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EXTINGUISHMENT OF SOLID PROPELLANTS
BY RAPID DEPRESSURIZATION
(A SUPPLEMENT TO AMS REPORT NO. 880)*

Aerospace and Mechanical Sciences Report
No. 880-S

by

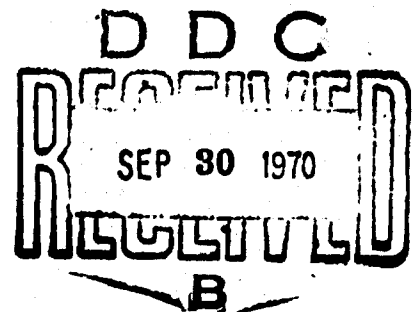
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January, 1970

Transmitted by:


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*As described in Appendix III-D, page 189 of AMS Report No. 880.

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SECTION I

EXPERIMENTAL PRESSURE VERSUS TIME DATA

A. Introduction

The following experimental pressure versus time data are presented in both tabular and plotted form*. Also included in the listings are the coefficients of the least squares fit polynomials used in the theoretical tests and in the plots presented herein.

The tabulated data are in the dimensions of psig versus seconds, as are the data plots. The polynomial used for the least squares fit was of the form:

$$\ln(P) = a_0 + a_1 \tau + a_2 \tau^2 + \dots + a_n \tau^n$$

where $P = p/p_{\text{initial}}$

$$\tau = t / (\alpha_p / r_{\text{ref}}^2)$$

$$\text{and } n = \begin{cases} 5 & \text{for 10 input points.} \\ 6 & \text{for 12 input points.} \\ 7 & \text{for 14 input points.} \end{cases}$$

Many of the pressure traces do not go all the way to 0.0 psig because the final trailoff in the test chamber was relatively slow and was occasionally deleted from the input to the theoretical prediction program.

The pressure versus time data for Batches No. 958 and No. 960 were not used in the theoretical prediction and are available only in the form of Visicorder graph records produced at the time of the experiments.

*The plots were made using a Calcomp 560 automatic plotter.

B: Tabulated and Plotted Data

BATCH # 944 / 82.5% AP, 27.5% PBAA

DATA FROM RUN # 119

TIME	P	LN(P)
0.0	1090.0	0.0
0.0007	900.0	-0.1915
0.0029	700.0	-0.4429
0.0047	565.0	-0.5571
0.0087	400.0	-1.0025
0.0097	345.0	-1.1504
0.0147	233.0	-1.5479
0.0197	163.0	-1.9002
0.0247	125.0	-2.1656
0.0297	95.0	-2.4401

$$T = (TIME * REF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

$A = -0.1276393900-01$ $E = 0.5296144270-02$
 $B = -0.5410312390-00$ $F = -0.4607579490-03$
 $C = 0.1726497310-00$ $G = 0.1655153330-04$
 $D = -0.4449636920-01$ $H = -0.2304346750-06$

TIME	P	LN(P)
0.0397	80.0	-2.5119
0.0497	60.0	-2.8976
0.0597	53.0	-3.0236
0.0797	45.0	-3.1873

DATA FROM RUN # 120

TIME	P	LN(P)
0.0	1090.0	0.0
0.0037	560.0	-0.5660
0.0087	295.0	-1.3070
0.0137	190.0	-1.7467
0.0187	125.0	-2.1656
0.0237	92.0	-2.4721
0.0287	63.0	-2.7744
0.0337	53.0	-3.0236
0.0387	42.0	-3.2563
0.0437	30.0	-3.5927

$$T = (TIME * REF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

$A = 0.1206169340-01$ $E = 0.1691070500-02$
 $B = -0.7442519300-00$ $F = -0.9127413930-04$
 $C = 0.1258304390-00$ $G = 0.2706752760-05$
 $D = -0.1826933050-01$ $H = -0.3393377750-07$

TIME	P	LN(P)
0.0537	24.0	-3.8159
0.0687	20.0	-3.9982
0.0003	951.9	-0.1355
0.0015	812.2	-0.2942

DATA FROM RUN # 121

TIME	P	LN(P)
0.0	1090.0	0.0
0.0237	490.0	-0.7977
0.0387	240.0	-1.5115
0.0137	135.0	-2.0663
0.0187	82.0	-2.5354
0.0237	53.0	-2.9317
0.0287	47.0	-3.1419
0.0337	33.0	-3.3545
0.0437	25.0	-3.7732
0.0537	15.0	-4.2340

$$T = (TIME * REF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

$A = 0.4453517310-02$ $E = 0.1101725450-01$
 $B = -0.9791620550-00$ $F = -0.3923763240-03$
 $C = 0.2741820360-00$ $G = 0.3536953780-04$
 $D = -0.7215313750-01$ $H = -0.5639572730-06$

TIME	P	LN(P)
0.0637	10.0	-4.6075
0.0005	970.4	-0.1033
0.0011	809.5	-0.2956
0.0017	672.4	-0.4520

DATA FROM RUN # 122

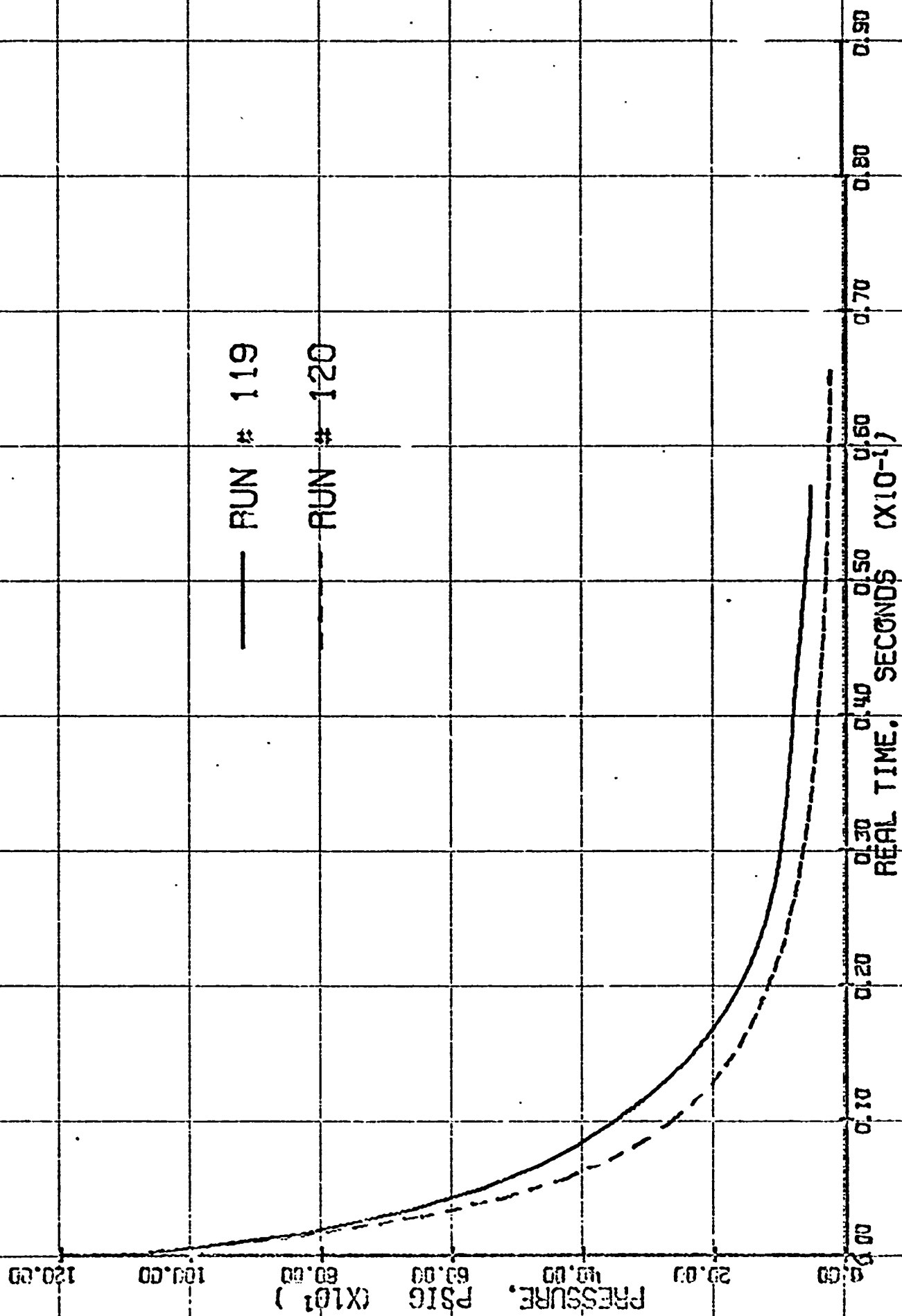
TIME	P	LN(P)
0.0	1090.0	0.0
0.0051	235.0	-1.2313
0.0101	110.0	-1.9004
0.0151	64.0	-2.0664
0.0201	21.0	-3.3547
0.0251	20.0	-3.4720
0.0305	50.0	-2.1441
0.0311	50.7	-2.5117
0.0317	462.0	-0.5007
0.0324	300.0	-1.7110

$$T = (TIME * REF**2) / ALPHA$$

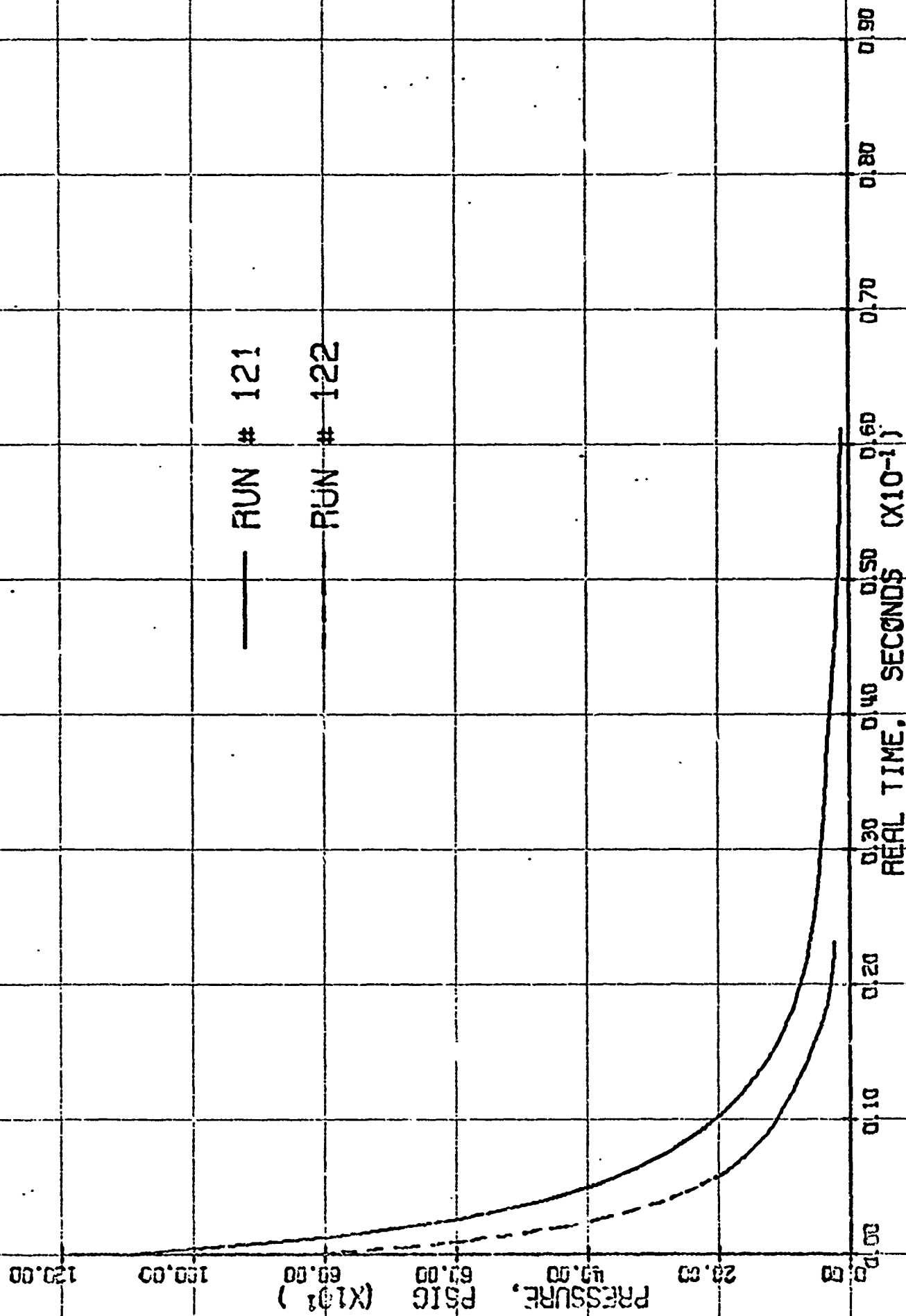
$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

$A = 0.1141517950-01$ $E = 0.1434705010-03$
 $B = -0.1305515450-01$ $F = -0.3253644920-01$
 $C = 0.5187970050-00$ $G = 0.2652173150-02$
 $D = -0.3120040360-00$ $H = -0.1558840230-03$

TIME	P	LN(P)
0.0030	352.0	-0.3251
0.0034	300.7	-0.9347
0.0042	266.2	-1.1064
0.0055	203.6	-1.3747



PRESSURE VS TIME DATA FOR BATCH # 944



PRESSURE VS TIME DATA FOR BATCH # 944

BATCH # 944 / 32.5% AP, 27.5% PBAA

DATA FROM RUN # 123

TIME	P	LN(P)
0.0	972.0	0.0
0.0010	700.0	-0.3233
0.0023	500.0	-0.6547
0.0030	405.0	-0.8755
0.0044	300.0	-1.1756
0.0073	200.0	-1.5310
0.0080	130.0	-1.5864
0.0093	140.0	-1.7377
0.0119	120.0	-2.0919
0.0130	82.0	-2.4726

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.6726131370-02$ $E = -0.3380337630-00$
 $B = -0.9233332650-00$ $F = 0.7673241770-01$
 $C = -0.4951015310-00$ $G = -0.8573347850-02$
 $D = 0.7190786520-00$ $H = 0.3783953950-03$

TIME	P	LN(P)
0.0157	60.0	-2.7650
0.0180	42.0	-3.1417
0.0198	30.0	-3.4782
0.0230	25.0	-3.6605

DATA FROM RUN # 124

TIME	P	LN(P)
0.0	905.0	0.0
0.0009	645.0	-0.3337
0.0059	225.0	-1.3913
0.0109	113.0	-2.0505
0.0159	60.0	-2.7136
0.0209	27.0	-3.5121
0.0259	25.0	-3.5891
0.0009	577.0	-0.2903
0.0016	548.7	-0.5004
0.0022	453.9	-0.5791

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.1099035770-01$ $E = -0.4129228020-00$
 $B = -0.9791033730-00$ $F = 0.9456037810-01$
 $C = -0.5645435100-00$ $G = -0.1045394220-01$
 $D = 0.8571057650-00$ $H = 0.4472570250-03$

TIME	P	LN(P)
0.0023	334.8	-0.8552
0.0034	327.8	-1.0155
0.0041	277.9	-1.1806
0.0053	220.9	-1.4102

DATA FROM RUN # 125

TIME	P	LN(P)
0.0	330.0	0.0
0.0017	335.0	-0.3525
0.0062	350.0	-0.7220
0.0103	192.0	-1.5224
0.0153	105.0	-2.1260
0.0203	67.0	-2.5752
0.0253	45.0	-2.9733
0.0303	23.0	-3.5444
0.0353	15.0	-4.0719
0.0023	720.5	-0.1029

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.2668540470-01$ $E = -0.2003176800-00$
 $B = 0.1163671440-00$ $F = 0.2972212720-01$
 $C = -0.1152456740-01$ $G = -0.2202550200-02$
 $D = 0.7003618540-00$ $H = 0.6424557050-04$

TIME	P	LN(P)
0.0029	594.4	-0.3924
0.0036	506.4	-0.5526
0.0042	440.0	-0.6931
0.0043	362.0	-0.8322

DATA FROM RUN # 126

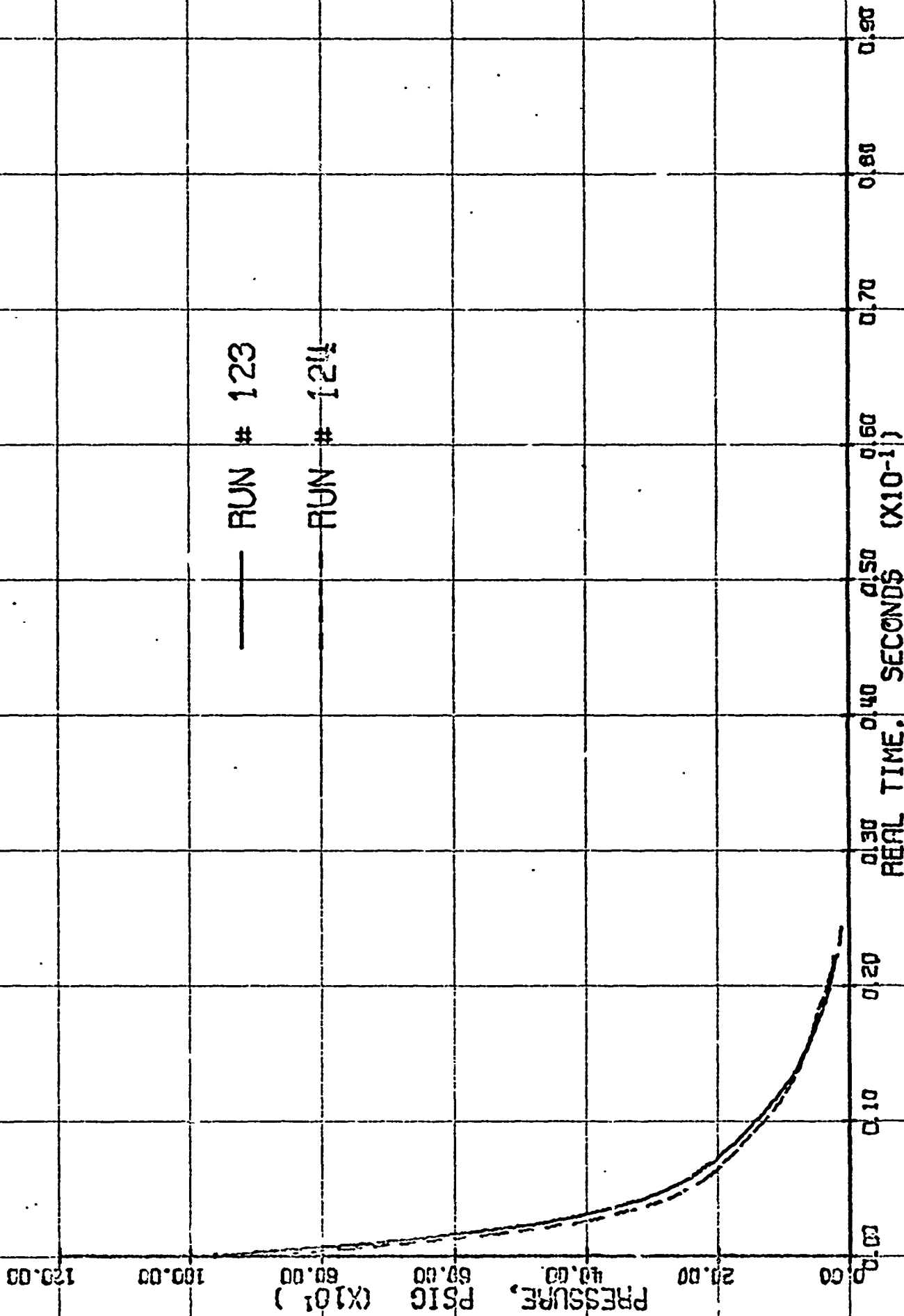
TIME	P	LN(P)
0.0	913.0	0.0
0.0010	705.0	-0.2560
0.0060	243.0	-1.1582
0.0110	140.0	-1.7470
0.0160	90.0	-2.3224
0.0210	55.0	-2.7140
0.0260	30.0	-3.4210
0.0310	25.0	-3.6512
0.0006	737.2	-0.1523
0.0012	650.2	-0.3445

$$T = (TIME * RREF ** 2) / ALPHA$$

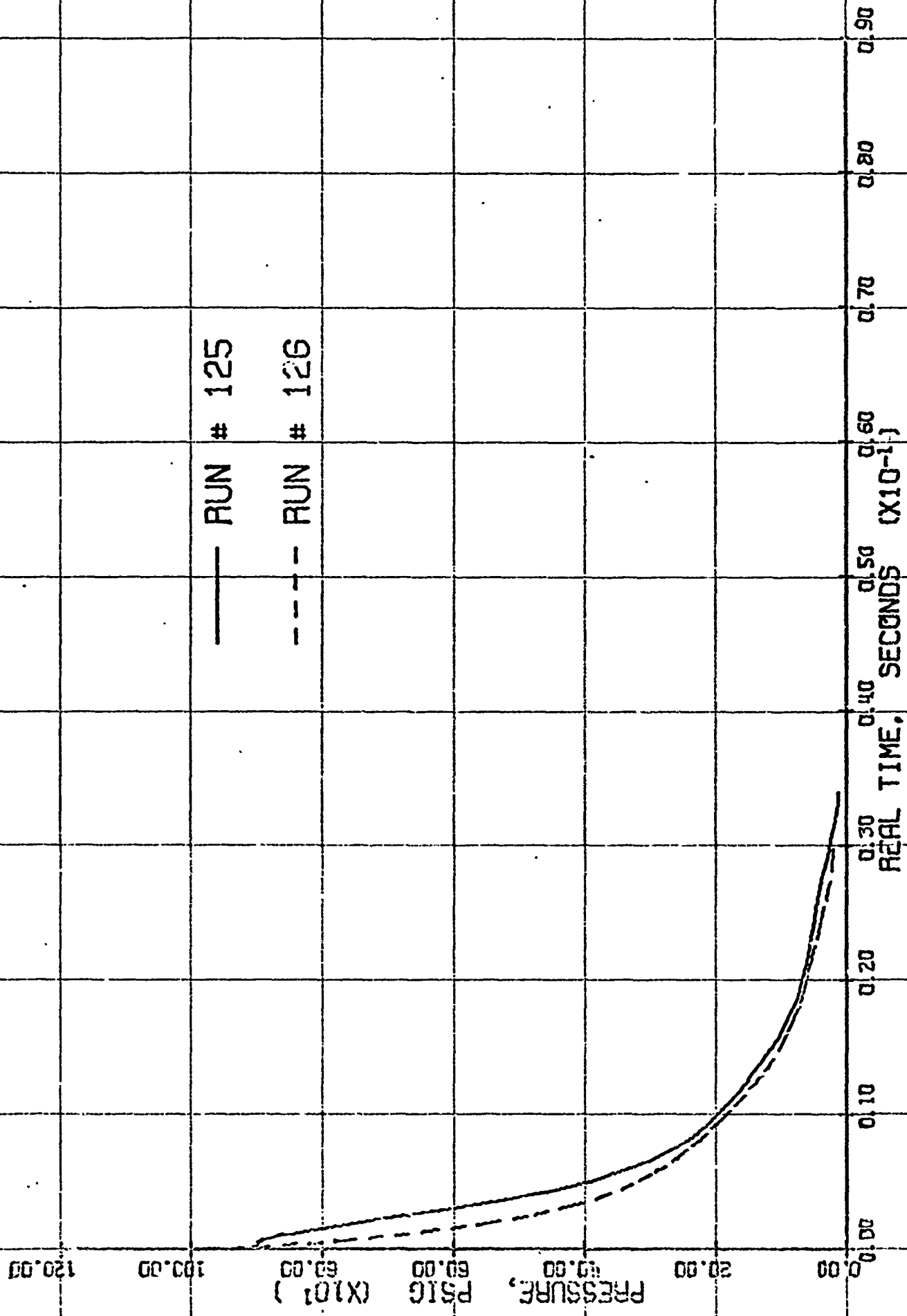
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.2218045950-01$ $E = -0.4629251220-01$
 $B = -0.1147106200-01$ $F = 0.1204144940-01$
 $C = 0.3025012590-00$ $G = -0.1273172770-02$
 $D = 0.2337102470-01$ $H = 0.4693132750-04$

