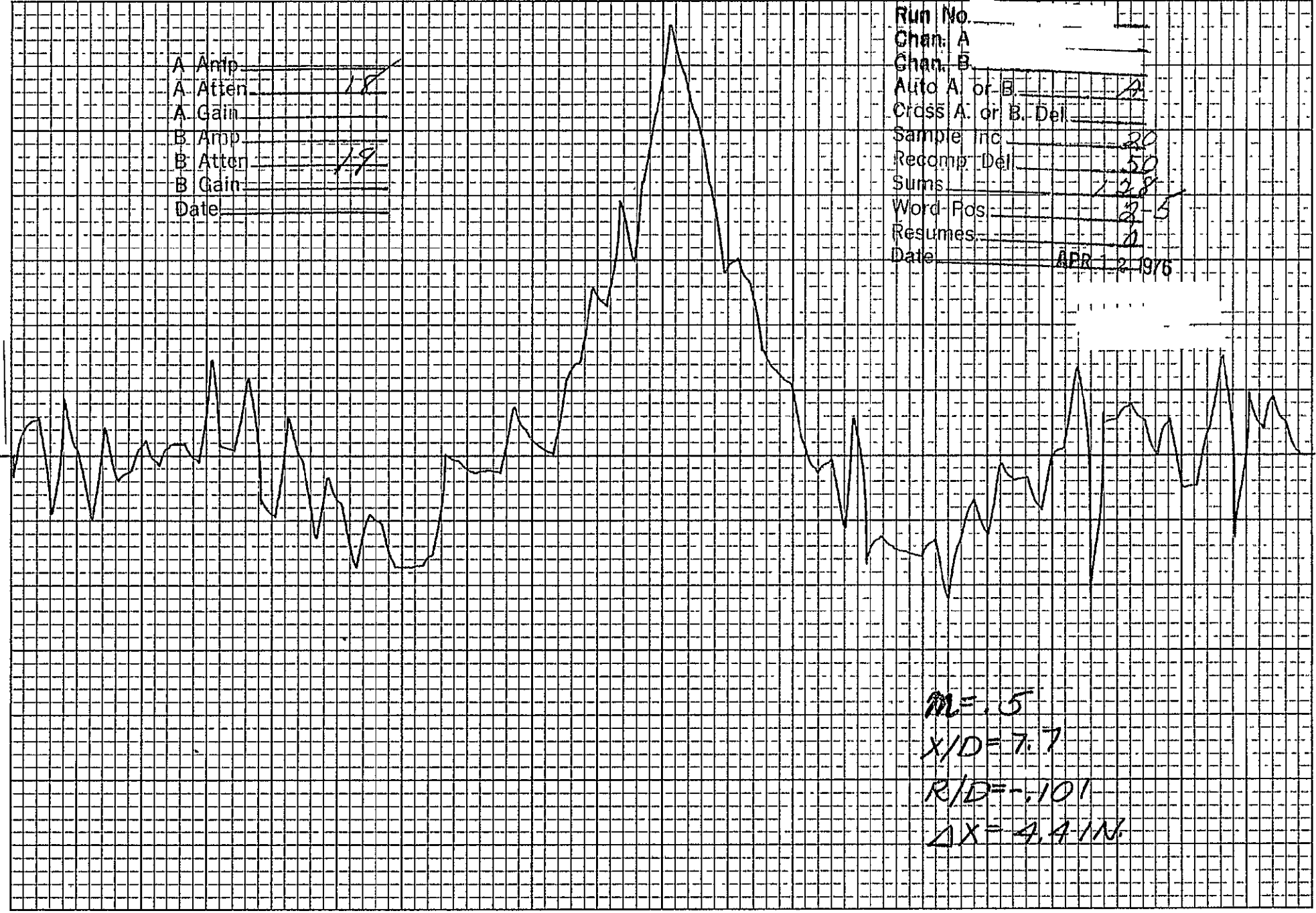
M = 5  
X/D = 7.7  
R/D = .101  
 $\Delta X = 0.41N$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 18  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 19  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A. or B. A  
 Cross A. or B. Del. \_\_\_\_\_  
 Sample Inc. 20  
 Recomp. Del. 50  
 Sums 128  
 Word Pos. 2-5  
 Resumes 0  
 Date APR 12 1976

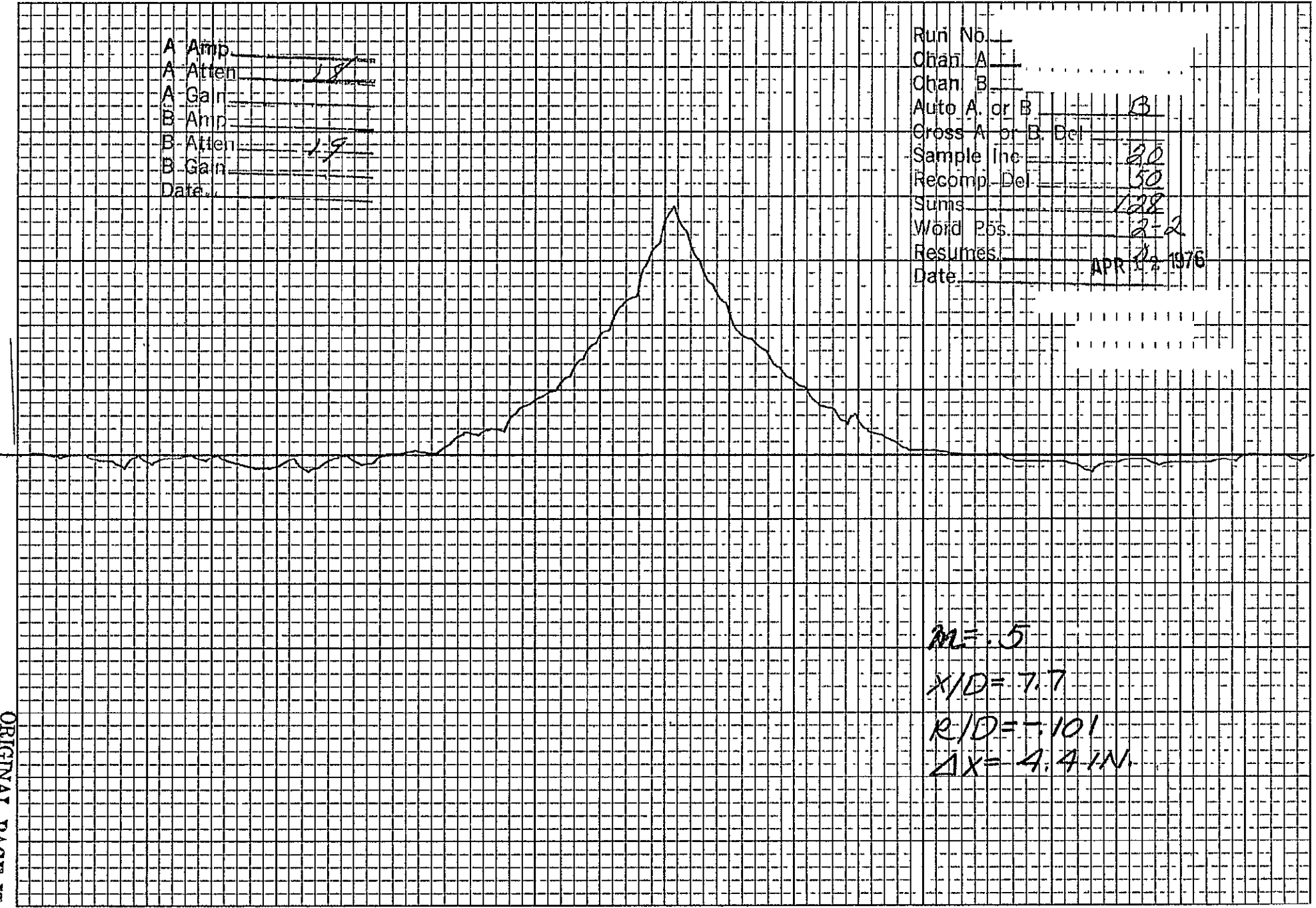
D-167



$M = .5$   
 $X/D = 7.7$   
 $R/D = -.101$   
 $\Delta X = 4.41N$

A Amp \_\_\_\_\_  
A Atten 1.7  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 1.9  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Del \_\_\_\_\_  
Sample Inc. 20  
Recomp. Del. 50  
Sums 128  
Word Pbs. 2-2  
Resumes \_\_\_\_\_  
Date APR 2 1976



$M = .5$   
 $X/D = 7.7$   
 $R/D = 1.101$   
 $\Delta X = 4.4 \text{ IN.}$

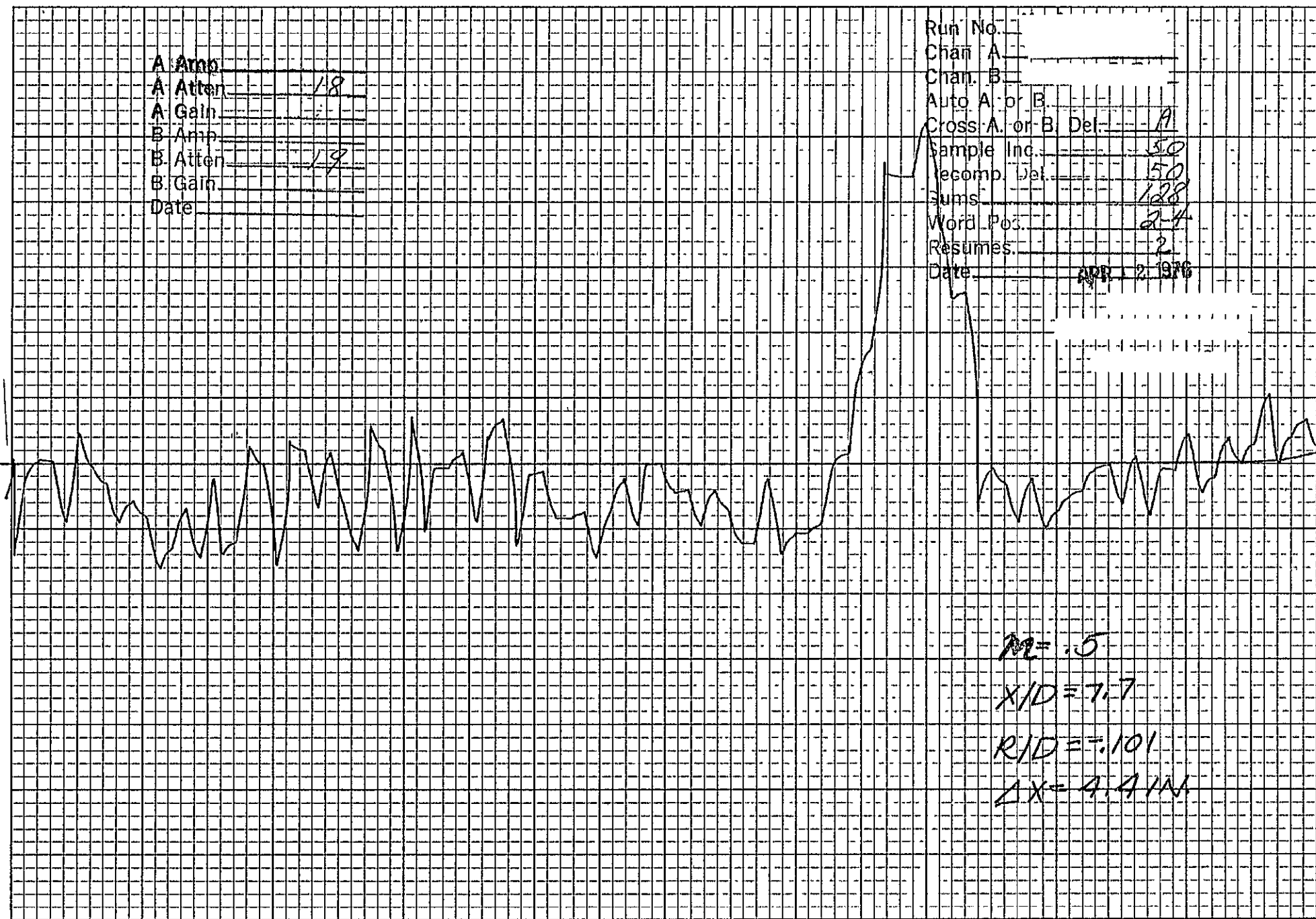
D-168

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 18  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 18  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A. or B. \_\_\_\_\_  
 Cross-A. or B. Def. A  
 Sample Inc. 50  
 Recomp. Del. 50  
 Sums 128  
 Word Pos. 24  
 Resumes 2  
 Date APR 2 1976

D-169



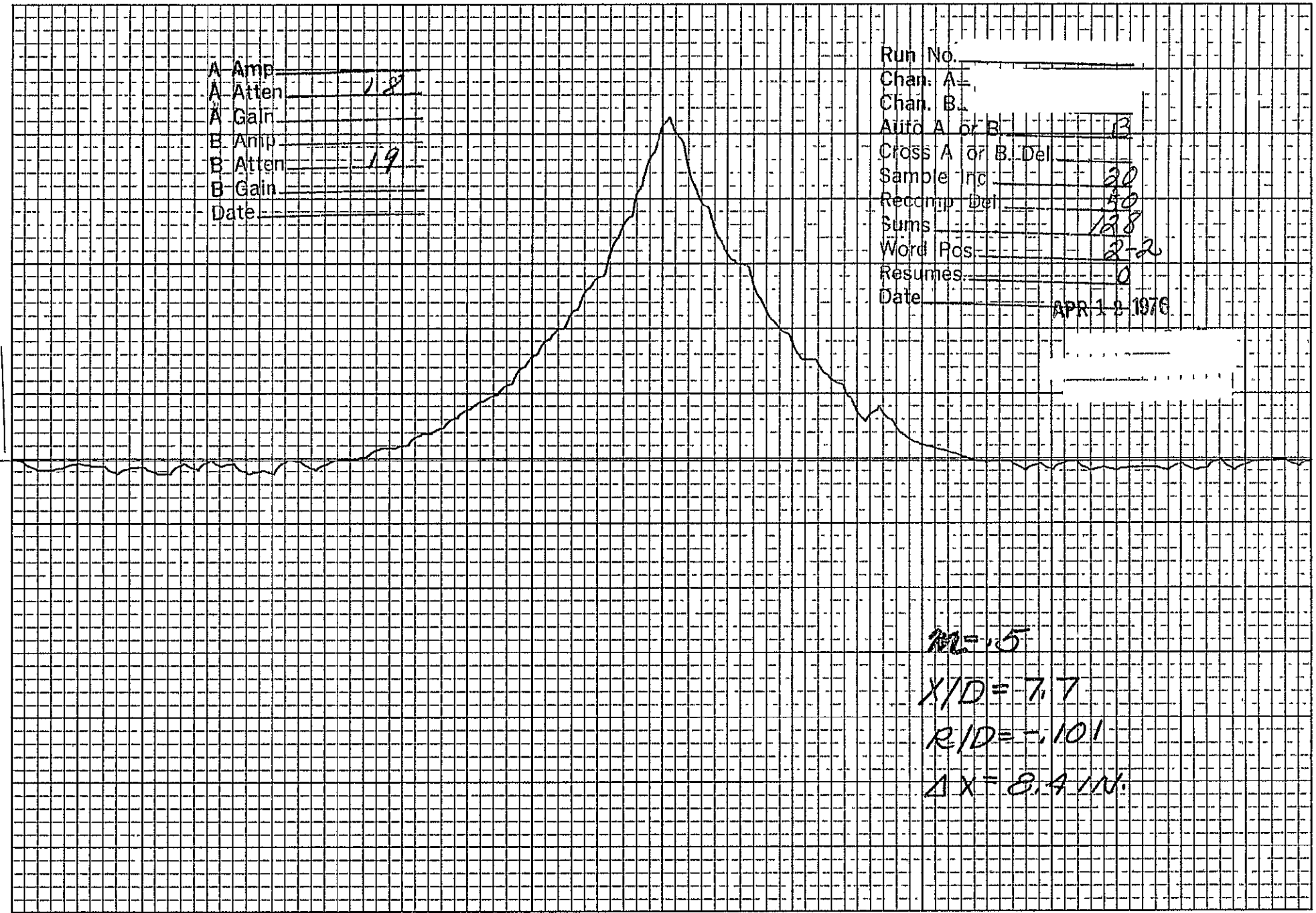
$M = .5$   
 $X/D = 7.7$   
 $R/D = .101$   
 $\angle X = 4.41 \mu$



A Amp \_\_\_\_\_  
 A Atten 22  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 19  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B B  
 Cross A or B Del \_\_\_\_\_  
 Sample Inc 20  
 Reconn Del 50  
 Sums 128  
 Word Pos 2-2  
 Resumes 0  
 Date APR 18 1976

D-170



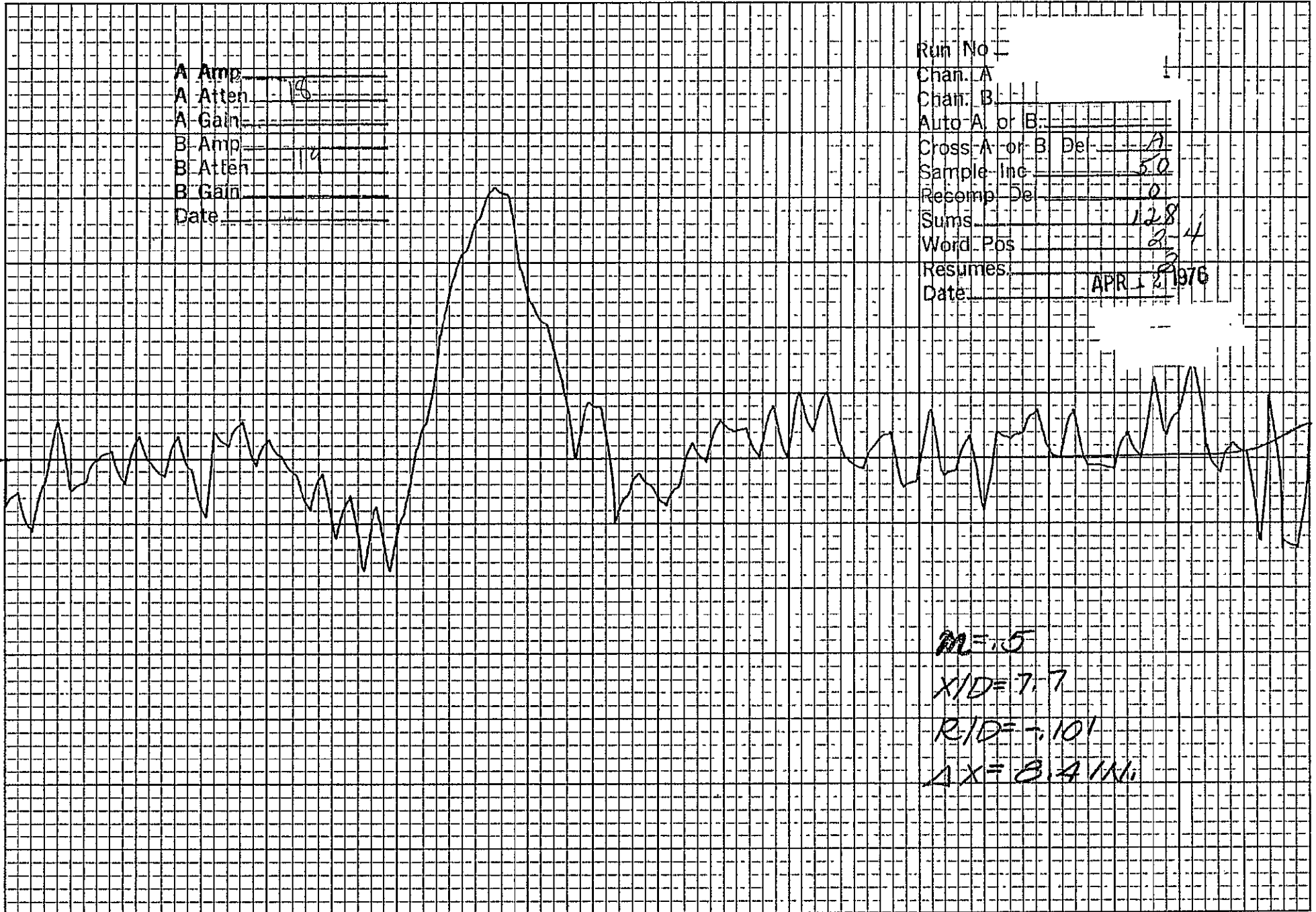
$M = 1.5$   
 $X/D = 7.7$   
 $R/D = -1.01$   
 $\Delta X = 8.4 \mu V$

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 16  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 19  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B: \_\_\_\_\_  
 Cross A or B Del A  
 Sample Inc 50  
 Recomp Del 0  
 Sums 128  
 Word Pos 2 4  
 Resumes 2  
 Date APR 2 1976

D-171

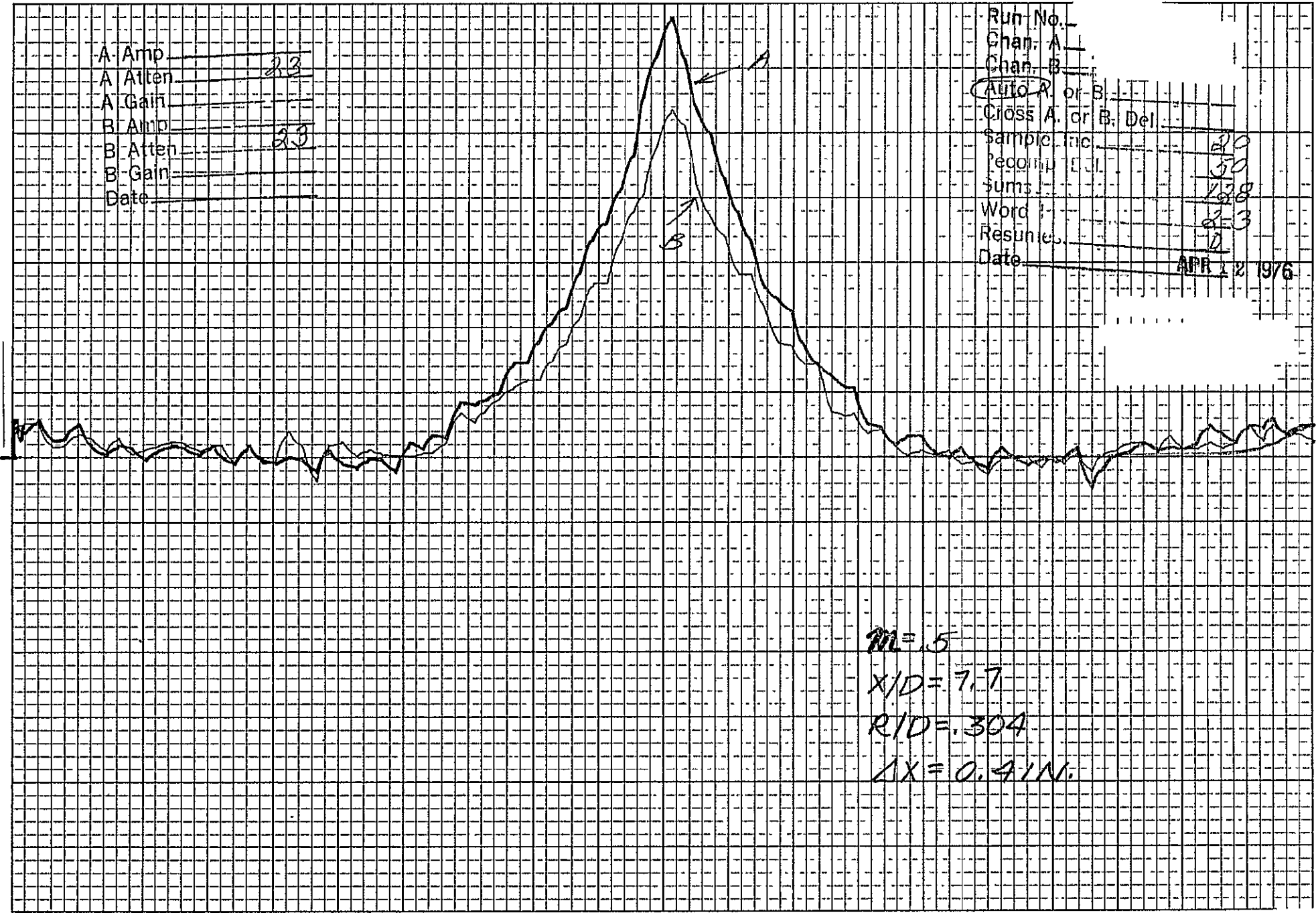


$M = .5$   
 $X/D = 7.7$   
 $R/D = .101$   
 $\Delta X = 8.4 \text{ Mli}$

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B  A  
 Cross A. or B. Del. \_\_\_\_\_  
 Sample Inc. 20  
 Record Length 50  
 Sums 238  
 Word 2-3  
 Resumes 2  
 Date APR 12 1976

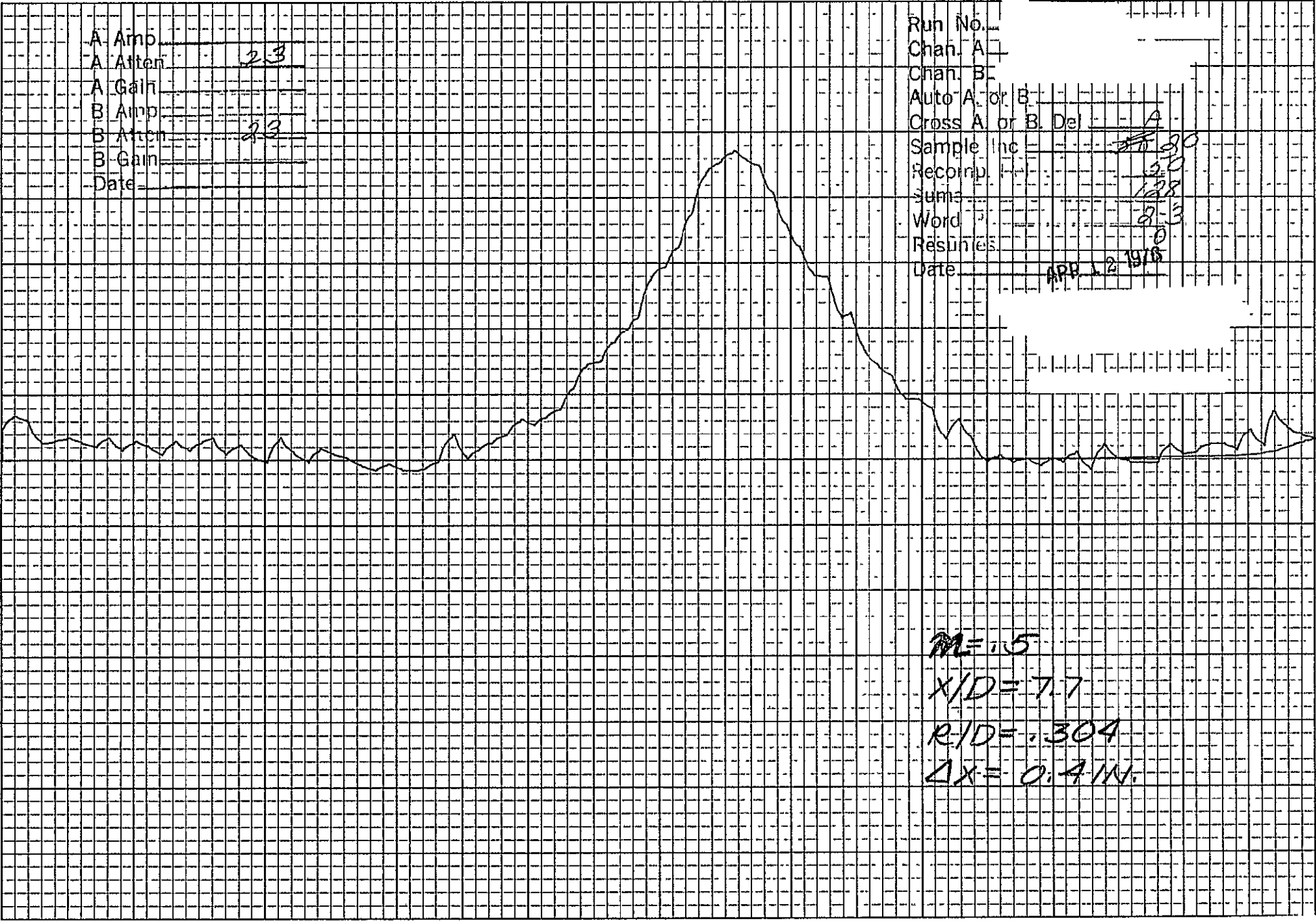
D-172



$M = 5$   
 $X/D = 7.7$   
 $R/D = .304$   
 $\Delta X = 0.41 \text{ IN.}$

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_  
 Cross A or B. Del A  
 Sample Inc 20  
 Record 30  
 Sum 128  
 Word 8-3  
 Resinies 0  
 Date APR 12 1978