TIME	P	LN(P)
0.0019	543.1	-0.5249
0.0025	471.2	-0.7555
0.0031	420.7	-0.7502
0.0044	374.2	-0.9307



PRESSURE VS TIME DATA FOR BATCH # 944



PRESSURE VS TIME DATA FOR BATCH # 944

DATA FROM RUN # 127

TIME	P	LN(P)
0.0	855.0	0.0
0.0013	640.0	-0.3241
0.0063	305.0	-1.0653
0.0113	185.0	-1.5552
0.0163	120.0	-1.9931
0.0213	73.0	-2.4289
0.0263	55.0	-2.7783
0.0313	40.0	-3.0967
0.0363	35.0	-3.2302
0.0413	25.0	-2.5557

$$T = (TIME * PREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.3736673200-02 E = -0.3777687320-02
 B = -0.9818115050 00 F = 0.3596909200-03
 C = 0.1795698370 00 G = -0.6233747890-04
 D = -0.1382658350-01 H = 0.1545012040-05

TIME	P	LN(P)
0.0513	20.0	-3.7899
0.0007	751.9	-0.1498
0.0014	654.1	-0.3023
0.0026	500.2	-0.5705

DATA FROM RUN # 128

TIME	P	LN(P)
0.0	925.0	0.0
0.0030	570.0	-0.4842
0.0061	400.0	-0.9383
0.0090	325.0	-1.0460
0.0130	222.0	-1.4271
0.0180	153.0	-1.7672
0.0230	120.0	-2.0423
0.0280	92.0	-2.3080
0.0380	63.0	-2.6367
0.0480	43.0	-2.9586

$$T = (TIME * PREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = -0.7303141200-02 E = 0.7910958470-03
 B = -0.6038202300 00 F = -0.3098072050-04
 C = 0.9086656000-01 G = 0.5116725450-06
 D = -0.1098509040-01 H = -0.4763792550-08

TIME	P	LN(P)
0.0580	40.0	-3.1409
0.0880	35.0	-3.2744
0.1030	32.0	-3.3641
0.1230	30.0	-3.4286

DATA FROM RUN # 129

TIME	P	LN(P)
0.0	380.0	0.0
0.0011	710.0	-0.2147
0.0061	330.0	-0.9803
0.0111	195.0	-1.5069
0.0161	125.0	-1.9516
0.0211	85.0	-2.3373
0.0261	65.0	-2.5055
0.0311	55.0	-2.4733
0.0361	33.0	-3.1423
0.0461	25.0	-3.5610

$$T = (TIME * PREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = -0.2224506350-02 E = 0.1219948300-01
 B = -0.9063038540 00 F = -0.1017764450-02
 C = 0.2981340740 00 G = 0.4357249200-04
 D = -0.6015370530-01 H = -0.7471685890-06

TIME	P	LN(P)
0.0561	20.0	-3.7842
0.0007	735.9	-0.1789
0.0013	629.7	-0.3347
0.0026	493.1	-0.5792

DATA FROM RUN # 130

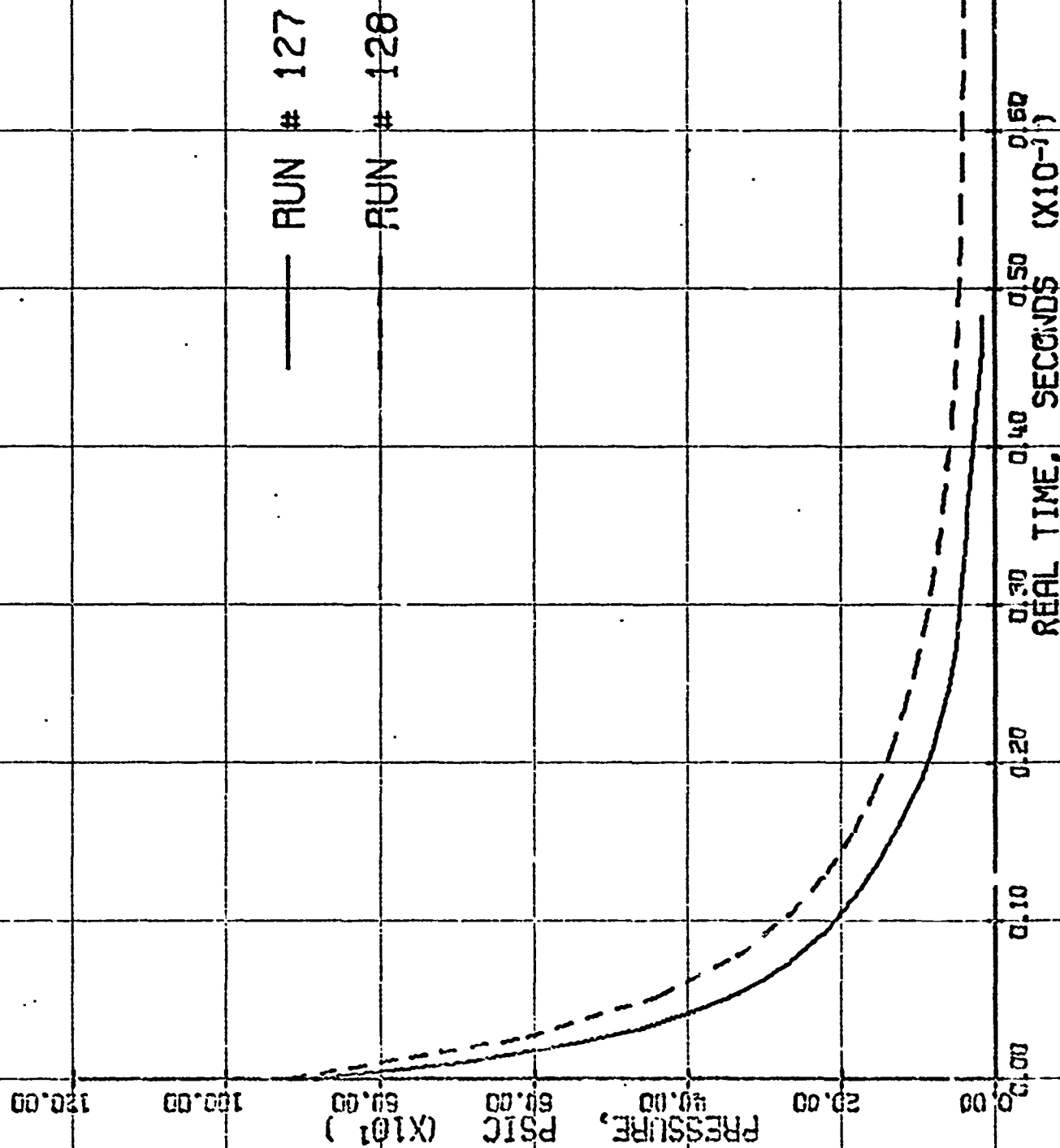
TIME	P	LN(P)
0.0	935.0	0.0
0.0009	905.0	-0.0525
0.0013	700.0	-0.2895
0.0033	500.0	-0.6259
0.0047	395.0	-0.9117
0.0066	290.0	-1.1368
0.0076	240.0	-1.3599
0.0097	205.0	-1.5175
0.0126	150.0	-1.8229
0.0147	120.0	-2.0531

$$T = (TIME * PREF ** 2) / ALPHA$$

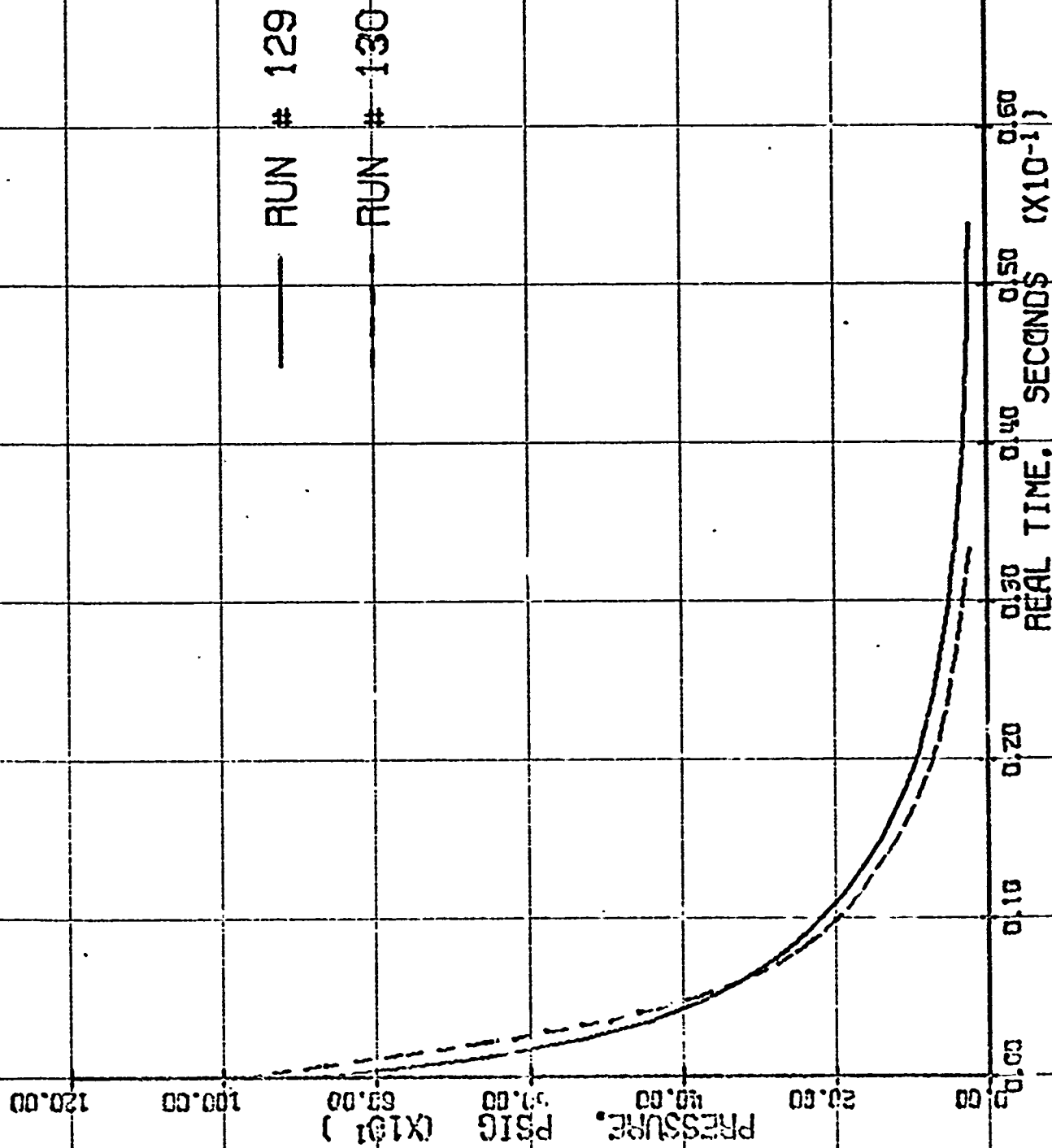
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.3952632140-01 E = -0.7474011530-01
 B = -0.4915955450 00 F = 0.1066814770-01
 C = -0.3581723330 00 G = -0.7484277470-03
 D = 0.2603247610 00 H = 0.2055547270-04

TIME	P	LN(P)
0.0197	75.0	-2.5231
0.0247	47.0	-2.9904
0.0277	33.0	-3.3440
0.0347	20.0	-3.8448



PRESSURE VS TIME DATA FOR BATCH # 944



PRESSURE VS TIME DATA FOR BATCH # 944

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BATCH # 944 / 32.56 AP, 27.53 PBAA

DATA FROM RUN # 131

TIME	P	LN(P)
0.0	550.0	0.0
0.0014	405.0	-0.3060
0.0054	215.0	-0.9393
0.0114	130.0	-1.4424
0.0164	85.0	-1.8673
0.0214	60.0	-2.2155
0.0264	45.0	-2.5033
0.0314	35.0	-2.7544
0.0414	25.0	-3.0910
0.0514	20.0	-3.3142

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.1448337130-01 E = 0.7875420930-02
 B = -0.7313133890 00 F = -0.7432633400-03
 C = 0.1314045320 00 G = 0.3656755180-04
 D = -0.4748873260-01 H = -0.7244661520-06

TIME	P	LN(P)
0.0009	485.2	-0.1232
0.0016	422.5	-0.2536
0.0022	374.6	-0.3840
0.0034	306.1	-0.5851

DATA FROM RUN # 132

TIME	P	LN(P)
0.0	435.0	0.0
0.0022	253.0	-0.5224
0.0072	130.0	-1.2076
0.0122	80.0	-1.5933
0.0172	43.0	-2.2041
0.0222	23.0	-2.7431
0.0272	20.0	-3.0756
0.0356	377.5	-0.1417
0.0312	320.1	-0.3067
0.0319	270.8	-0.4738

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.1960028720-02 E = -0.2438401510 00
 B = -0.7835331950 00 F = 0.5298759190-01
 C = -0.3439754930 00 G = -0.5409808450-02
 D = 0.5448544270 00 H = 0.2133994840-03

TIME	P	LN(P)
0.0025	238.0	-0.5030
0.0031	213.4	-0.7122
0.0044	172.4	-0.9258
0.0056	147.7	-1.0799

DATA FROM RUN # 133

TIME	P	LN(P)
0.0	412.0	0.0
0.0013	310.0	-0.2645
0.0053	155.0	-0.9151
0.0112	120.0	-1.2335
0.0163	82.0	-1.6143
0.0213	62.0	-1.8939
0.0263	50.0	-2.1990
0.0313	40.0	-2.3321
0.0413	25.0	-2.6921
0.0513	20.0	-3.0253

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.2043799820-01 E = 0.1830053090-01
 B = -0.9396272190 00 F = -0.1655151400-02
 C = 0.3967377550 00 G = 0.7427486550-04
 D = -0.1162606500 00 H = -0.1327287740-05

TIME	P	LN(P)
0.0010	337.3	-0.1935
0.0016	295.0	-0.3235
0.0022	263.7	-0.4453
0.0035	214.2	-0.6539

DATA FROM RUN # 134

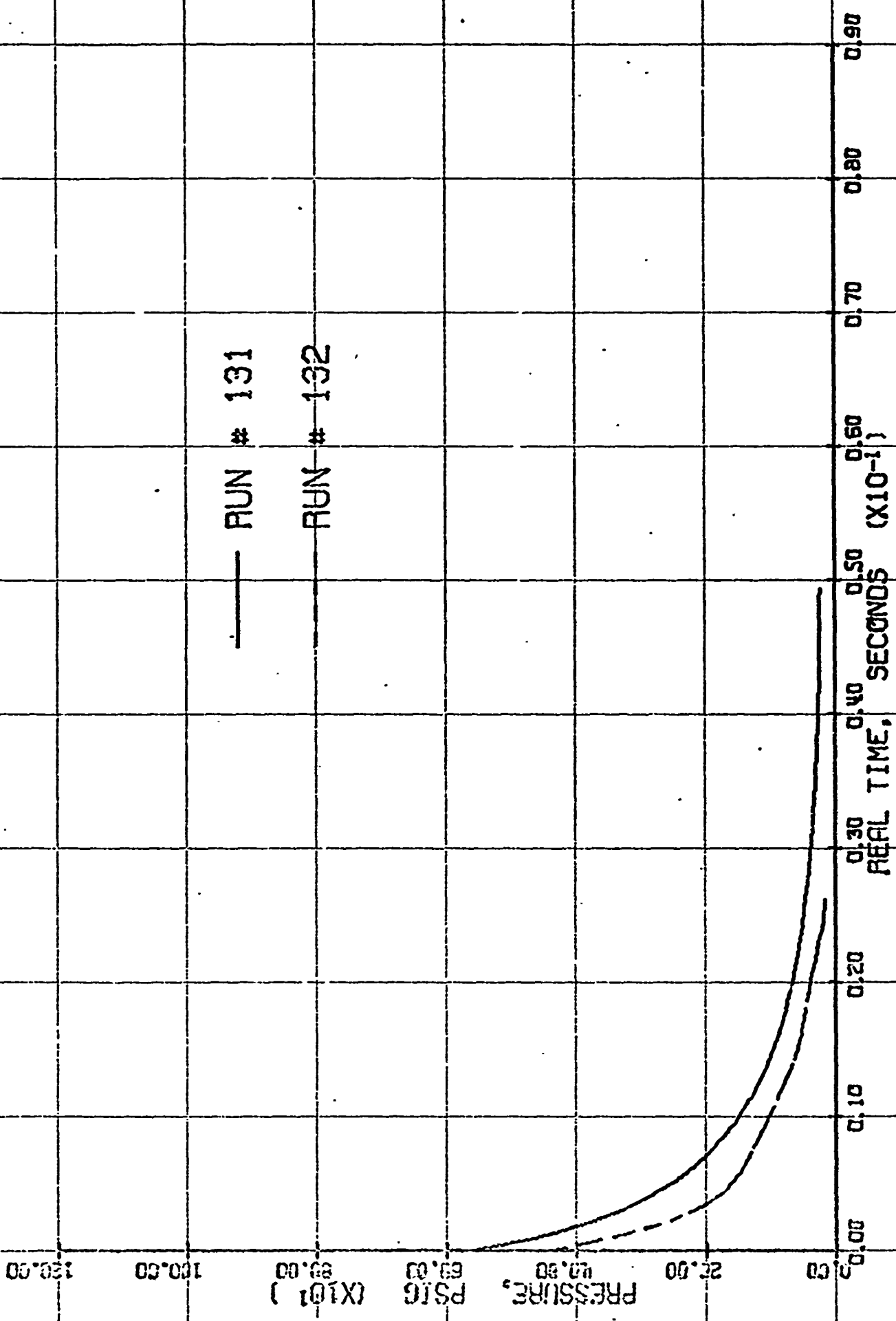
TIME	P	LN(P)
0.0	550.0	0.0
0.0011	535.0	-0.1431
0.0061	235.0	-1.0174
0.0111	150.0	-1.4443
0.0161	95.0	-1.9231
0.0211	65.0	-2.3026
0.0261	45.0	-2.6733
0.0311	35.0	-2.8216
0.0411	25.0	-3.0910
0.0511	20.0	-3.3142

$$T = (TIME * RREF ** 2) / ALPHA$$

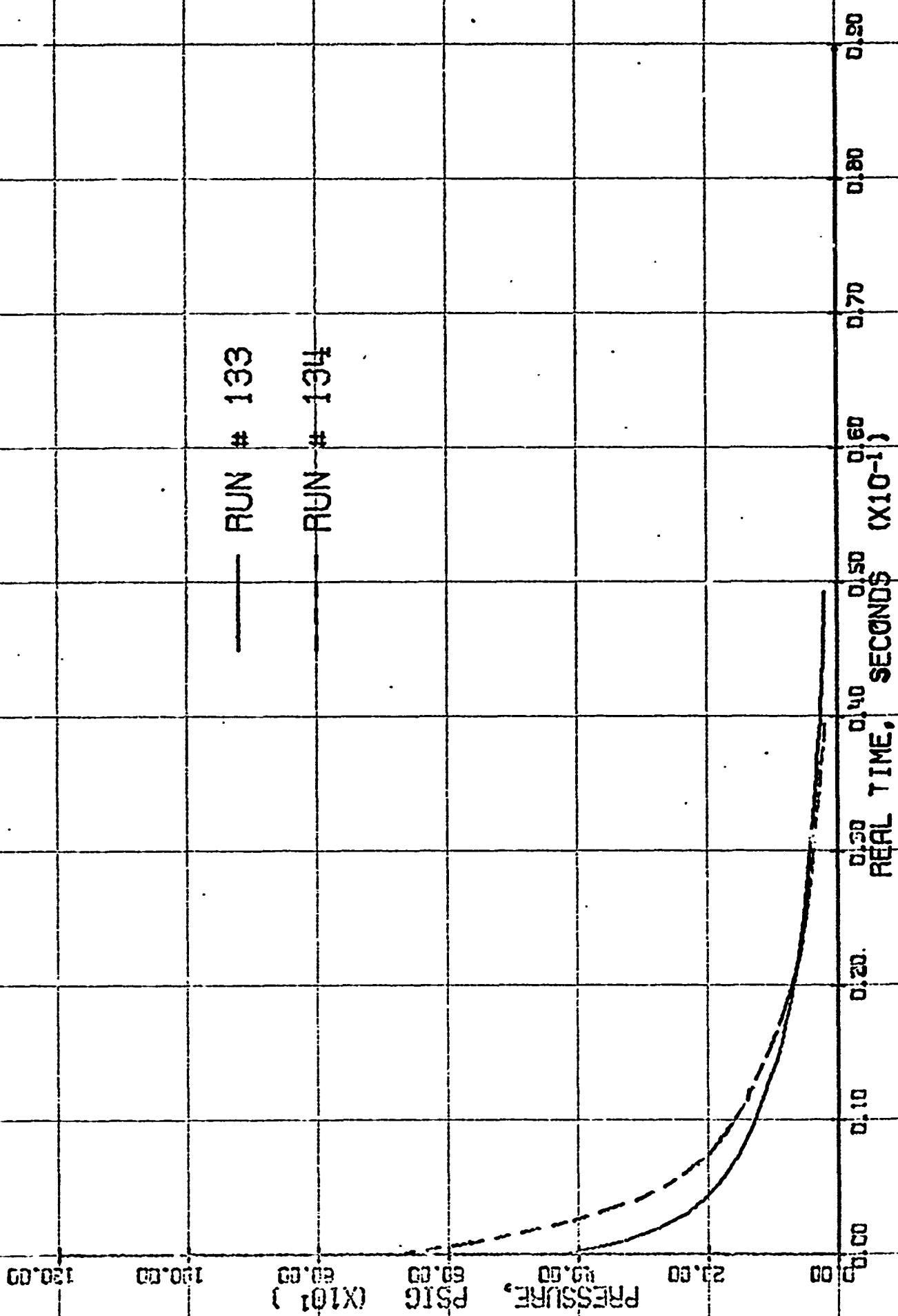
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.3449649220-01 E = -0.3423233960-01
 B = -0.6947907110 00 F = 0.4837527720-02
 C = -0.5226810120-01 G = -0.3218425730-03
 D = 0.1674052430 00 H = 0.8202036000-05

TIME	P	LN(P)
0.0012	539.0	-0.1472
0.0019	459.3	-0.3453
0.0025	394.3	-0.4947
0.0037	317.1	-0.7173



PRESSURE VS TIME DATA FOR BATCH # 944



PRESSURE VS TIME DATA FOR BATCH # 944

DATA FROM RUN # 135

TIME	P	LN(P)
0.0	330.0	0.0
0.0035	220.0	-0.5465
0.0035	135.0	-1.0349
0.0135	90.0	-1.4404
0.0185	65.0	-1.7658
0.0235	50.0	-2.0281
0.0285	40.0	-2.2513
0.0335	32.0	-2.4744
0.0435	20.0	-2.9444
0.0911	297.1	-0.2392

$T = (TIME * RPEF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.1342840380-02 E= 0.2244772760-01
 B=-0.8906489680 00 F=-0.2195191850-02
 C= 0.3888333620 00 G= 0.1102083130-03
 D=-0.1254045970 00 H=-0.2226030930-05

TIME	P	LN(P)
0.0017	265.3	-0.3536
0.0023	237.7	-0.4692
0.0036	202.1	-0.6313
0.0048	169.8	-0.8056

DATA FROM RUN # 135

TIME	P	LN(P)
0.0	325.0	0.0
0.0006	290.0	-0.1139
0.0012	255.0	-0.2425
0.0019	212.0	-0.4272
0.0025	192.0	-0.5263
0.0027	190.0	-0.5363
0.0050	135.0	-0.3786
0.0062	110.0	-1.0833
0.0077	105.0	-1.1299
0.0127	65.0	-1.6094

$T = (TIME * RPEF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.3287514560-02 F=-0.1255777320 00
 B=-0.7045365580 00 F= 0.2531619760-01
 C=-0.1555537250 00 G=-0.2421531950-02
 D= 0.2920388140 00 H= 0.3932765890-04

TIME	P	LN(P)
0.0177	42.0	-2.0462
0.0227	28.0	-2.4516
0.0277	15.0	-3.0758
0.0037	151.7	-0.5983

DATA FROM RUN # 137

TIME	P	LN(P)
0.0	935.0	0.0
0.0036	510.0	-0.6061
0.0086	265.0	-1.2603
0.0136	157.0	-1.7226
0.0186	113.0	-2.1132
0.0236	85.0	-2.3979
0.0286	65.0	-2.5682
0.0336	50.0	-2.9285
0.0436	35.0	-3.2852
0.0536	25.0	-3.4217

$T = (TIME * RPEF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A=-0.7862926730-02 E= 0.2092952960-03
 B=-0.5754713350 00 F= 0.2434190260-04
 C= 0.5865999200-01 G=-0.2011360660-05
 D=-0.7975749150-02 H= 0.4349320380-07

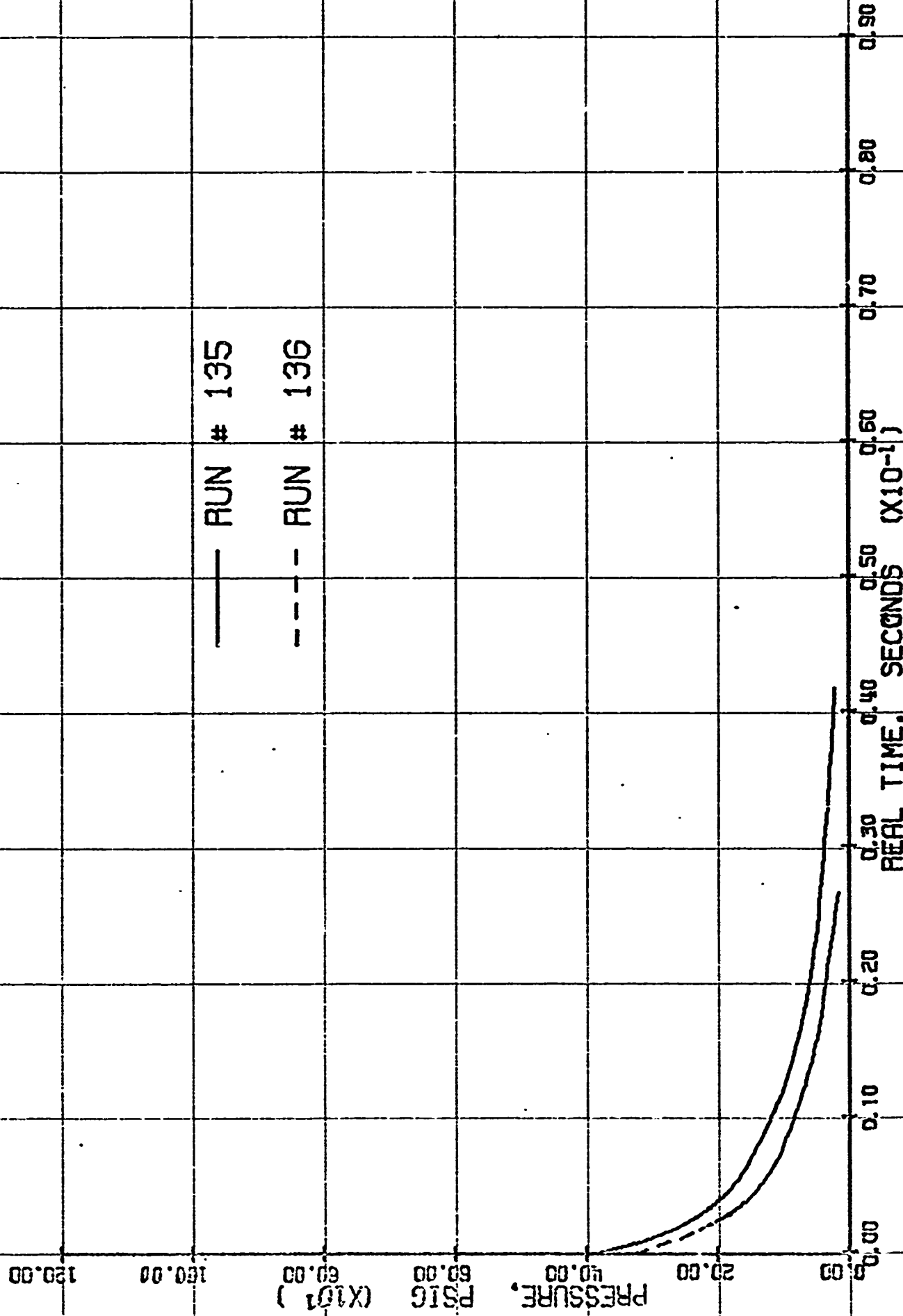
TIME	P	LN(P)
0.0636	20.0	-3.3448
0.0010	771.5	-0.1922
0.0016	672.2	-0.3300
0.0029	550.0	-0.5306

DATA FROM RUN # 138

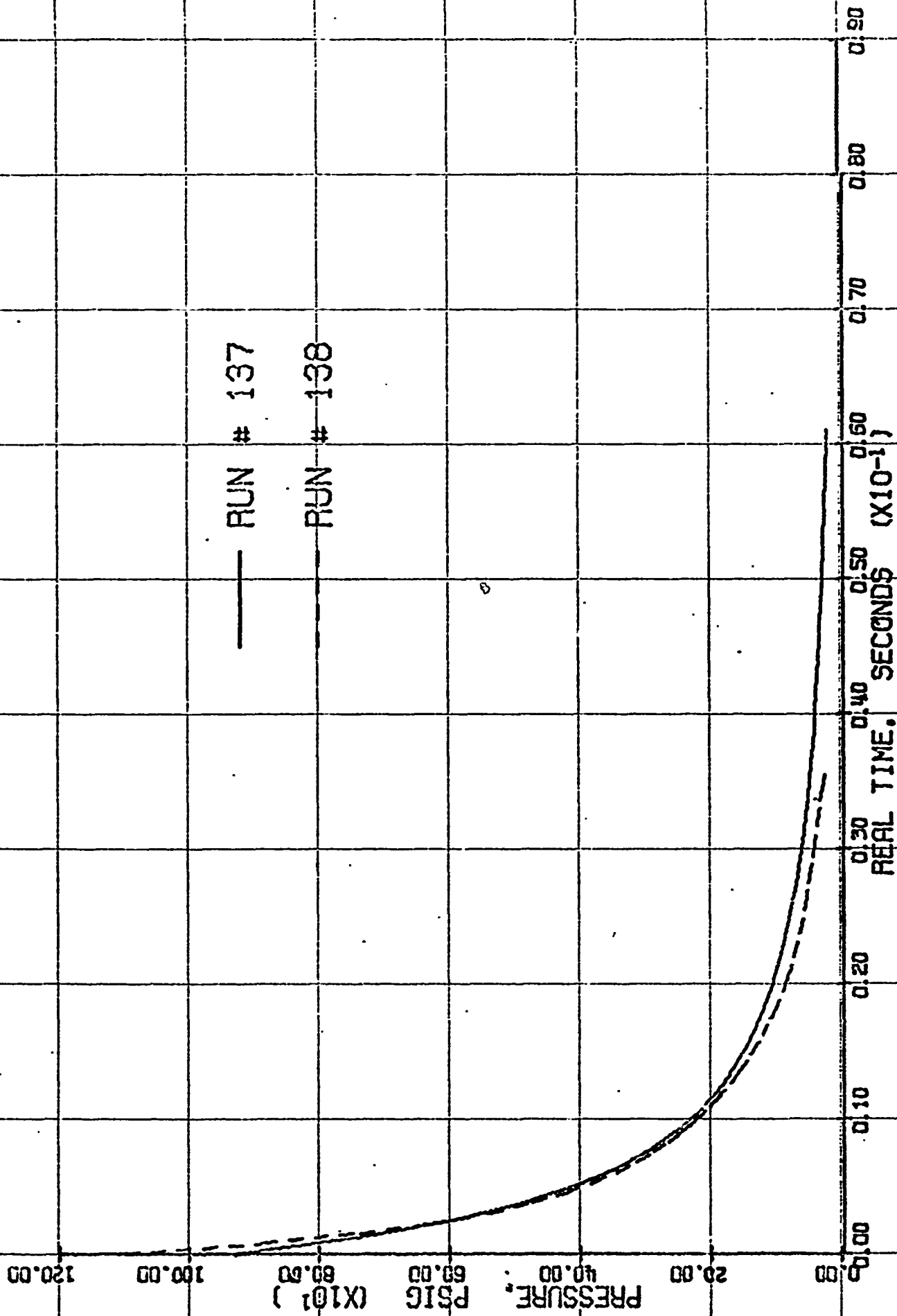
TIME	P	LN(P)
0.0	1085.0	0.0
0.0020	670.0	-0.4821
0.0070	312.0	-1.2463
0.0120	180.0	-1.7544
0.0170	111.0	-2.2795
0.0220	72.0	-2.7127
0.0270	50.0	-3.0773
0.0320	35.0	-3.4340
0.0370	20.0	-3.9330
0.0005	954.4	-0.1173

$T = (TIME * RPEF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.1228698000-01 E= 0.1085335000-01
 B=-0.1047940630 01 F=-0.7157202310-03
 C= 0.3345407240 00 G= 0.2058313260-04
 D=-0.3231722220-01 H=-0.1791643890-04

TIME	P	LN(P)
0.0011	300.2	-0.7270
0.0017	590.2	-0.4524
0.0030	542.5	-0.6031
0.0042	420.5	-0.7251



PRESSURE VS TIME DATA FOR BATCH # 944



PRESSURE VS TIME DATA FOR BATCH # 944

DATA FROM RUN # 139

TIME	P	LN(P)
0.0	820.0	0.0
0.0013	775.0	-0.0554
0.0035	515.0	-0.4651
0.0085	270.0	-1.1109
0.0135	165.0	-1.5034
0.0185	110.0	-2.0088
0.0235	80.0	-2.3275
0.0285	50.0	-2.6150
0.0335	47.0	-2.8592

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

A= 0.4760250900-01 E= -0.1319748630-02
 B= -0.4843530630 00 F= 0.7103238560-04
 C= -0.8339355360-02 G= -0.1415847290-05
 D= 0.1026595200-01

TIME	P	LN(P)
0.0365	40.0	-3.0204
0.0485	28.0	-3.3771
0.0585	20.0	-3.7136

DATA FROM RUN # 140

TIME	P	LN(P)
0.0	645.0	0.0
0.0014	470.0	-0.3165
0.0064	245.0	-0.9640
0.0114	145.0	-1.4925
0.0164	100.0	-1.8541
0.0214	70.0	-2.2208
0.0264	55.0	-2.4519
0.0314	42.0	-2.7316
0.0414	37.0	-2.8583
0.0514	20.0	-3.4735

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A= 0.6036803430-02 E= 0.1622598090-01
 B= -0.3019507670 00 F= -0.1777678440-02
 C= 0.2537406150 00 G= 0.0295296000-04
 D= -0.8195622790-01 H= -0.2170233880-05

TIME	P	LN(P)
0.0007	570.5	-0.1227
0.0013	499.2	-0.2562
0.0019	443.7	-0.3740
0.0032	364.5	-0.5707

DATA FROM RUN # 141

TIME	P	LN(P)
0.0	550.0	0.0
0.0030	382.0	-0.5315
0.0080	203.0	-1.1394
0.0130	128.0	-1.5240
0.0180	83.0	-2.0581
0.0230	60.0	-2.3825
0.0280	45.0	-2.6703
0.0330	35.0	-2.9216
0.0430	23.0	-3.1443
0.0530	23.0	-3.3415

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A= 0.2042132630-02 E= 0.2262698920-02
 B= -0.7073838990 00 F= -0.1103398760-03
 C= 0.1323398430 00 G= 0.2137074950-05
 D= -0.2263318440-01 H= -0.6341967190-08

TIME	P	LN(P)
0.0530	20.0	-3.4812
0.0010	544.3	-0.1775
0.0022	425.0	-0.4226
0.0035	355.0	-0.6049

DATA FROM RUN # 142

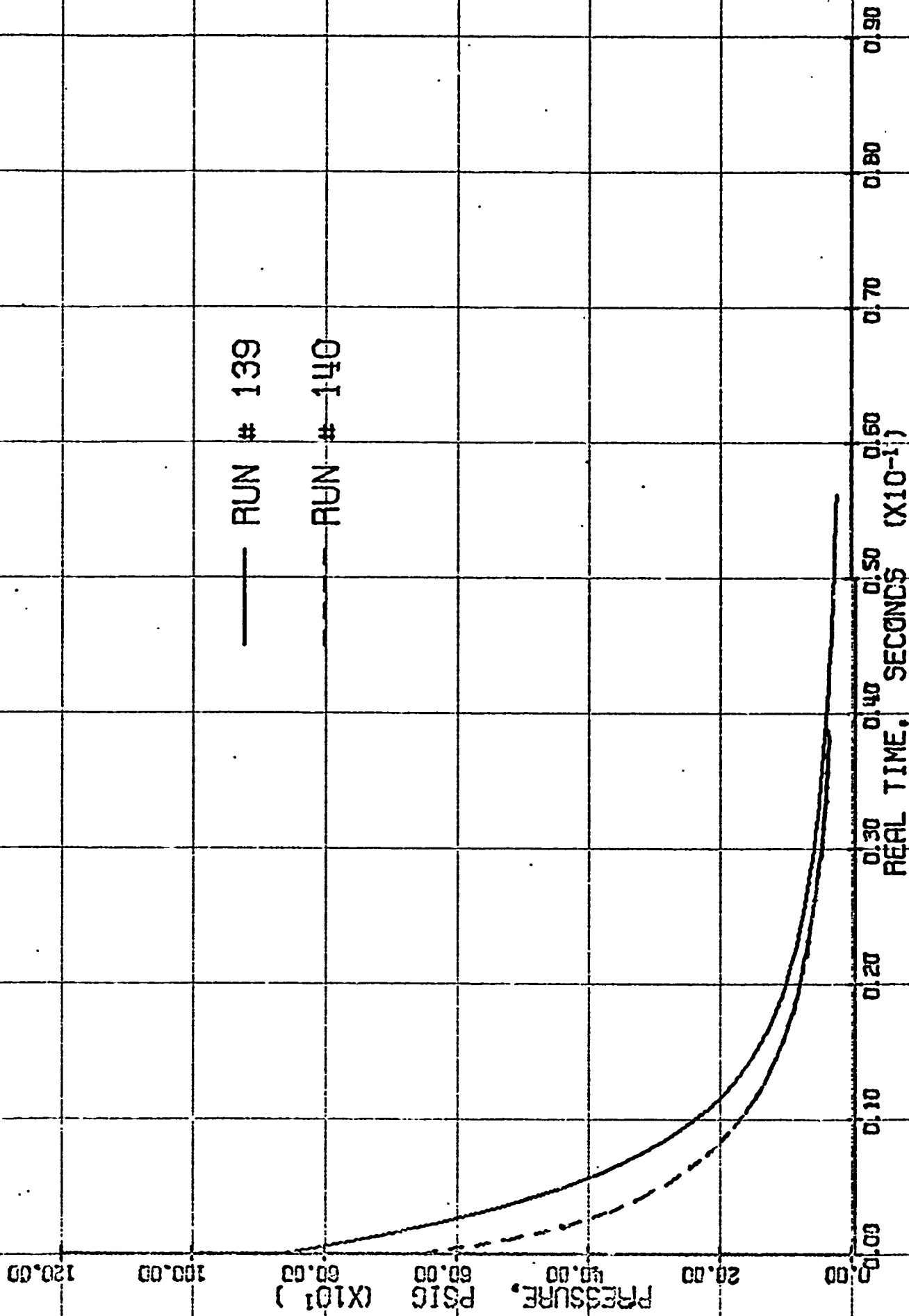
TIME	P	LN(P)
0.0	505.0	0.0
0.0031	300.0	-0.5205
0.0061	170.0	-1.0388
0.0131	105.0	-1.5705
0.0181	75.0	-1.9071
0.0231	55.0	-2.2172
0.0281	45.0	-2.4173
0.0331	35.0	-2.6152
0.0431	20.0	-3.2297
0.0531	15.0	-3.5185

$$T = (TIME * RREF ** 2) / ALPHA$$

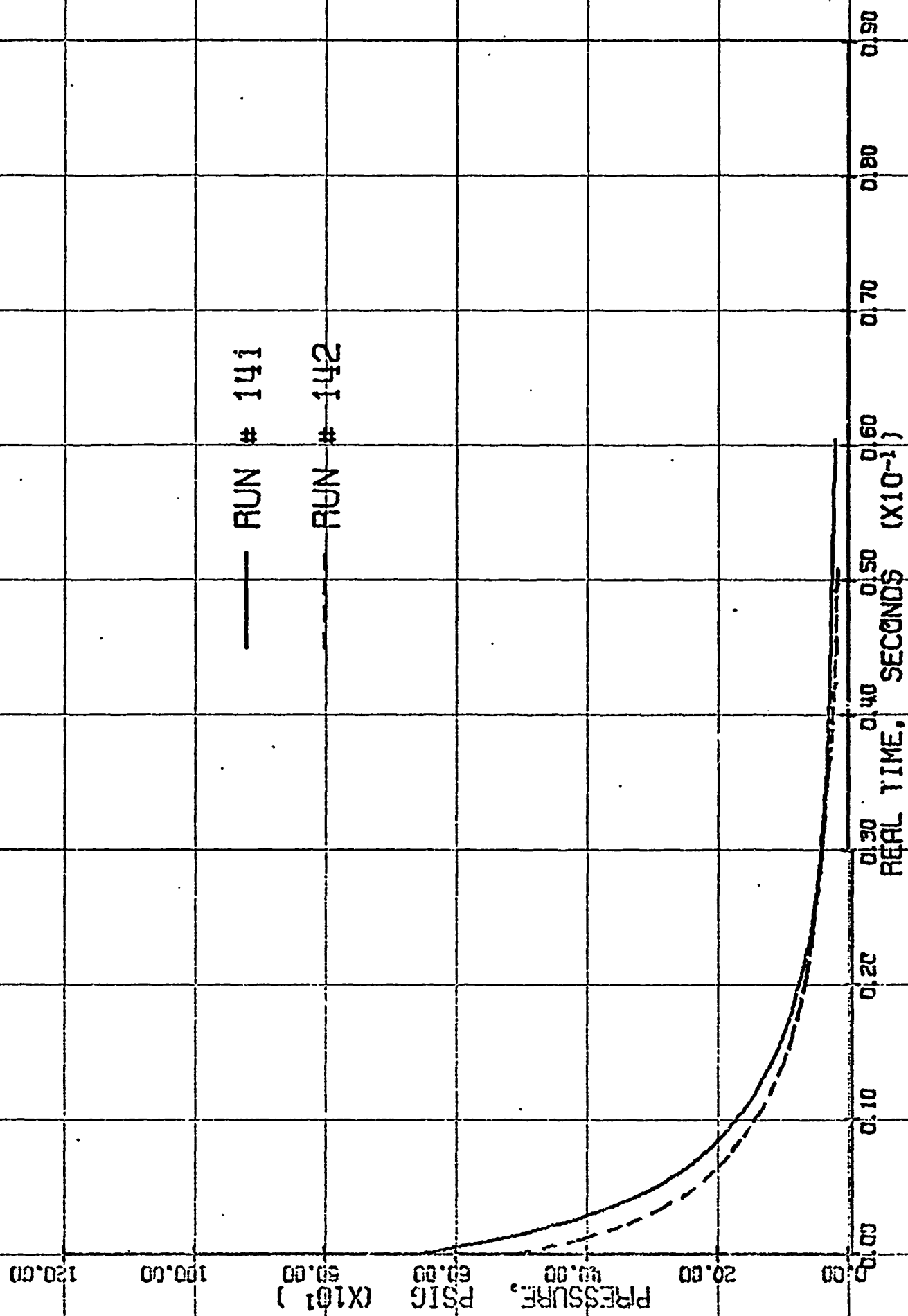
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A= 0.2222534010-02 E= 0.1417310730-01
 B= -0.7385125890 00 F= -0.1251765330-02
 C= 0.2602575510 00 G= 0.5441405590-04
 D= -0.7077227650-01 H= -0.1203345300-05

TIME	P	LN(P)
0.0011	408.3	-0.2112
0.0017	350.7	-0.3365
0.0029	286.5	-0.5322
0.0042	240.0	-0.7091



PRESSURE VS TIME DATA FOR BATCH # 944



PRESSURE VS TIME DATA FOR BATCH # 944

BATCH # 944 / 82.5% AP, 27.5% PRAA

DATA FROM RUN # 143

TIME	P	LN(P)
0.0	300.0	0.0
0.0043	215.0	-0.5955
0.0093	122.0	-1.1521
0.0143	79.0	-1.5767
0.0193	55.0	-1.9585
0.0243	40.0	-2.2773
0.0293	30.0	-2.5649
0.0343	24.0	-2.7381
0.0393	20.0	-2.9704
0.1011	357.5	-0.0870

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.1978840330-01 E = -0.4478406610-01
 B = -0.3943953060 00 F = 0.5739347510-02
 C = -0.2715420690 00 G = -0.3772484380-03
 D = 0.1811106500 00 H = 0.9327483610-05

TIME	P	LN(P)
0.0017	308.7	-0.2336
0.0030	243.7	-0.4700
0.0042	203.1	-0.6523
0.0074	130.0	-1.0986

DATA FROM RUN # 145

TIME	P	LN(P)
0.0	855.0	0.0
0.0002	820.0	-0.0418
0.0052	350.0	-0.3932
0.0102	192.0	-1.4936
0.0152	125.0	-1.9228
0.0202	85.0	-2.3084
0.0252	65.0	-2.5767
0.0302	50.0	-2.8391
0.0352	40.0	-3.0622
0.0402	30.0	-3.3499

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.8661277070-02 E = 0.7024392000-02
 B = -0.8062715020 00 F = -0.6140282950-03
 C = 0.1832086680 00 G = 0.2717194430-04
 D = -0.4509992430-01 H = -0.4722794380-06

TIME	P	LN(P)
0.0502	20.0	-3.7554
0.0602	15.0	-4.0431
0.0008	739.5	-0.1452
0.0021	554.6	-0.4329

DATA FROM RUN # 146

TIME	P	LN(P)
0.0	595.0	0.0
0.0022	405.0	-0.3847
0.0072	215.0	-1.0179
0.0122	140.0	-1.4469
0.0172	95.0	-1.8347
0.0222	67.0	-2.1339
0.0272	50.0	-2.4765
0.0322	40.0	-2.6997
0.0372	32.0	-2.8228
0.0472	22.0	-3.2975

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.1239455840-01 E = 0.5953472720-03
 B = -0.5707391700 00 F = 0.4552170430-04
 C = 0.1141635440 00 G = -0.5704337510-05
 D = -0.1488491890-01 H = 0.1540105480-06