$M = 1.5$   
 $X/D = 7.7$   
 $R/D = .304$   
 $\Delta X = 0.4 \text{ IN.}$

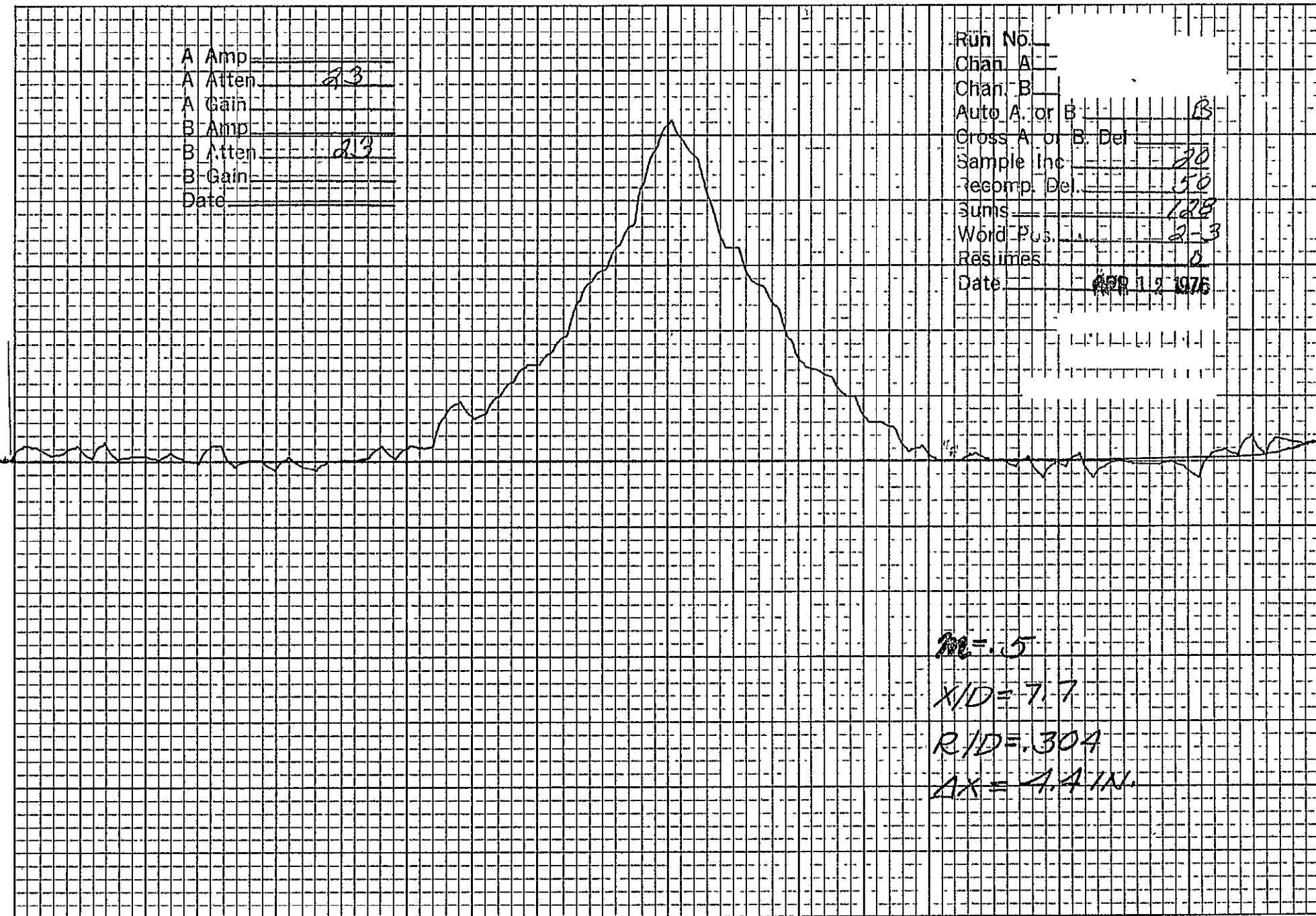
D-173

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto. A. or B. B  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 20  
Recomp. Del. 50  
Sums 128  
Word Pos. 2-3  
Res. Times 0  
Date SEP 12 1976

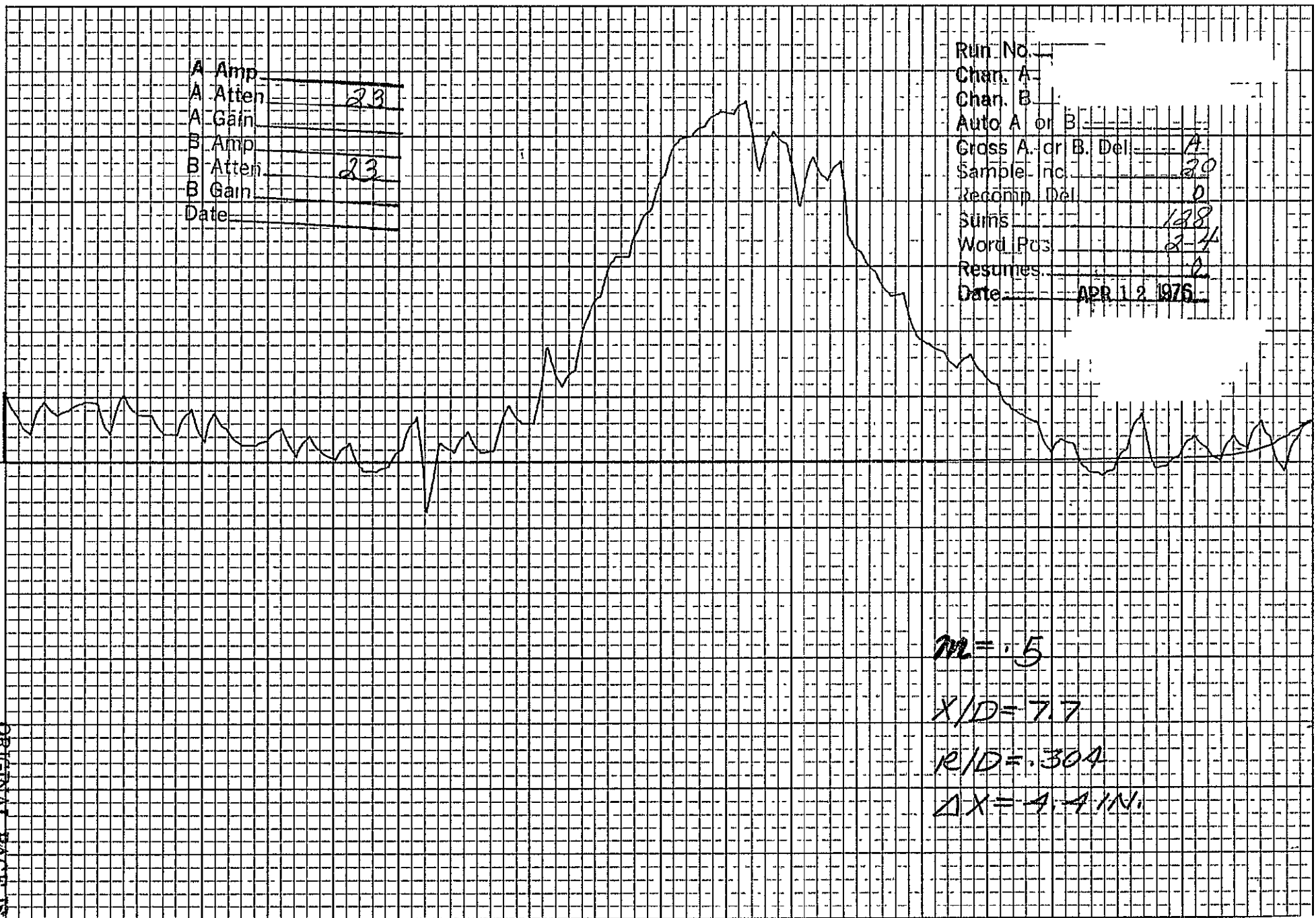
D-174



$M = .5$   
 $X/D = 7.7$   
 $R/D = .304$   
 $AX = 7.4 IN.$

A Amp  
 A Atten 23  
 A Gain  
 B Amp  
 B Atten 23  
 B Gain  
 Date

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_  
 Cross A. or B. Del. A  
 Sample Inc. 20  
 Reconip. Del. 0  
 Sum's 128  
 Word Puz 2-4  
 Restimes 2  
 Date APR 12 1976



$M = .5$   
 $X/D = 7.7$   
 $R/D = .304$   
 $\Delta X = 4.4 IN.$

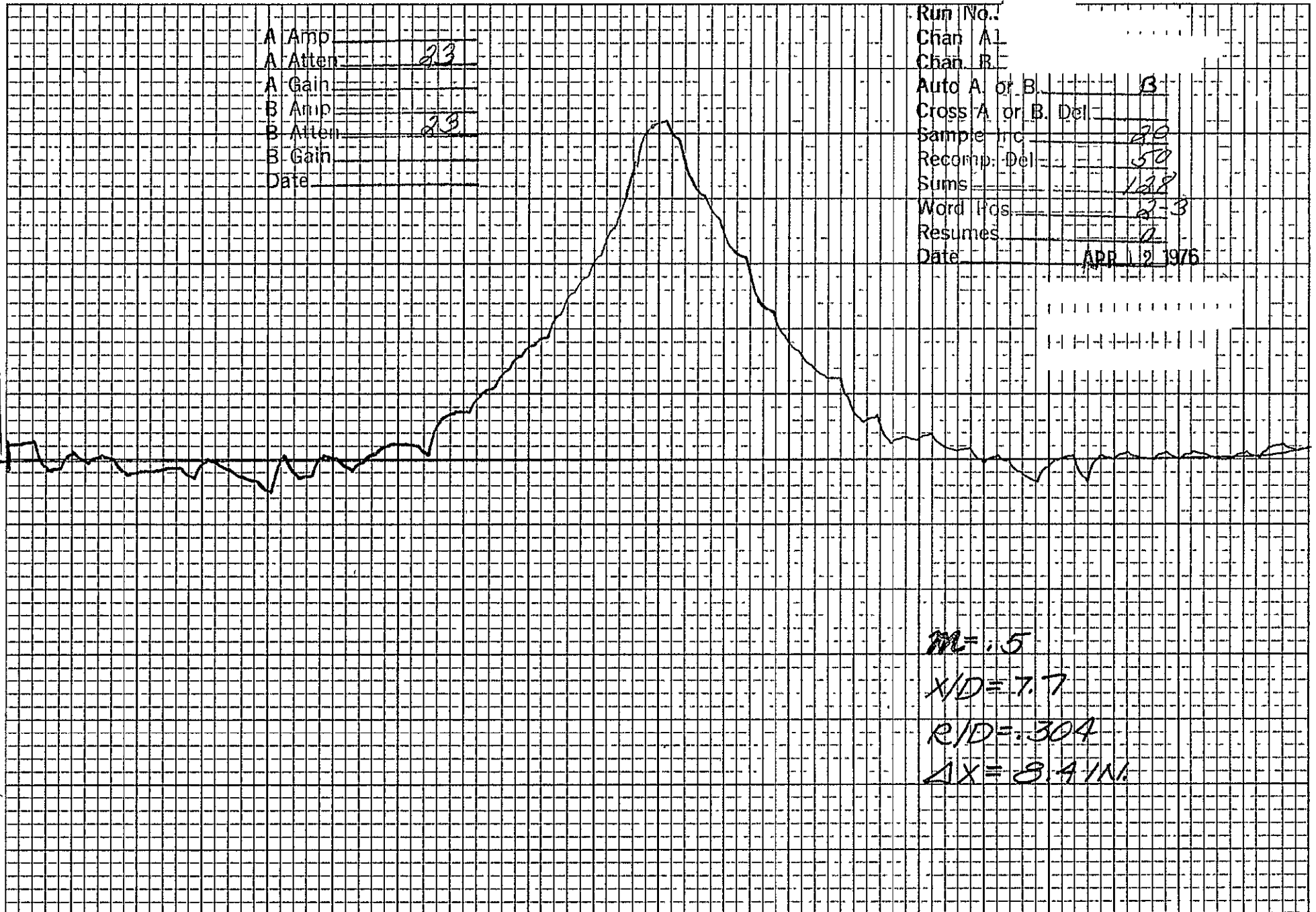
D-175

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan A \_\_\_\_\_  
 Chan B \_\_\_\_\_  
 Auto A or B. B  
 Cross A or B. Del \_\_\_\_\_  
 Sample Inc 20  
 Recomp. Del 50  
 Sums 128  
 Word Pos. 2-3  
 Resumes 0  
 Date APR 12 1976

D-176

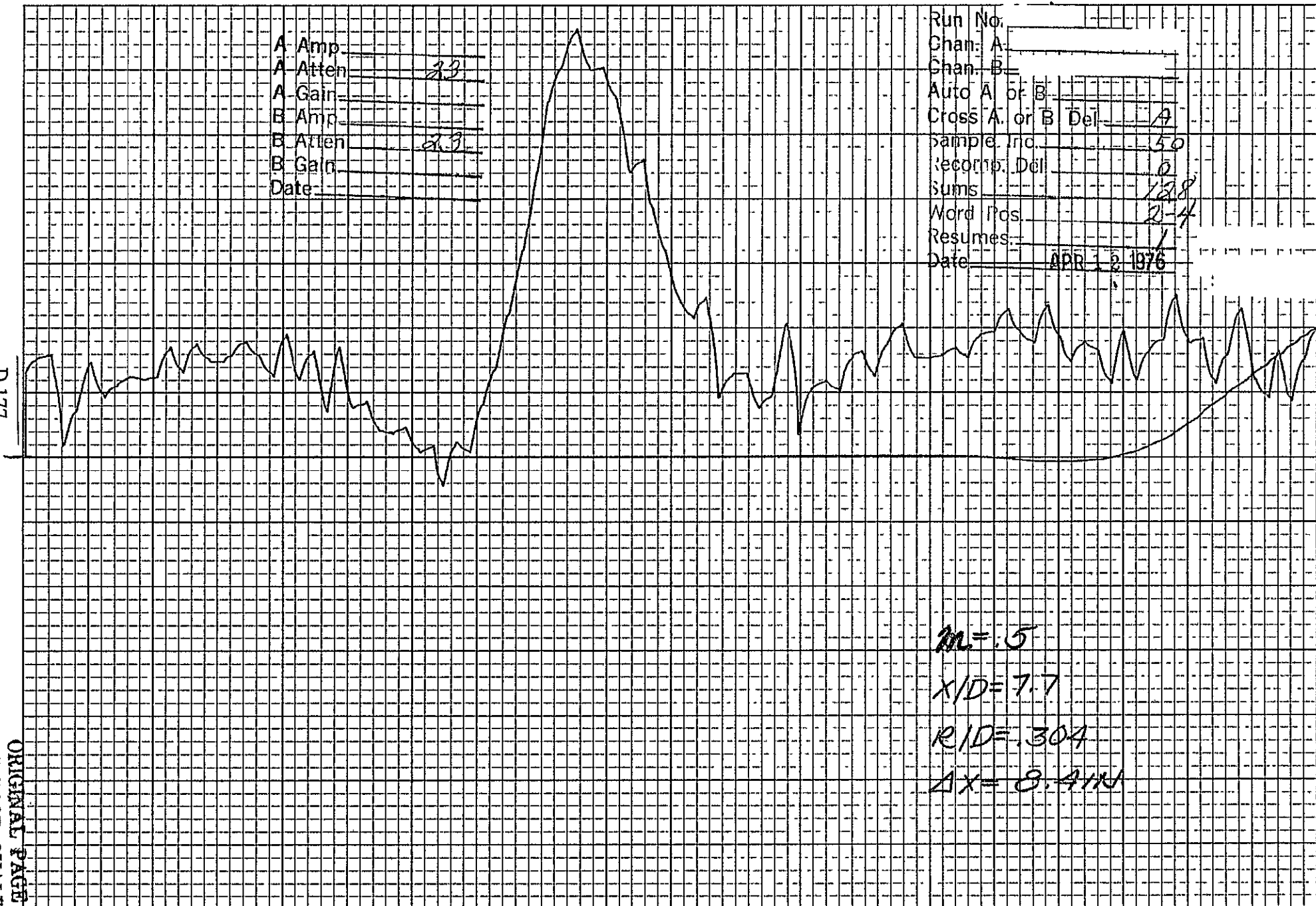


$M = 1.5$   
 $X/D = 7.7$   
 $R/D = .304$   
 $\Delta X = 8.4 IN.$

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A. or B Del. A  
Sample Inc. 50  
Record Del. 0  
Sums 1288  
Word Pcs. 2-4  
Resumes \_\_\_\_\_  
Date APR 12 1976

D-177



$m = .5$   
 $X/D = 7.7$   
 $R/D = .304$   
 $\Delta X = 8.411$

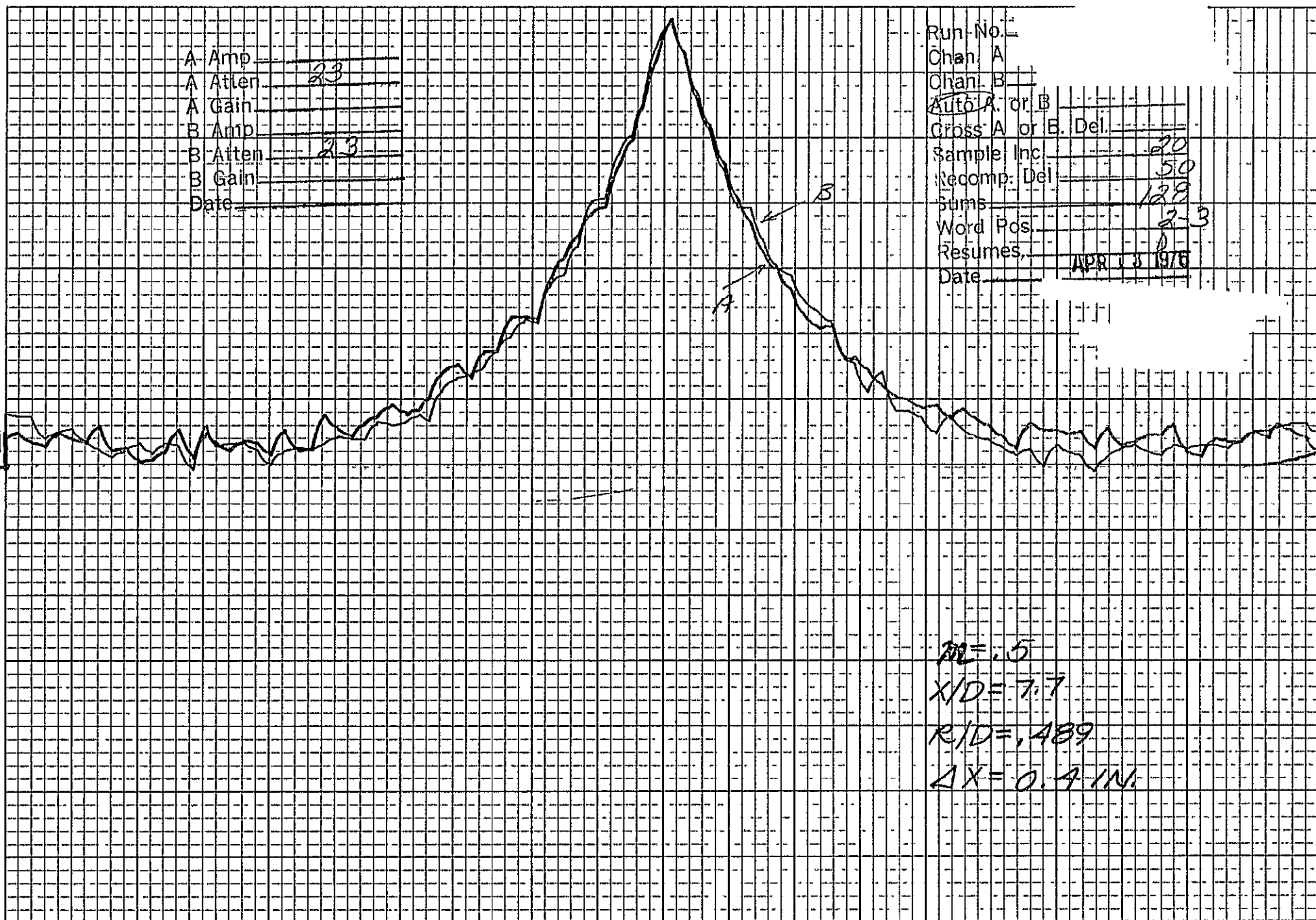
ORIGINAL PAGE IS  
OF POOR QUALITY



A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_  
 Cross A or B Del. \_\_\_\_\_  
 Sample Inc. 20  
 Recomp. Del. 50  
 Sums 128  
 Word Pos. 2-3  
 Resumes. 1  
 Date APR 13 1978

D-178

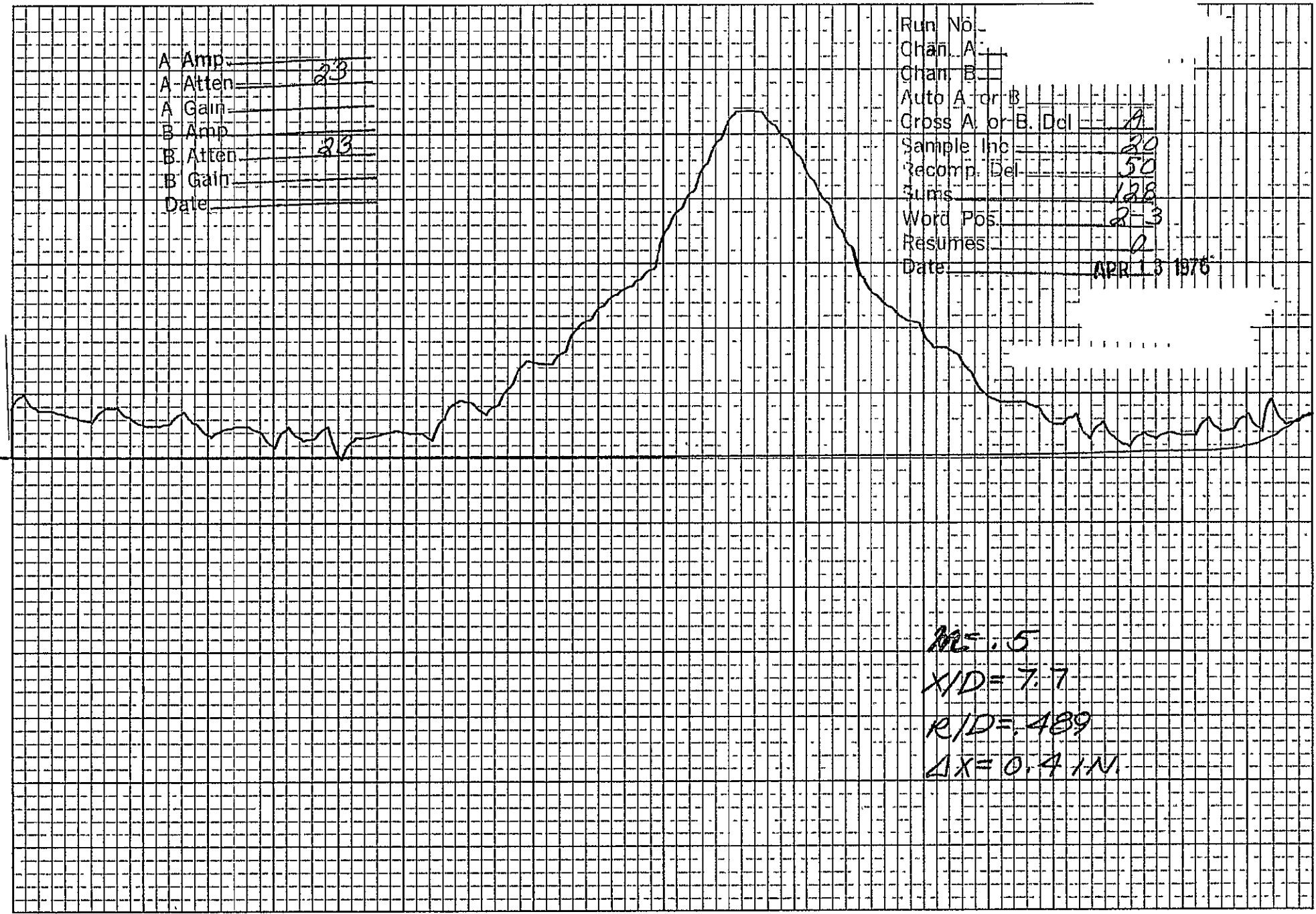


$RL = .5$   
 $X/D = 7.7$   
 $R/D = .489$   
 $\Delta X = 0.4 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A   
Chan. B   
Auto A or B \_\_\_\_\_  
Cross A or B. Del A  
Sample Inc \_\_\_\_\_ 20  
Recomp. Del \_\_\_\_\_ 50  
Sums \_\_\_\_\_ 128  
Word Pos. \_\_\_\_\_ 2-3  
Resumes \_\_\_\_\_ 2  
Date \_\_\_\_\_ APR 13 1976