TIME	P	LN(P)
0.0572	20.0	-3.3928
0.0011	517.3	-0.1390
0.0017	450.3	-0.2787
0.0029	359.9	-0.4754

DATA FROM RUN # 147

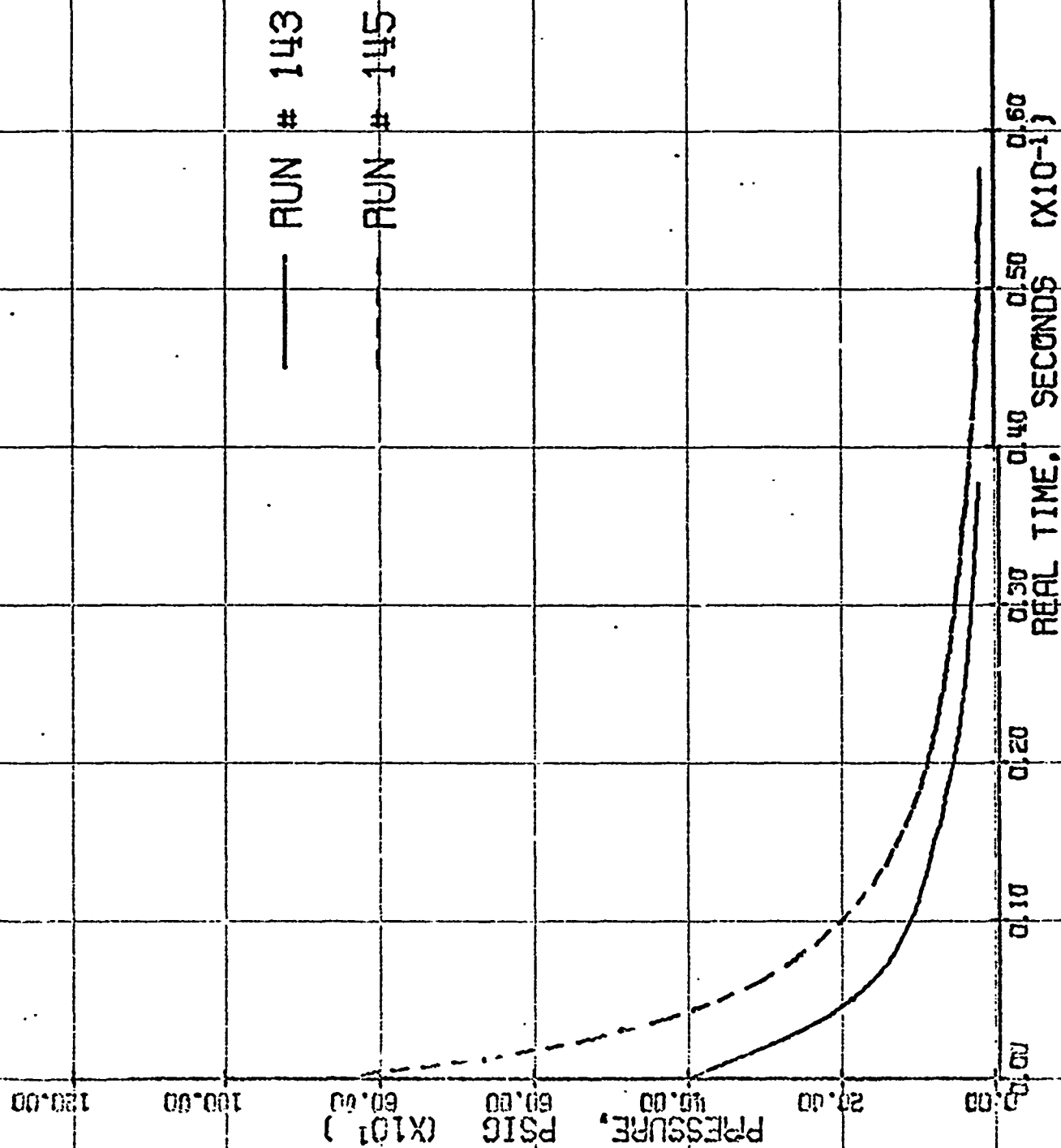
TIME	P	LN(P)
0.0	850.0	0.0
0.0007	740.0	-0.1503
0.0016	640.0	-0.2815
0.0024	530.0	-0.4341
0.0024	530.0	-0.5245
0.0032	440.0	-0.6055
0.0045	350.0	-0.7708
0.0057	270.0	-1.1544
0.0074	215.0	-1.5453
0.0124	100.0	-2.1512

$$T = (TIME * REF ** 2) / ALPHA$$

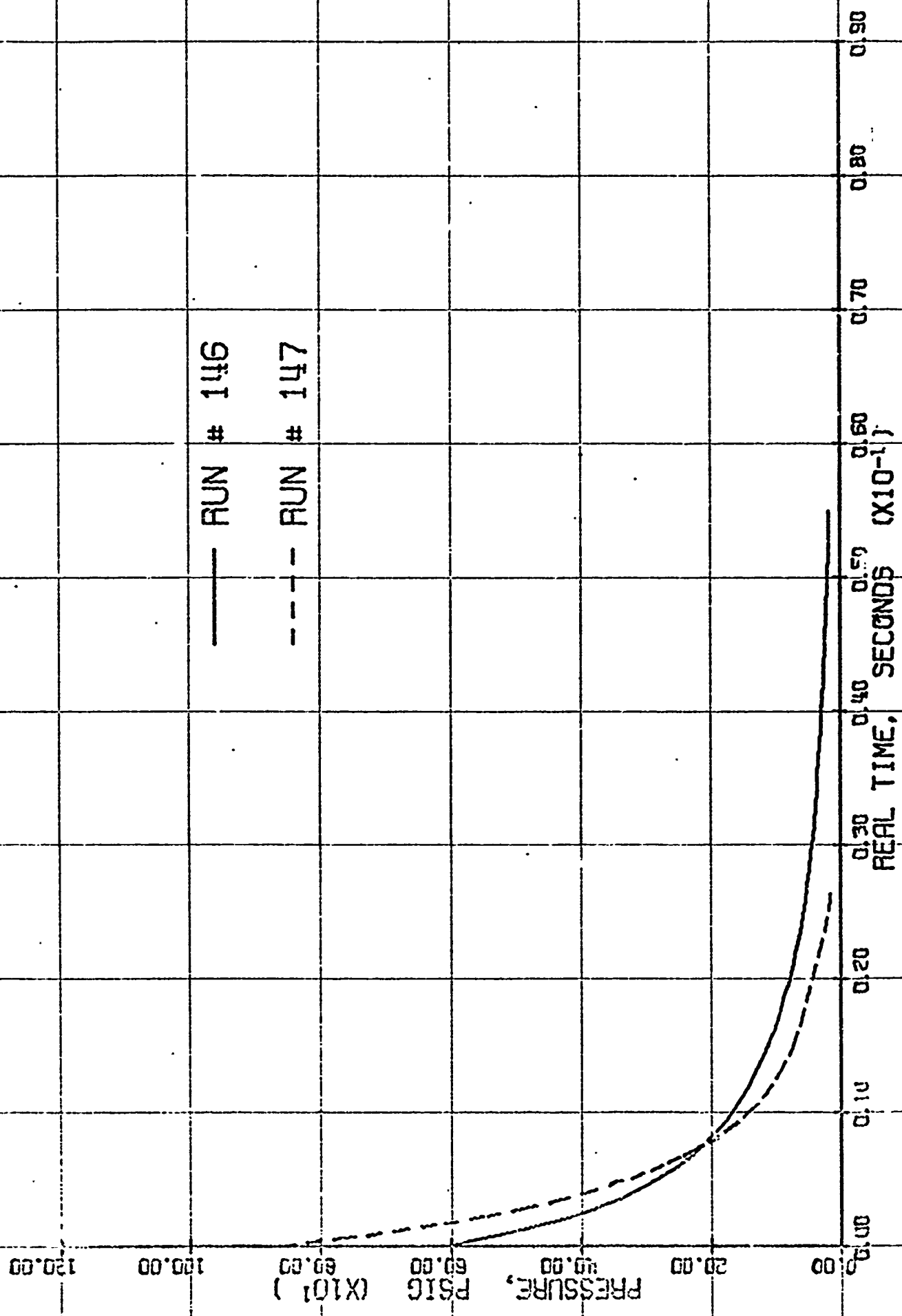
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = -0.1445724740-02 E = -0.5647572240-01
 B = -0.4031598050 00 F = 0.1371919140-01
 C = -0.5649114000-01 G = -0.1579931660-02
 D = 0.1135614750 00 H = 0.5846502090-04

TIME	P	LN(P)
0.0174	57.0	-2.7139
0.0224	30.0	-3.3557
0.0274	15.0	-4.0431
0.0020	571.3	-0.4000



PRESSURE VS TIME DATA FOR BATCH # 944



PRESSURE VS TIME DATA FOR BATCH # 9144

DATA FROM RUN # 37

TIME	P	LN(P)
0.0	635.0	0.0
0.0036	390.0	-0.4675
0.0085	215.0	-1.0830
0.0135	125.0	-1.6253
0.0185	80.0	-2.0716
0.0235	55.0	-2.4453
0.0285	40.0	-2.7647
0.0335	27.0	-3.1578
0.0435	15.0	-3.7456
0.0535	5.0	-4.6442

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A= 0.9835308410-02 E= 0.1055635630-01
 B=-0.5502068750 00 F=-0.1364472040-02
 C= 0.8543379520-01 G= 0.8308569730-04
 D=-0.3943343920-01 H=-0.1920137380-05

TIME	P	LN(P)
0.0002	619.4	-0.0249
0.0008	577.7	-0.0945
0.0014	536.1	-0.1693
0.0021	473.6	-0.2932

DATA FROM RUN # 38

TIME	P	LN(P)
0.0	525.0	0.0
0.0027	405.0	-0.2595
0.0077	255.0	-0.7221
0.0127	170.0	-1.1276
0.0177	125.0	-1.4351
0.0227	95.0	-1.7095
0.0327	60.0	-2.1691
0.0427	43.0	-2.5022
0.0527	33.0	-2.6258
0.0627	35.0	-2.7659

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A= 0.2762337500-01 E=-0.7907418680-02
 B=-0.2659757930 00 F= 0.5660915510-03
 C=-0.1123542110 00 G=-0.2761757210-04
 D= 0.4713432350-01 H= 0.4482353490-06

TIME	P	LN(P)
0.0006	519.5	-0.0105
0.0012	503.1	-0.0426
0.0019	475.8	-0.0984
0.0025	432.0	-0.1949

DATA FROM RUN # 39

TIME	P	LN(P)
0.0	700.0	0.0
0.0030	440.0	-0.4642
0.0080	235.0	-1.0915
0.0130	145.0	-1.5743
0.0180	92.0	-2.0293
0.0230	50.0	-2.6391
0.0330	25.0	-3.3322
0.0380	452.6	-0.0549
0.0010	545.5	-0.1784
0.0015	525.0	-0.2301

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A= 0.5541333210-02 E=-0.3250473230-02
 B=-0.6939795140 00 F= 0.7630602380-03
 C= 0.1163478530 00 G=-0.5333425330-04
 D=-0.9142973890-02 H= 0.1022116660-05

TIME	P	LN(P)
0.0022	470.2	-0.3079
0.0029	433.7	-0.4857
0.0035	397.6	-0.5857
0.0047	324.6	-0.7321

DATA FROM RUN # 30

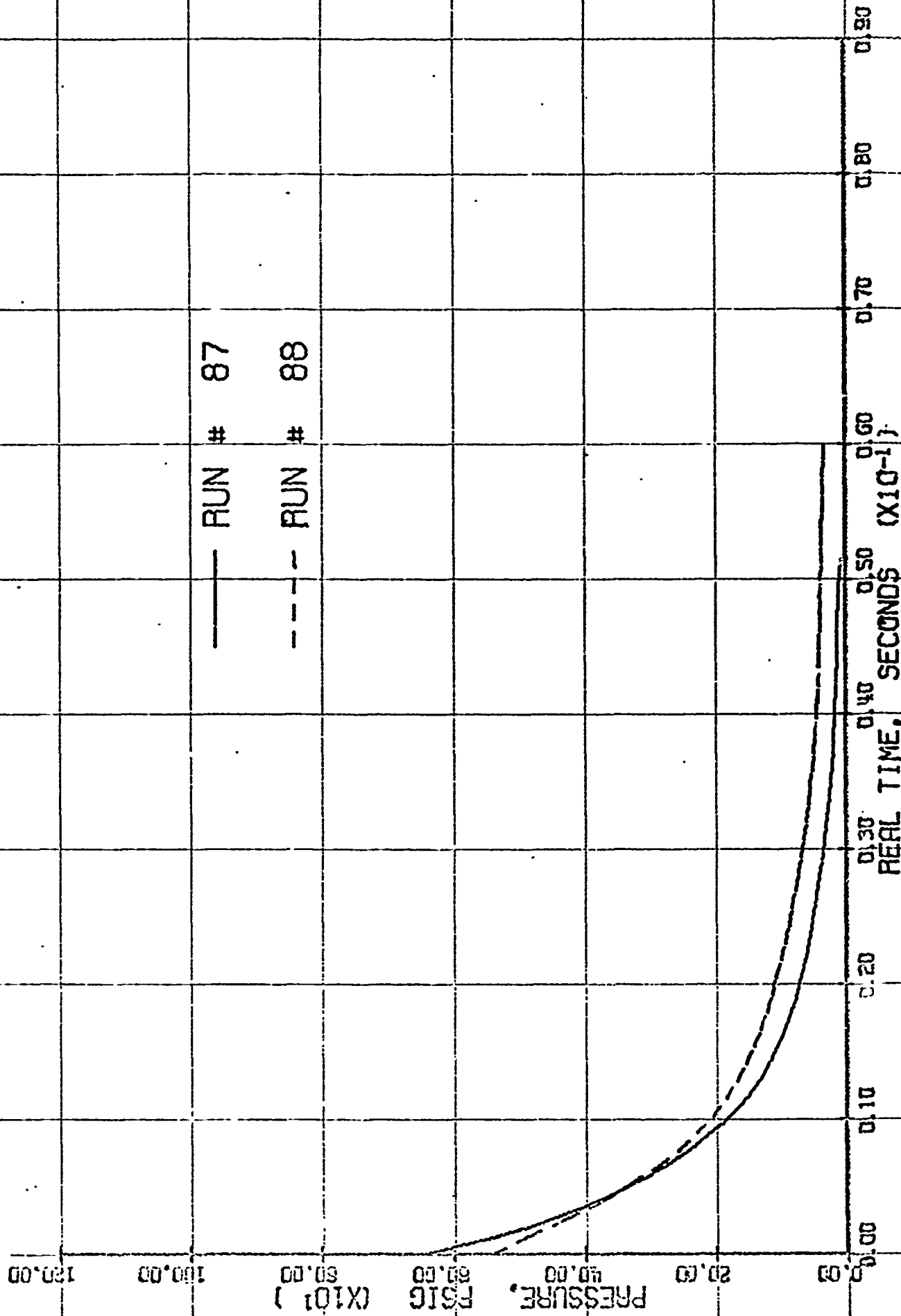
TIME	P	LN(P)
0.0	415.0	0.0
0.0015	315.0	-0.2757
0.0030	145.0	-1.0915
0.0115	35.0	-1.6355
0.0155	50.0	-2.1143
0.0215	30.0	-2.5371
0.0215	25.0	-2.8594
0.0240	15.0	-3.3322
0.0255	10.0	-3.7207
0.0005	200.7	-0.3973

$$T = (TIME * RREF ** 2) / ALPHA$$

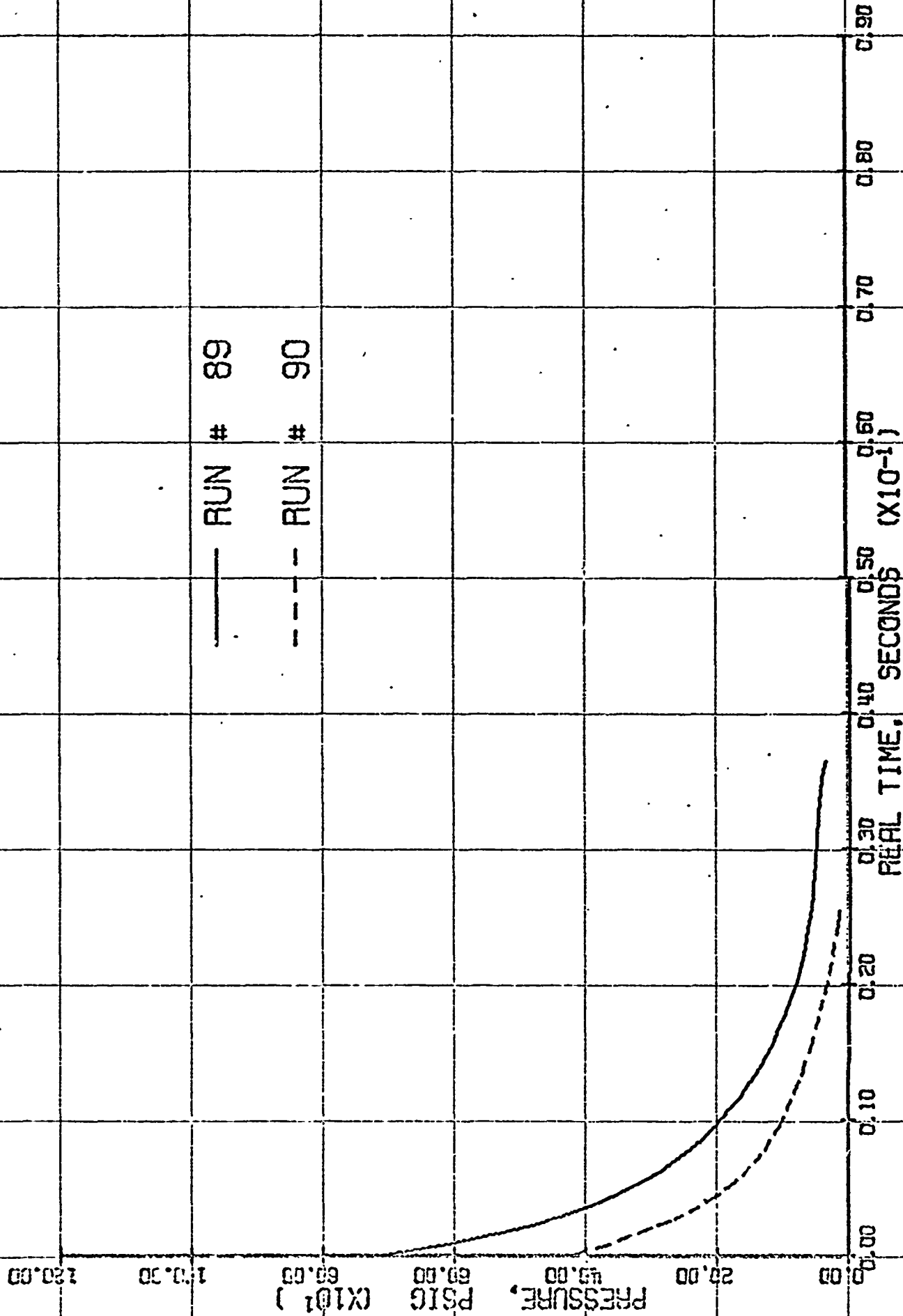
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A= 0.710022370-02 E=-0.7616550250-01
 B=-0.6041193340 00 F= 0.1534806730-01
 C=-0.1208372210 00 G=-0.1507945450-02
 D= 0.2070624520 00 H= 0.5495736720-04

TIME	P	LN(P)
0.0013	312.3	-0.2543
0.0021	243.3	-0.5117
0.0043	206.1	-0.6933
0.0013	145.1	-1.0440



PRESSURE VS TIME DATA FOR BATCH # 941



PRESSURE VS TIME DATA FOR BATCH # 941

DATA FROM RUN # 91

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	675.0	0.0
0.0050	300.0	-0.8109
0.0100	172.0	-1.3672
0.0150	110.0	-1.8142
0.0200	75.0	-2.1772
0.0300	40.0	-2.8259
0.0400	25.0	-3.2959
0.0500	20.0	-3.5190
0.0700	10.0	-4.2121
0.0900	5.44.4	-0.0159

A= 0.2689936240-01 E= 0.9627413560-02
 B=-0.3780985850 00 F=-0.8004854280-03
 C= 0.2528669810 00 G= 0.3423688490-04
 D=-0.6431986950-01 H=-0.5325363960-05

TIME	P	LN(P)
0.0009	535.8	-0.1401
0.0015	510.2	-0.2799
0.0021	441.1	-0.4253
0.0027	390.1	-0.5433

DATA FROM RUN # 92

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	415.0	0.0
0.0048	135.0	-0.3079
0.0098	110.0	-1.3278
0.0148	75.0	-1.7108
0.0248	42.0	-2.2906
0.0348	20.0	-3.3325
0.0448	5.0	-4.4183
0.0002	407.3	-0.0183
0.0008	359.7	-0.1431
0.0014	315.4	-0.2744

A= 0.9125042040-02 F=-0.3949631350-01
 B=-0.5360173840 00 F= 0.1443775020-01
 C=-0.1900459490 00 G=-0.1086578310-02
 D= 0.2523372690 00 H= 0.3075728570-04

TIME	P	LN(P)
0.0021	276.7	-0.4055
0.0027	245.7	-0.5242
0.0039	197.0	-0.7451
0.0052	160.5	-0.9502

DATA FROM RUN # 93

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

TIME	P	LN(P)
0.0	460.0	0.0
0.0005	400.0	-0.1393
0.0015	300.0	-0.4274
0.0003	350.0	-0.2451
0.0010	240.0	-0.3023
0.0028	205.0	-0.3082
0.0073	82.0	-1.7245

A= 0.9467127670-02 D=-0.5372532960-02
 B=-0.1180705750 01 E=-0.6425389740-02
 C= 0.2053518920 00 F= 0.6420521870-03

TIME	P	LN(P)
0.0123	38.0	-2.4936
0.0178	15.0	-3.4232
0.0228	5.0	-4.5218

DATA FROM RUN # 94

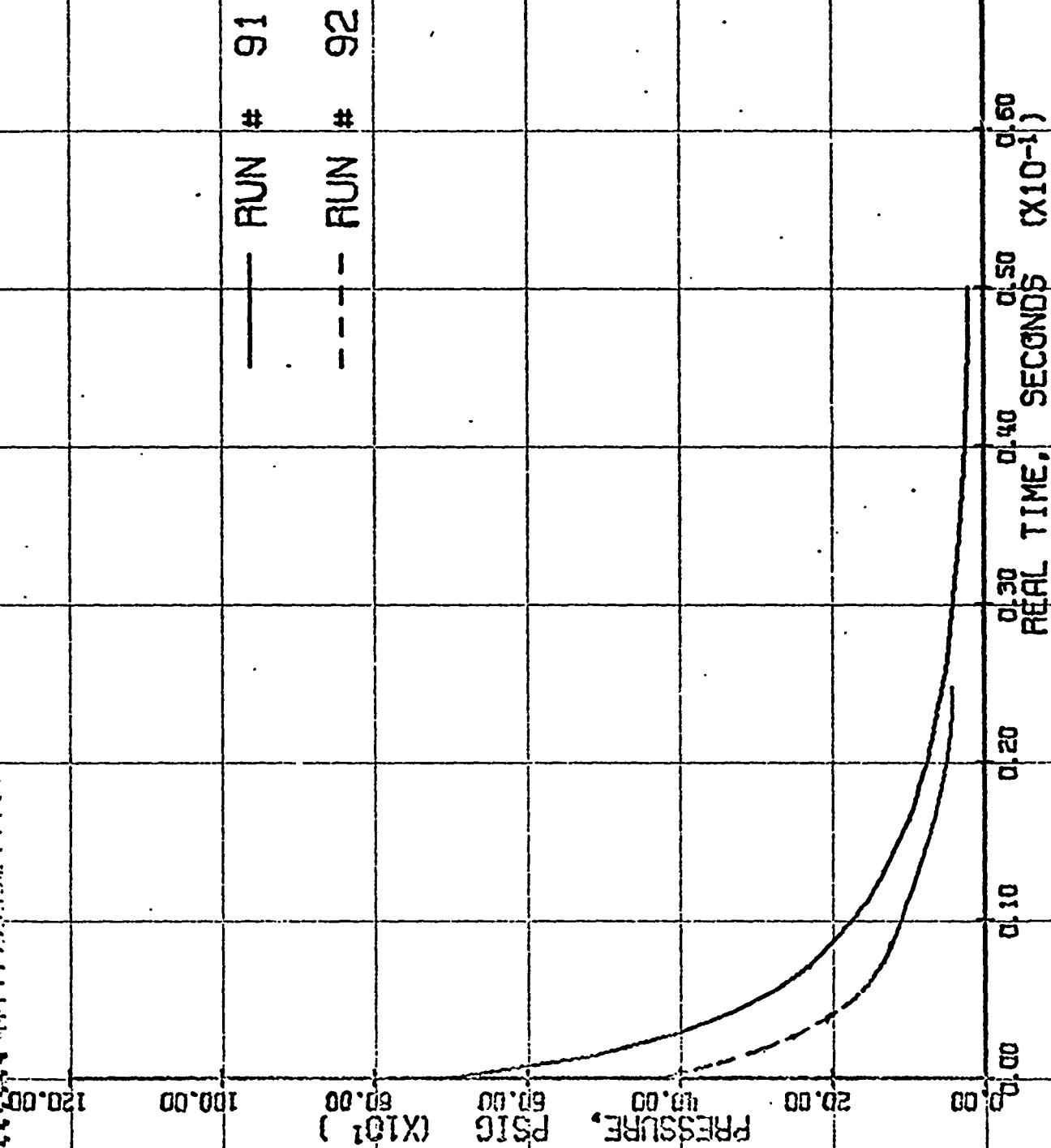
$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

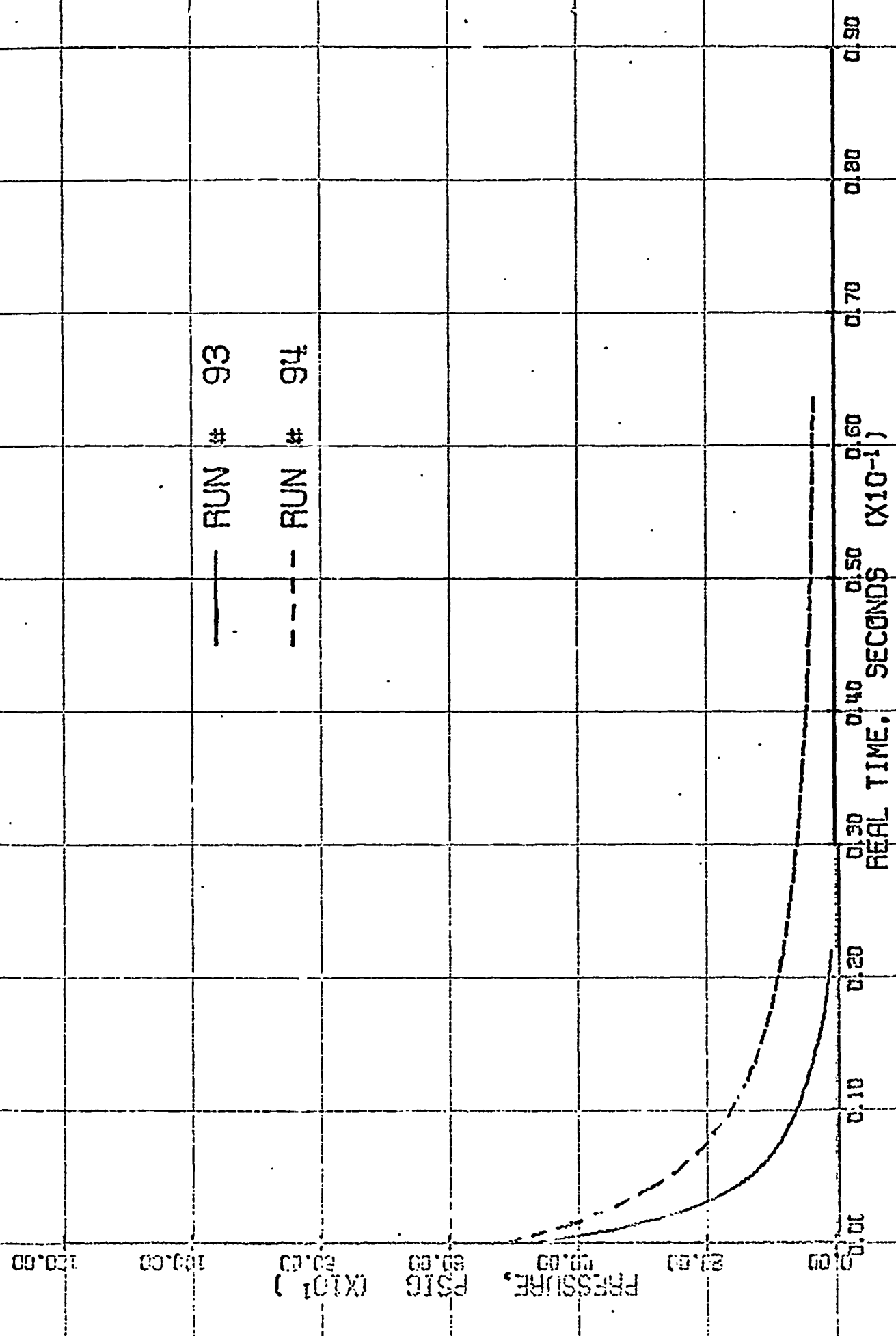
TIME	P	LN(P)
0.0	502.0	0.0
0.0025	350.0	-0.3507
0.0075	200.0	-0.9203
0.0125	130.0	-1.3511
0.0175	92.0	-1.5335
0.0225	75.0	-1.3619
0.0325	55.0	-2.2113

A= 0.1259618640-01 D=-0.9576150460-02
 B=-0.6046027350 00 E= 0.4477311100-03
 C= 0.3550220090-01 F=-0.9000777330-05

TIME	P	LN(P)
0.0425	40.0	-2.5297
0.0550	35.0	-2.5633
0.0655	30.0	-2.3174



PRESSURE VS TIME DATA FOR BATCH # 941



PRESSURE VS TIME DATA FOR BATCH # 941

DATA FROM RUN # 97

TIME	P	LN(P)
0.0	420.0	0.0
0.0043	235.0	-0.5807
0.0073	155.0	-0.9968
0.0143	115.0	-1.2953
0.0193	83.0	-1.5629
0.0243	72.0	-1.7636
0.0343	52.0	-2.0290
0.0443	42.0	-2.3026
0.0543	41.0	-2.3267
0.0901	416.7	-0.0080

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.1529233670-01 E=-0.5178302800-02
 B=-0.5673114510 00 F= 0.7010999170-03
 C= 0.5897693900-01 G=-0.4175293460-04
 D= 0.1177762200-01 H= 0.9282413330-06

TIME	P	LN(P)
0.0007	333.0	-0.0770
0.0014	350.0	-0.1323
0.0020	320.0	-0.2719
0.0026	294.4	-0.3552

DATA FROM RUN # 93

TIME	P	LN(P)
0.0	920.0	0.0
0.0020	695.0	-0.2305
0.0070	390.0	-0.3582
0.0120	265.0	-1.2446
0.0170	190.0	-1.5773
0.0220	140.0	-1.3327
0.0270	103.0	-2.1422

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 A=-0.7219448510-03 D=-0.3433015680-02
 B=-0.5592069440 00 E= 0.4916677230-03
 C= 0.7635995350-01 F=-0.1067456050-04

TIME	P	LN(P)
0.0370	72.0	-2.5477
0.0470	55.0	-2.9170
0.0670	40.0	-3.1355

DATA FROM RUN # 99

TIME	P	LN(P)
0.0	543.0	0.0
0.0013	435.0	-0.1221
0.0053	270.0	-0.7079
0.0113	162.0	-1.2137
0.0153	100.0	-1.7011
0.0253	55.0	-2.2989
0.0353	35.0	-2.7509

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 A= 0.1614993870-01 D= 0.1959343130-02
 B=-0.4501497410 00 E=-0.1534572740-03
 C= 0.1025055390-01 F= 0.3652610490-05

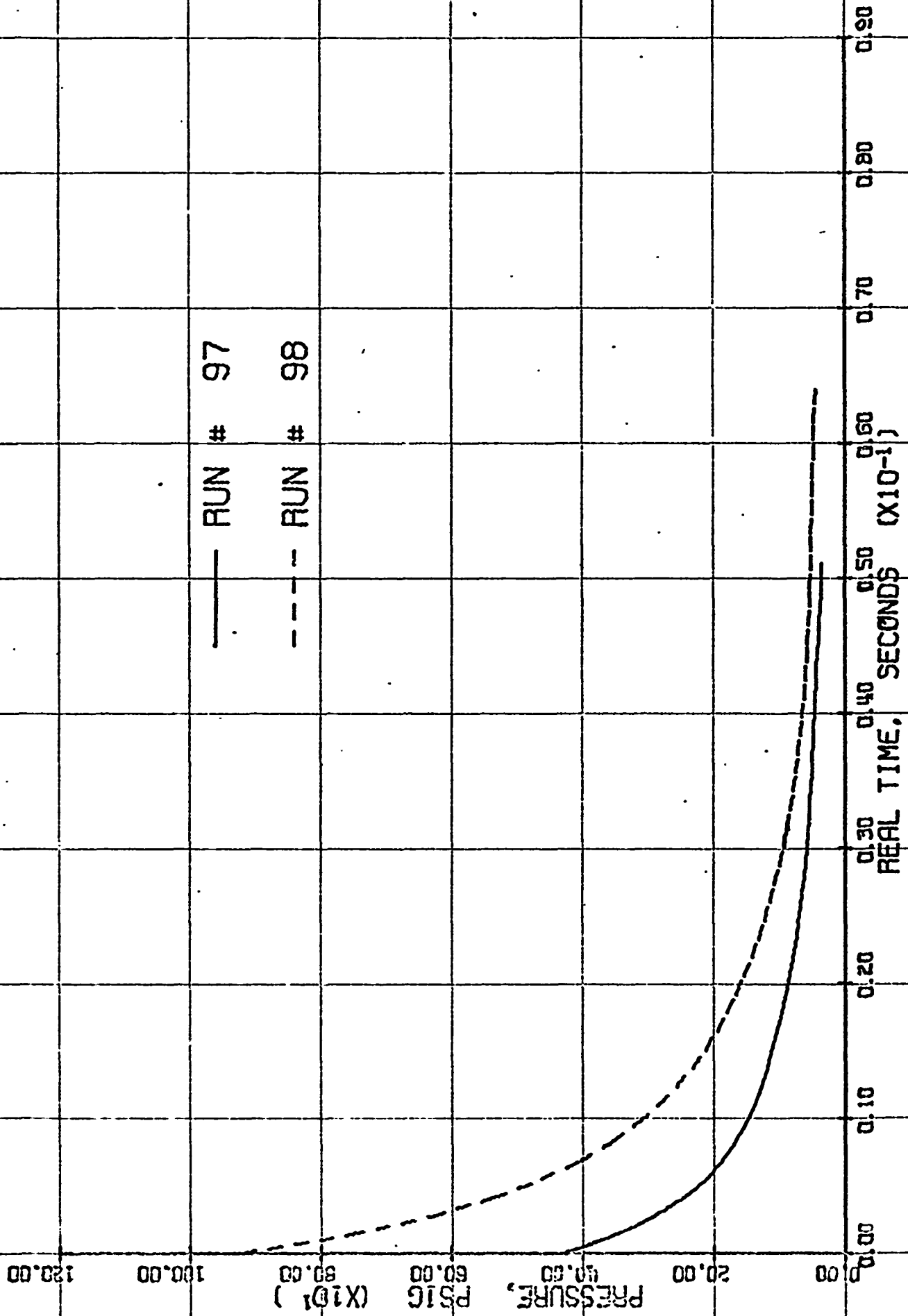
TIME	P	LN(P)
0.0453	25.0	-3.0374
0.0553	20.0	-3.3105
0.0653	15.0	-3.5982

DATA FROM RUN # 100

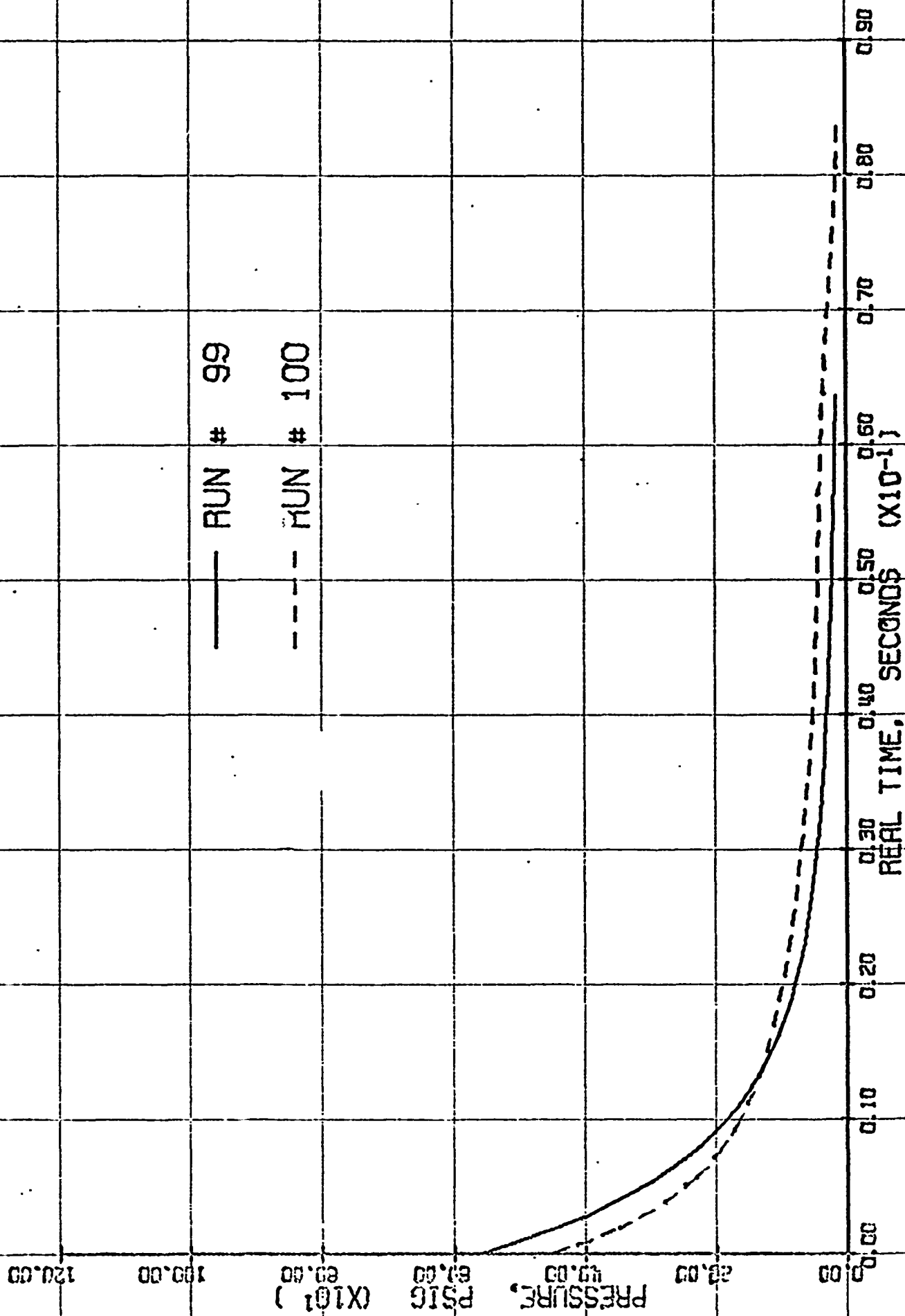
TIME	P	LN(P)
0.0	452.0	0.0
0.0007	400.0	-0.1222
0.0017	340.0	-0.2701
0.0037	270.0	-0.4969
0.0057	225.0	-0.5975
0.0077	190.0	-0.8667
0.0097	155.0	-1.1077
0.0117	143.0	-1.1508
0.0157	112.0	-1.3952
0.0217	92.0	-1.5919

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.7532375500-04 F=-0.2544733330-03
 B=-0.5419122930 00 G= 0.5327307330-04
 C= 0.7514227400-01 H=-0.2627694330-05
 D=-0.4752318000-02 H= 0.4239434650-07

TIME	P	LN(P)
0.0317	55.0	-1.9393
0.0417	50.0	-2.2017
0.0517	38.0	-2.4751
0.0617	30.0	-2.7125



PRESSURE VS TIME DATA FOR BATCH # 941



PRESSURE VS TIME DATA FOR BATCH # 941

DATA FROM RUN # 101

TIME	P	LN(P)
0.0	455.0	0.0
0.0009	400.0	-0.1283
0.0017	350.0	-0.2624
0.0026	300.0	-0.4165
0.0044	240.0	-0.6397
0.0067	175.0	-0.7555
0.0117	90.0	-1.6205

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 A= 0.2795887300-03 D=-0.3517364290-02
 B=-0.5752673340 00 E= 0.5531727090-03
 C= 0.3061098200-01 F=-0.7137655980-04

TIME	P	LN(P)
0.0157	50.0	-2.2083
0.0217	25.0	-2.9014
0.0267	10.0	-3.3177

DATA FROM RUN # 102

TIME	P	LN(P)
0.0	475.0	0.0
0.0012	380.0	-0.2231
0.0040	232.0	-0.7166
0.0090	140.0	-1.2217
0.0140	95.0	-1.6094
0.0190	62.0	-2.0362
0.0240	47.0	-2.3132
0.0290	35.0	-2.6090
0.0340	25.0	-2.9444
0.0390	17.0	-3.3301

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.3130639940-01 E= 0.1455812360-01
 B=-0.9315812120 00 F=-0.1300048990-02
 C= 0.3224564730 00 G= 0.5948037300-04
 D=-0.3901350250-01 H=-0.1096795480-05

TIME	P	LN(P)
0.0440	10.0	-3.3607
0.0006	436.3	-0.0849
0.0012	381.1	-0.2202
0.0024	292.7	-0.4841

DATA FROM RUN # 103

TIME	P	LN(P)
0.0	448.0	0.0
0.0017	355.0	-0.2327
0.0057	210.0	-0.7577
0.0117	152.0	-1.0309
0.0167	120.0	-1.3173
0.0267	80.0	-1.7223
0.0367	53.0	-2.0443
0.0567	40.0	-2.4159
0.0667	35.0	-2.5494
0.0006	414.6	-0.0776

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.1342362550-01 E=-0.3372502610-03
 B=-0.5973271530 00 F= 0.1406972550-03
 C= 0.1131043740 00 G=-0.3973402270-05
 D=-0.1045009040-01 H= 0.1637027800-06

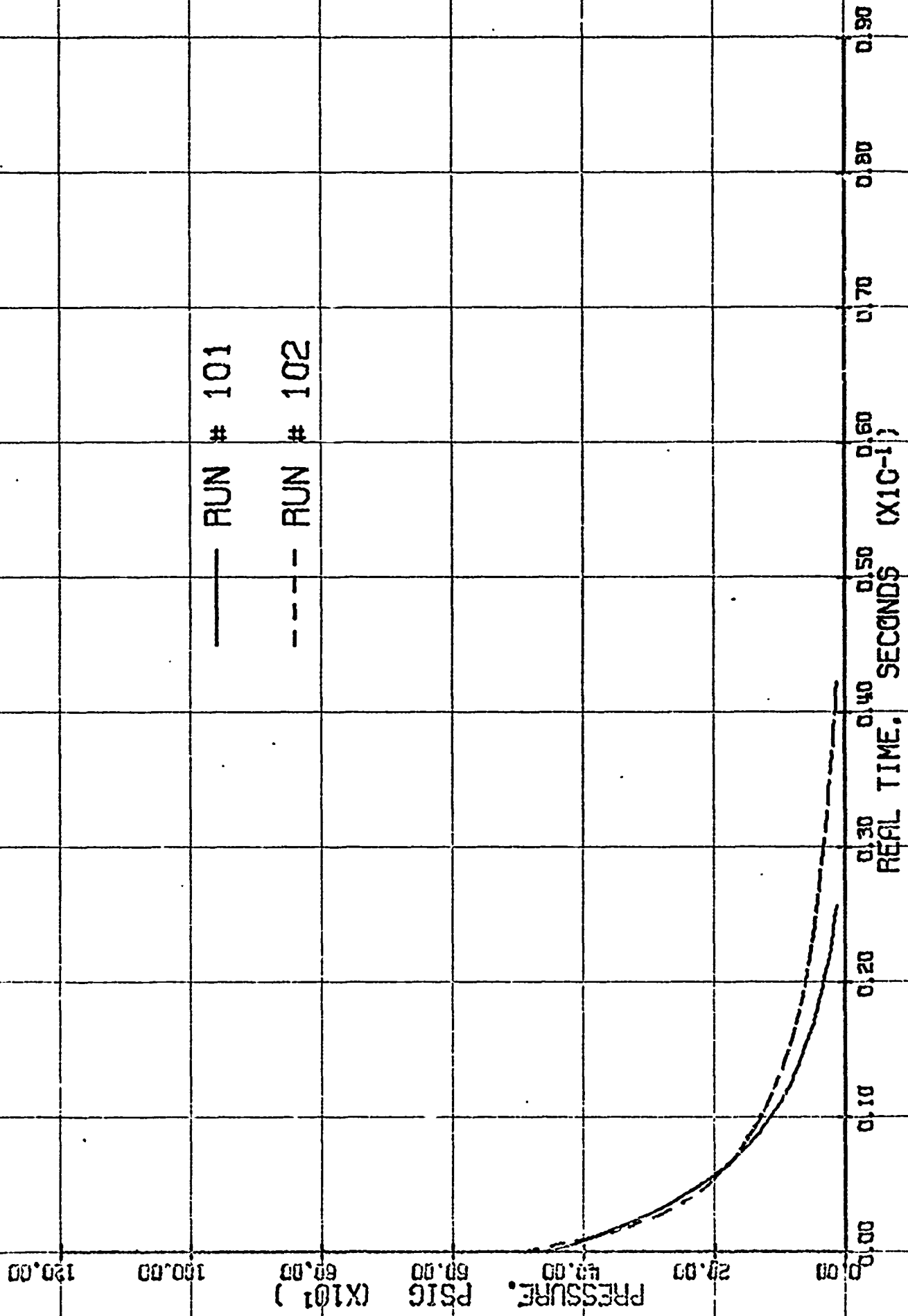
TIME	P	LN(P)
0.0012	373.9	-0.1675
0.0019	345.5	-0.2599
0.0031	290.9	-0.4319
0.0044	253.0	-0.5715

DATA FROM RUN # 104

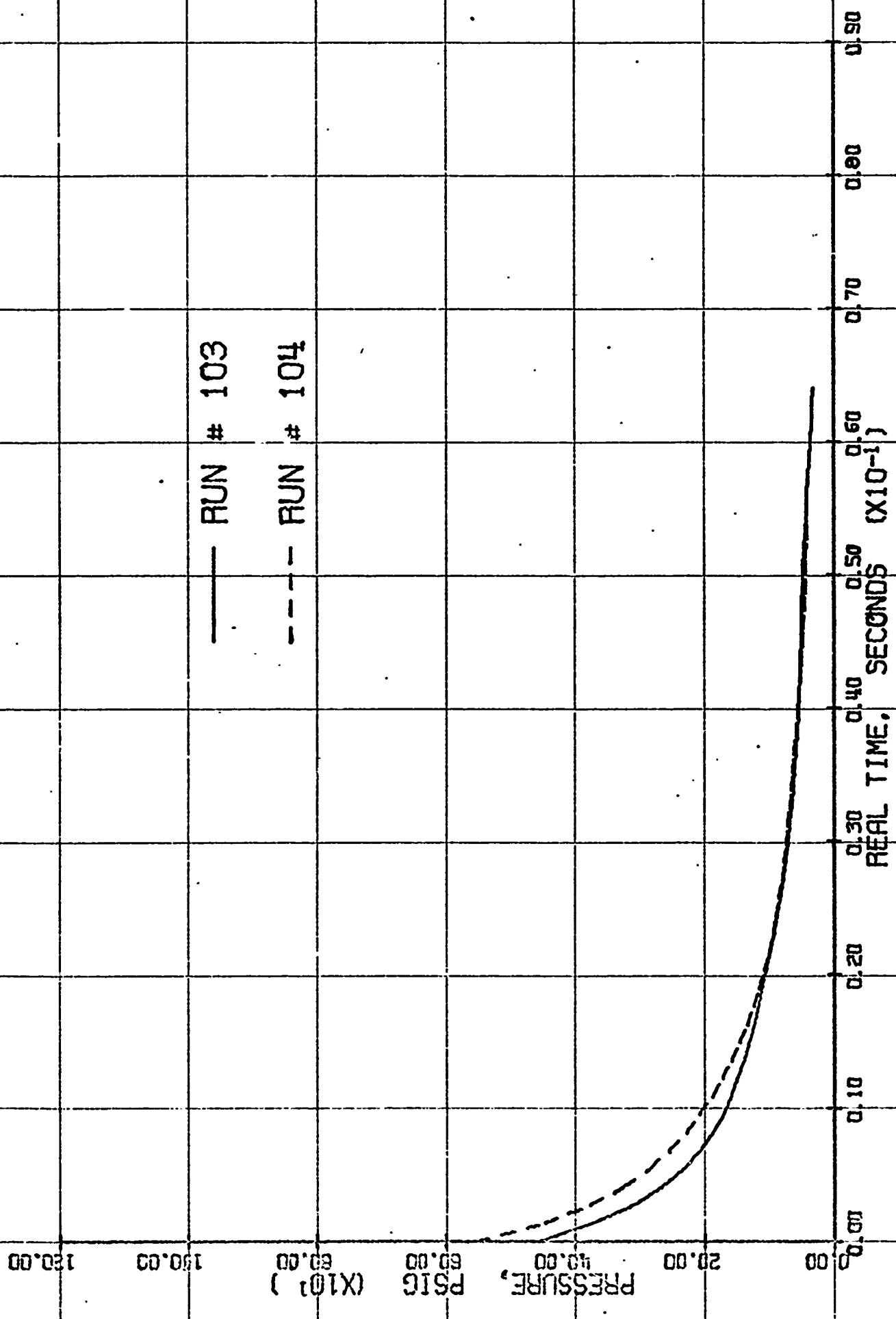
TIME	P	LN(P)
0.0	547.0	0.0
0.0012	455.0	-0.1624
0.0032	266.5	-0.7224
0.0112	132.0	-1.1304
0.0162	133.0	-1.3772
0.0212	100.0	-1.6093
0.0262	85.0	-1.8613
0.0312	70.0	-2.0540
0.0362	62.0	-2.1773
0.0462	47.0	-2.4443

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.9311867240-02 E= 0.7044373110-02
 B=-0.4353521560 00 F=-0.5301547430-03
 C= 0.1815600200 00 G= 0.2420566910-04
 D=-0.4664375430-01 H=-0.3993693110-06