D-179

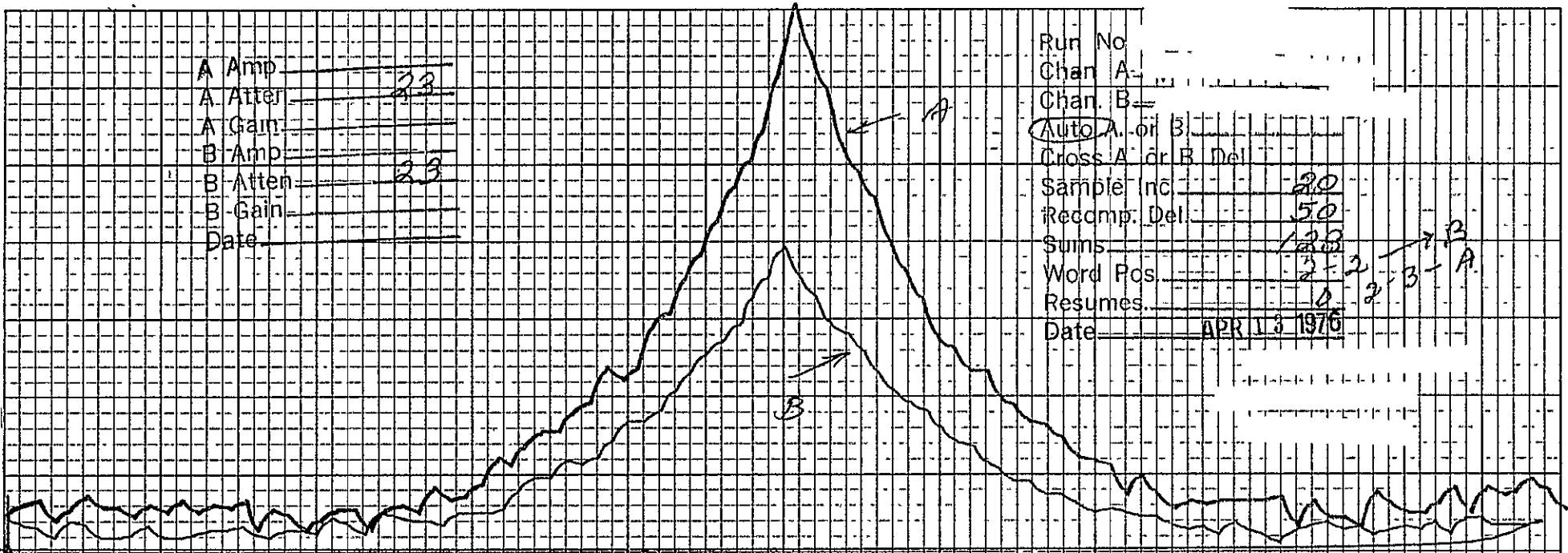


$\mu = .5$   
 $X/D = 7.7$   
 $R/D = 489$   
 $\Delta X = 0.4 IN.$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No \_\_\_\_\_  
 Chan A \_\_\_\_\_  
 Chan B \_\_\_\_\_  
 Auto A. or B. Auto  
 Cross A. or B. Del \_\_\_\_\_  
 Sample Inc 20  
 Recomp. Del 50  
 Sums 123  
 Word Pos 2-2-3-A  
 Resumes 0  
 Date APR 13 1970

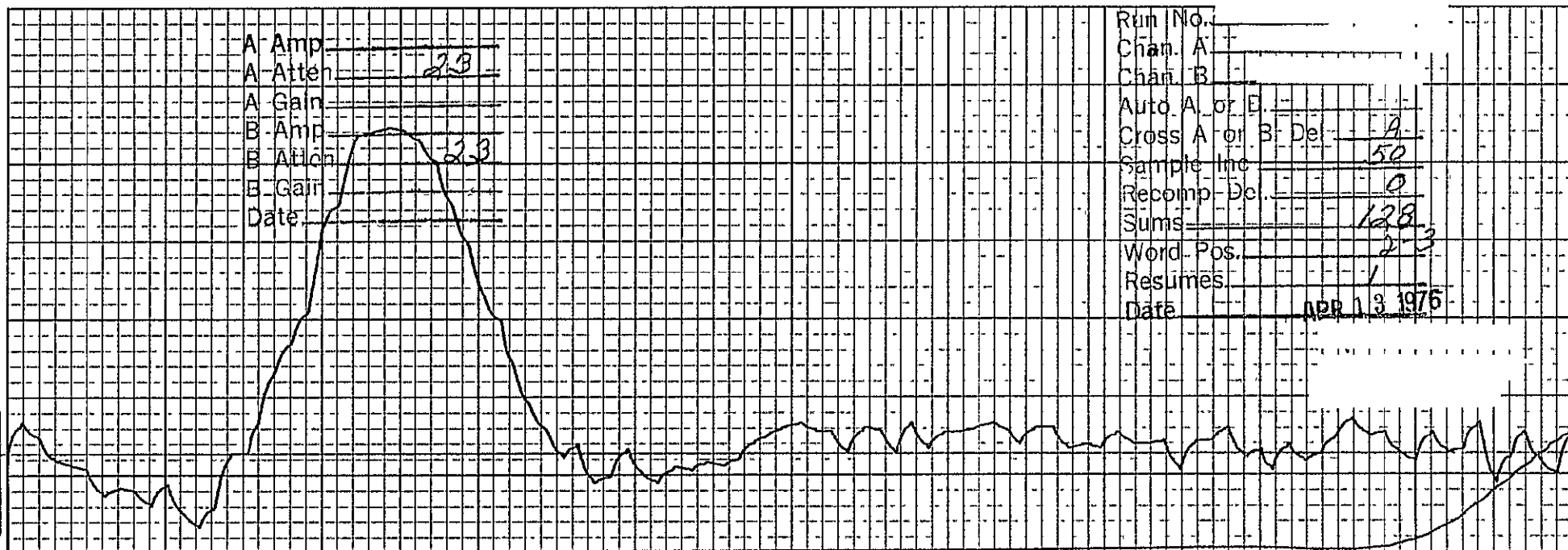


D-180

$M = .5$   
 $X/D = 7.7$   
 $R/D = .489$   
 $\Delta X = 4.41N$

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or E \_\_\_\_\_  
 Cross A or B Del 9  
 Sample Inc 50  
 Recomp Dec 0  
 Sums 128  
 Word Pos 23  
 Resumes 1  
 Date APR 13 1975



$M = .5$   
 $X/D = 7.7$   
 $R/D = .489$   
 $\Delta X = 4.4 IN.$

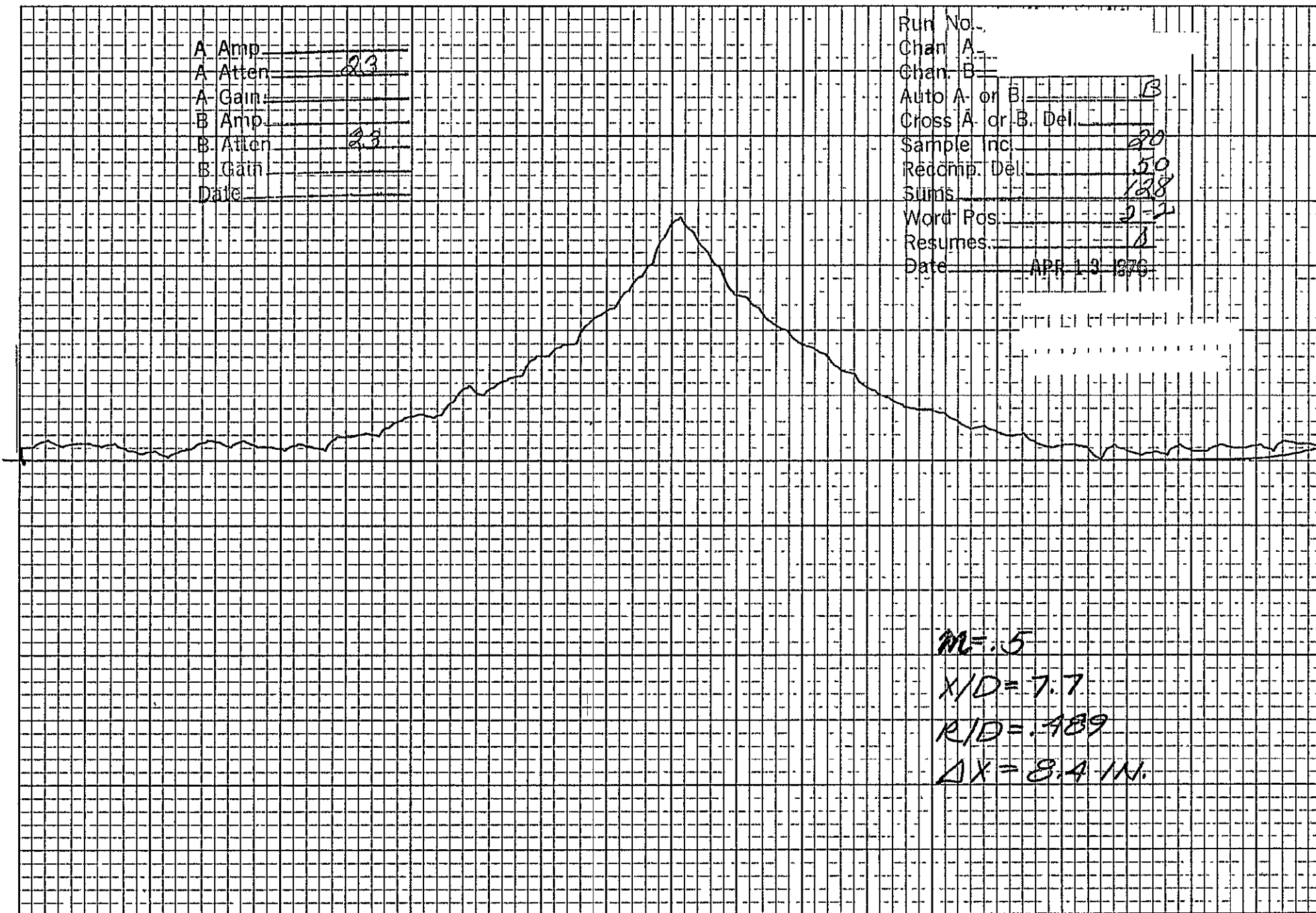
D-181

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B B  
 Cross A or B. Del. \_\_\_\_\_  
 Sample Inc. 20  
 Recomp. Del. 50  
 Sumis 128  
 Word Pos. 2-2  
 Resumes. 1  
 Date APR 13 1976

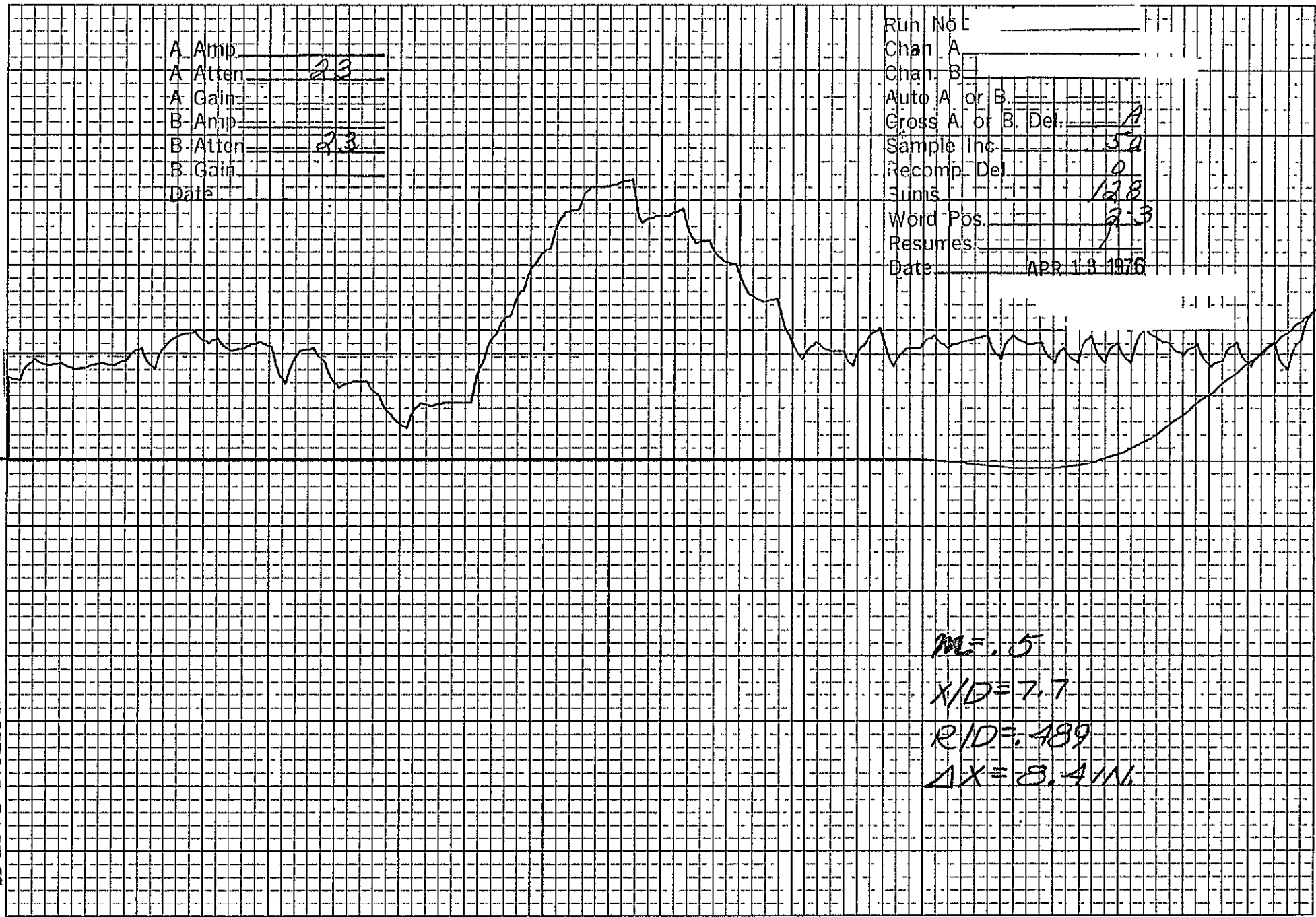
D-182



$M = .5$   
 $X/D = 7.7$   
 $R/D = .989$   
 $\Delta X = 8.4 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Gross A or B Del. 1  
Sample Inc. 32  
Recomp. Del. 0  
Sumis 128  
Word Pos. 23  
Resumes 1  
Date APR 13 1976



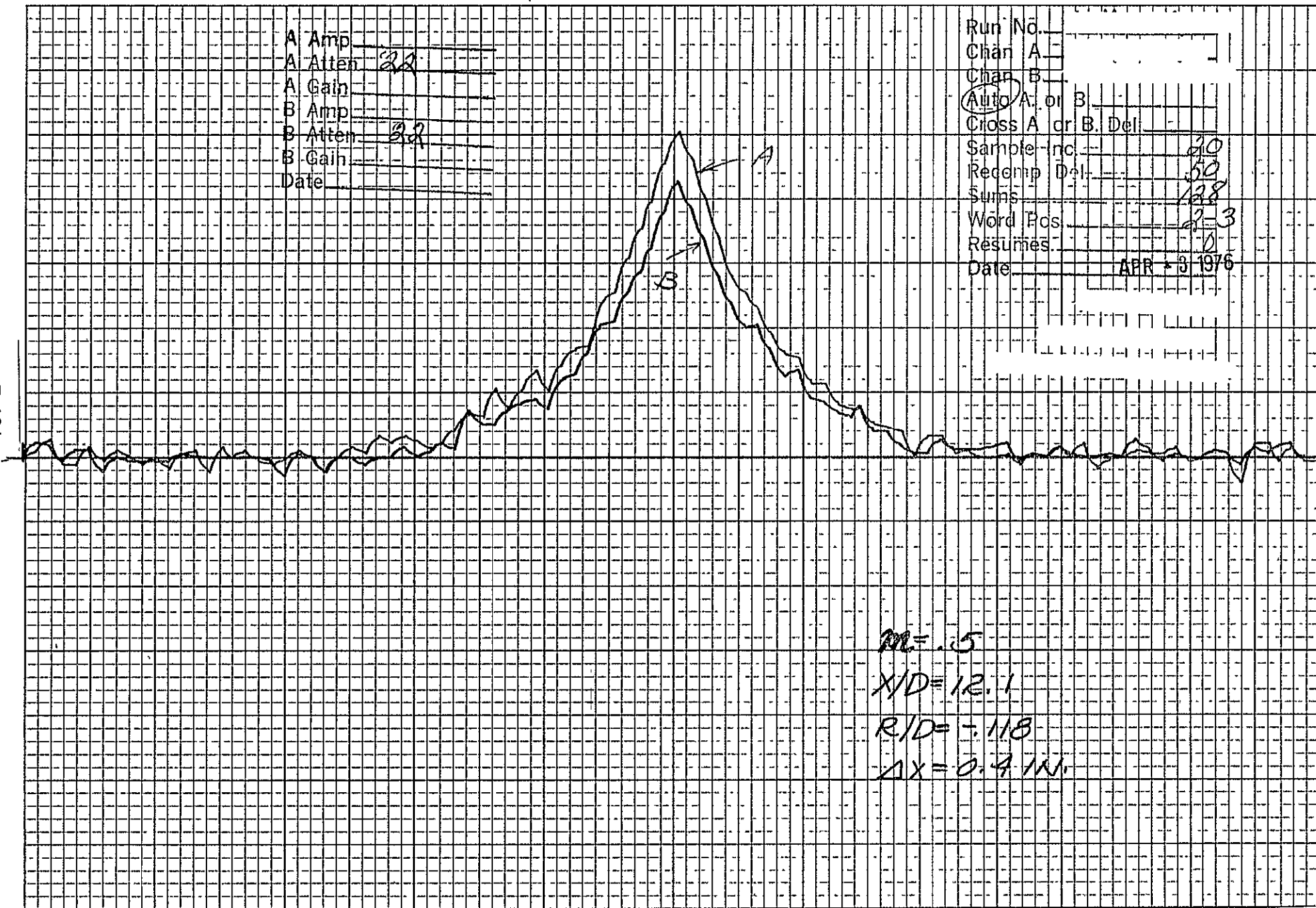
D-183

$M = .5$   
 $X/D = 7.7$   
 $R/D = .489$   
 $\Delta X = 8.411$

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 22  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 32  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan A \_\_\_\_\_  
Chan B \_\_\_\_\_  
 Auto A. or B.  
Cross A or B. Del. \_\_\_\_\_  
Sample Inc. 20  
Recamp Del. 50  
Sums 128  
Word Pcs. 23  
Resumes 0  
Date APR 3 1976



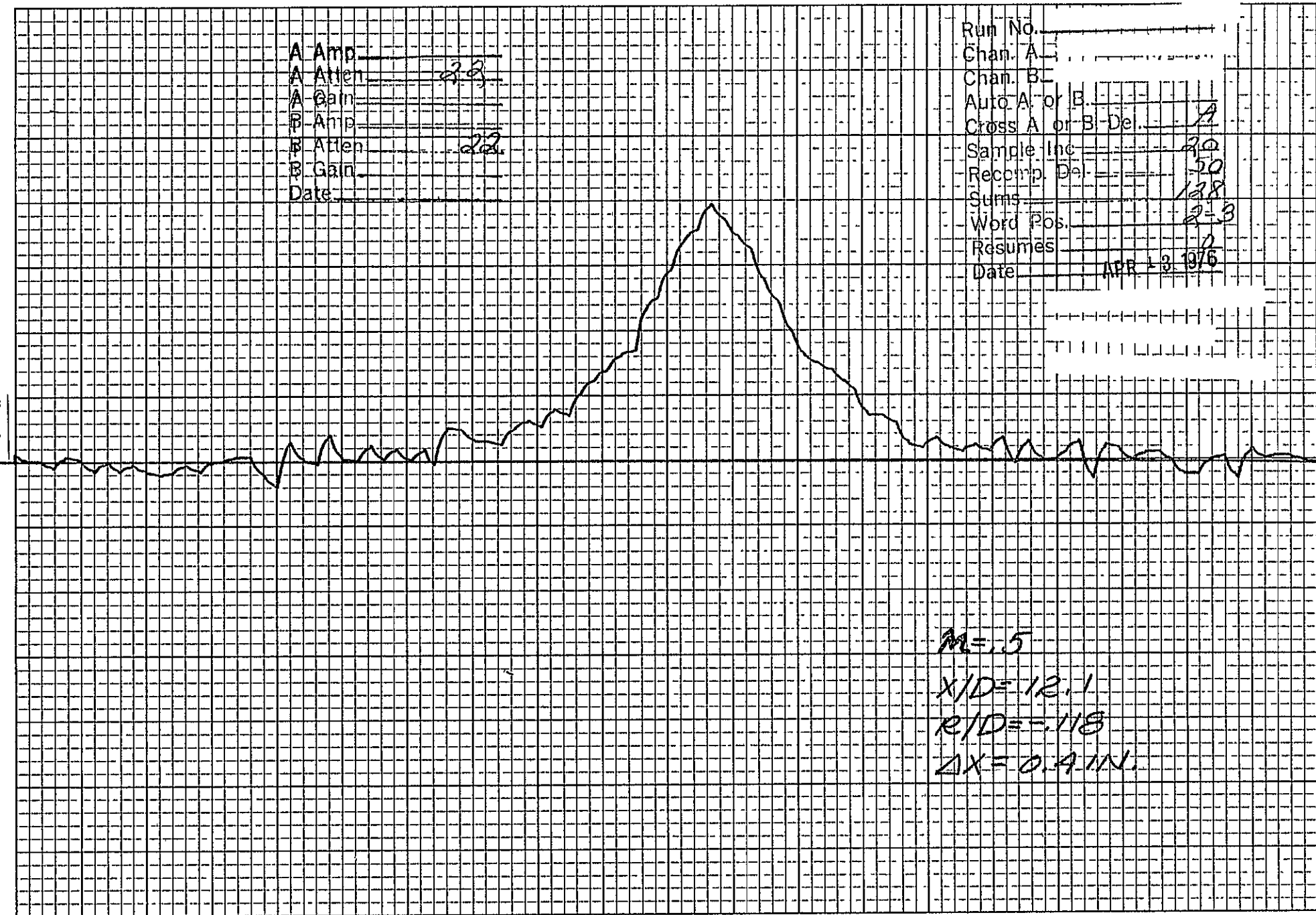
$M = .5$   
 $X/D = 12.1$   
 $R/D = .118$   
 $\Delta X = 0.9 \text{ IN.}$

D-184

A Amp \_\_\_\_\_  
A Atten 2.2  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 2.2  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B-De. A  
Sample Inc. 20  
Recomp. De. 50  
Sums 128  
Word Pos. 2-3  
Resumes 2  
Date APR 13 1976

D-185

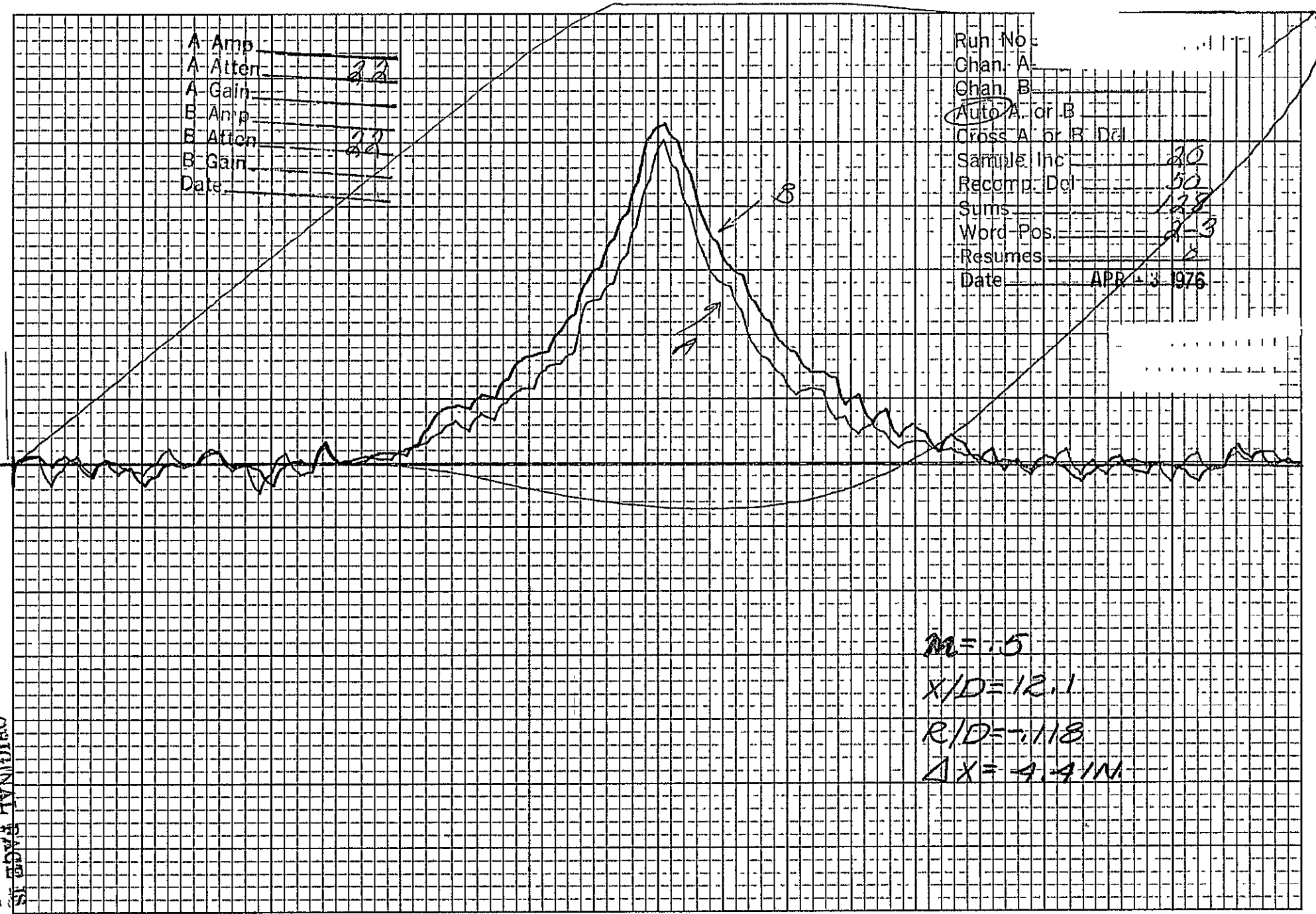


$M = .5$   
 $X/D = 12.1$   
 $R/D = -.118$   
 $\Delta X = 0.4 IN.$



A Amp \_\_\_\_\_  
 A Attenu \_\_\_\_\_ 22  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Attenu \_\_\_\_\_ 22  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No: \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A. or B \_\_\_\_\_  
 Cross A. or B. Del. \_\_\_\_\_  
 Sample Inc \_\_\_\_\_ 20  
 Recomp. Del \_\_\_\_\_ 50  
 Sums \_\_\_\_\_ 128  
 Word Pos \_\_\_\_\_ 2-3  
 Resumes \_\_\_\_\_ 2  
 Date \_\_\_\_\_ APR 23 1976



$m = 1.5$   
 $X/D = 12.1$   
 $R/D = 1.18$   
 $\Delta X = 4.41M$

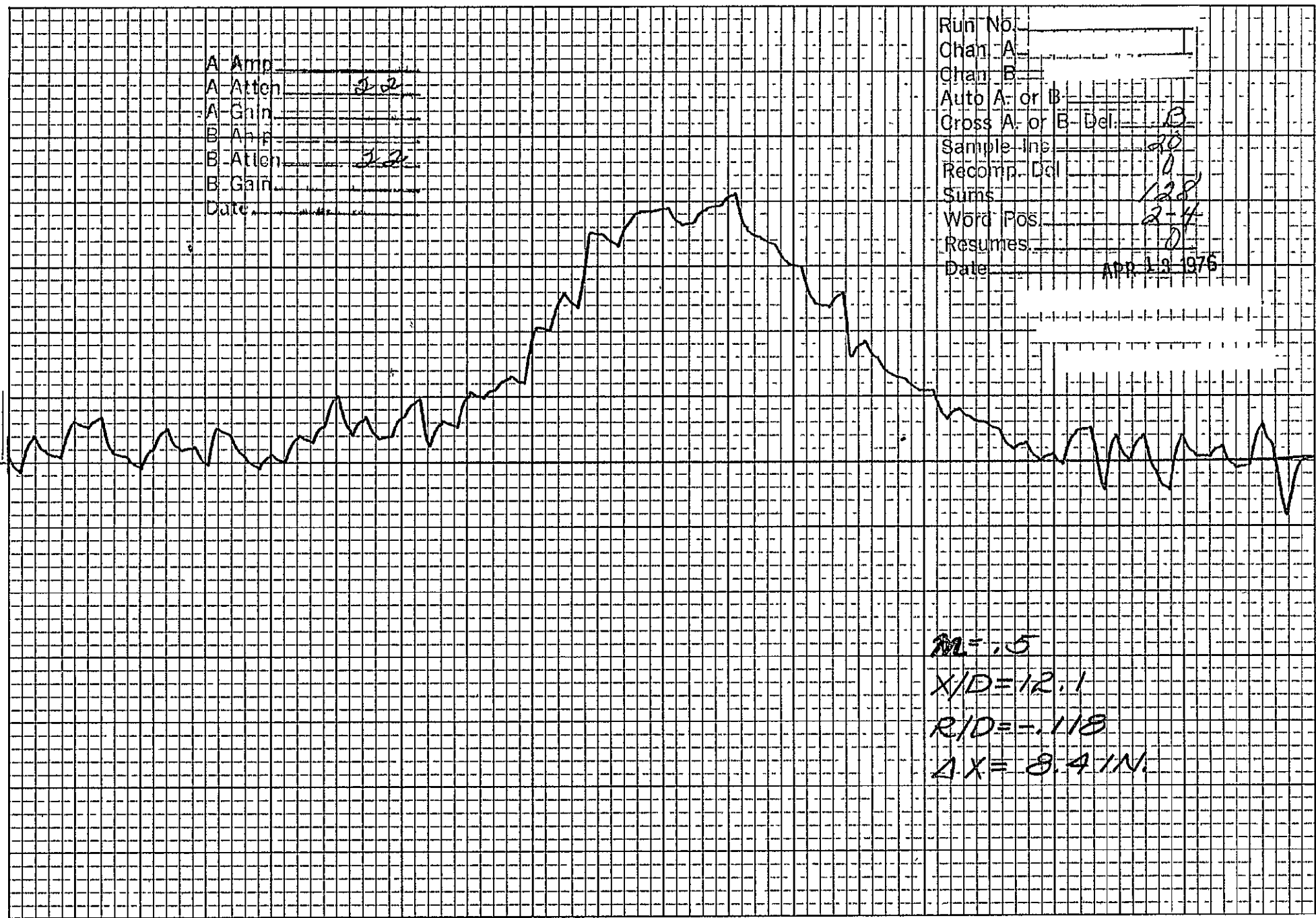
D-186

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 22  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 22  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A. or B. \_\_\_\_\_  
 Cross A. or B. Del. B  
 Sample Inp. 20  
 Recomp. Del. 0  
 Sums 128  
 Word Pos. 2-4  
 Resumes 0  
 Date APR 13 1975

D-187

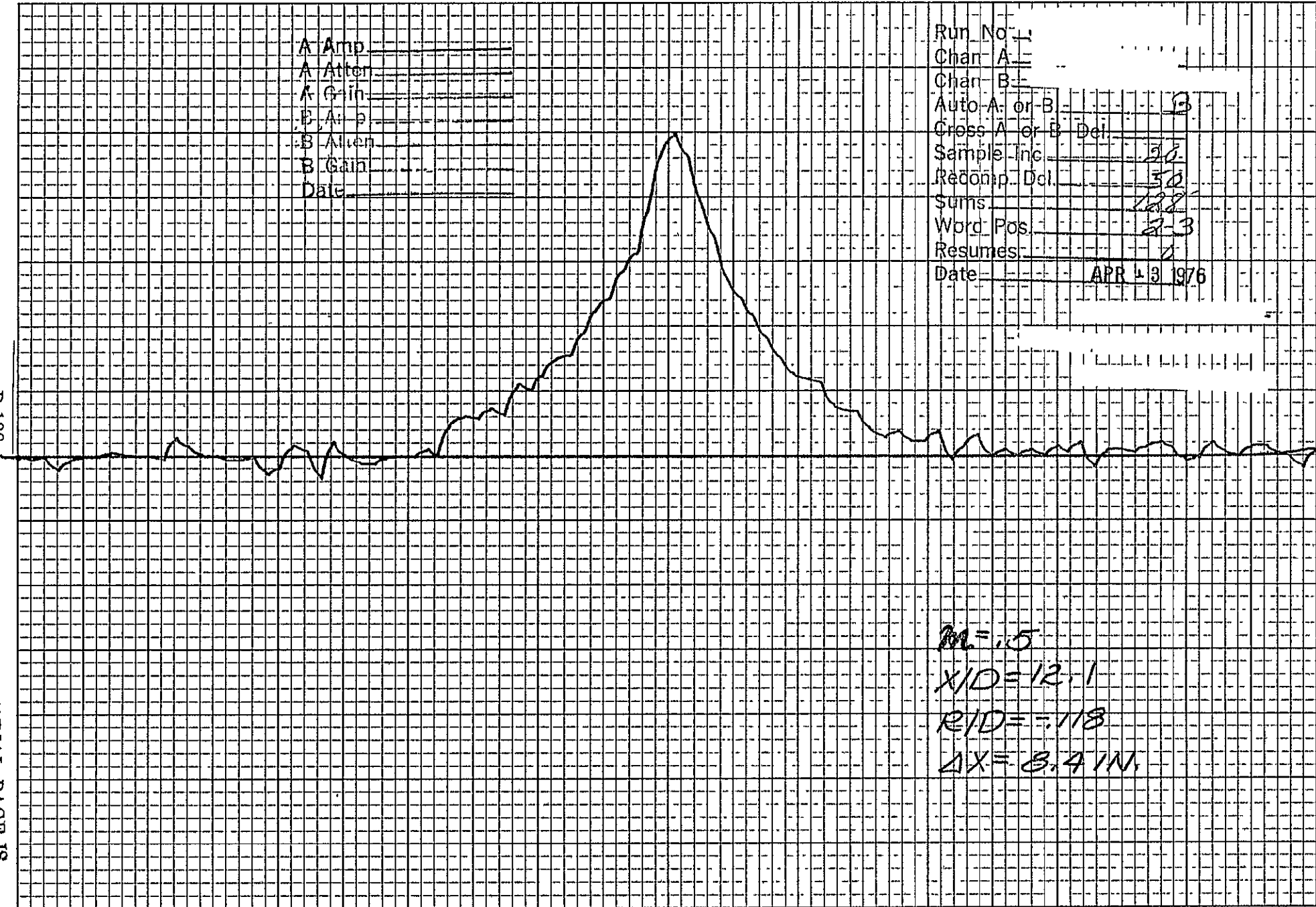


$M = .5$   
 $X/D = 12.1$   
 $R/D = -.118$   
 $\Delta X = 8.4 \text{ IN.}$

A Amp \_\_\_\_\_  
 A Atten \_\_\_\_\_  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten \_\_\_\_\_  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan A \_\_\_\_\_  
 Chan B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_ B  
 Cross A or B Del \_\_\_\_\_  
 Sample Inc \_\_\_\_\_ 20  
 ReComp Del \_\_\_\_\_ 50  
 Sums \_\_\_\_\_ 128  
 Word Pos \_\_\_\_\_ 2-3  
 Resumes \_\_\_\_\_ 1  
 Date \_\_\_\_\_ APR 23 1976

D-188



$M = 1.5$   
 $X/D = 12.1$   
 $R/D = 1.18$   
 $\Delta X = 8.4 \text{ IN.}$

ORIGINAL PAGE IS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 22  
 A Gain \_\_\_\_\_  
 F Amp \_\_\_\_\_  
 B Atten 22  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A ✓  
 Chan. B \_\_\_\_\_  
 Auto A. or B. \_\_\_\_\_  
 Cross A. or B. Del. 14  
 Sample Inc. 100  
 Recomp. Del. 0  
 Sums 138  
 Word Pos. 24  
 Resumes 1  
 Date APR 13 1976

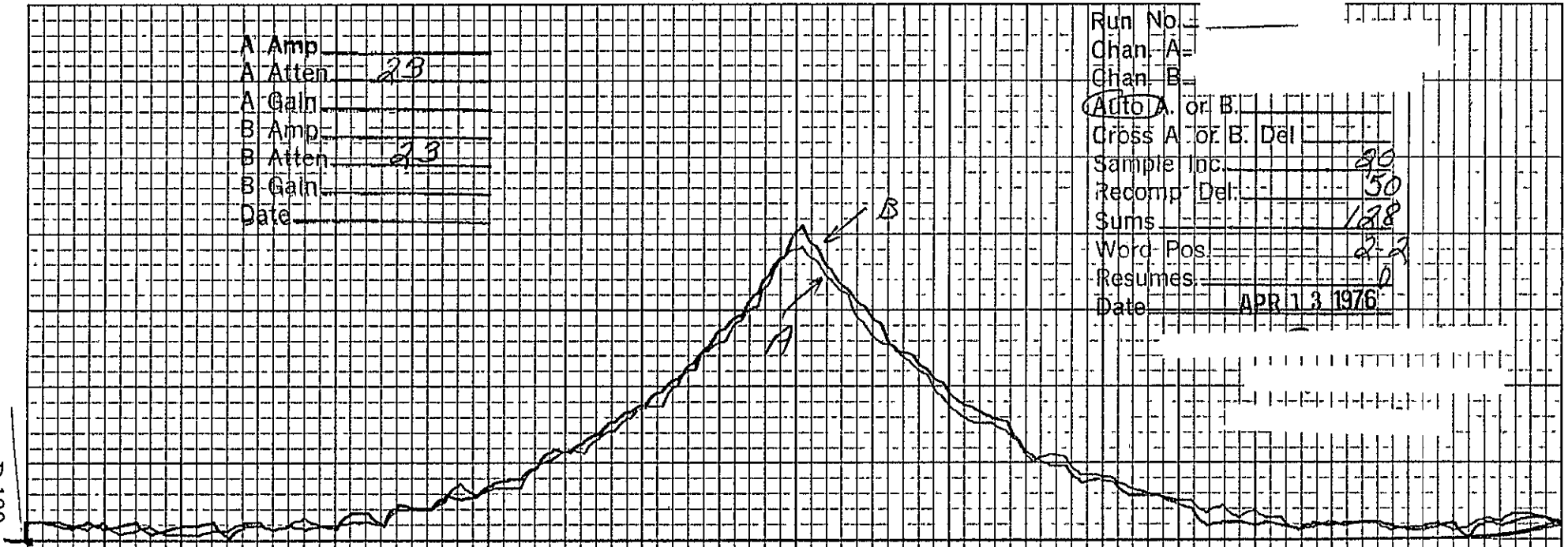
D-189



$M = .5$   
 $X/D = 12.1$   
 $R/D = 118$   
 $\Delta X = 8.4 \text{ IN.}$

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del. \_\_\_\_\_  
Sample Inc. 20  
Recomp. Del. 30  
Sums 128  
Word Pos. 2-27  
Resumes 0  
Date APR 13 1976



$M = .5$   
 $X/D = 12.1$   
 $R/D = .287$   
 $\Delta X = 0.4 \text{ IN}$

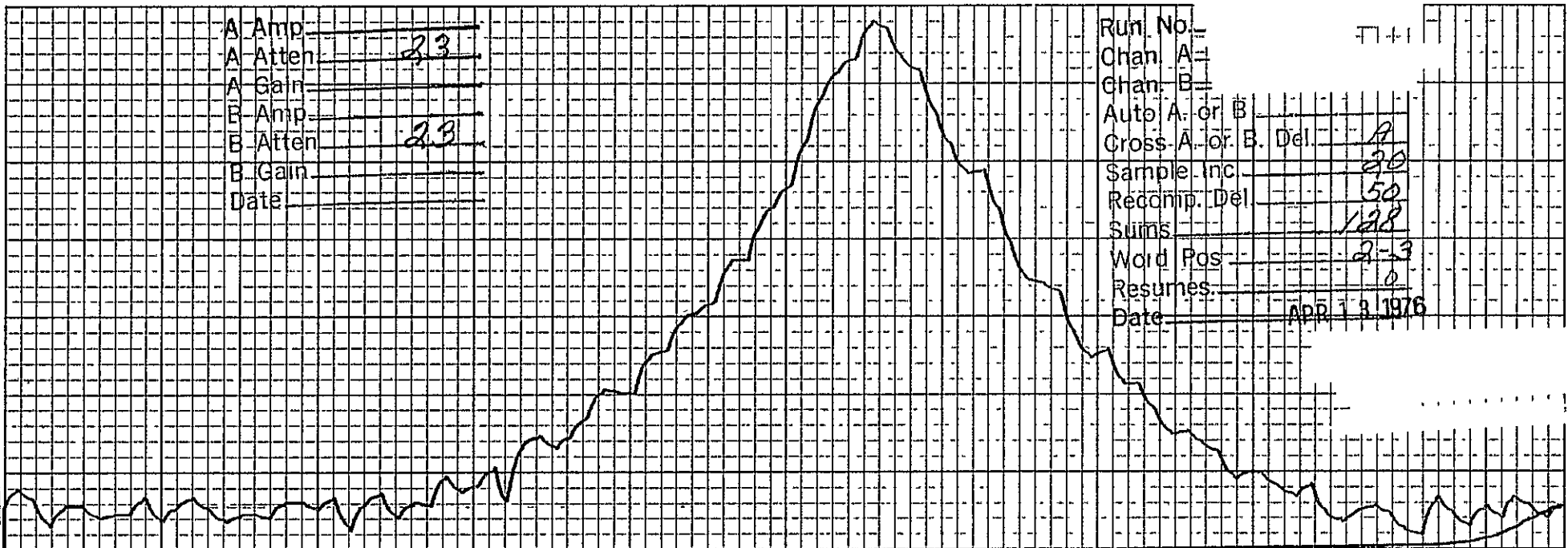
D-190

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run. No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A. or B. \_\_\_\_\_  
 Cross A. or B. Del. A  
 Sample Inc. 20  
 Recomp. Del. 50  
 Sums 128  
 Word Pos. 2-3  
 Resumes. 0  
 Date APR 13 1976

D-191

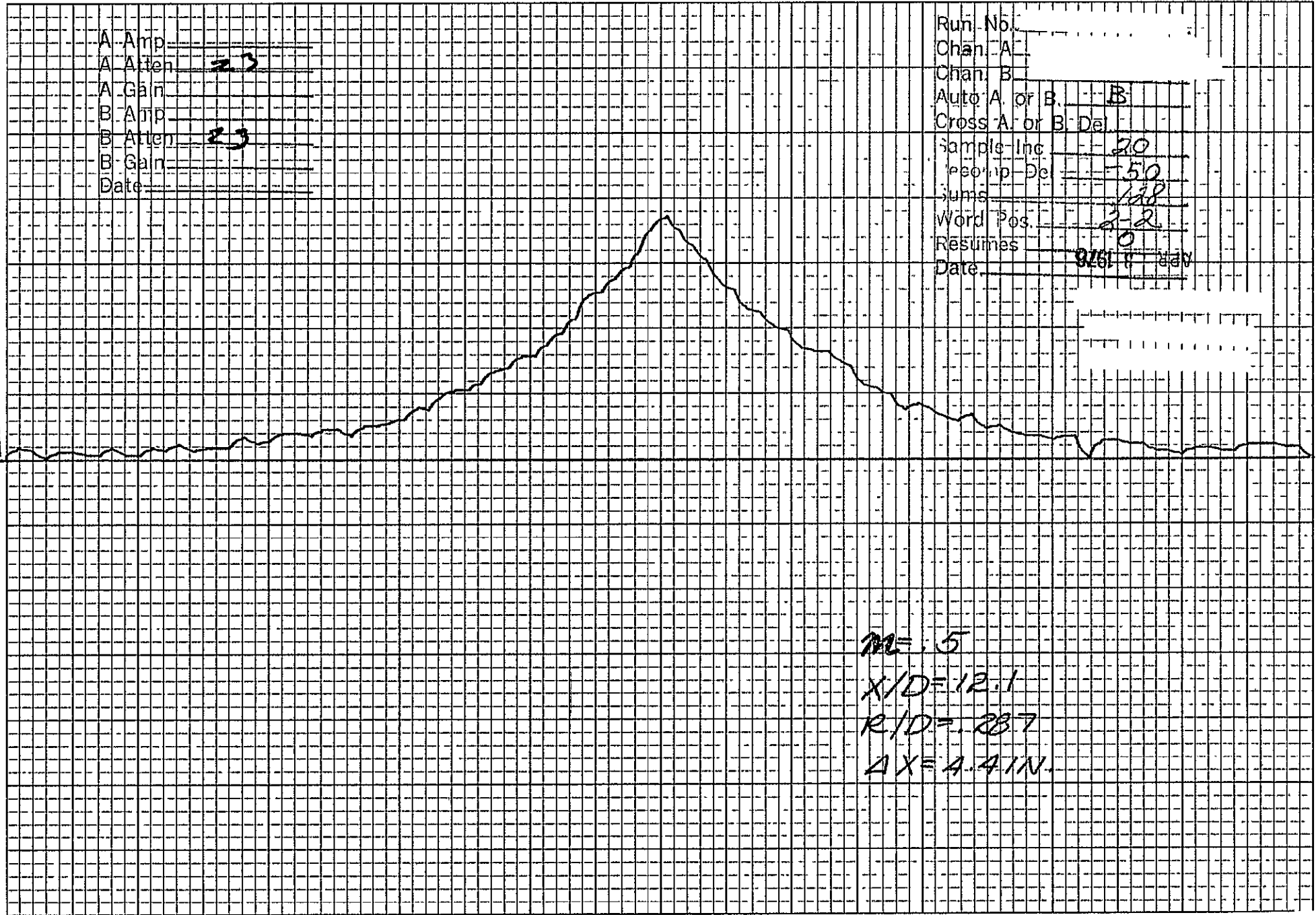


$M = .5$   
 $X/D = 12.1$   
 $R/D = .287$   
 $\Delta X = 0.414$

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. B  
Cross A. or B. Dial \_\_\_\_\_  
Sample Inc. 20  
Recorp. De. 50  
Sums 128  
Word Pos. 2-2  
Resumes 0  
Date 9/26/64

D-192



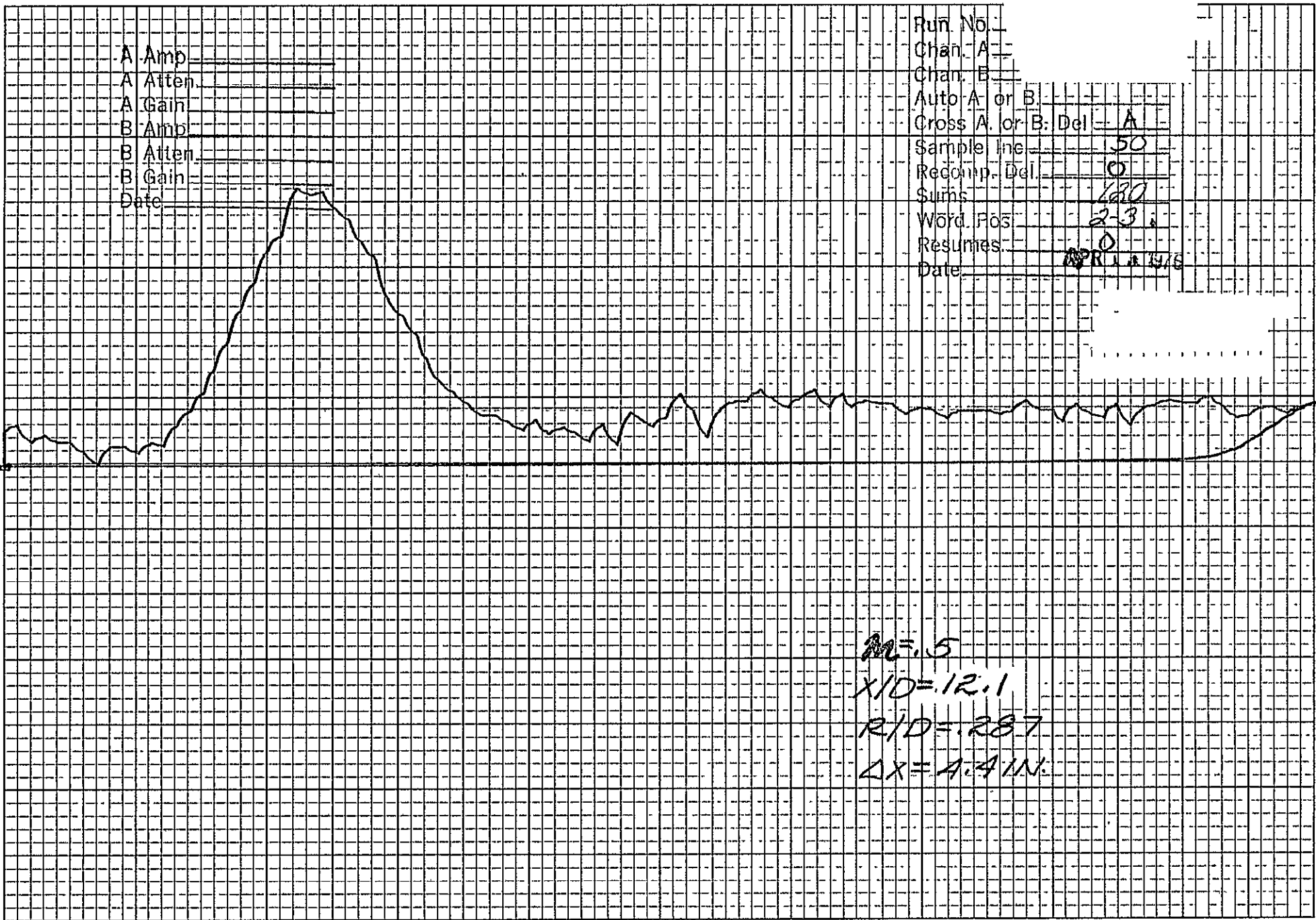
$M = 5$   
 $X/D = 12.1$   
 $R/D = 287$   
 $\Delta X = 4.41N$

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A Amp \_\_\_\_\_  
 A Atten. \_\_\_\_\_  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten. \_\_\_\_\_  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B. \_\_\_\_\_  
 Cross A. or B: Del. A  
 Sample Ine. 50  
 Recomp. Del. 0  
 Sums 180  
 Word. Pos. 23  
 Resumes 0  
 Date APR 14 1976

D-193

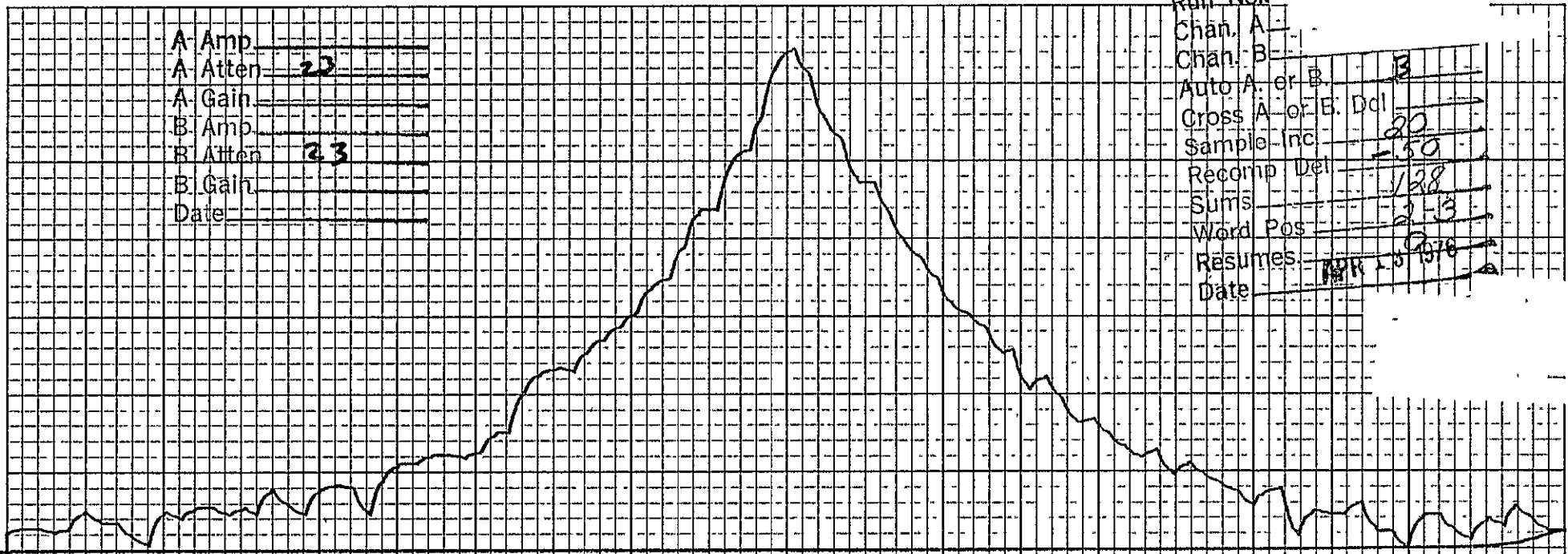


$M = 1.5$   
 $X/D = 12.1$   
 $R/D = .287$   
 $\Delta X = 4.4 \text{ IN.}$



A Amp. \_\_\_\_\_  
 A Atten. 22  
 A Gain. \_\_\_\_\_  
 B Amp. \_\_\_\_\_  
 B Atten. 23  
 B Gain. \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A. \_\_\_\_\_  
 Chan. B. \_\_\_\_\_  
 Auto A. or B. B  
 Cross A. or B. Dcl. \_\_\_\_\_  
 Sample Inc. 20  
 Record Del. -50  
 Sums 128  
 Word Pos. 213  
 Resumes \_\_\_\_\_  
 Date APR 13 1976



$M = 1.5$   
 $X/D = 12.1$   
 $R/D = .287$   
 $LX = 8.4 IN.$

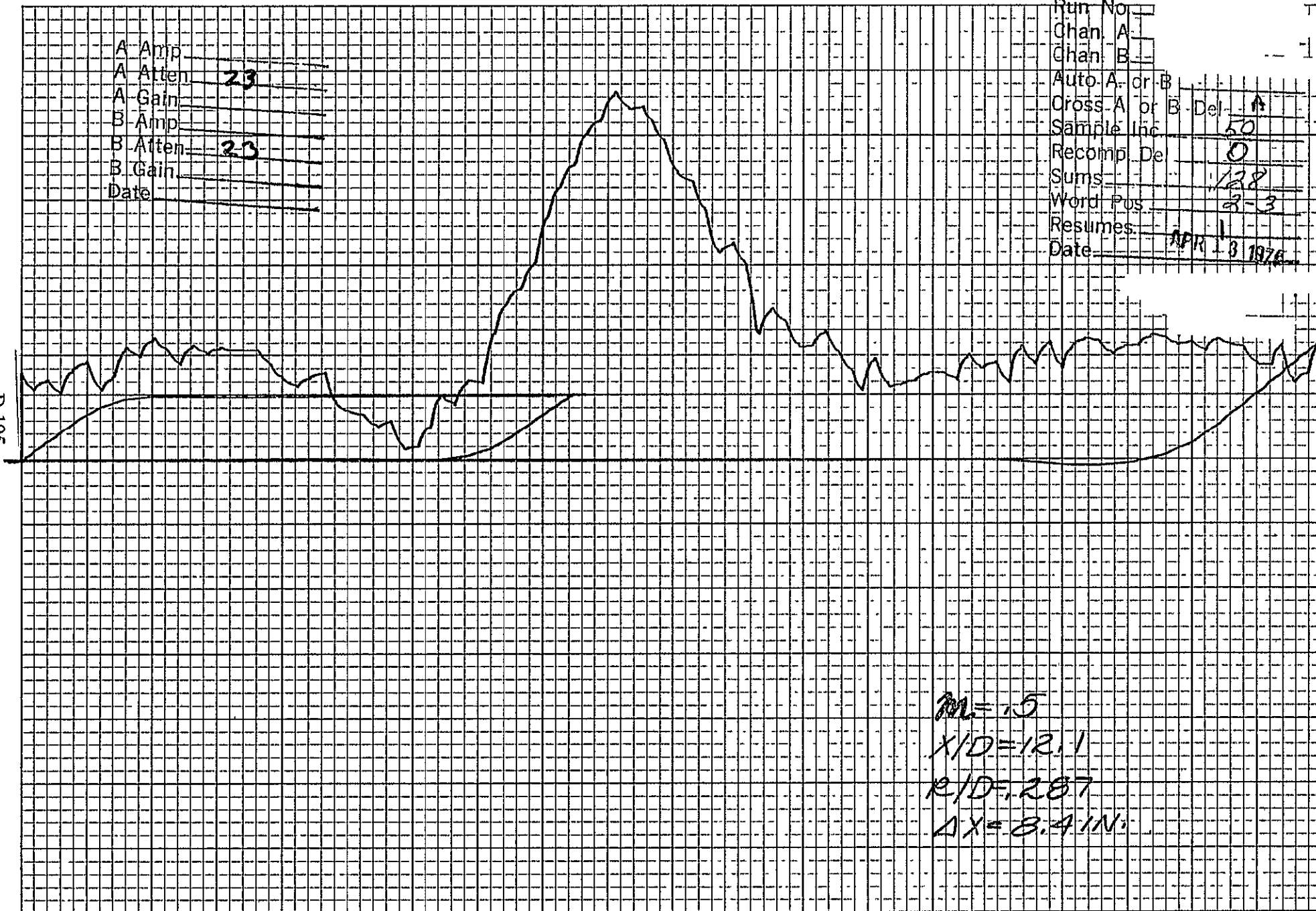
D-194

ORIGINAL FACETS  
 OF POOR QUALITY

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto. A. or B. \_\_\_\_\_  
 Cross. A. or B. Del. A  
 Sample Inc. 50  
 Reconp. De. 0  
 Sums 128  
 Word Pos. 3-3  
 Resumes: \_\_\_\_\_  
 Date APR 13 1976