TIME	P	LN(P)
0.0562	43.0	-2.5432
0.0662	40.0	-2.6156
0.0021	403.2	-0.3051
0.0027	370.5	-0.3897



PRESSURE VS TIME DATA FOR BATCH # 941



PRESSURE VS TIME DATA FOR BATCH # 941

BATCH # 941 / 30.0% AP, 20.0% PBAA

DATA FROM RUN # 105

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	695.0	0.0
0.0005	630.0	-0.0082
0.0055	290.0	-0.6740
0.0115	175.0	-1.3791
0.0155	115.0	-1.7290
0.0215	75.0	-2.2254
0.0255	50.0	-2.5319
0.0355	20.0	-3.5482
0.0455	10.0	-4.2413
0.0003	671.0	-0.0351

A = 0.3059120960-01	E = 0.3939321990-01
B = -0.1001964030 01	F = -0.4874554130-02
C = 0.4668015380 00	G = 0.3091154140-03
D = -0.1763251630 00	H = -0.7756165940-05

TIME	P	LN(P)
0.0009	533.2	-0.1754
0.0016	511.3	-0.3070
0.0022	447.4	-0.4406
0.0023	402.6	-0.5459

DATA FROM RUN # 106

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	720.0	0.0
0.0042	392.0	-0.6080
0.0092	242.0	-1.0903
0.0142	170.0	-1.4435
0.0192	115.0	-1.8343
0.0242	80.0	-2.1972
0.0292	65.0	-2.4049
0.0342	48.0	-2.7080
0.0292	40.0	-2.3904
0.0442	30.0	-3.1781

A = 0.1554671980-01	E = 0.6262388900-02
B = -0.6999331430-00	F = -0.4760018630-03
C = 0.1859164020 00	G = 0.1844949770-04
D = -0.4503222340-01	H = -0.2850120360-06

TIME	P	LN(P)
0.0492	25.0	-3.3604
0.0592	17.0	-3.7460
0.0692	10.0	-4.2767
0.0010	627.2	-0.1380

DATA FROM RUN # 107

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	750.0	0.0
0.0004	715.0	-0.0478
0.0054	330.0	-0.6799
0.0114	247.0	-1.1107
0.0154	175.0	-1.4553
0.0214	127.0	-1.7759
0.0314	72.0	-2.3434
0.0414	43.0	-2.7482
0.0614	27.0	-3.3242
0.0814	20.0	-3.6243

A = 0.9028999340-02	E = 0.6723083090-02
B = -0.6838066790 00	F = -0.4667792250-03
C = 0.2043936340 00	G = 0.1777319430-04
D = -0.4994414070-01	H = -0.2554994190-06

TIME	P	LN(P)
0.0002	734.2	-0.0213
0.0003	663.2	-0.1231
0.0014	537.4	-0.2444
0.0021	536.8	-0.3344

DATA FROM RUN # 108

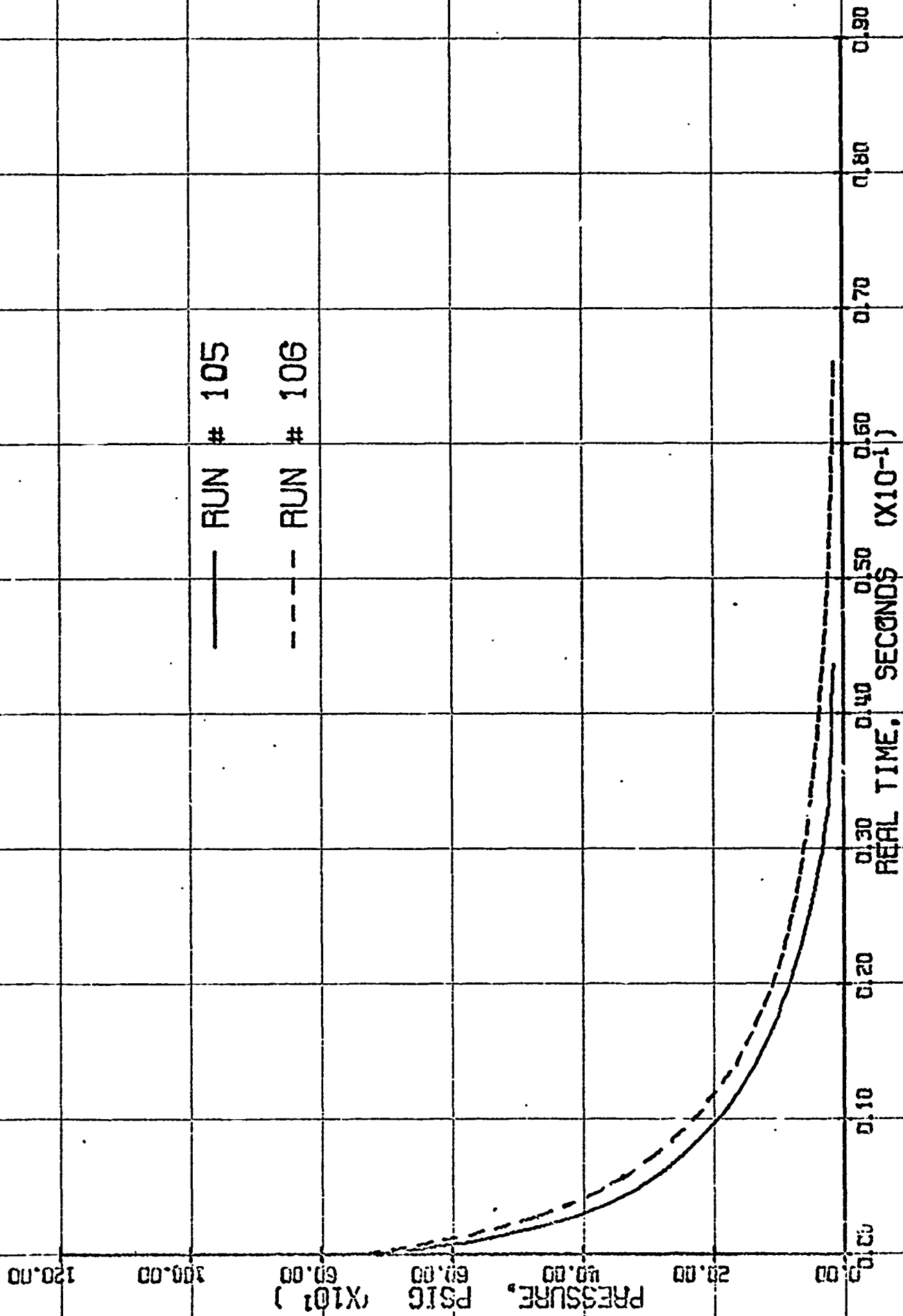
$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6$$

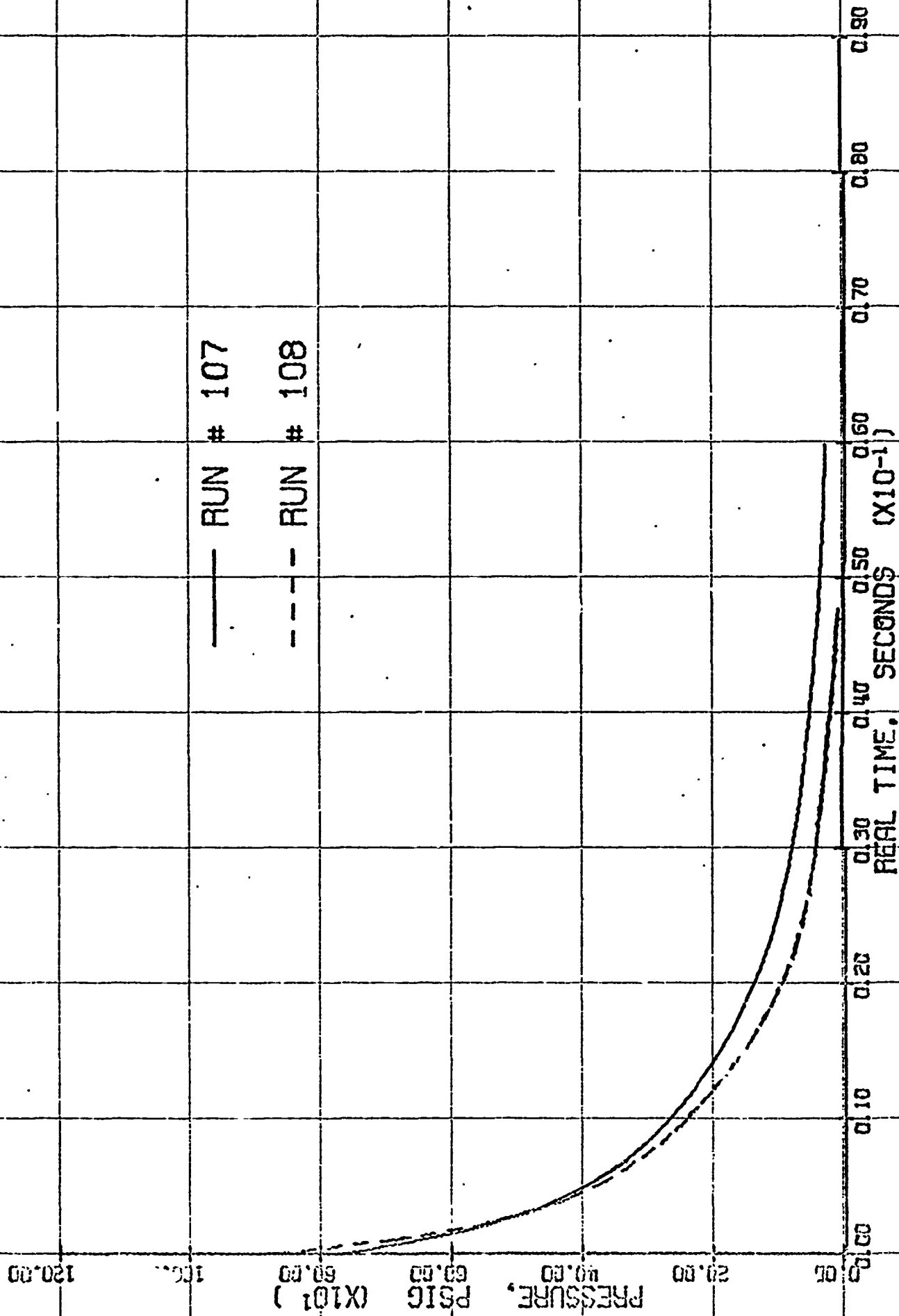
TIME	P	LN(P)
0.0	350.0	0.0
0.0043	320.0	-0.7791
0.0093	235.0	-1.2357
0.0143	162.0	-1.5573
0.0193	92.0	-2.2234
0.0293	42.0	-3.0076
0.0393	20.0	-3.7455
0.0493	5.0	-5.1350
0.0005	779.0	-0.0362

A = 0.2014479750-01	E = 0.1233779430-01
B = -0.0454164430 00	F = -0.7539393730-03
C = 0.3534341430 00	G = 0.1749694060-04
D = -0.9436503670-01	

TIME	P	LN(P)
0.0011	676.4	-0.2254
0.0017	569.5	-0.3659
0.0024	540.3	-0.4713



PRESSURE VS TIME DATA FOR BATCH # 941



PRESSURE VS TIME DATA FOR BATCH # 941

BATCH # 941 A 50.0% AP, 20.0% PSA

DATA FROM RUN # 109

TIME	P	LN(P)
0.0	890.0	0.0
0.0023	615.0	-0.3696
0.0073	360.0	-0.9051
0.0123	245.0	-1.2900
0.0173	175.0	-1.6264
0.0223	125.0	-1.9629
0.0323	72.0	-2.5140
0.0423	45.0	-2.9246
0.0523	30.0	-3.3900
0.0723	20.0	-3.7955

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.1162944220-01 E = 0.7057370080-02
 B = -0.7353728500 00 F = -0.5257133720-03
 C = 0.2165303700 00 G = 0.2008378360-04
 D = -0.5206190280-01 H = -0.3059853340-06

TIME	P	LN(P)
0.0007	804.9	-0.1305
0.0013	712.0	-0.2231
0.0017	642.3	-0.3251
0.0026	530.4	-0.4274

DATA FROM RUN # 110

TIME	P	LN(P)
0.0	1055.0	0.0
0.0038	535.0	-0.5790
0.0083	345.0	-1.1173
0.0138	245.0	-1.4600
0.0183	172.0	-1.8138
0.0238	125.0	-2.1330
0.0283	93.0	-2.4287
0.0338	75.0	-2.5438
0.0388	60.0	-2.8570
0.0438	43.0	-3.2001

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.5521439870-02 E = 0.6638226490-02
 B = -0.2357331940 00 F = -0.4232319200-03
 C = 0.2525055720 00 G = 0.1401965640-04
 D = -0.5543138730-01 H = -0.1825638770-06

TIME	P	LN(P)
0.0538	30.0	-3.5601
0.0688	24.0	-3.7332
0.0728	20.0	-3.9656
0.0023	706.4	-0.4011

DATA FROM RUN # 111

TIME	P	LN(P)
0.0	1070.0	0.0
0.0010	1010.0	-0.0577
0.0060	460.0	-0.3442
0.0110	272.0	-1.3556
0.0160	175.0	-1.3105
0.0210	112.0	-2.2569
0.0310	55.0	-2.7681
0.0410	37.0	-3.3645
0.0510	15.0	-4.2674
0.0610	5.0	-5.3660

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.4605079810-01 E = -0.1907324840-01
 B = -0.4365404020 00 F = 0.1996542920-02
 C = -0.1555212200 00 G = -0.1007179040-03
 D = 0.3900970220-01 H = 0.1943316010-05

TIME	P	LN(P)
0.0004	1284.0	-0.0143
0.0013	913.2	-0.1530
0.0024	819.1	-0.2585
0.0037	629.9	-0.5299

DATA FROM RUN # 112

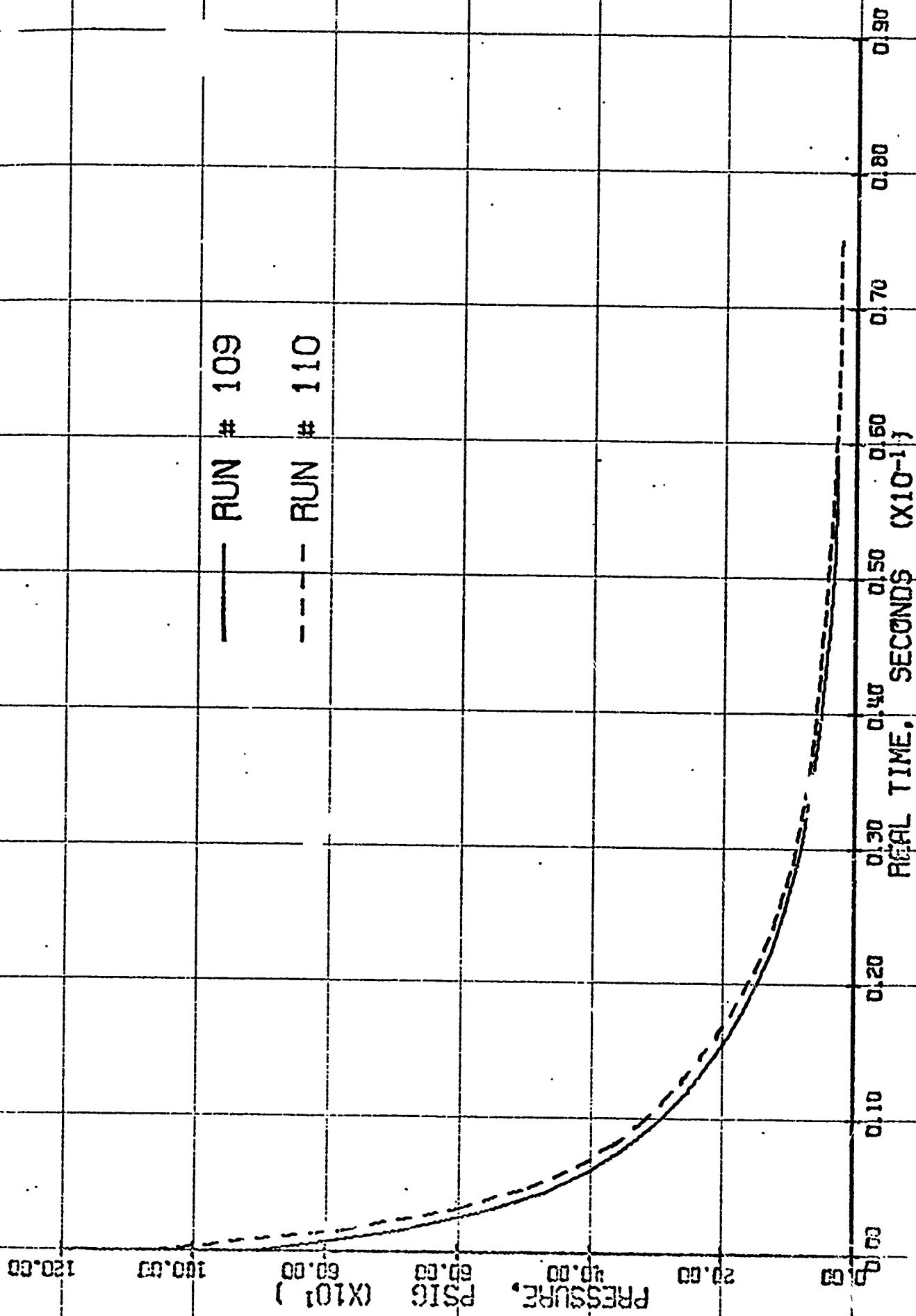
TIME	P	LN(P)
0.0	1065.0	0.0
0.0026	645.0	-0.5015
0.0076	340.0	-1.1412
0.0126	215.0	-1.5501
0.0176	132.0	-2.0140
0.0226	95.0	-2.4109
0.0326	25.0	-3.7619
0.0326	5.0	-5.3613
0.0003	910.0	-0.1470

$$T = (TIME * REF ** 2) / ALPHA$$

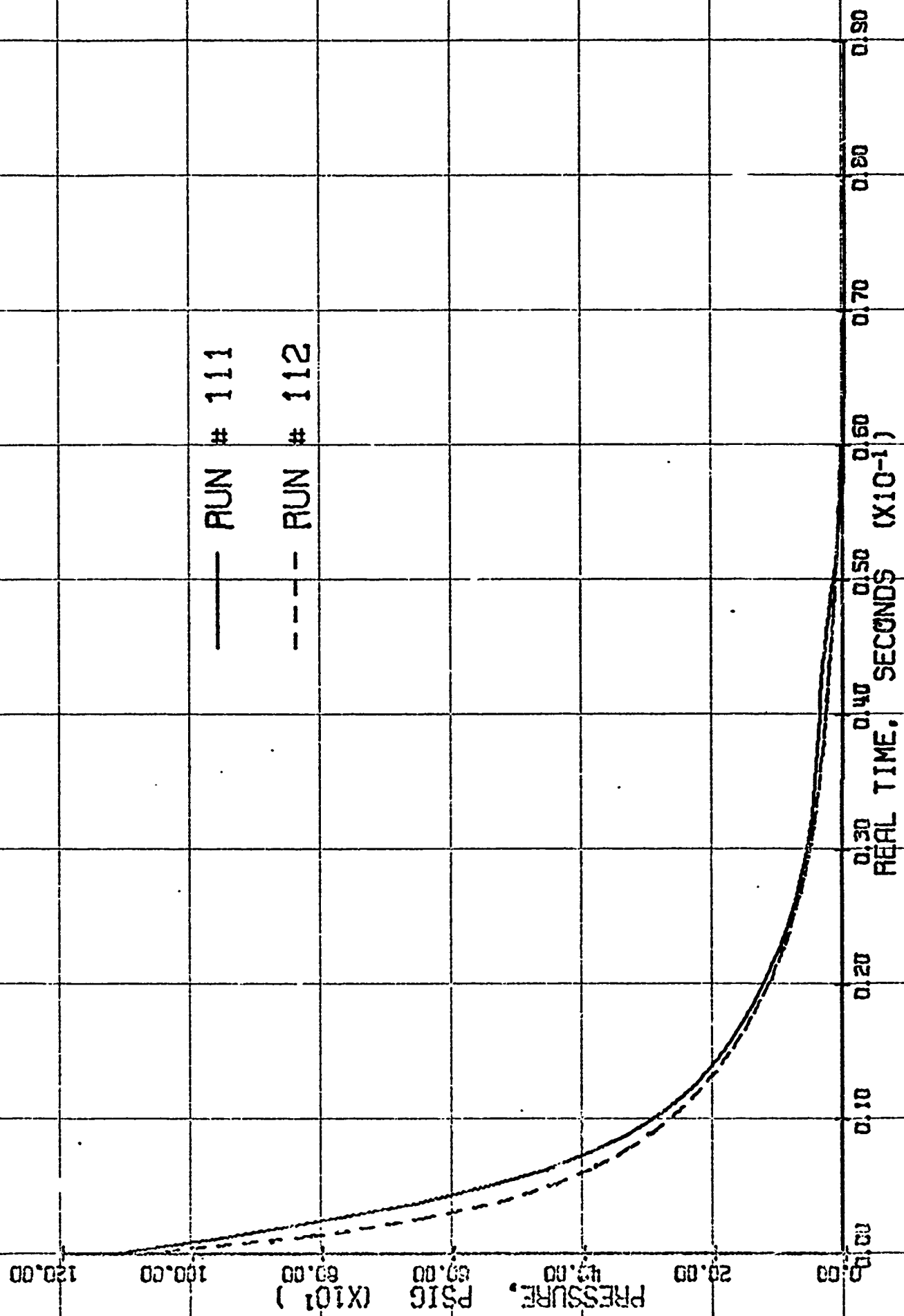
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.1522463050-01 E = 0.4199270600-02
 B = -0.2630250000 00 F = -0.2053350450-03
 C = 0.2156613390 00 G = 0.3950709360-05
 D = -0.4150743000-01

TIME	P	LN(P)
0.0014	750.0	-0.2962
0.0027	635.9	-0.5151
0.0039	513.3	-0.7296



PRESSURE VS TIME DATA FOR BATCH # 941



PRESSURE VS TIME DATA FOR BATCH # 941

DATA FROM RUN # 113

TIME	P	LN(P)
0.0	800.0	0.0
0.0033	440.0	-0.5978
0.0083	240.0	-1.2040
0.0132	130.0	-1.8171
0.0183	100.0	-2.0704
0.0233	65.0	-2.5102
0.0283	47.0	-2.8345
0.0333	32.0	-3.2189
0.0383	20.0	-3.5689
0.0433	12.0	-4.1097

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = -0.1243509510-01 E = 0.1055726140-01
 B = -0.7942936990 00 F = -0.1125496760-02
 C = 0.1936162350 00 G = 0.5975080580-04
 D = -0.5540751530-01 H = -0.1231202290-05

TIME	P	LN(P)
0.0483	8.0	-4.6052
0.0533	5.0	-5.0752
0.0011	627.5	-0.2429
0.0017	549.0	-0.3765

DATA FROM RUN # 114

TIME	P	LN(P)
0.0	870.0	0.0
0.0031	540.0	-0.4769
0.0081	323.0	-0.9755
0.0131	225.0	-1.3524
0.0181	160.0	-1.6933
0.0231	115.0	-2.0236
0.0331	63.0	-2.5490
0.0431	48.0	-2.8973
0.0531	33.0	-3.2720
0.0631	25.0	-3.5104

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.4979693640-02 E = 0.6456361600-02
 B = -0.7161041590 00 F = -0.4593326130-03
 C = 0.2048950410 00 G = 0.1654457900-04
 D = -0.4881981330-01 H = -0.2366324270-06

TIME	P	LN(P)
0.0731	20.0	-3.7728
0.0011	714.6	-0.1967
0.0017	652.5	-0.2877
0.0030	543.8	-0.4700

DATA FROM RUN # 115

TIME	P	LN(P)
0.0	495.0	0.0
0.0021	365.0	-0.3047
0.0071	220.0	-0.8109
0.0121	155.0	-1.1611
0.0171	110.0	-1.5041
0.0271	65.0	-2.0302
0.0371	45.0	-2.3979
0.0471	30.0	-2.8034
0.0571	20.0	-3.2088
0.0602	481.9	-0.9270

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.2463192840-01 E = 0.8854124670-02
 B = -0.7111538070 00 F = -0.3932435590-03
 C = 0.2316418700 00 G = 0.2727164690-04
 D = -0.5033983940-01 H = -0.4228243220-06