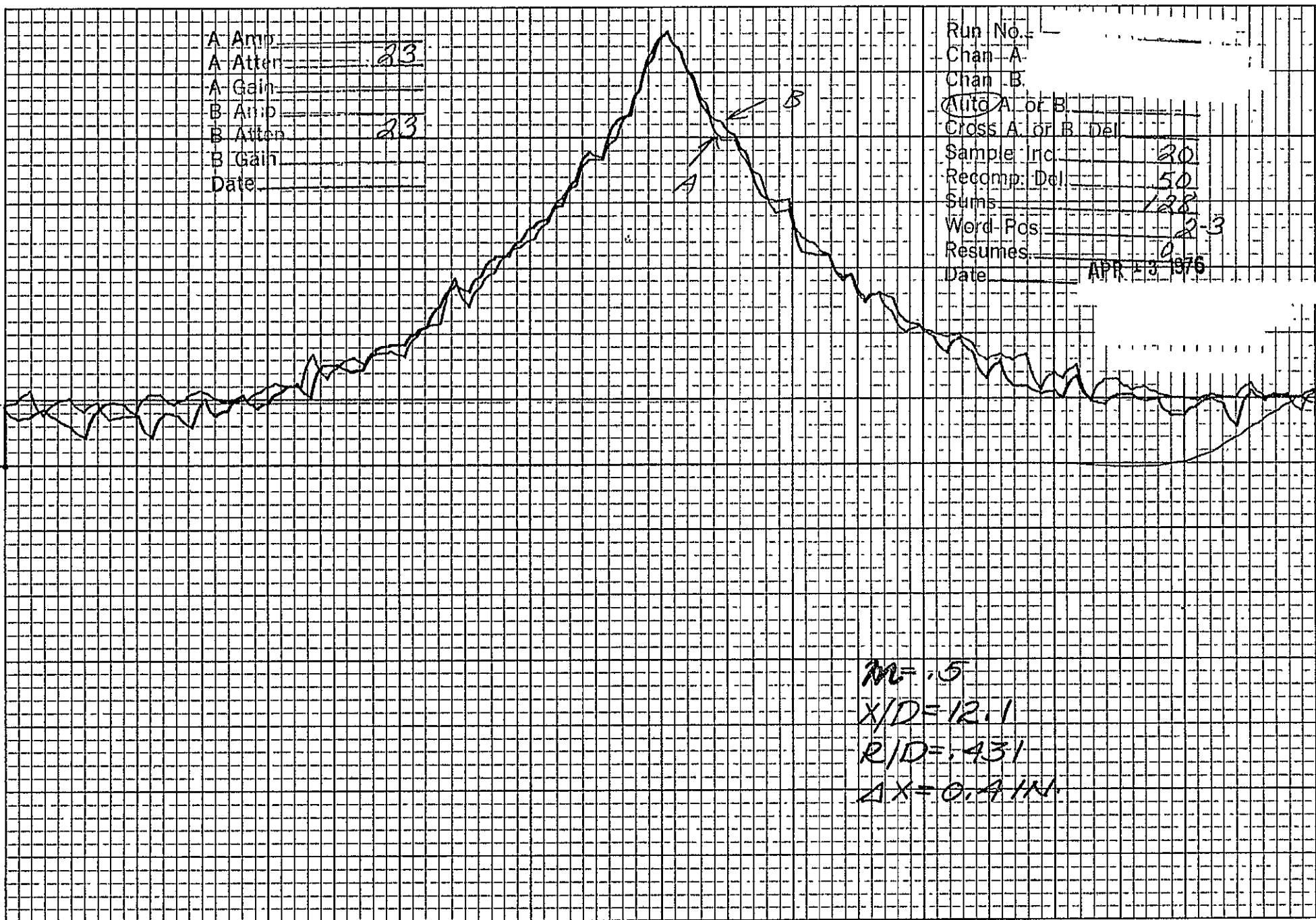
D-195



$M = .5$   
 $X/D = 12.1$   
 $R/D = 287$   
 $\Delta X = 8.4 \text{ IN.}$

A Amp \_\_\_\_\_  
 A Atten \_\_\_\_\_ 23  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten \_\_\_\_\_ 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 (Auto) A or B \_\_\_\_\_  
 Cross A. or B. Del. \_\_\_\_\_  
 Sample Inc. \_\_\_\_\_ 20  
 Recomp. Del. \_\_\_\_\_ 50  
 Sums \_\_\_\_\_ 128  
 Word Pcs \_\_\_\_\_ 2-3  
 Resumes \_\_\_\_\_ 0  
 Date \_\_\_\_\_ APR 13 1976



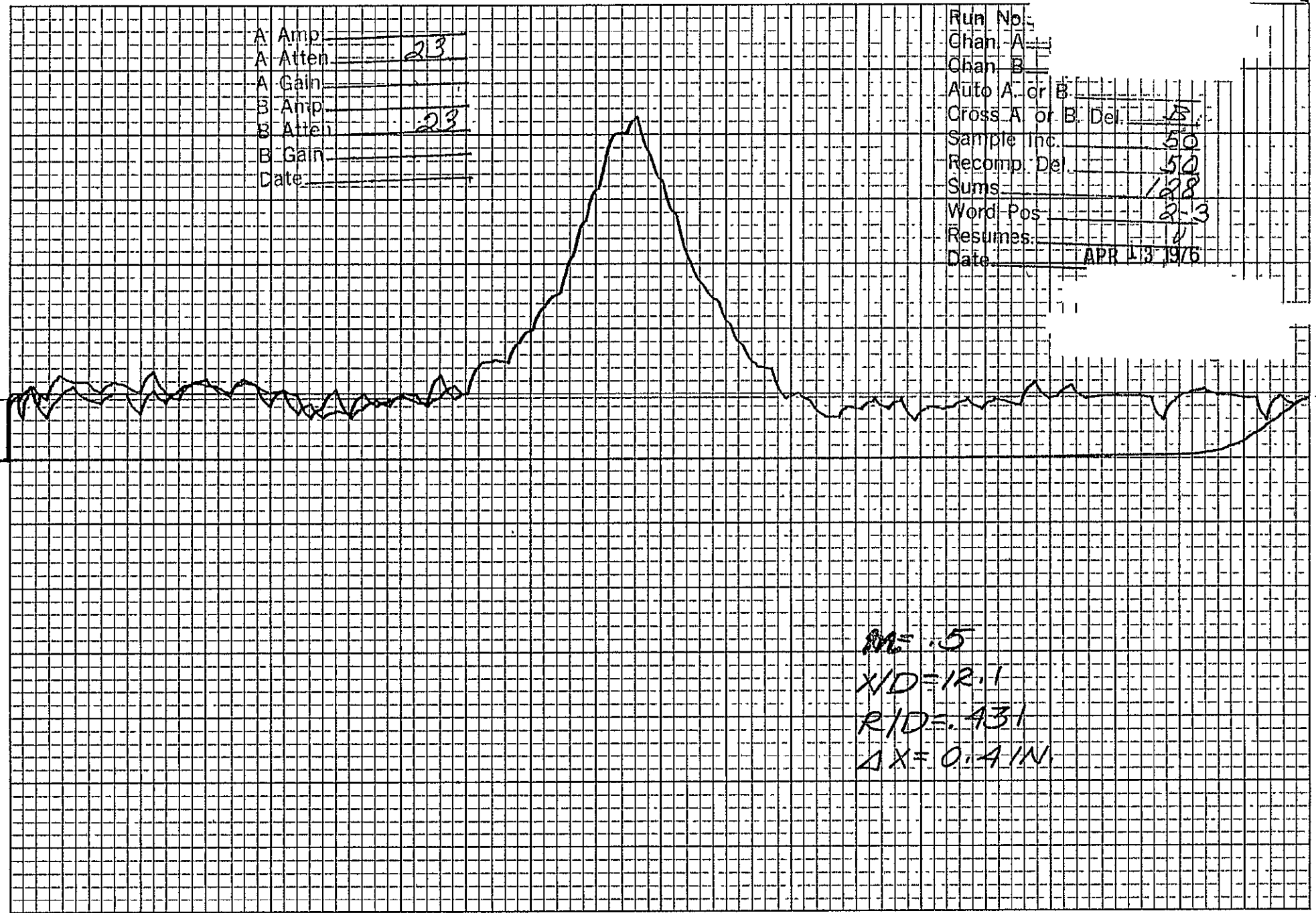
$M = .5$   
 $X/D = 12.1$   
 $R/D = .431$   
 $\Delta X = 0.4 \text{ IN.}$

D-196

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A Amp \_\_\_\_\_  
A Atten. 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A 1  
Chan. B \_\_\_\_\_  
Auto A or B \_\_\_\_\_  
Cross A or B Del. 5  
Sample Inc. 50  
Recomp. Del. 50  
Sums 128  
Word Pos. 2-3  
Resumes. 4  
Date APR 13 1976



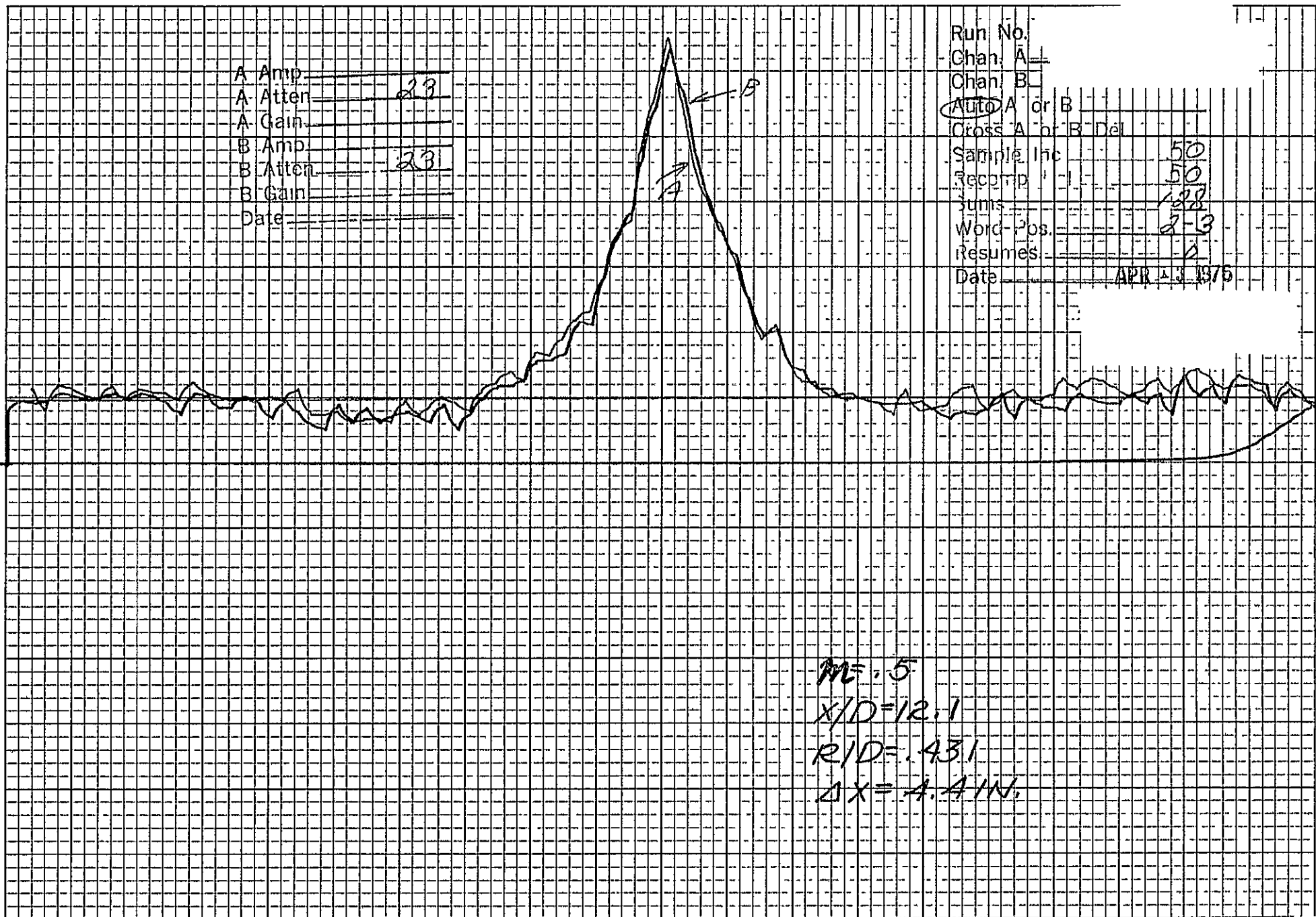
$RA = .5$   
 $X/D = 12.1$   
 $R/D = .431$   
 $\Delta X = 0.4 \text{ IN.}$

D-197

ORIGINAL PAGE IS  
OF POOR QUALITY

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
AUTO A or B \_\_\_\_\_  
Cross A or B Del \_\_\_\_\_  
Sample Inc 50  
Recorp 50  
Summ 128  
Word Pos. 2-3  
Resumes 1  
Date APR 23 1975

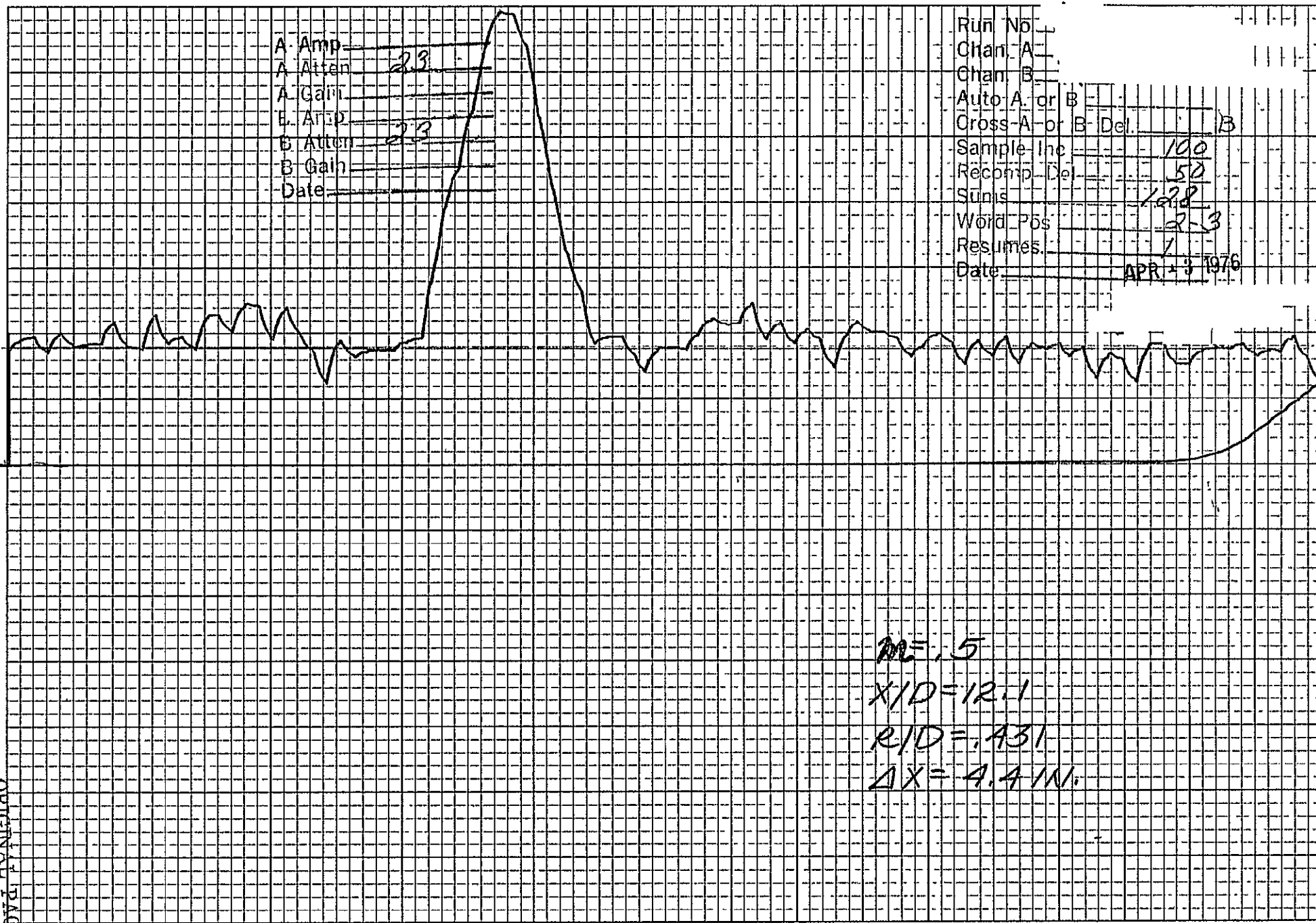


D-198

$M = .5$   
 $X/D = 12.1$   
 $R/D = .431$   
 $\Delta X = 4.4 IN.$

A Amp \_\_\_\_\_  
 A Atten 23  
 A Gain \_\_\_\_\_  
 E AFID \_\_\_\_\_  
 B Atten 23  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No \_\_\_\_\_  
 Chan. A \_\_\_\_\_  
 Chan. B \_\_\_\_\_  
 Auto A or B \_\_\_\_\_  
 Cross-A or B Del. B  
 Sample Ine 100  
 Reomp Del 50  
 Sums 128  
 Word Pos 2-3  
 Res. mes. 1  
 Date APR 3 1976



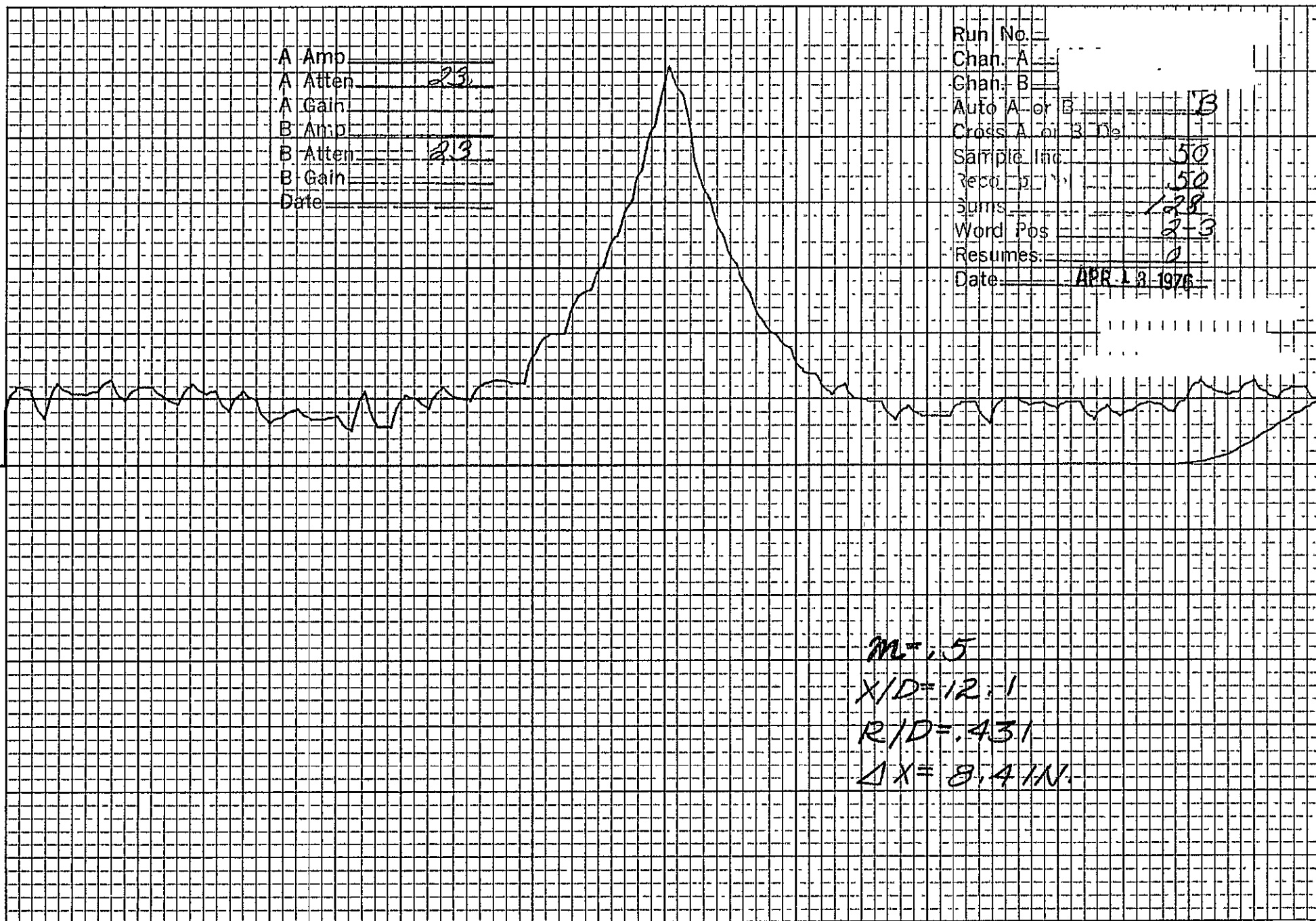
$M = .5$   
 $X/D = 12.1$   
 $R/D = .431$   
 $\Delta X = 4.4 IN.$

D-199

ORIGINAL PAGE IS  
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A Amp \_\_\_\_\_  
A Atten. 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten. 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A or B B  
Cross A or B No. \_\_\_\_\_  
Sample Inc. 50  
Rec. [ ] \_\_\_\_\_  
Sums 128  
Word Pos. 2-3  
Resumes: 0  
Date: APR 13 1976

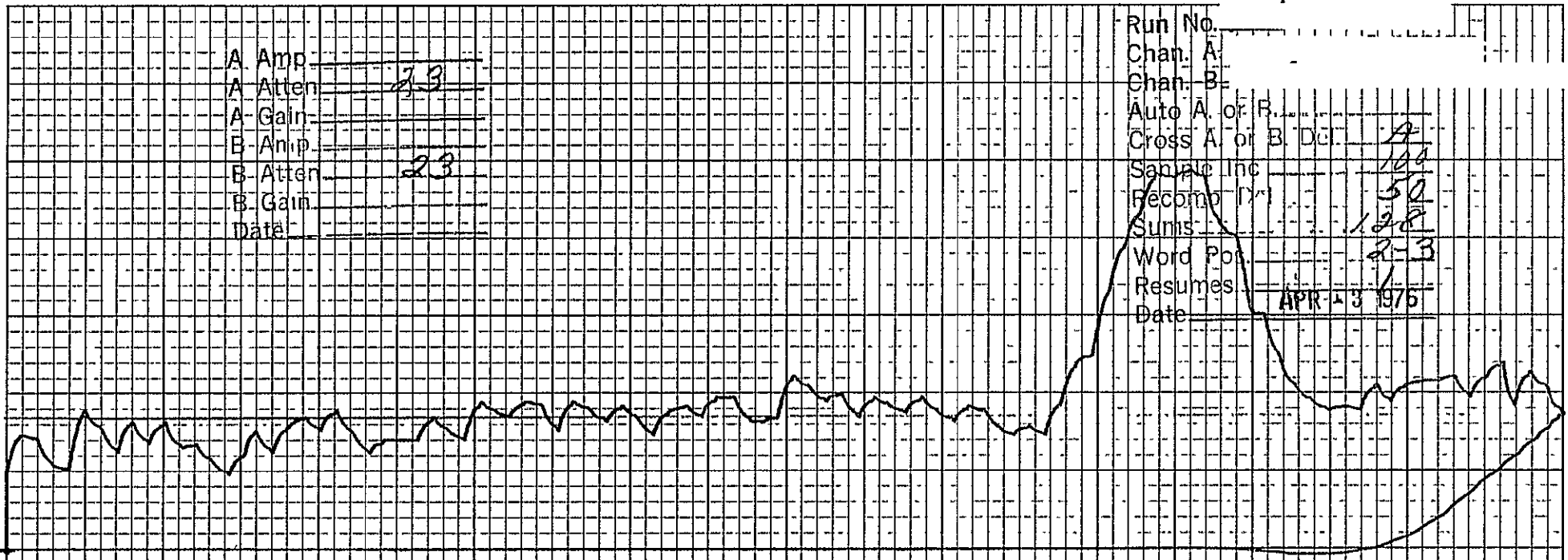


D-200

$M = .5$   
 $X/D = 12.1$   
 $R/D = .431$   
 $\Delta X = 8.4 IN.$

A Amp \_\_\_\_\_  
A Atten 23  
A Gain \_\_\_\_\_  
B Amp \_\_\_\_\_  
B Atten 23  
B Gain \_\_\_\_\_  
Date \_\_\_\_\_

Run No. \_\_\_\_\_  
Chan. A \_\_\_\_\_  
Chan. B \_\_\_\_\_  
Auto A. or B. \_\_\_\_\_  
Cross A. or B. Del. A  
Sample Inc 100  
Recomp (%) 50  
Sumis 128  
Word Pos 2-3  
Resumes 1  
Date APR 13 1975



$m = .5$   
 $X/D = 12.1$   
 $R/D = .431$   
 $\Delta X = 8.4 \text{ IN.}$

D-201

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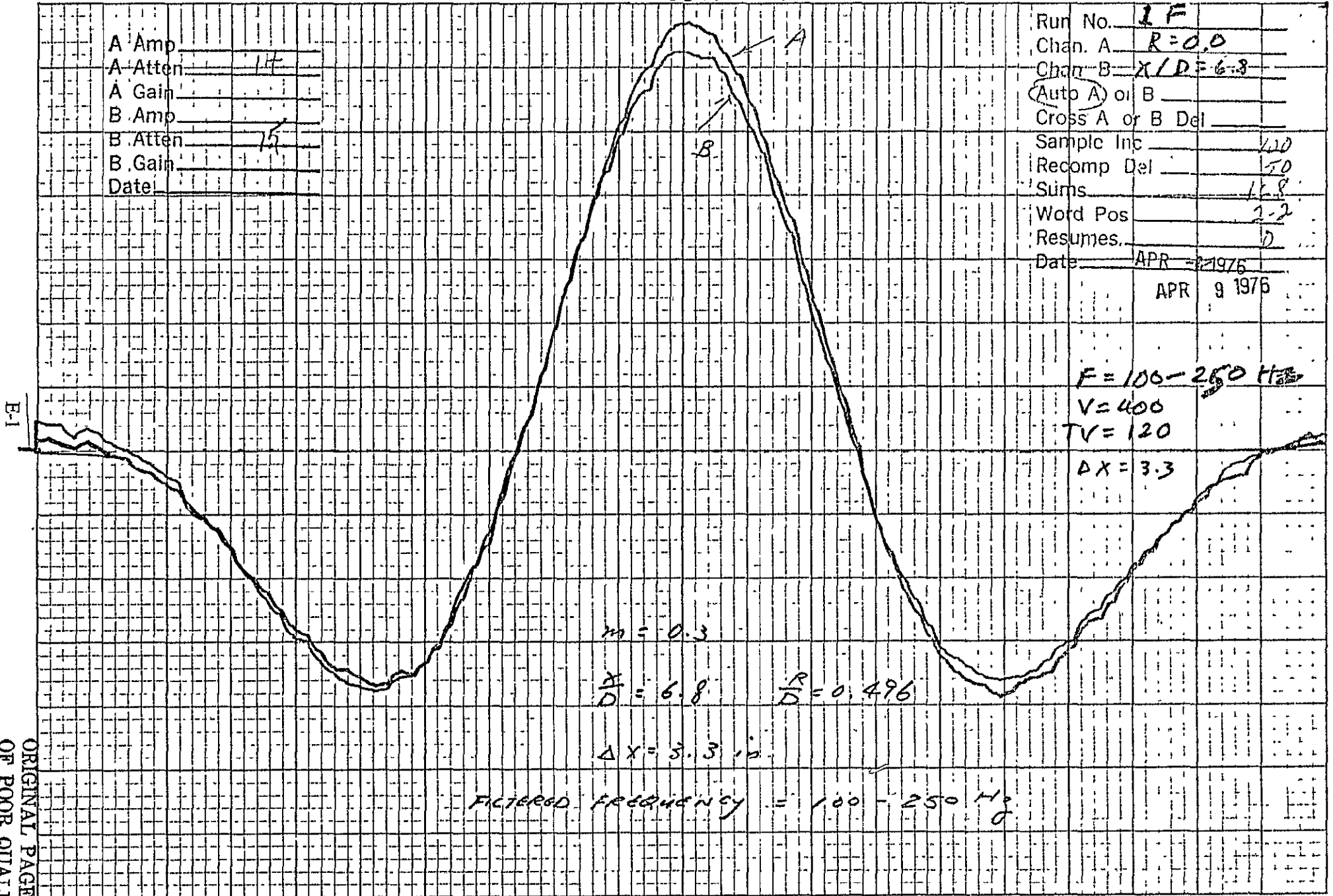
E. Filtered Auto and Cross Correlations

This section contains the filtered auto and cross correlations. In section D, all the signals were band-pass filtered from 0-20 KHz. In this section the signals were band-pass filtered at the various selected frequency ranges as listed on the bottom center of the plots.

FILTERED AUTO CORRELATION

A Amp \_\_\_\_\_  
 A Atten 14  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 15  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. IF  
 Chan. A R=0.0  
 Chan. B X/D=6.8  
 (Auto A) or B \_\_\_\_\_  
 Cross A or B Del \_\_\_\_\_  
 Sample Inc \_\_\_\_\_ 100  
 Recomp Del \_\_\_\_\_ 50  
 Sums \_\_\_\_\_ 12.8  
 Word Pos \_\_\_\_\_ 2-2  
 Resumes \_\_\_\_\_ 0  
 Date APR 9 1976



F = 100 - 250 Hz  
V = 400  
TV = 120  
ΔX = 3.3

m = 0.3  
X/D = 6.8      R/D = 0.496  
ΔX = 3.3 in.

FILTERED FREQUENCY = 100 - 250 Hz

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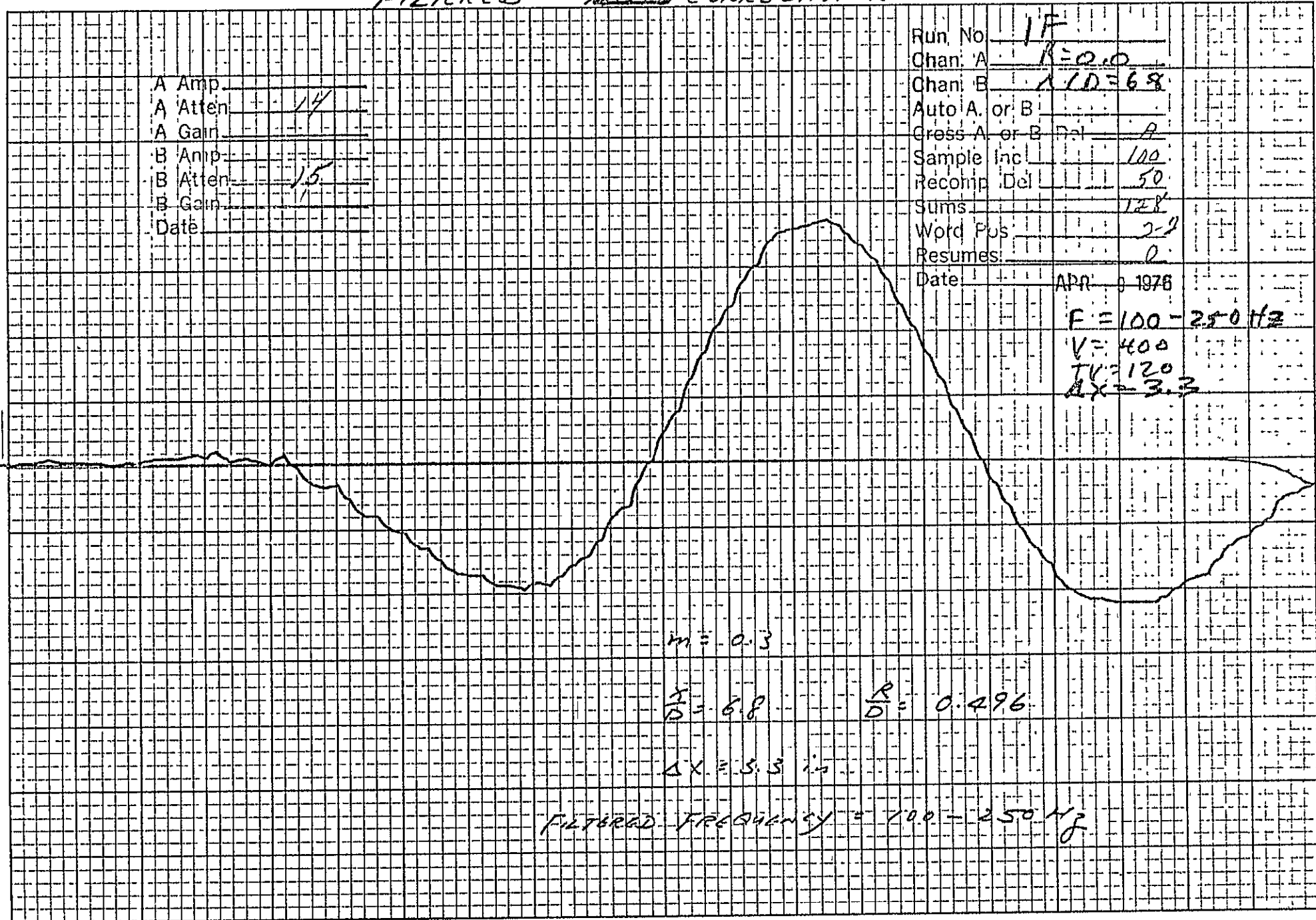
CROSS  
 FILTERED ~~A~~ CORRELATION

A Amp \_\_\_\_\_  
 A Atten 14  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 15  
 B Gain 11  
 Date \_\_\_\_\_

Run No 1F  
 Chan: A R=0.0  
 Chan: B A/D=68  
 Auto A. or B \_\_\_\_\_  
 Cross A. or B Del A  
 Sample inc 100  
 Rechip Del 50  
 Sums 128  
 Word Pos 29  
 Resumes 0  
 Date APR 9 1978

F = 100 - 250 Hz  
 V = 400  
 TV = 120  
 AX = 3.3

B-2



$m = 0.3$

$\frac{F}{D} = 6.8$

$\frac{R}{D} = 0.496$

$\Delta X = 5.3$  in

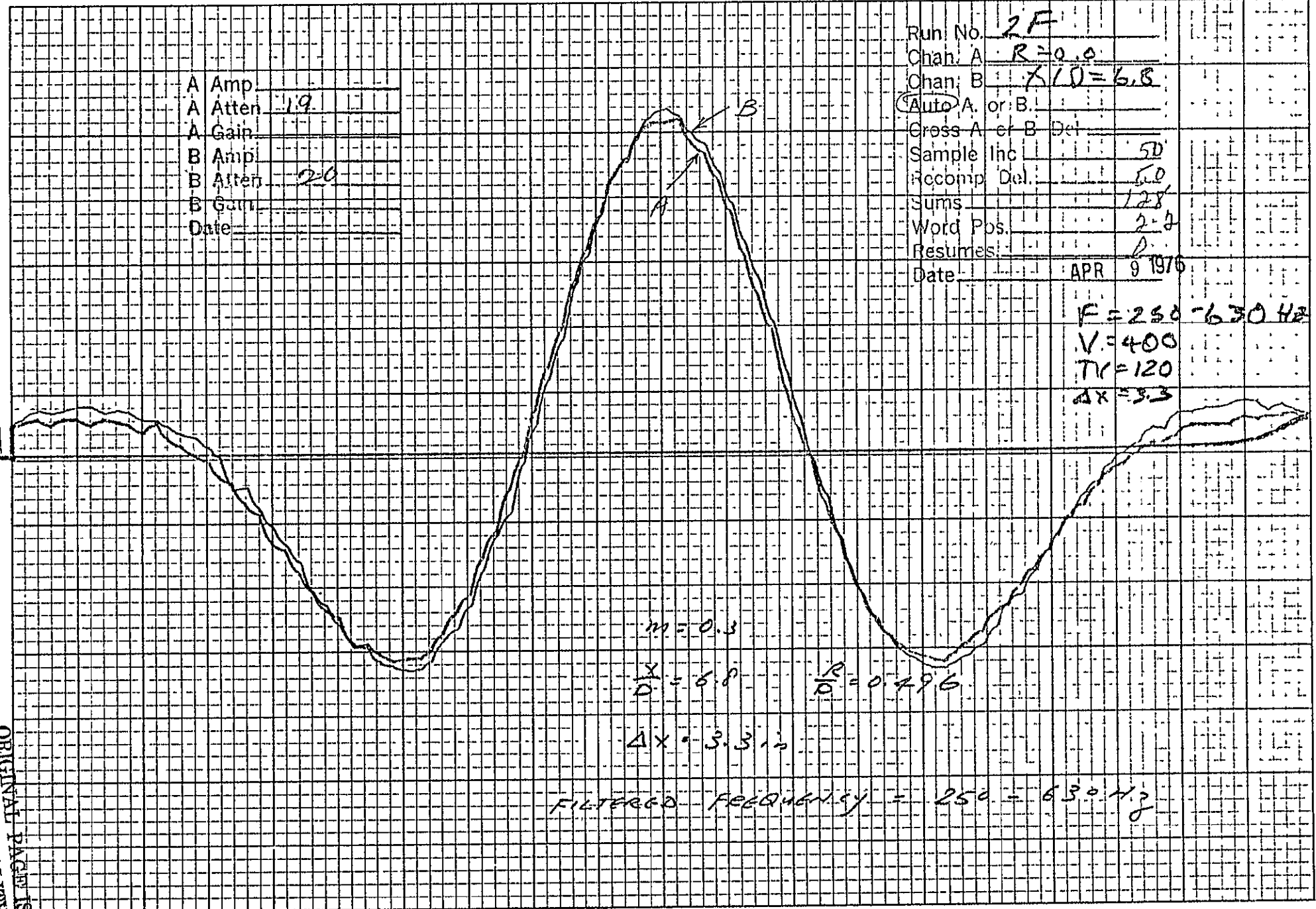
FILTERED FREQUENCY = 100 - 250 Hz

FILTERED AUTO CORRELATION

A Amp.  
 A Atten. 19  
 A Gain.  
 B Amp.  
 B Atten. 20  
 B Gain.  
 Date

Run No. 2F  
 Chan. A R=0.0  
 Chan. B  $\Delta D=6.8$   
 (Auto) A. or B.  
 Cross A. or B. Del.  
 Sample Inc. 50  
 Recomp. Del. 50  
 Sums 128  
 Word Pos. 2-2  
 Resumes 0  
 Date APR 9 1976

F = 250 - 630 Hz  
 V = 400  
 TR = 120  
 $\Delta X = 3.3$



FILTERED FREQUENCY = 250 - 630 Hz

E-3 ORIGINAL PAGE IS OF POOR QUALITY

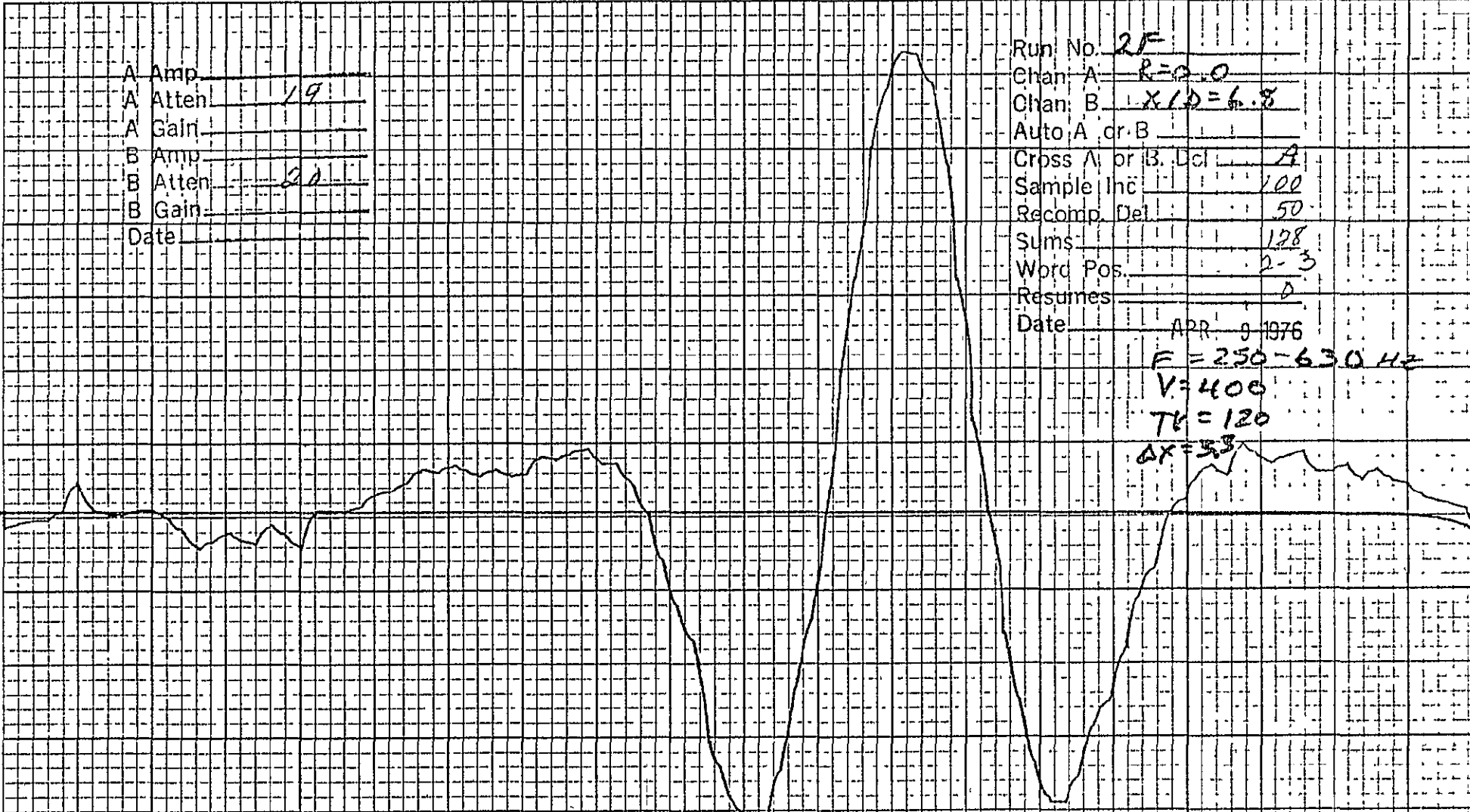
# FILTERED CROSS CORRELATION

A Amp \_\_\_\_\_  
 A Atten 19  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 20  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. 2F  
 Chan: A R=0.0  
 Chan: B X/D=6.8  
 Auto A cr B \_\_\_\_\_  
 Cross A or B. Dcl A  
 Sample Inc 100  
 Recomp. Del 50  
 Sums 128  
 Word Pos. 2-3  
 Resumes 0  
 Date APR 9 1976

F = 250-630 Hz  
V = 400  
TK = 120  
AX = 3.3

B4



m = 0.5

X/D = 6.8

AX = 3.3 in

R/D = 0.496

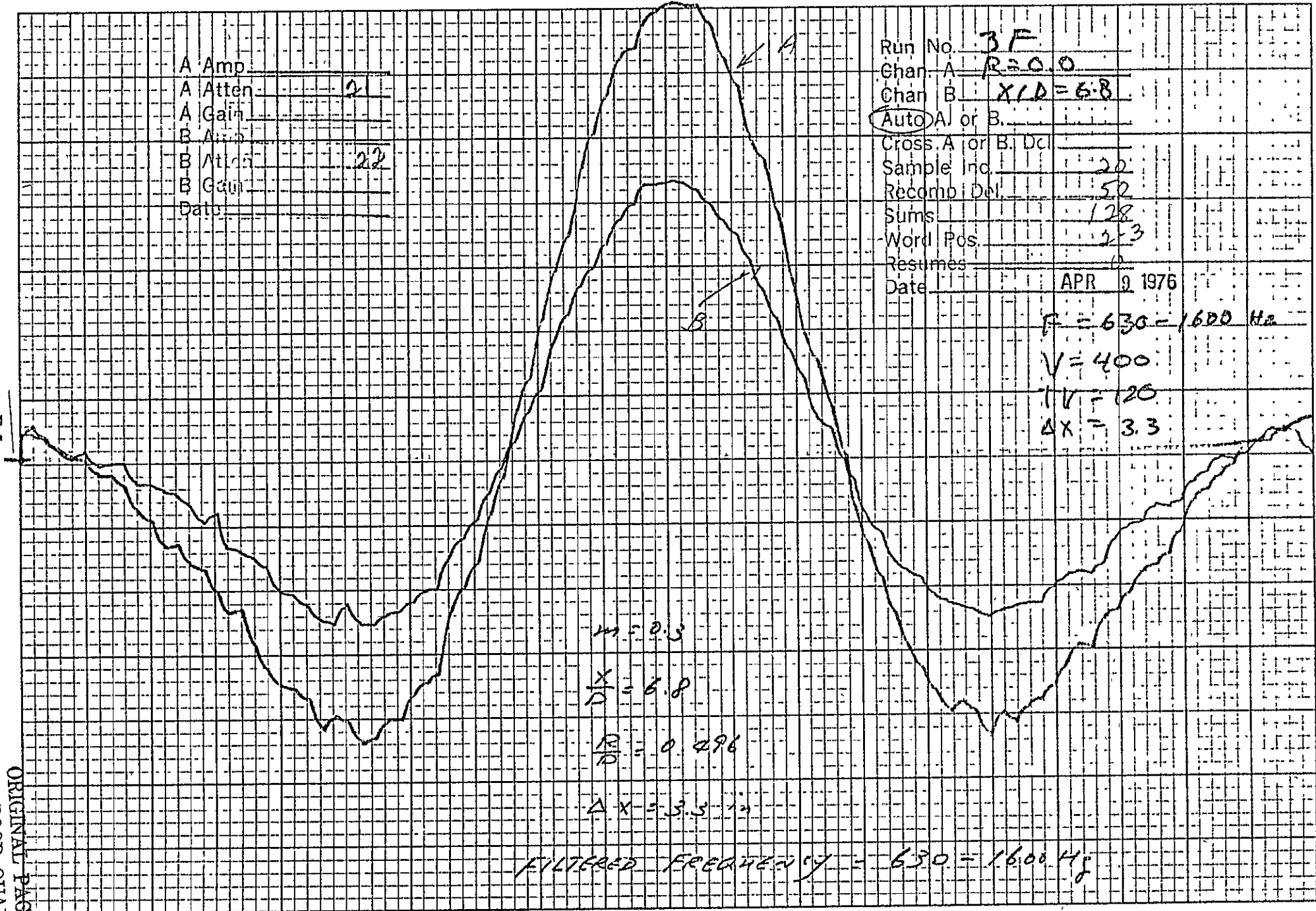
FILTERED FREQUENCY = 250-630 Hz

FILTERED AUTO CORRELATION

A Amp \_\_\_\_\_  
 A Atten 21  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 22  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. 3F  
 Chan. A R=0.0  
 Chan. B X/D=6.8  
 (Auto) A or B \_\_\_\_\_  
 Cross. A or B. Del \_\_\_\_\_  
 Sample Inc. 20  
 Recomb. Del. 50  
 Sums 128  
 Word Pos. 2-3  
 Restimes \_\_\_\_\_  
 Date APR 9 1976

$F = 630 - 1600 \text{ Hz}$   
 $V = 400$   
 $W = 120$   
 $\Delta X = 3.3$



$m = 0.3$   
 $\frac{X}{D} = 6.8$   
 $\frac{R}{D} = 0.496$   
 $\Delta X = 3.3$

FILTERED FREQUENCY =  $630 - 1600 \text{ Hz}$

E-5

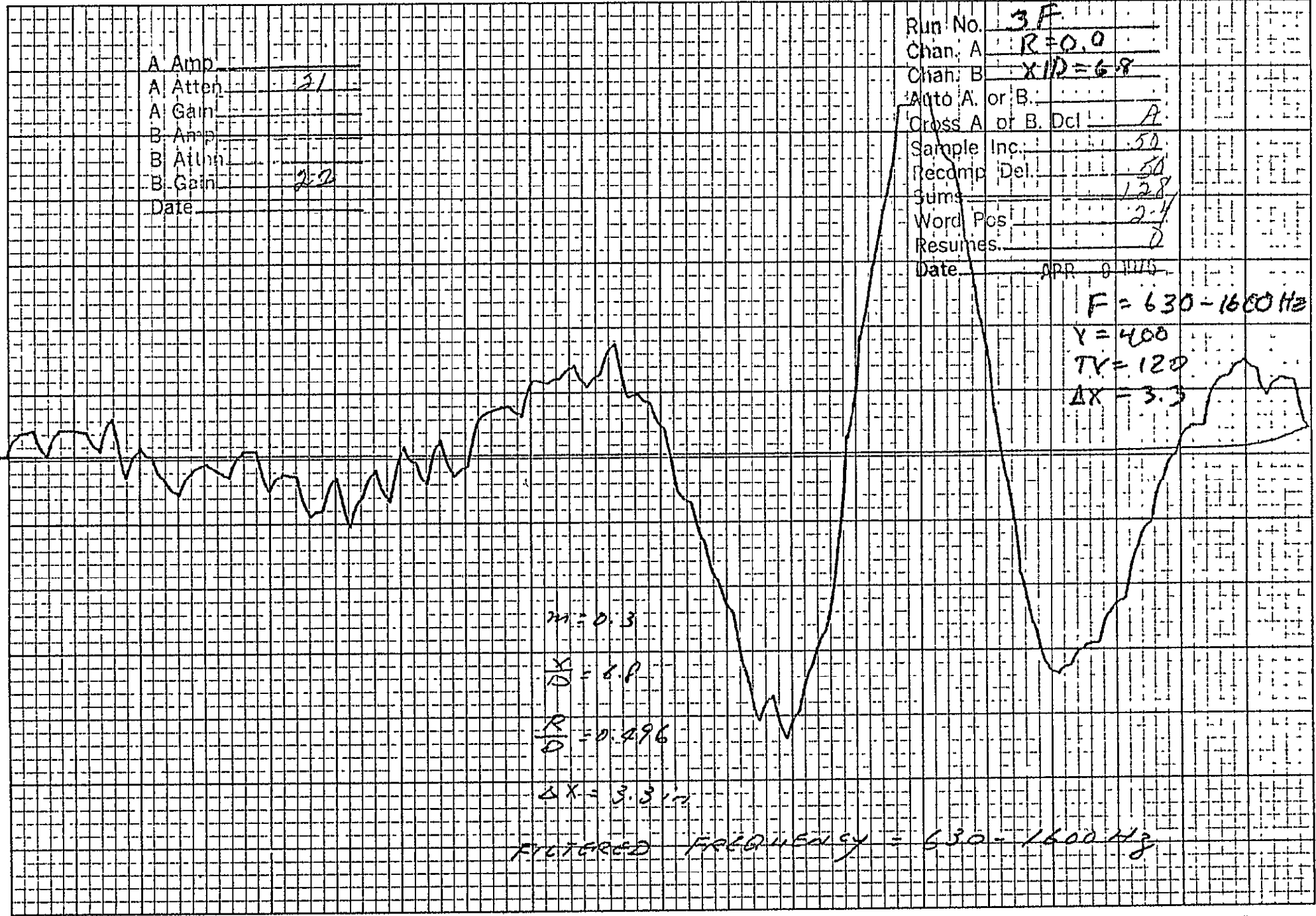
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FILTERED CROSS CORRELATION

A Amp \_\_\_\_\_  
 A Atten 21  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Attn \_\_\_\_\_  
 B Gain 22  
 Date \_\_\_\_\_

Run No. 3F  
 Chan. A R=0.0  
 Chan. B X10=6.8  
 Auto A. or B. \_\_\_\_\_  
 Cross A. or B. Dcl. A  
 Sample Inc. .50  
 Recomp Del. .50  
 Sums 128  
 Word Pos. 2-4  
 Resumes. 0  
 Date APR 9 1975