TIME	P	LN(P)
0.0009	437.2	-0.1241
0.0016	395.0	-0.2231
0.0026	321.7	-0.4308
0.0041	230.5	-0.5680

DATA FROM RUN # 116

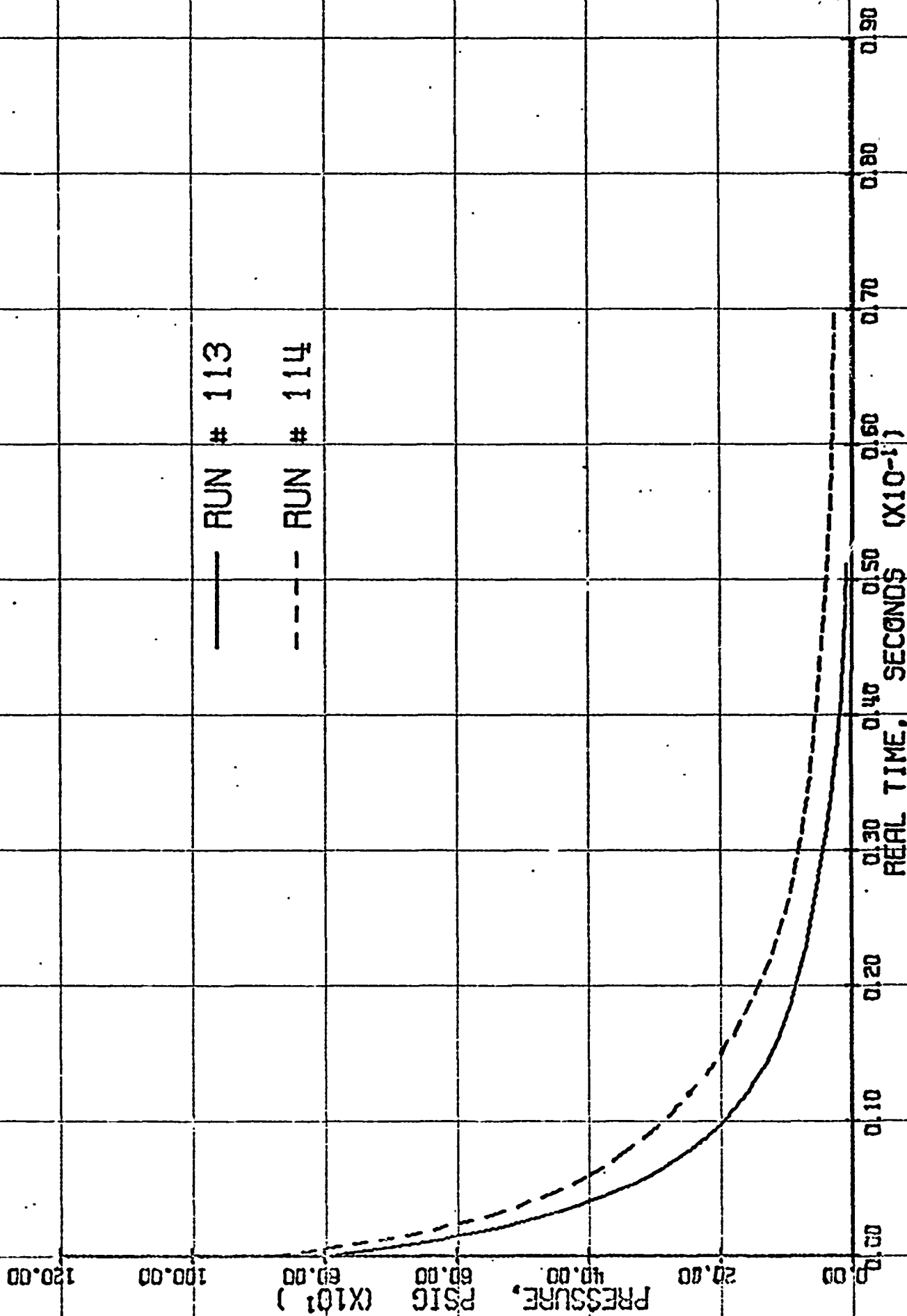
TIME	P	LN(P)
0.0	1140.0	0.0
0.0003	1000.0	-0.0449
0.0052	540.0	-0.7472
0.0103	350.0	-1.2397
0.0153	215.0	-1.5631
0.0253	115.0	-2.2929
0.0353	65.0	-2.5951
0.0453	45.0	-2.8644
0.0553	30.0	-3.3011
0.1053	25.0	-3.5199

$$T = (TIME * RREF ** 2) / ALPHA$$

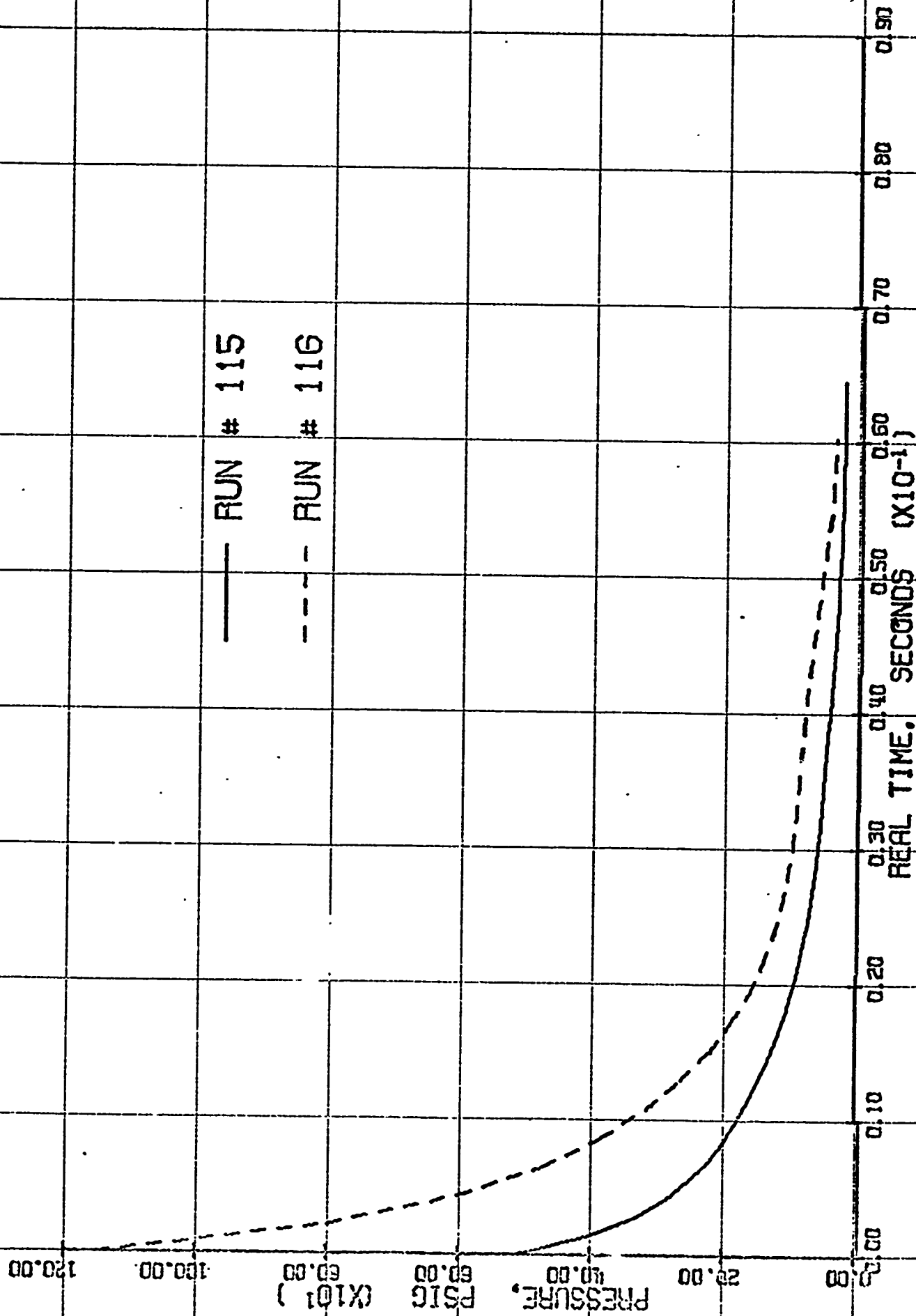
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.3511021000-02 E = 0.0692457050-07
 B = -0.7194132870 00 F = -0.4941574340-06
 C = 0.1857655400 00 G = 0.1752468950-04
 D = -0.4671245450-01 H = -0.2334166890-06

TIME	P	LN(P)
0.0007	1019.2	-0.1120
0.0014	803.4	-0.2582
0.0020	600.3	-0.3523
0.0032	673.5	-0.5175



PRESSURE VS TIME DATA FOR BATCH # 941



PRESSURE VS TIME DATA FOR BATCH # 941

DATA FROM RUN # 117

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0	792.0	0.0
0.0004	745.0	-0.0612
0.0013	600.0	-0.2776
0.0054	415.0	-0.6463
0.0084	320.0	-0.9062
0.0104	275.0	-1.0578
0.0154	192.0	-1.4171
0.0204	140.0	-1.7329
0.0254	105.0	-2.0206

A = -0.3192772630-02	E = 0.3350814110-02
B = -0.5890866580 00	F = -0.1857614320-03
C = 0.1356237730 00	G = 0.3345617930-05
D = -0.2895168770-01	

TIME	P	LN(P)
0.0304	32.0	-2.2673
0.0404	55.0	-2.6672
0.0704	40.0	-2.9357

DATA FROM RUN # 118

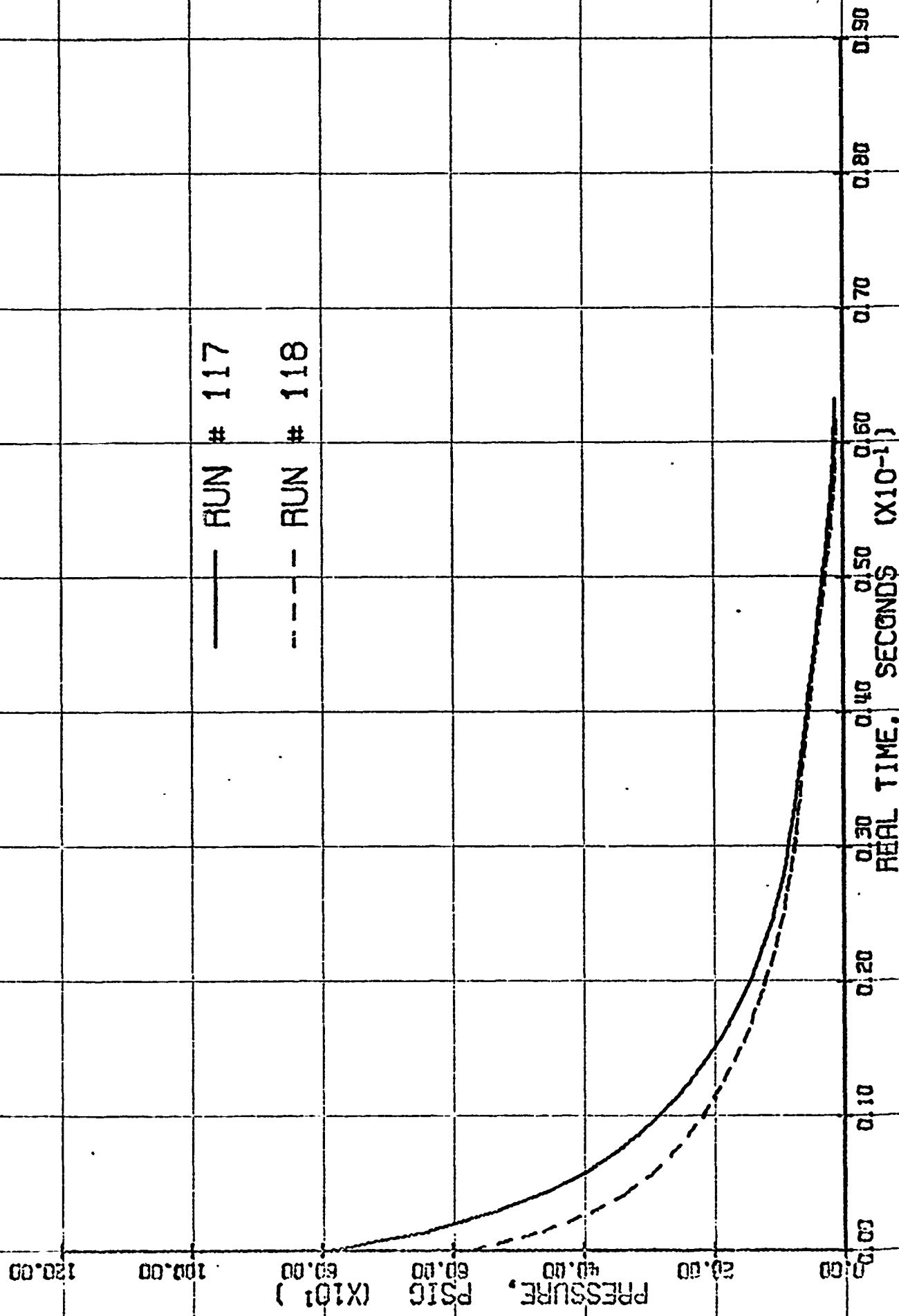
$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0	555.0	0.0
0.0041	340.0	-0.4900
0.0091	230.0	-0.8809
0.0141	170.0	-1.1832
0.0191	125.0	-1.4907
0.0291	73.0	-1.9623
0.0391	55.0	-2.3116
0.0591	40.0	-2.5301
0.0005	533.7	-0.0299

A = 0.2776750340-01	E = 0.4324980410-02
B = -0.6037050740 00	F = -0.2433232150-03
C = 0.1660895670 00	G = 0.5112395940-05
D = -0.3680200890-01	

TIME	P	LN(P)
0.0011	439.7	-0.1252
0.0024	408.1	-0.3075
0.0036	351.0	-0.4583



PRESSURE VS TIME DATA FOR BATCH # 941

BATCH # 945 / 77.5% AP, 22.5% PBAA

DATA FROM RUN # 143

TIME	P	LN(P)
0.0	860.0	0.0
0.0018	670.0	-0.2497
0.0068	370.0	-0.8434
0.0118	238.0	-1.2847
0.0168	165.0	-1.6510
0.0218	115.0	-2.0120
0.0268	85.0	-2.3143
0.0318	65.0	-2.5825
0.0418	40.0	-3.1631
0.0518	25.0	-3.532

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

A = 0.1450569050-01 E = -0.8346424400-02
 B = -0.8251632360 00 F = 0.2220253830-02
 C = 0.1600727380 00 G = -0.2143121480-03
 D = -0.8356225520-02 H = 0.7280519820-05

TIME	P	LN(P)
0.0009	774.8	-0.1044
0.0015	697.3	-0.2097
0.0021	619.8	-0.3275
0.0034	526.8	-0.4900

DATA FROM RUN # 149

TIME	P	LN(P)
0.0	760.0	0.0
0.0039	495.0	-0.4288
0.0089	335.0	-0.8192
0.0139	255.0	-1.0921
0.0189	205.0	-1.3103
0.0239	170.0	-1.4975
0.0289	145.0	-1.6566
0.0339	125.0	-1.8050
0.0389	110.0	-1.9323
0.0439	90.0	-2.1335

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

A = -0.1702251260-02 E = 0.1847622200-02
 B = -0.6340123610 00 F = -0.9717196300-04
 C = 0.1294095760 00 G = 0.2659946150-05
 D = -0.1987049310-01 H = -0.2936757540-07

TIME	P	LN(P)
0.0589	75.0	-2.3158
0.0789	60.0	-2.5390
0.0989	50.0	-2.7213
0.1289	40.0	-2.9444

DATA FROM RUN # 150

TIME	P	LN(P)
0.0	738.0	0.0
0.0005	690.0	-0.0673
0.0054	415.0	-0.5757
0.0106	260.0	-1.0433
0.0156	175.0	-1.4342
0.0216	130.0	-1.7364
0.0256	102.0	-1.9790
0.0316	85.0	-2.1613
0.0356	70.0	-2.3554
0.0456	52.0	-2.4527

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

A = -0.6080528640-02 E = -0.1073685250-01
 B = -0.4718636830 00 F = 0.1105621970-02
 C = -0.3171737460-01 G = -0.5740524670-04
 D = 0.5237040020-01 H = 0.1196348360-05

TIME	P	LN(P)
0.0556	40.0	-2.9151
0.0656	35.0	-3.0486
0.0914	637.9	-0.1457
0.0026	562.9	-0.2709

DATA FROM RUN # 151

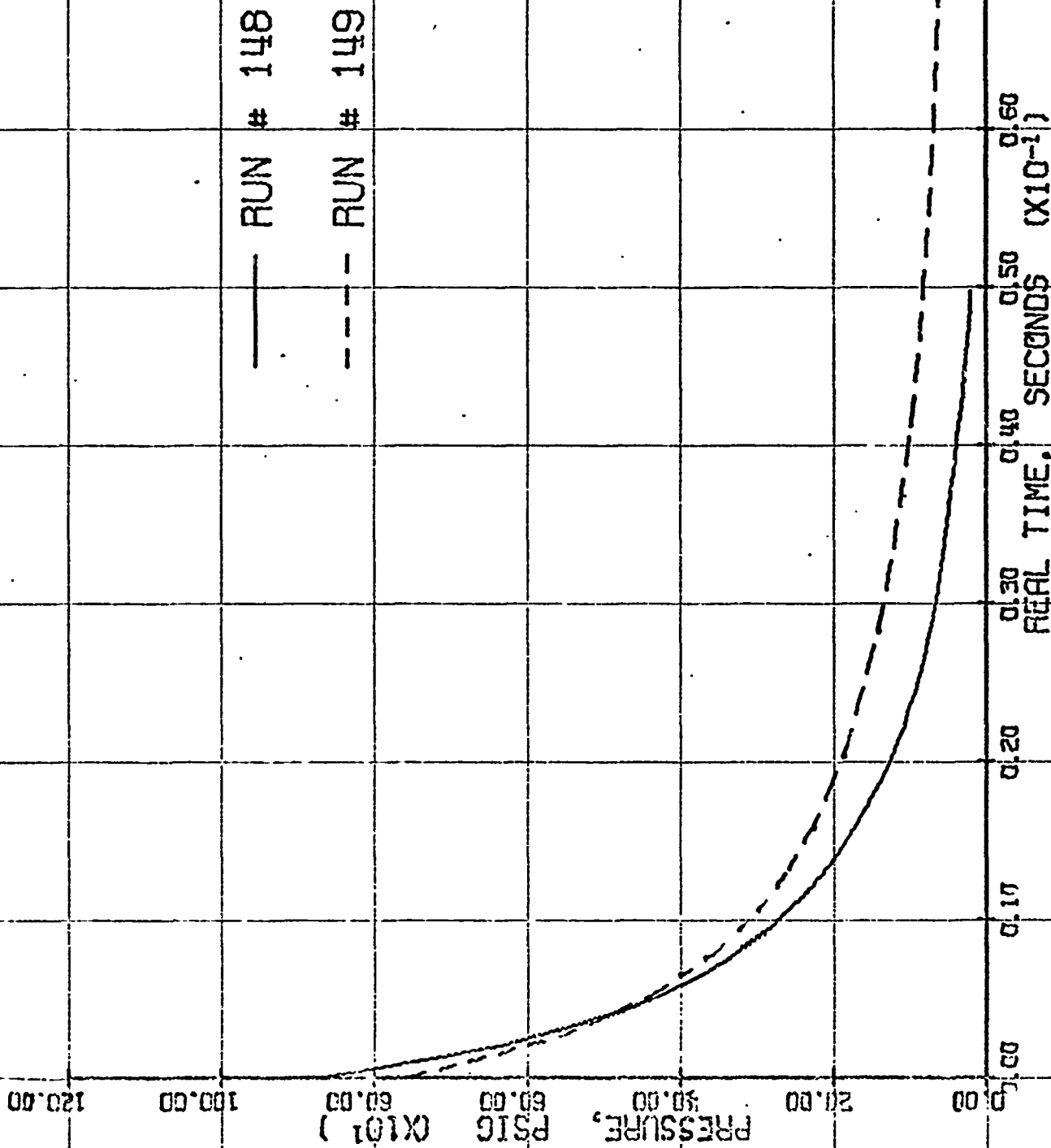
TIME	P	LN(P)
0.0	675.0	0.0
0.0004	640.0	-0.0532
0.0054	365.0	-0.9615
0.0104	275.0	-1.0979
0.0154	205.0	-1.1917
0.0204	165.0	-1.4032
0.0254	132.0	-1.6319
0.0304	115.0	-1.7696
0.0354	95.0	-1.9409
0.0454	75.0	-2.1072

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

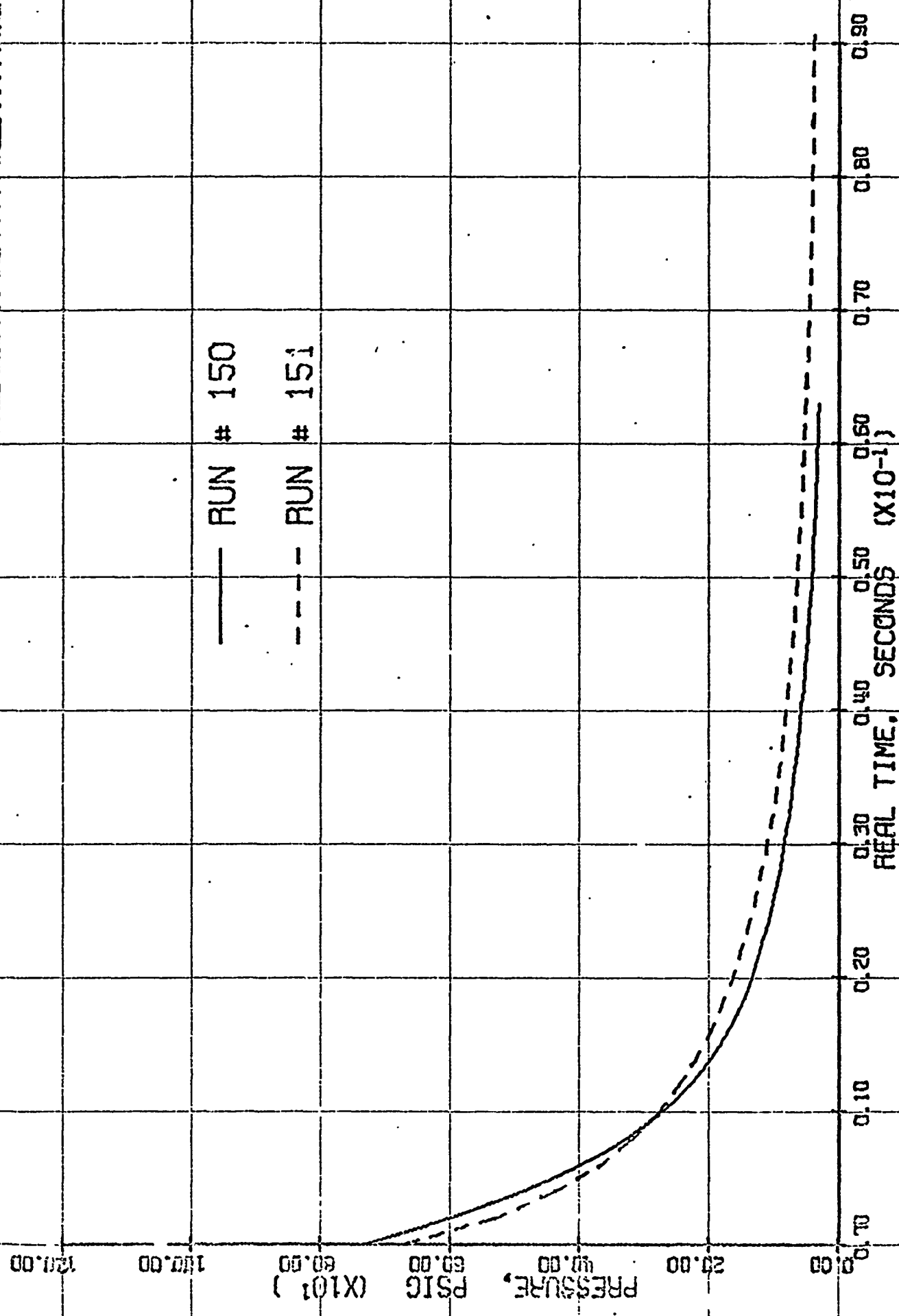
A = -0.2177329400-02 E = 0.3173983790-02
 B = -0.6342781970 00 F = -0.2134494530-03
 C = 0.1332753820 00 G = 0.7861965480-05
 D = -0.2638514300-01 H = -0.1144568500-06