$F = 630 - 1600 \text{ Hz}$   
 $Y = 400$   
 $TY = 120$   
 $\Delta X = 3.3$



$m = 0.3$   
 $\frac{x}{D} = 6.8$   
 $\frac{R}{D} = 0.496$   
 $\Delta X = 3.3$

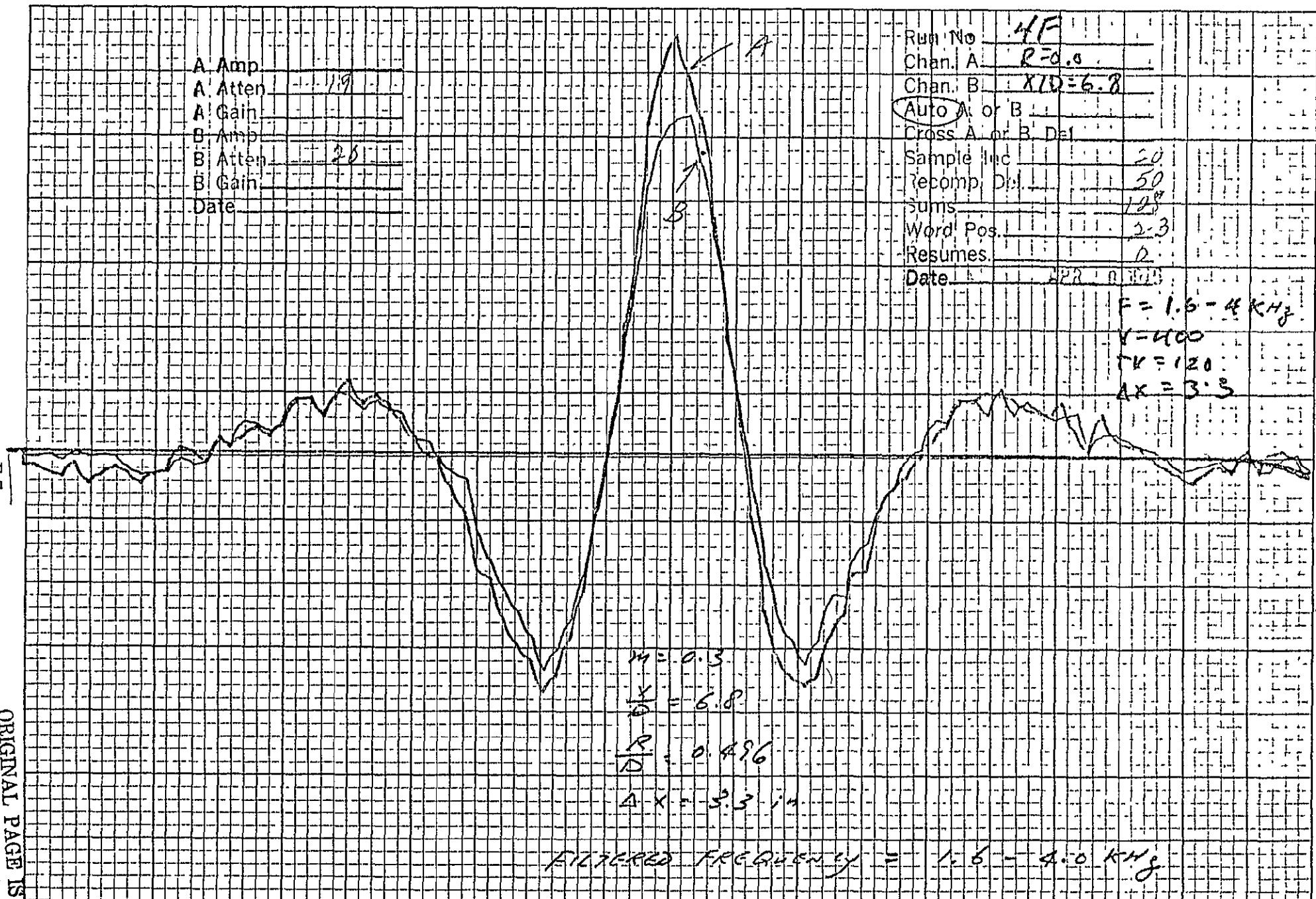
FILTERED FREQUENCY = 630 - 1600 Hz

FILTERED AUTOCORRELATION

A Amp  
 A Atten 1.9  
 A Gain  
 B Amp  
 B Atten 2.0  
 B Gain  
 Date

Run No 4F  
 Chan. A R=0.8  
 Chan. B X/D=6.8  
 Auto A or B  
 Cross A or B Def  
 Sample Inc 20  
 Recomp. Del. 50  
 Sums 128  
 Word Pos. 2-3  
 Resumes 2  
 Date APR 10 1963

F = 1.6 - 4.0 KHz  
 V = 400  
 TK = 120  
 AX = 3.3



$M = 0.3$   
 $\frac{X}{D} = 6.8$   
 $\frac{R}{D} = 0.496$   
 $\Delta X = 3.3$

FILTERED FREQUENCY = 1.6 - 4.0 KHz

E-7 ORIGINAL PAGE IS OF POOR QUALITY

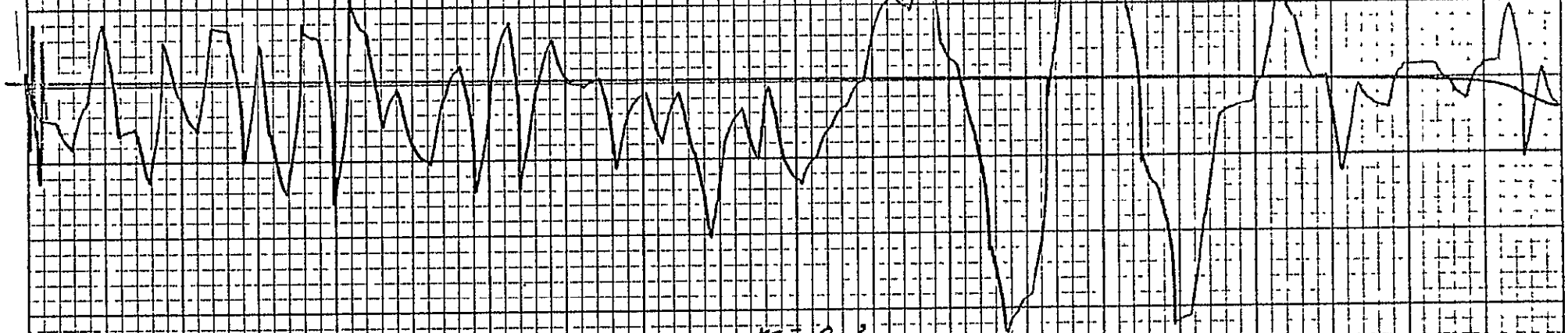


FILTERED CROSS CORRELATION

A Amp \_\_\_\_\_  
 A Atten 19  
 A Gain \_\_\_\_\_  
 B Amp \_\_\_\_\_  
 B Atten 20  
 B Gain \_\_\_\_\_  
 Date \_\_\_\_\_

Run No. 41F  
 Chan. A R=10.0  
 Chan. B X/D=6.8  
 Auto A. or B. \_\_\_\_\_  
 Cross A. or B. Dcl A  
 Sample Inc 50  
 Recomp Del 50  
 Sums 128  
 Word Pbs. 2-4  
 Resumes 0  
 Date APR 9 1976

F = 1.6 - 4.0 KHZ  
 V = 400  
 TV = 120  
 ΔX = 3.3



$M = 0.3$   
 $\frac{X}{D} = 6.8$   
 $\frac{R}{D} = 1.496$   
 $\Delta X = 3.3$

FILTERED FREQUENCY = 1.6 - 4.0 KHZ

B-8

F. Normalized Cross Correlation Coefficients

With the following definitions:

$A_A$  = Channel A attenuation for cross correlation

$A_B$  = Channel B attenuation for cross correlation

$A_A'$  = Channel A attenuation for auto correlation

$A_B'$  = Channel B attenuation for auto correlation

$R_{AB}$  = peak cross correlation read from raw data chart

$R_{AA}$  = peak autocorrelation read from raw data chart

$R_{BB}$  = peak autocorrelation read from raw data chart

$W_A, W_B, W_{AB}$  = word position appropriate for autocorrelation A, autocorrelation B, or cross correlation AB

$\gamma_A, \gamma_B, \gamma_{AB}$  = resumes factor appropriate for autocorrelation A, autocorrelation B, or cross correlation AB

The normalized cross correlation coefficient  $\hat{R}_{AB}$  is given by

$$\hat{R}_{AB} = \frac{10^{-A_A/10} 10^{-A_B/10} R_{AB} W_{AB} \gamma_{AB}}{\sqrt{10^{-2A_A'/10} R_{AA} W_A \gamma_A 10^{-2A_B'/10} R_{BB} W_B \gamma_B}}$$

The factor  $\gamma$  may be determined from Table F.1.

Table F.1

Relation of  $\gamma$  to Number of Resumes

<u>Resume</u>	<u><math>\gamma</math></u>
0	1
1	$\frac{1}{2}$
2	$\frac{1}{3}$
3	$\frac{1}{4}$

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Resume

8

h

$\frac{1}{5}$

Normalized cross correlation coefficients are plotted for fixed velocity ratio, in axial position X/D, and radial position R/D as a function of probe axial separation.

Sample Calculation

The following calculation was made for the first set of data in Section D; m = 0, X/D = 3, R/D = 0.363. ΔX = 0.6 in. The data are contained on pages D1 (Autocorrelation A), D2 (Autocorrelation B), and D3 (Cross Correlation).

$$A_A = 27$$

$$A_B = 27$$

$$A'_A = 27$$

$$A'_B = 27$$

$$R_{AB} = 27.8$$

$$R_{AA} = 20.0$$

$$R_{BB} = 18.0$$

$$W_A = 2-3$$

$$W_B = 2-3$$

$$W_{AB} = 2-4$$

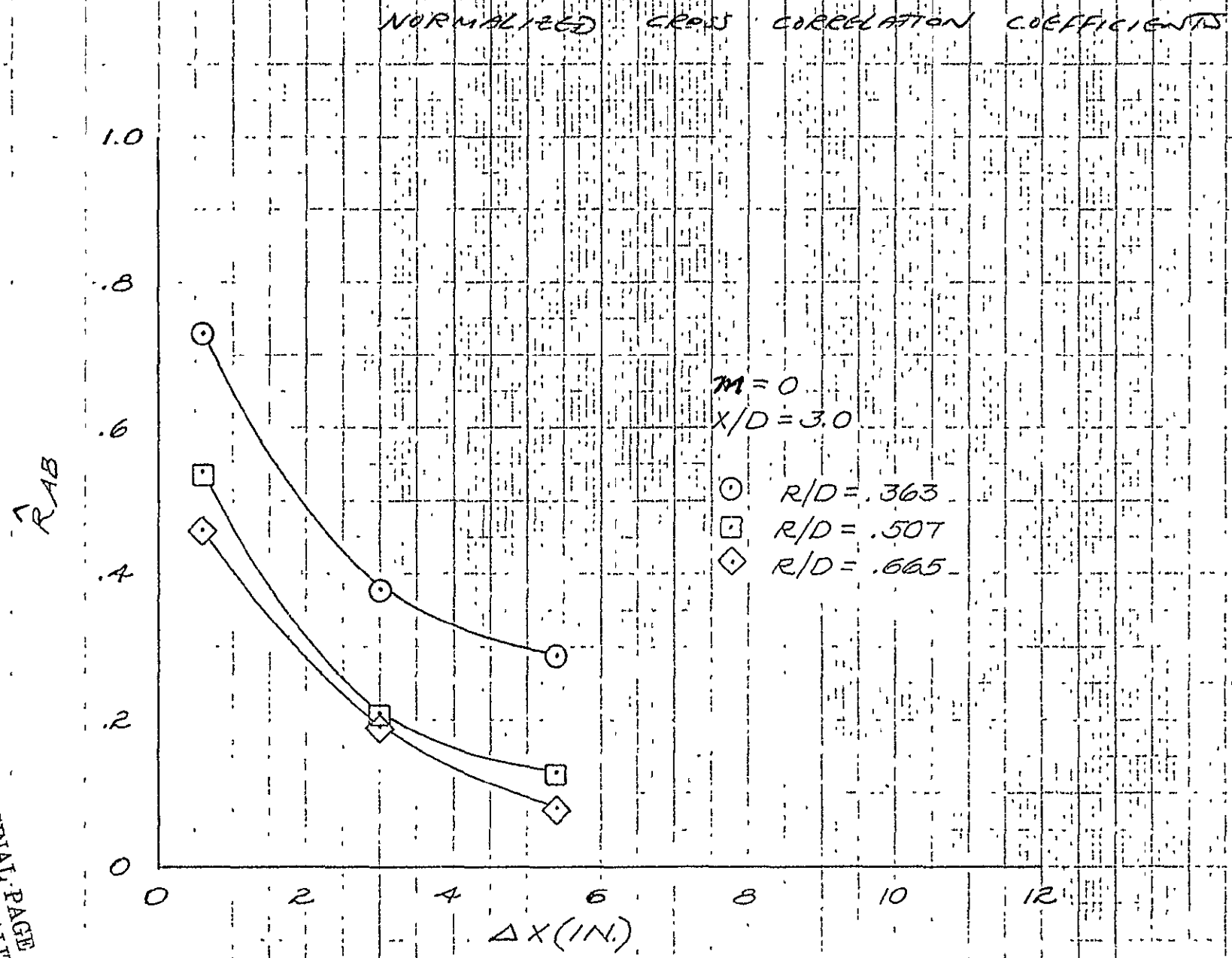
$$r_A = 1$$

$$r_B = 1$$

$$r_{AB} = 1$$

$$\text{Then } \hat{R}_{AB} = \frac{10^{-2.7} \times 10^{-2.7} \times 27.8 \times 2^{-4} \times 1}{\sqrt{10^{-5.4} \times 20 \times 2^{-3} \times 1 \times 10^{-5.4} \times 18 \times 2^{-3} \times 1}} = 0.73$$

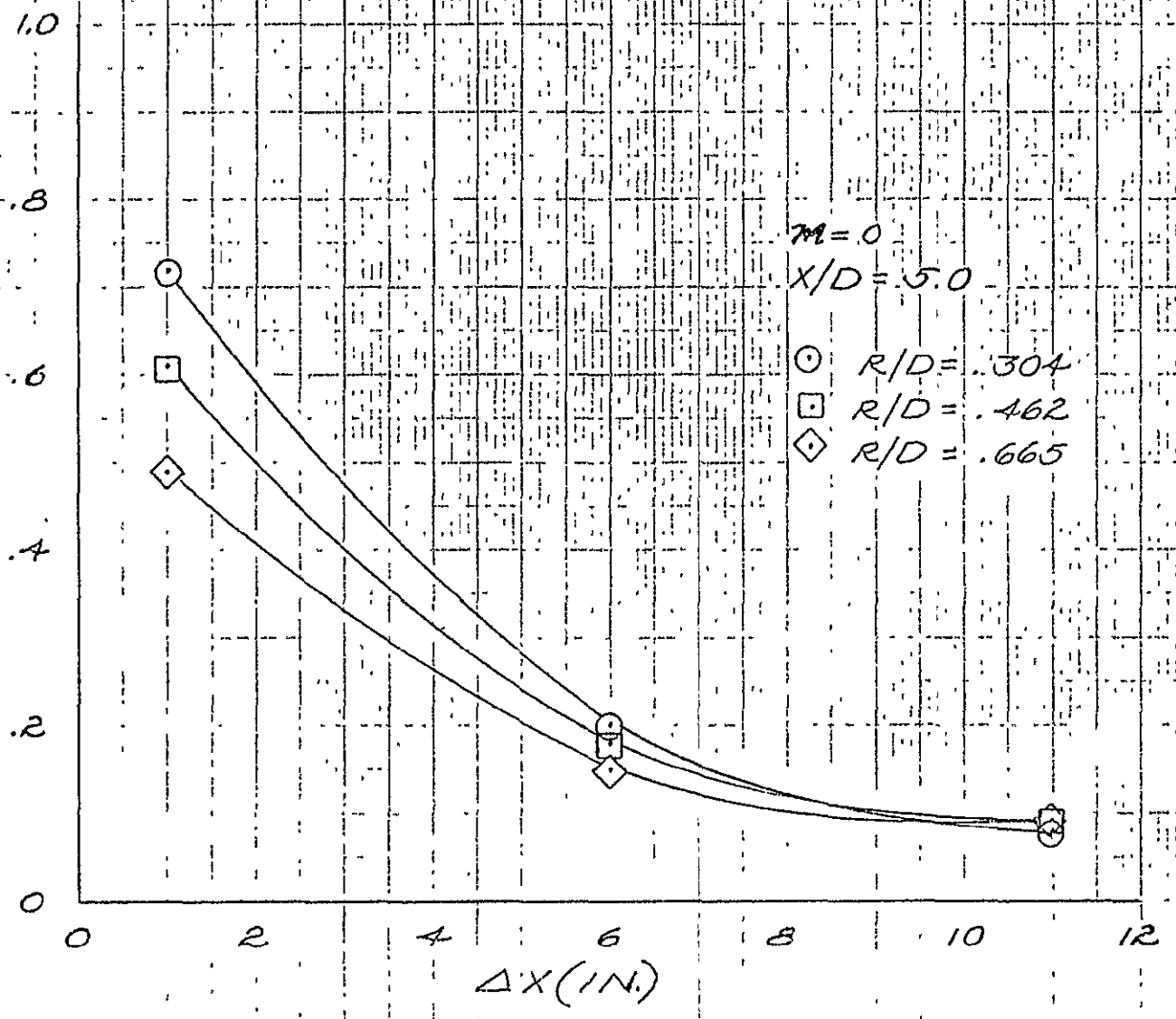
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NORMALIZED CROSS CORRELATION COEFFICIENTS

$\hat{r}_{AB}$

$M=0$   
 $X/D=5.0$   
 $\circ R/D=.304$   
 $\square R/D=.462$   
 $\diamond R/D=.665$

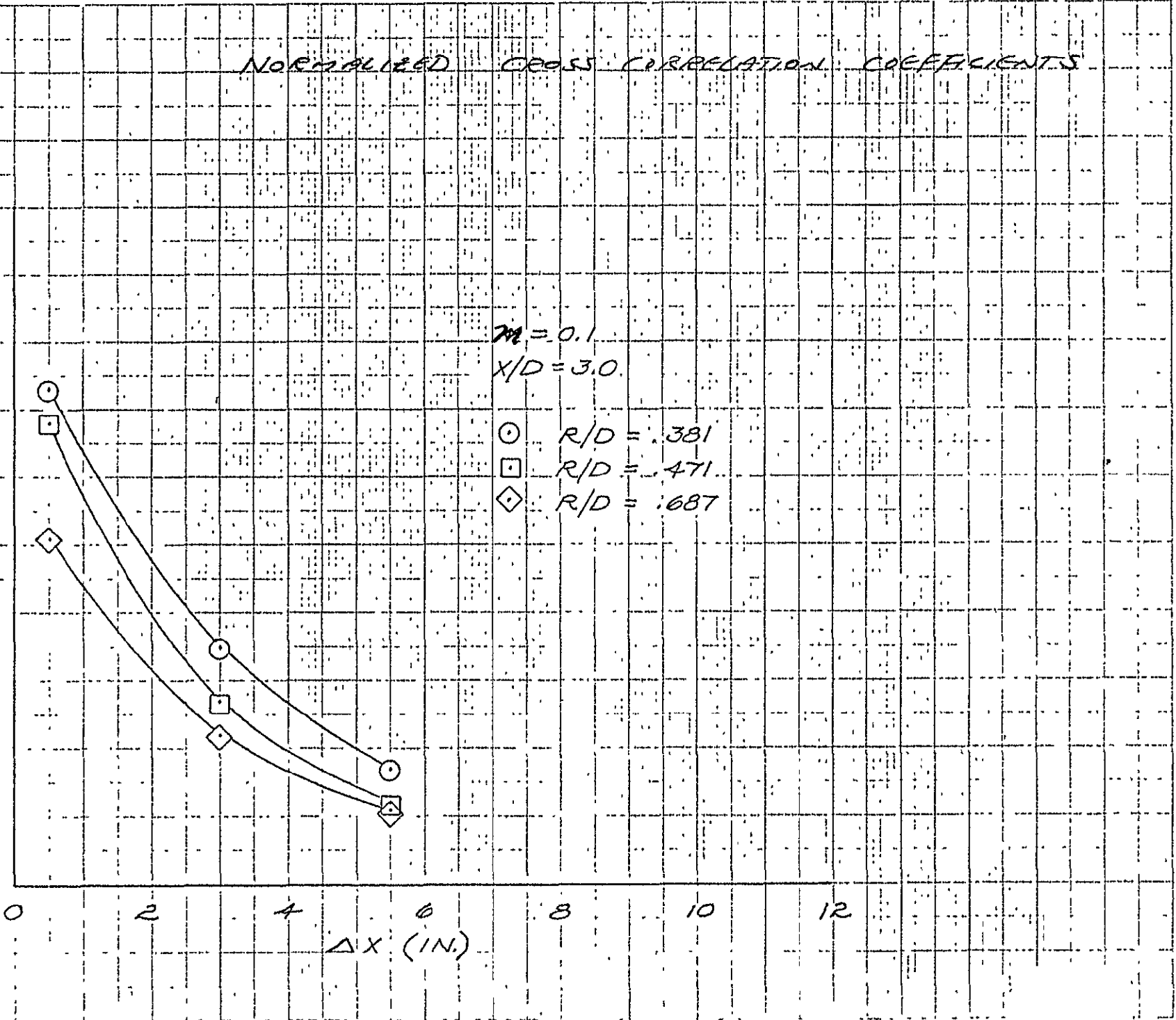


F-3

NORMALIZED CROSS-CORRELATION COEFFICIENTS

$r_{AB}$

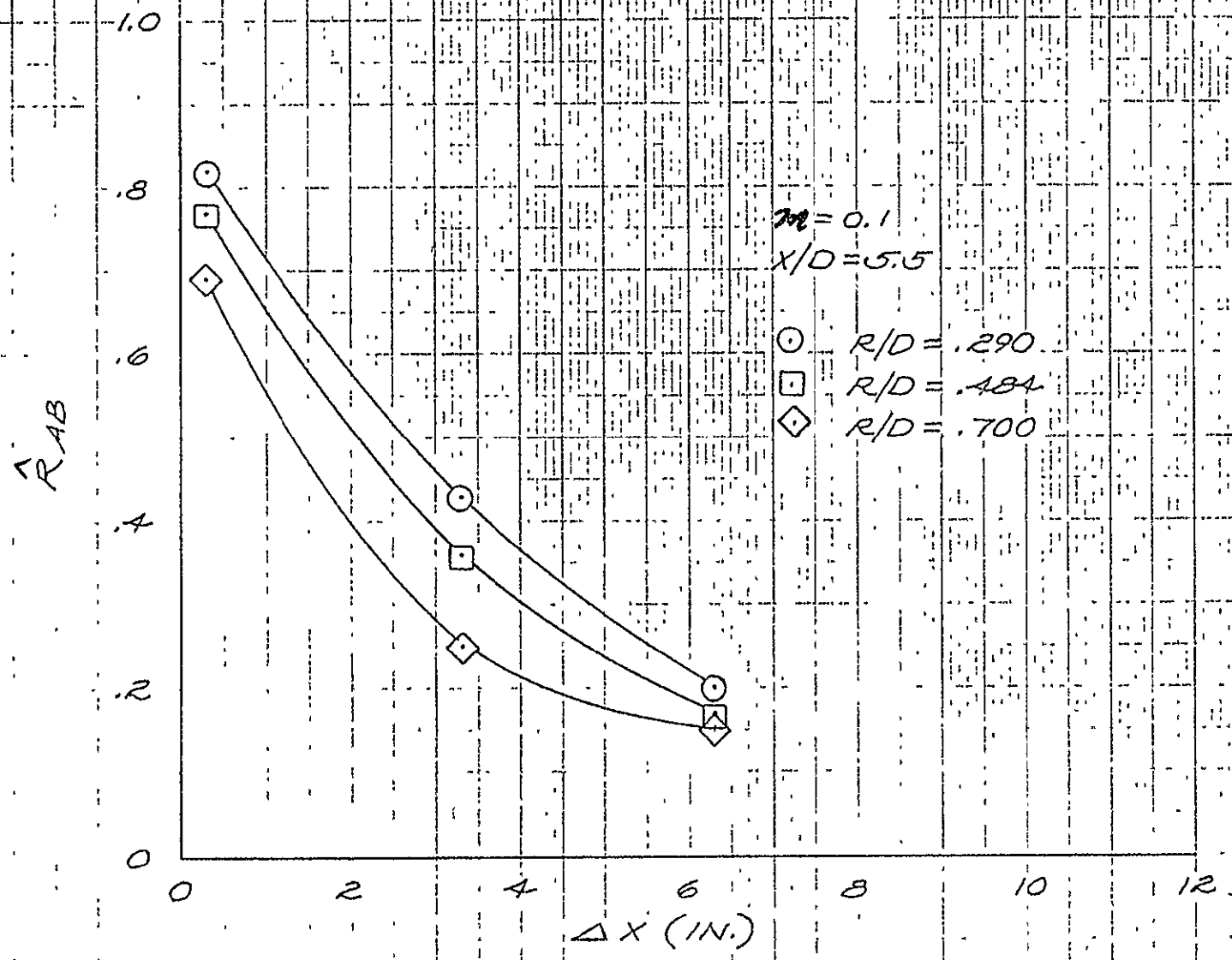
$M = 0.1$   
 $X/D = 3.0$   
○  $R/D = .381$   
□  $R/D = .471$   
◇  $R/D = .687$



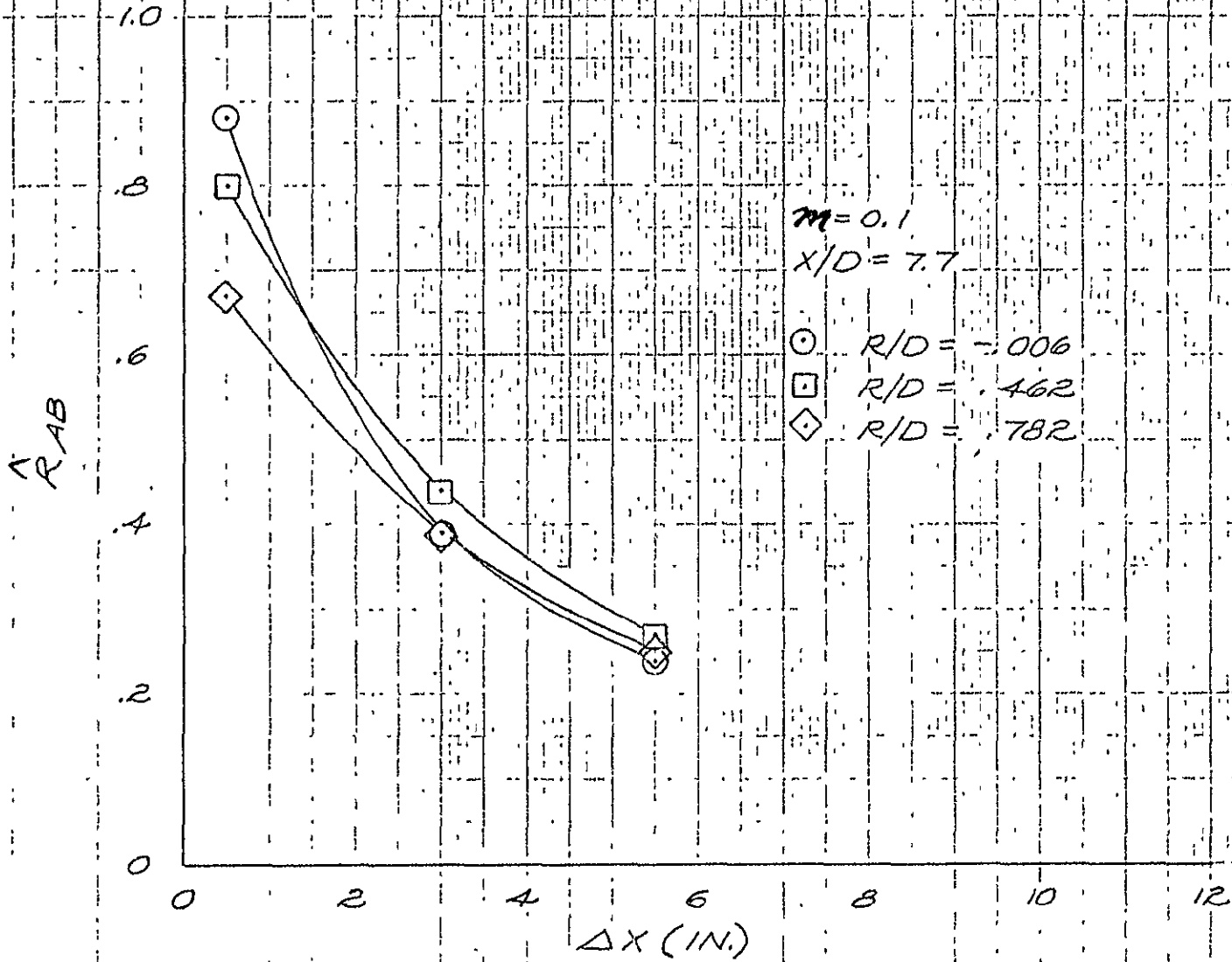
F4

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NORMALIZED CROSS-CORRELATION COEFFICIENTS

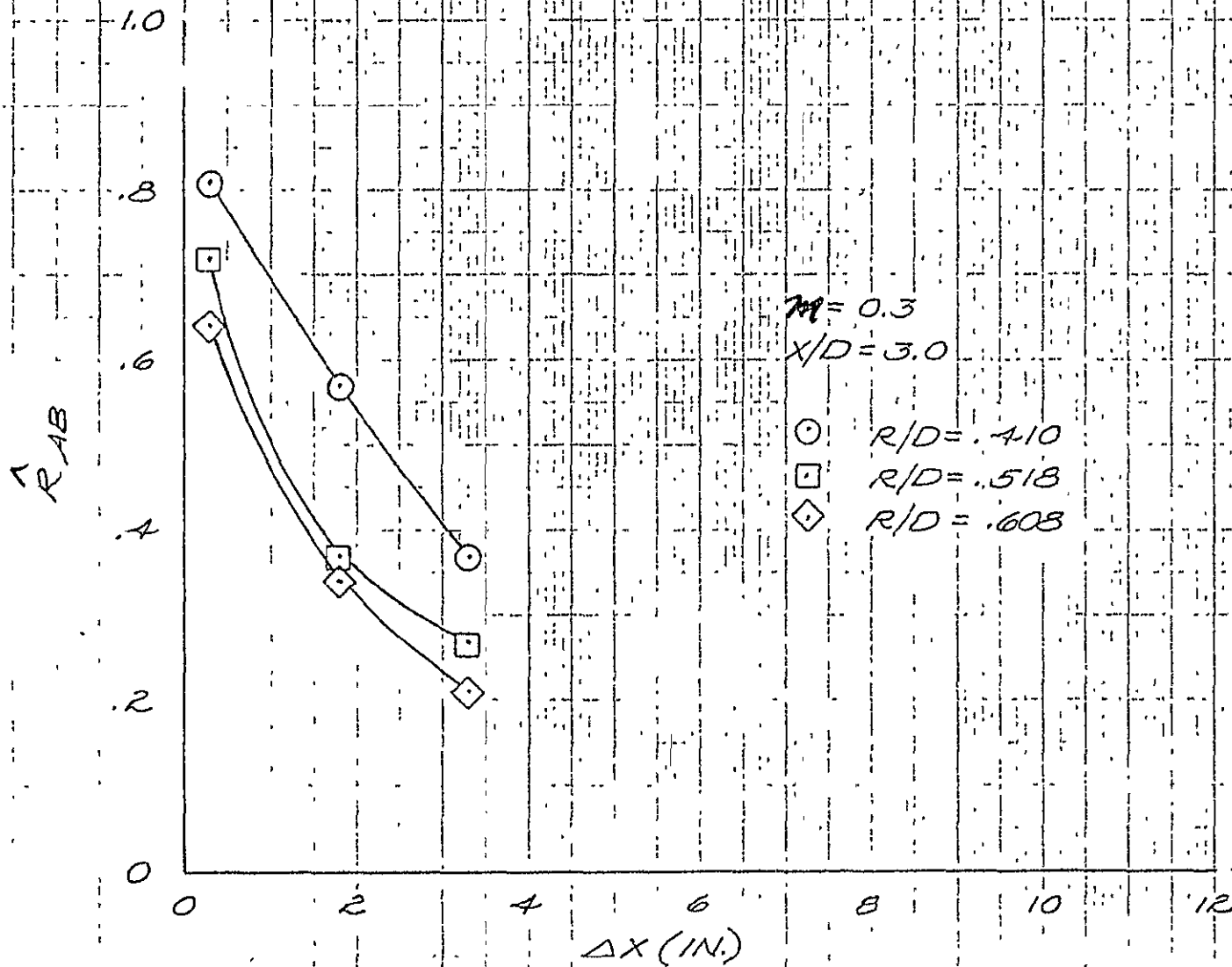


NORMALIZED CROSS CORRELATION COEFFICIENTS





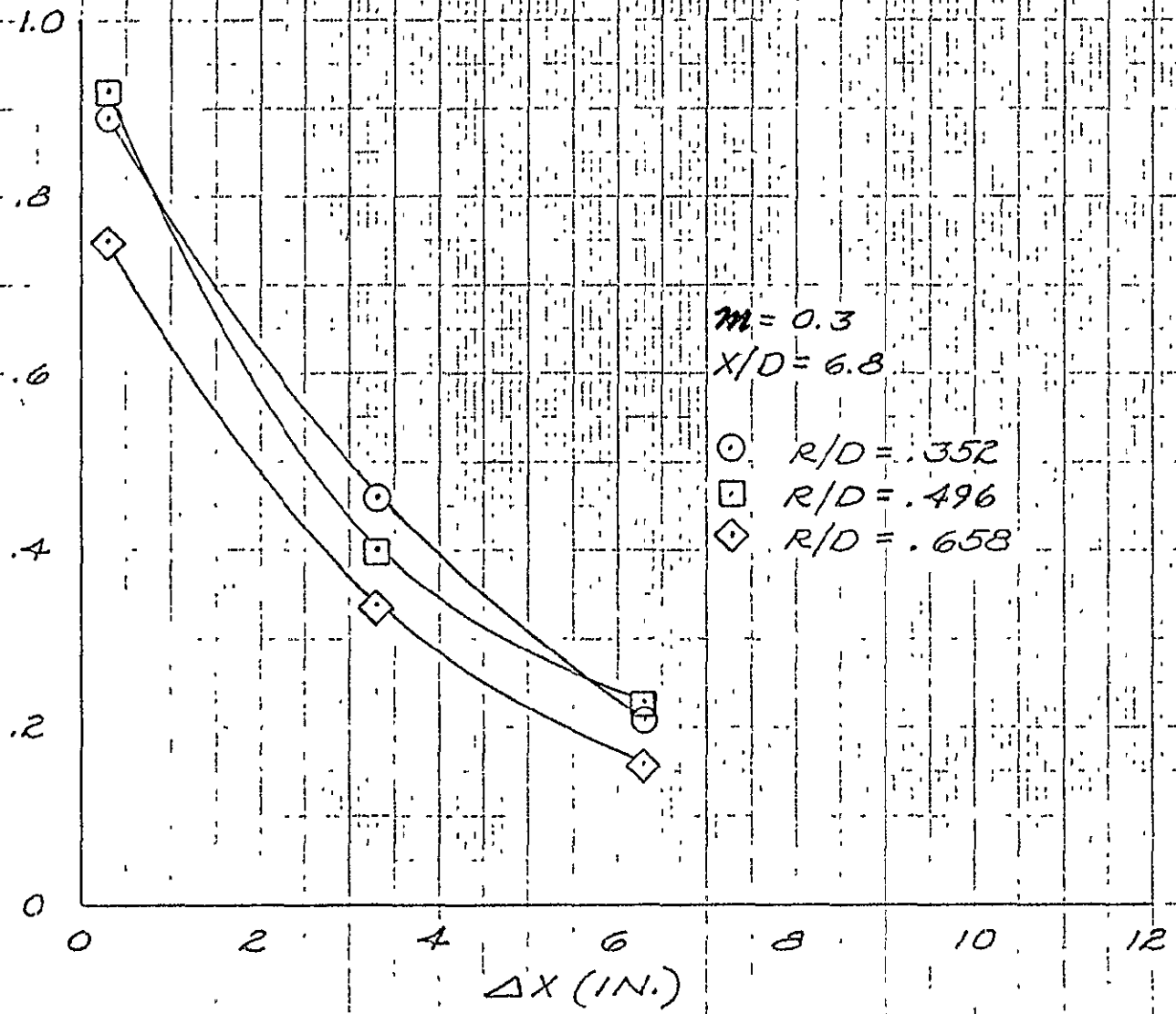
NORMALIZED CROSS CORRELATION COEFFICIENTS



$M = 0.3$   
 $X/D = 3.0$   
○  $R/D = .410$   
□  $R/D = .518$   
◇  $R/D = .608$

NORMALIZED CROSS CORRELATION COEFFICIENTS

$r_{AB}$



$M = 0.3$   
 $X/D = 6.8$   
 $\circ R/D = .352$   
 $\square R/D = .496$   
 $\diamond R/D = .658$

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# NORMALIZED CROSS CORRELATION COEFFICIENTS

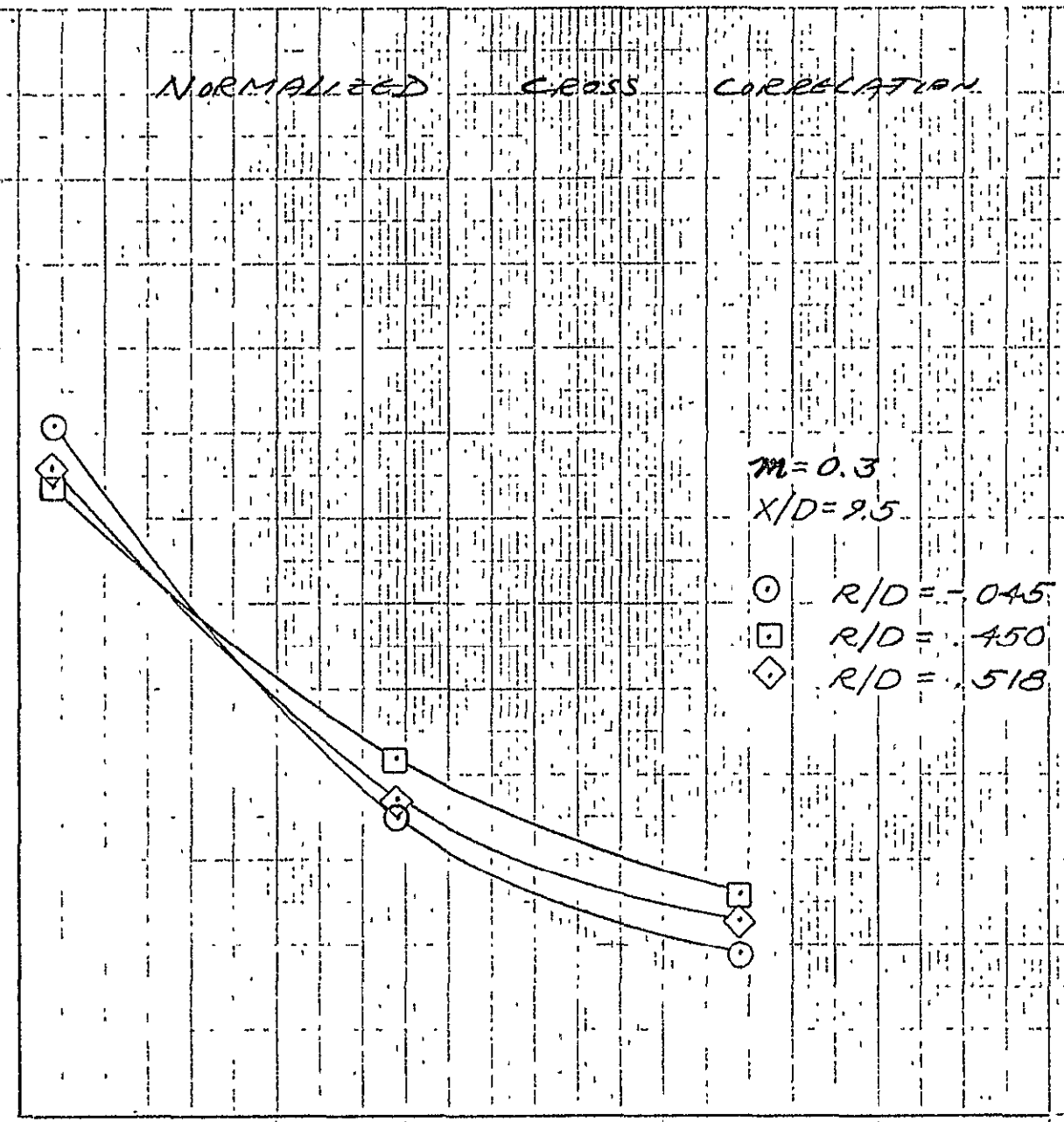
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$r_{AB}$

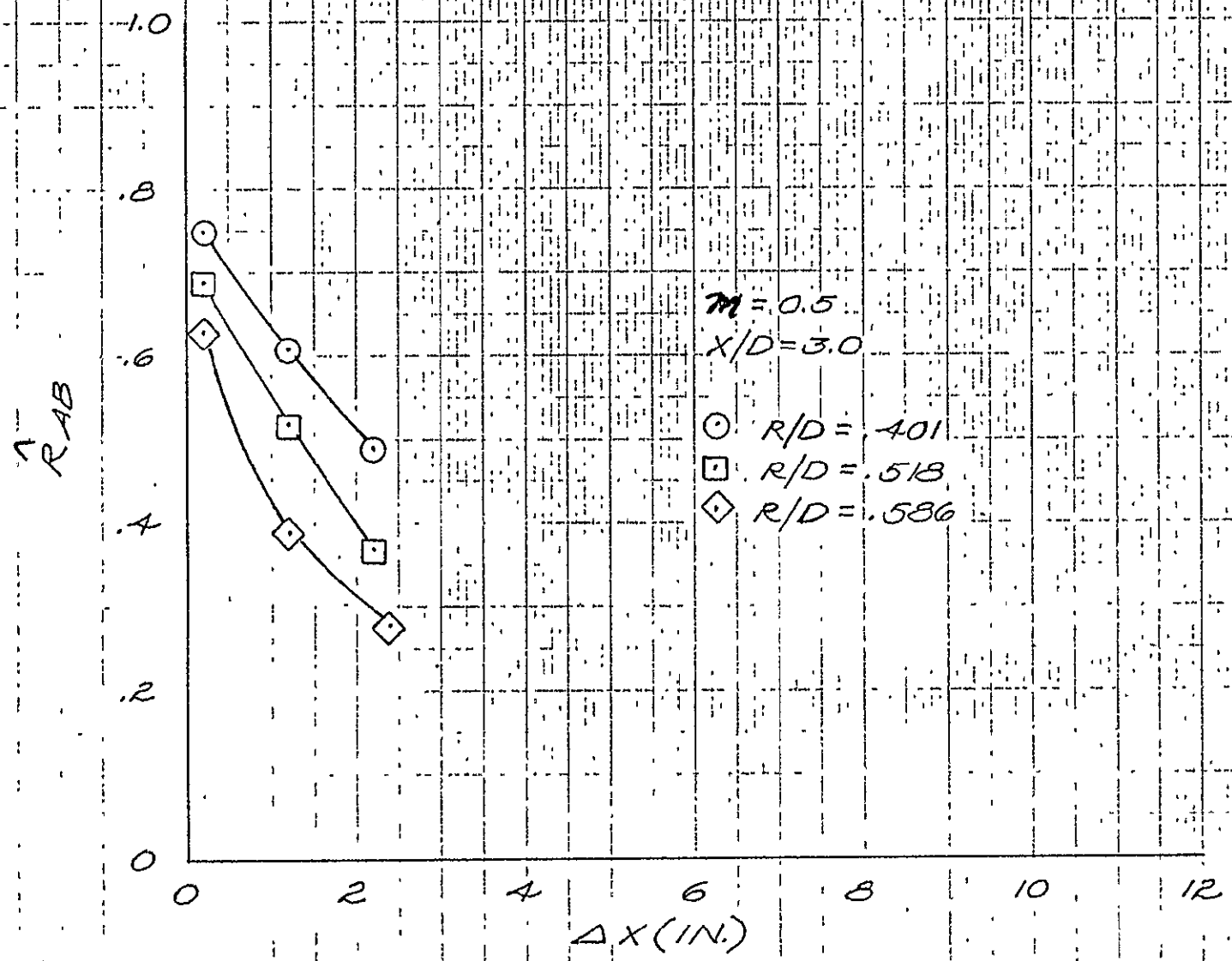
1.0  
0.8  
0.6  
0.4  
0.2  
0

$\Delta x$  (IN.)

$m = 0.3$   
 $x/D = 9.5$   
○  $R/D = 0.45$   
□  $R/D = 0.50$   
◇  $R/D = 0.518$

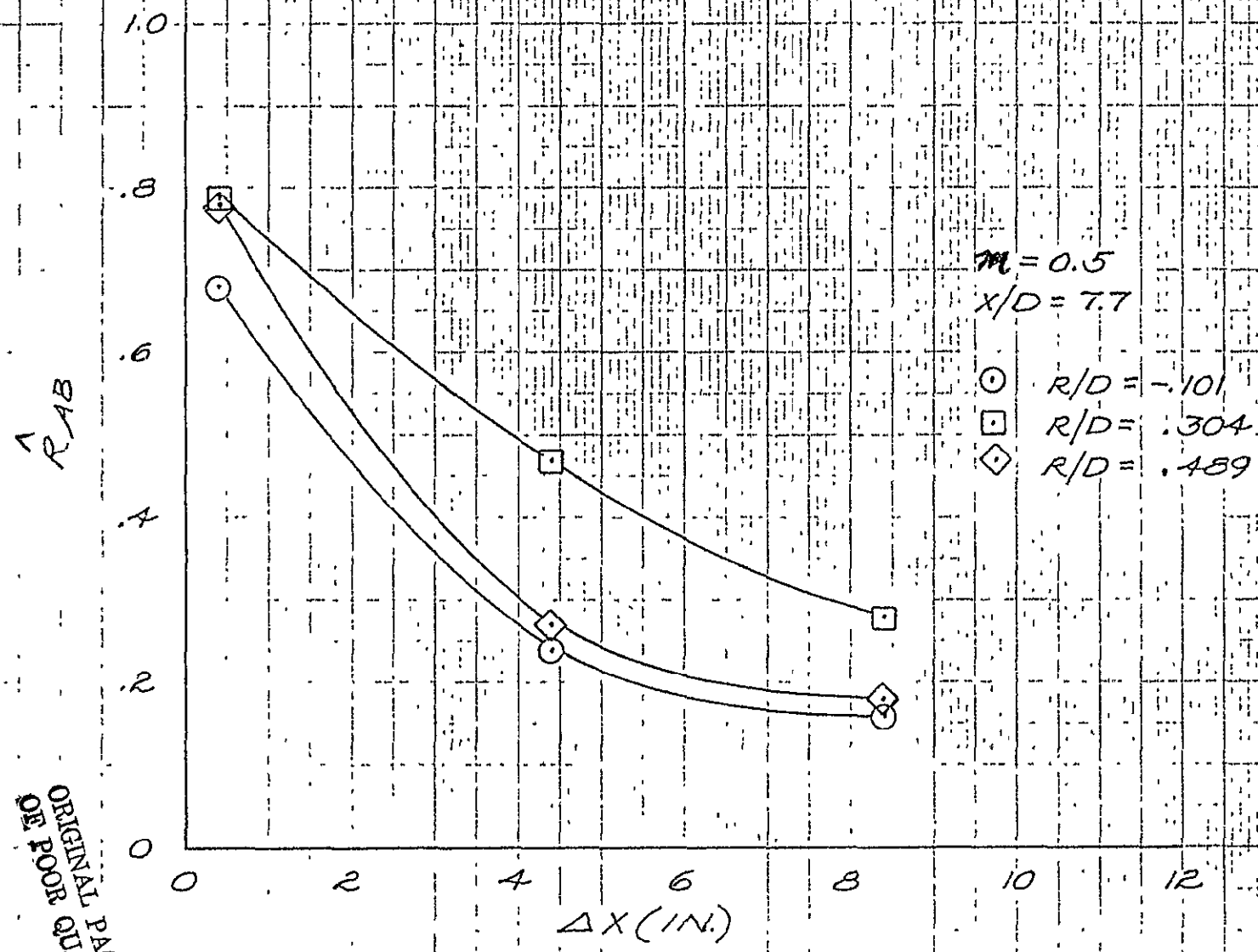


# NORMALIZED CROSS CORRELATION COEFFICIENTS



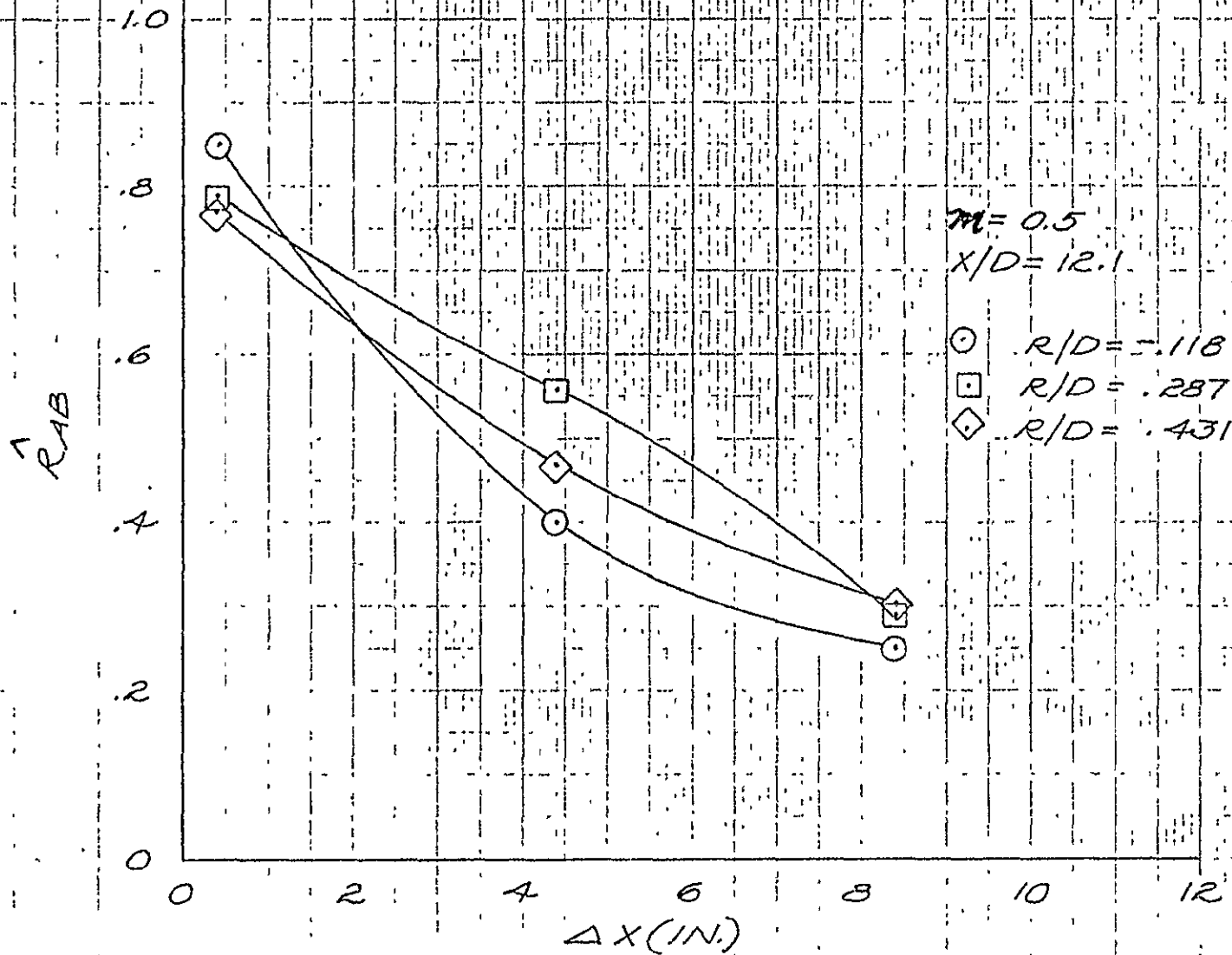
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NORMALIZED CROSS CORRELATION COEFFICIENTS



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NORMALIZED CROSS CORRELATION COEFFICIENTS



NORMALIZED CROSS CORRELATION COEFFICIENTS

1.0  
0.8  
0.6  
0.4  
0.2  
0

$R_{AB}$

$M = 0.3$   
 $X/D = 6.8$

$R/D = 0.496$   
 $\Delta x = 3.3$  in

FILTERED FREQUENCY (KHz)

- 0.1 - 0.25
- 0.25 - 0.63
- ◇ 0.63 - 1.60
- △ 1.60 - 4.00

0 2 4 6 8 10 12  
 $\Delta x$  (IN.)

513

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CONVECTION VELOCITY

$m = \frac{u_e}{u_j}$	$\frac{X}{D}$	$\frac{R}{D}$	$\Delta X$ (in)	$u_c$ (fps)	$m = \frac{u_e}{u_j}$	$\frac{X}{D}$	$\frac{R}{D}$	$\Delta X$ (in)	$u_c$ (fps)		
0	3.0	0.363	0.6	200	0.1	3.0	0.381	0.5	278		
		0.363	3.0	281			0.381	3.0	278		
		0.363	5.4	282			0.381	5.5	296		
			0.507	0.6		213			0.471	0.5	189
			0.507	3.0		230			0.471	3.0	263
			0.507	5.4		254			0.471	5.5	270
			0.665	0.6		106			0.687	0.5	194
			0.665	3.0		181			0.687	3.0	199
		∇	0.665	5.4		190		∇	0.687	5.5	202
	5.0	0.304	1.0	278		5.5	0.290	0.3	196		
		0.304	6.0	297			0.290	3.3	289		
		0.304	11.0	278			0.290	6.3	282		
			0.462	1.0		220			0.484	0.3	147
			0.462	6.0		250			0.484	3.3	239
			0.462	11.0		237			0.484	6.3	239
			0.665	1.0		167			0.700	0.3	86
			0.665	6.0		217			0.700	3.3	198
		∇	0.665	11.0		207		∇	0.700	6.3	202
							7.7	0.5	306		
								3.0	301		
								5.5	337		
			0.462	0.5		177			0.462	3.0	238
			0.462	5.5		239			0.462	0.5	123
			0.782	0.5		123			0.782	3.0	160
			0.782	3.0		160			0.782	5.5	189
		∇						∇			

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CONVECTION VELOCITY

$m = \frac{U_c}{U_j}$	$\frac{x}{D}$	$\frac{R}{D}$	$\Delta x$ (in)	$U_c$ (FPS)	$m = \frac{U_c}{U_j}$	$\frac{x}{D}$	$\frac{R}{D}$	$\Delta x$ (in)	$U_c$ (FPS)
0.3	3.0	0.410	0.3	240	0.5	3.0	0.401	0.2	333
		0.410	1.8	319			0.401	1.2	333
		0.410	3.3	299			0.401	2.2	340
		0.518	0.3	216			0.518	0.2	269
		0.518	1.8	259			0.518	1.2	286
		0.518	3.3	263			0.518	2.2	306
		0.608	0.3	174			0.586	0.2	157
		0.608	1.8	246			0.586	1.2	286
	∇	0.608	3.3	246		∇	0.586	2.4	276
6.8	6.8	0.352	0.3	219	7.7	-101	0.4	980	
		0.352	3.3	299			4.4	367	
		0.352	6.3	309			8.4	375	
		0.496	0.3	179			0.304	0.4	292
		0.496	3.3	262			0.304	4.4	324
		0.496	6.3	269			0.304	8.4	328
0.658	0.658	0.3	132	0.489	0.4	256			
		3.3	237			4.4	302		
		6.3	236			8.4	295		
9.5	9.5	-0.45	0.4	347	12.1	-118	0.4	483	
		-0.45	4.4	327			4.4	353	
		-0.45	8.4	318			8.4	350	
		0.450	0.4	185			0.287	0.4	298
		0.450	4.4	256			0.287	4.4	319
		0.450	8.4	252			0.287	8.4	306
		0.518	0.4	139			0.431	0.4	300
		0.518	4.4	255			0.431	4.4	286
∇	∇	0.518	8.4	238	∇	∇	0.431	8.4	269

# CONVECTION VELOCITY

$$\frac{R}{D} = 0.496$$

$m = \frac{U_e}{U_j}$	$\frac{x}{D}$	$\Delta x$ (in)	FILTERED FREQUENCY (KHz)	VC (fps)
0.3	6.8	3.3	.1 - .25	217
			.25 - .63	250
			.63 - 1.60	275
Y	Y	Y	1.60 - 4.00	285

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