TIME	P	LN(P)
0.0554	62.0	-2.3676
0.0654	53.0	-2.5444
0.0754	47.0	-2.6546
0.0954	40.0	-2.8253



PRESSURE VS TIME DATA FOR BATCH # 945

— RUN # 150
--- RUN # 151



PRESSURE VS TIME DATA FOR BATCH # 945

BATCH 1 945 / 77.5% AP, 22.5% PMAA

DATA FROM RUN # 153

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	1095.0	0.0
0.0023	742.0	-0.3719
0.0073	425.0	-0.9372
0.0123	270.0	-1.3909
0.0172	185.0	-1.7690
0.0223	127.0	-2.1451
0.0273	95.0	-2.4355
0.0323	72.0	-2.7127
0.0373	58.0	-2.9239
0.0423	42.0	-3.2517

A=	0.1150997550-01	E=	0.2900660860-01
B=	-0.9698002090-00	F=	-0.3344928600-02
C=	0.3543180900-00	G=	0.1934531090-03
D=	-0.1355573730-00	H=	-0.4372564540-05

TIME	P	LN(P)
0.0523	25.0	-3.7705
0.0623	20.0	-3.9936
0.0011	925.7	-0.1583
0.0029	682.9	-0.4630

DATA FROM RUN # 154

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	863.0	0.0
0.0050	430.0	-0.5924
0.0100	305.0	-1.0459
0.0150	215.0	-1.3956
0.0200	155.0	-1.7228
0.0250	115.0	-2.0213
0.0300	90.0	-2.2664
0.0350	75.0	-2.4437
0.0400	60.0	-2.6718
0.0500	42.0	-3.0285

A=	0.6414356100-02	E=	0.1014425100-01
B=	-0.7559539940-00	F=	-0.9995730230-03
C=	0.1985347830-00	G=	0.5019610420-04
D=	-0.5693268530-01	H=	-0.1002862050-05

TIME	P	LN(P)
0.0600	30.0	-3.3650
0.0700	22.0	-3.6751
0.0009	774.2	-0.1144
0.0022	641.2	-0.3028

DATA FROM RUN # 155

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	555.0	0.0
0.0013	570.0	-0.1390
0.0050	420.0	-0.4444
0.0063	373.0	-0.5497
0.0113	270.0	-0.8362
0.0143	205.0	-1.1616
0.0213	150.0	-1.4095
0.0263	127.0	-1.6404
0.0313	102.0	-1.8597
0.0363	84.0	-2.0073

A=	-0.2543596140-02	E=	0.1956960050-02
B=	-0.5230532690-00	F=	-0.1173133070-03
C=	0.3919840530-01	G=	0.3220925900-05
D=	-0.1687163890-01	H=	-0.2993430330-07

TIME	P	LN(P)
0.0463	68.0	-2.2651
0.0563	59.0	-2.4071
0.0763	45.0	-2.6760
0.0963	40.0	-2.7958

DATA FROM RUN # 156

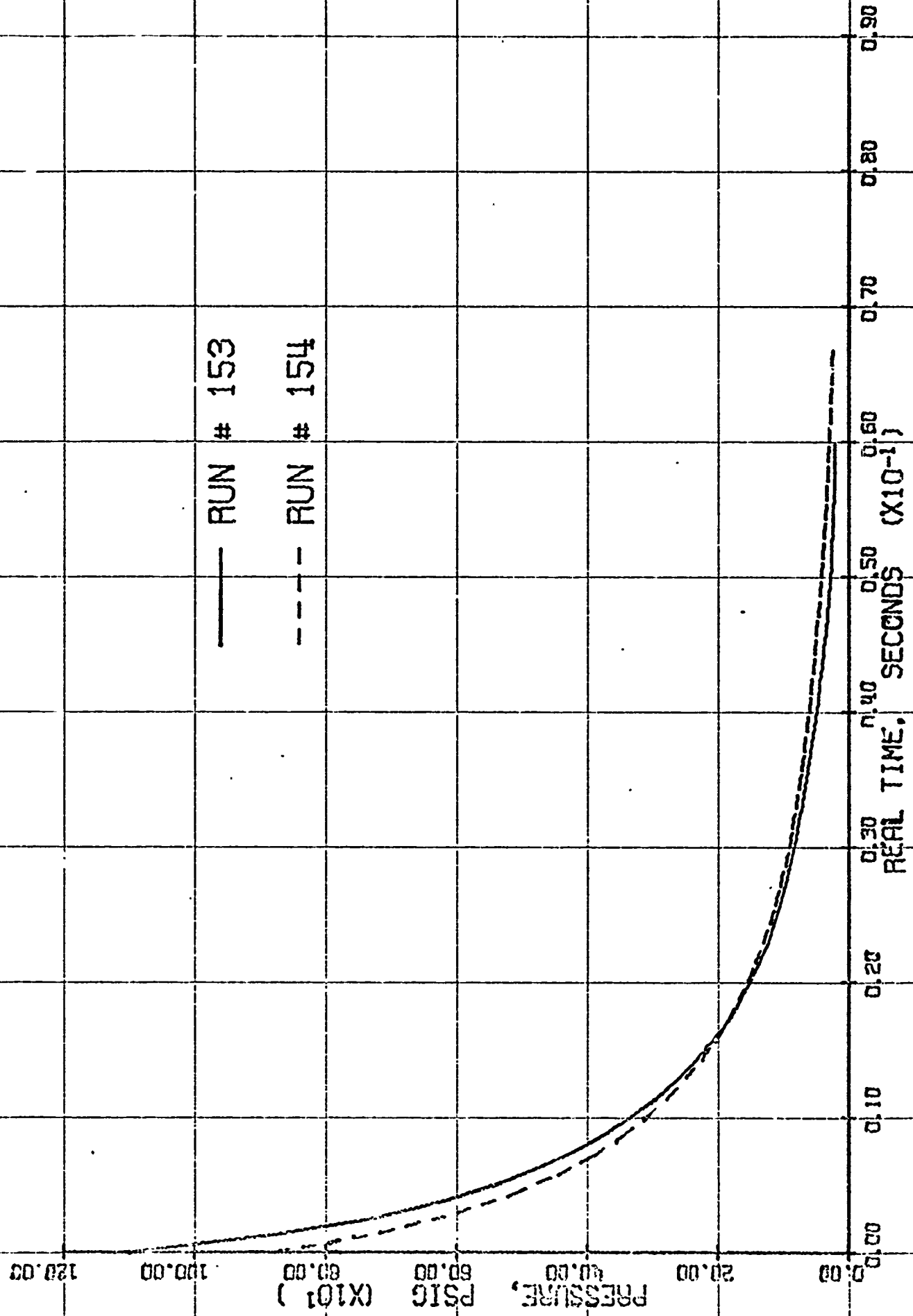
$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

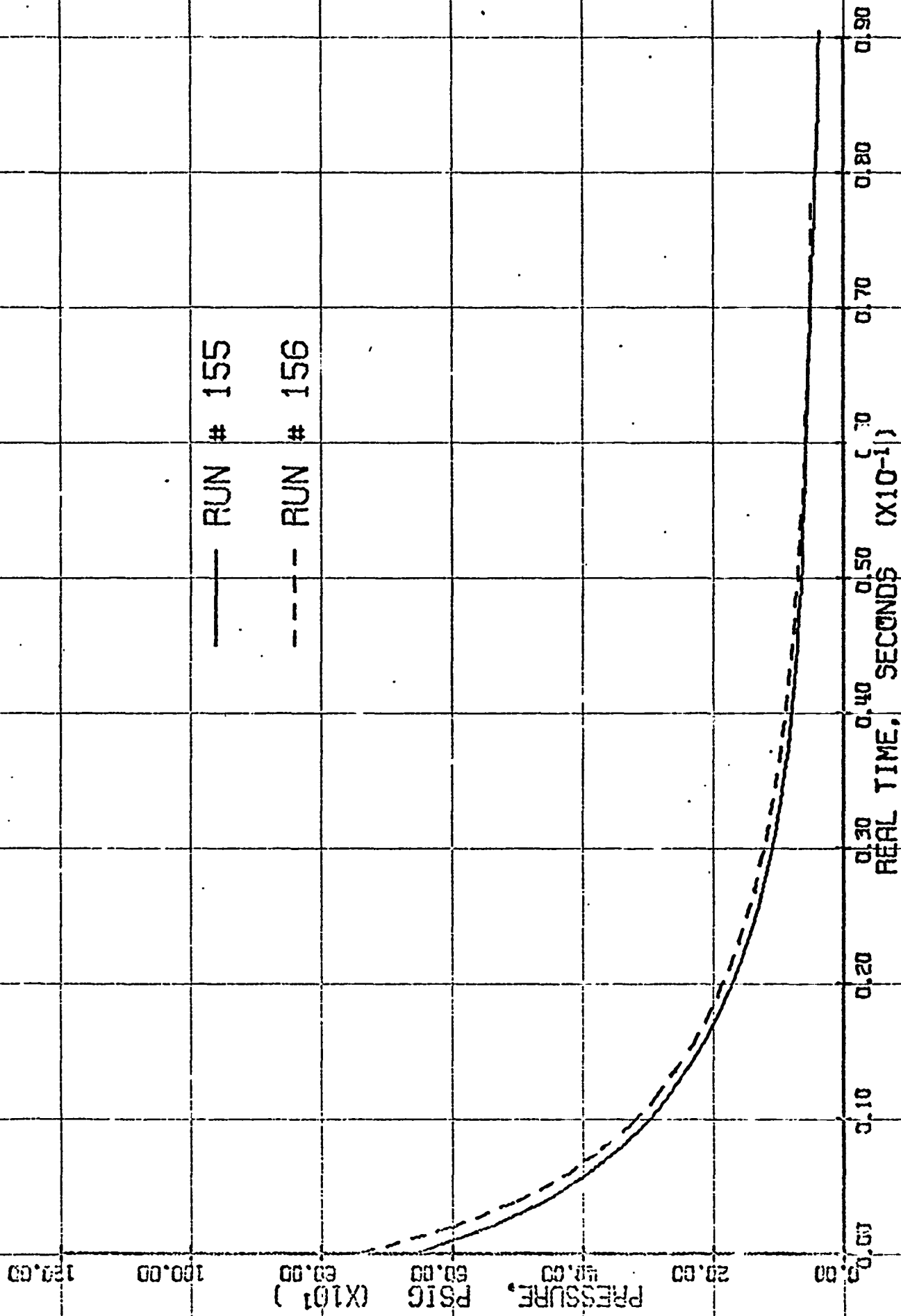
TIME	P	LN(P)
0.0	750.0	0.0
0.0033	500.0	-0.6920
0.0063	342.0	-0.7710
0.0133	252.0	-1.0772
0.0163	194.0	-1.3337
0.0233	150.0	-1.6032
0.0263	120.0	-1.7783
0.0333	100.0	-1.9245
0.0363	90.0	-2.0210
0.0433	80.0	-2.2245

A=	-0.1135415350-02	E=	0.3172851740-02
B=	-0.5372121140-00	F=	-0.2404171610-03
C=	0.1173393300-00	G=	0.9475442760-05
D=	-0.2293575550-01	H=	-0.1400682800-05

TIME	P	LN(P)
0.0533	65.0	-2.4325
0.0633	55.0	-2.5923
0.0733	50.0	-2.6040
0.0833	45.0	-2.8050



PRESSURE VS TIME DATA FOR BATCH # 945



PRESSURE VS TIME DATA FOR BATCH # 945

DATA FROM RUN # 157

TIME	P	LN(P)
0.0	515.0	0.0
0.0005	545.0	-0.0331
0.0055	320.0	-0.6533
0.0105	210.0	-1.0745
0.0155	142.0	-1.4653
0.0205	100.0	-1.8165
0.0255	75.0	-2.1041
0.0305	58.0	-2.3612
0.0355	45.0	-2.6150
0.0455	30.0	-3.0204

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4$
 $+ F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.2334404810-01 E= 0.4498110830-01
 B=-0.9123448800 00 F=-0.5940140950-02
 C= 0.4207143530 00 G= 0.3980499000-03
 D=-0.1339937320 00 H=-0.1059335410-04

TIME	P	LN(P)
0.0555	20.0	-3.4259
0.0019	471.2	-0.2663
0.0031	399.4	-0.4318
0.0044	351.4	-0.5596

DATA FROM RUN # 158

TIME	P	LN(P)
0.0	532.0	0.0
0.0033	335.0	-0.4625
0.0033	208.0	-0.9391
0.0133	145.0	-1.2999
0.0183	100.0	-1.6715
0.0233	80.0	-1.8945
0.0283	52.0	-2.1495
0.0333	50.0	-2.3646
0.0383	40.0	-2.5878
0.0433	25.0	-3.0573

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4$
 $+ F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.1344047240-02 E= 0.2281203790-01
 B=-0.7320047220 00 F=-0.2834353340-02
 C= 0.2608621260 00 G= 0.1756066470-03
 D=-0.0015613900-01 H=-0.4249130260-05

TIME	P	LN(P)
0.0588	20.0	-3.2809
0.0008	467.5	-0.1292
0.0022	390.1	-0.3102
0.0034	338.5	-0.4520

DATA FROM RUN # 159

TIME	P	LN(P)
0.0	485.0	0.0
0.0026	372.0	-0.2653
0.0076	265.0	-0.6044
0.0126	188.0	-0.9477
0.0176	147.0	-1.1937
0.0226	120.0	-1.3967
0.0276	98.0	-1.5992
0.0326	85.0	-1.7415
0.0426	60.0	-1.9645

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4$
 $+ F * T ** 5 + G * T ** 6$
 A=-0.7859359830-02 E= 0.9477331680-03
 B=-0.4905331230 00 F=-0.5029011970-04
 C= 0.3706034070-01 G= 0.1014474630-05
 D=-0.9329679540-02

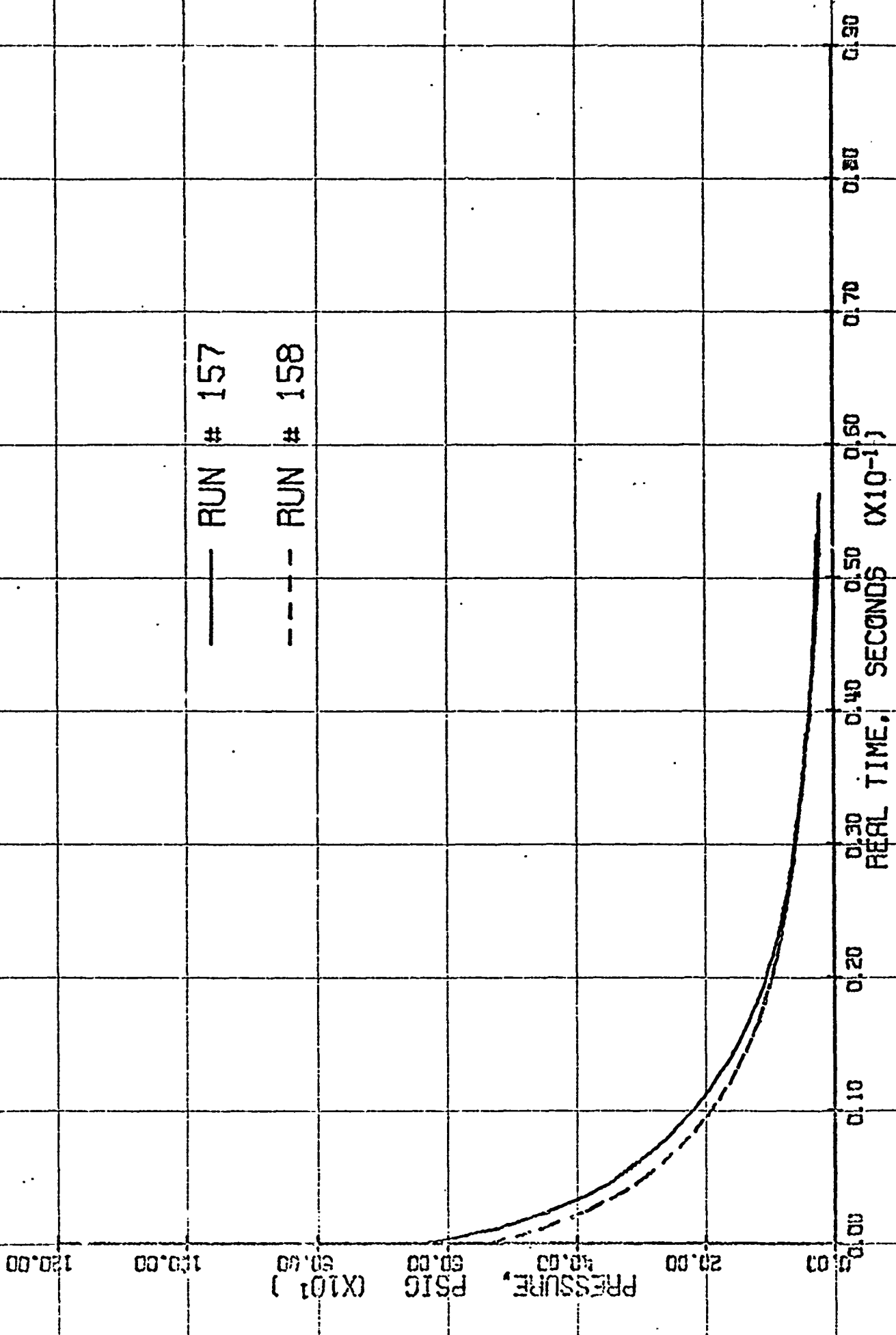
TIME	P	LN(P)
0.0526	50.0	-2.1066
0.0726	45.0	-2.3775
0.0026	40.0	-2.4953

DATA FROM RUN # 160

TIME	P	LN(P)
0.0	442.0	0.0
0.0023	350.0	-0.2052
0.0058	275.0	-0.4745
0.0108	205.0	-0.7523
0.0158	160.0	-1.1121
0.0208	115.0	-1.4444
0.0258	105.0	-1.4276
0.0308	88.0	-1.6160
0.0358	75.0	-1.7346
0.0408	70.0	-1.6428

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4$
 $+ F * T ** 5 + G * T ** 6 + H * T ** 7$
 A=-0.4403495440-02 E= 0.7614052370-03
 B=-0.4375157600 00 F=-0.5086225760-04
 C= 0.8417334530-01 G= 0.1662725640-05
 D=-0.6735934550-02 H=-0.2042021160-07

TIME	P	LN(P)
0.0458	55.0	-1.9169
0.0558	59.0	-2.0138
0.0758	48.0	-2.2201
0.1058	40.0	-2.4024



PRESSURE VS TIME DATA FOR BATCH # 945

— RUN # 159
--- RUN # 160

PRESSURE, PSIG (X10¹)

REAL TIME, SECONDS (X10⁻¹)

PRESSURE VS TIME DATA FOR BATCH # 945

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90

0.00 20.00 40.00 60.00 80.00 100.00 120.00

PRESSURE, PSIG

DATA FROM RUN # 161

TIME	P	LN(P)
0.0	520.0	0.0
0.0029	395.0	-0.2749
0.0077	260.0	-0.6931
0.0129	165.0	-1.1479
0.0179	112.0	-1.5353
0.0229	80.0	-1.8713
0.0279	50.0	-2.1595

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

$A = -0.9911132290-02$ $D = 0.2668023520-01$
 $B = -0.3349109380-00$ $E = -0.3245529250-02$
 $C = -0.7136527830-01$ $F = 0.1348794180-03$

TIME	P	LN(P)
0.0329	45.0	-2.4472
0.0429	25.0	-3.0350
0.0529	20.0	-3.2581

DATA FROM RUN # 162

TIME	P	LN(P)
0.0	438.0	0.0
0.0018	330.0	-0.1420
0.0029	300.0	-0.3764
0.0075	188.0	-0.8453
0.0110	140.0	-1.1406
0.0175	85.0	-1.6396
0.0215	70.0	-1.8337

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

$A = 0.3229711170-02$ $D = 0.2048495980-01$
 $B = -0.638553020-00$ $E = -0.4800610290-02$
 $C = 0.2581182625-01$ $F = 0.2863550760-03$

TIME	P	LN(P)
0.0275	45.0	-2.2756
0.0325	30.0	-2.6310
0.0375	20.0	-3.0865

DATA FROM RUN # 163

TIME	P	LN(P)
0.0	535.0	0.0
0.0016	430.0	-0.2135
0.0041	320.0	-0.5139
0.0066	248.0	-0.7633
0.0116	165.0	-1.1763
0.0166	112.0	-1.5638
0.0216	80.0	-1.9002

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

$A = -0.2465273840-02$ $D = -0.1735561010-01$
 $B = -0.7063637310-00$ $E = 0.9261607310-03$
 $C = 0.1188095230-00$ $F = 0.1551164830-04$

TIME	P	LN(P)
0.0266	60.0	-2.1879
0.0316	45.0	-2.4756
0.0416	40.0	-2.5934

DATA FROM RUN # 165

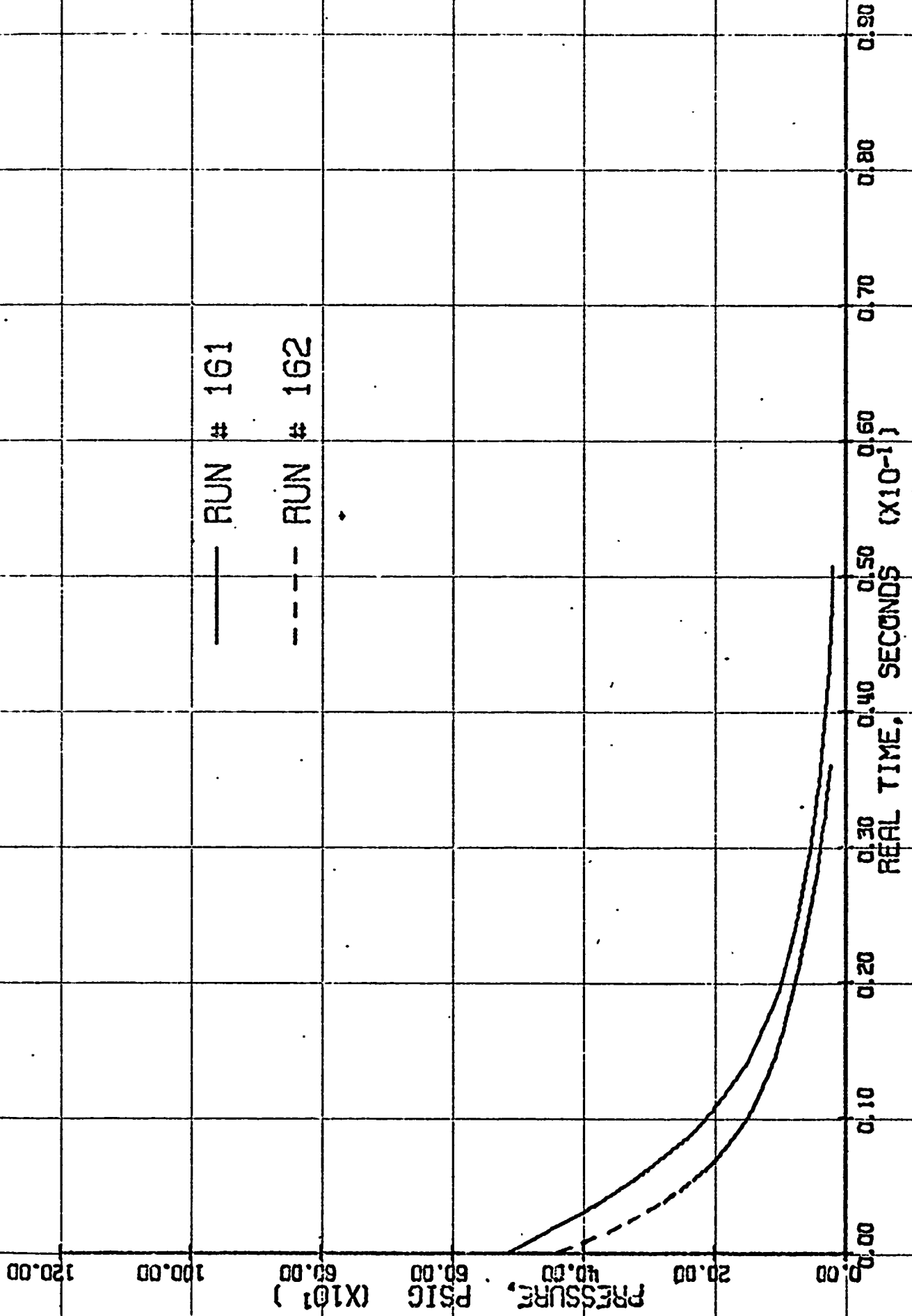
TIME	P	LN(P)
0.0	535.0	0.0
0.0022	370.0	-0.3111
0.0072	215.0	-0.8539
0.0122	155.0	-1.1166
0.0172	105.0	-1.5705
0.0222	75.0	-1.9071
0.0272	50.0	-2.1302

$$T = (TIME * RREF ** 2) / ALPHA$$

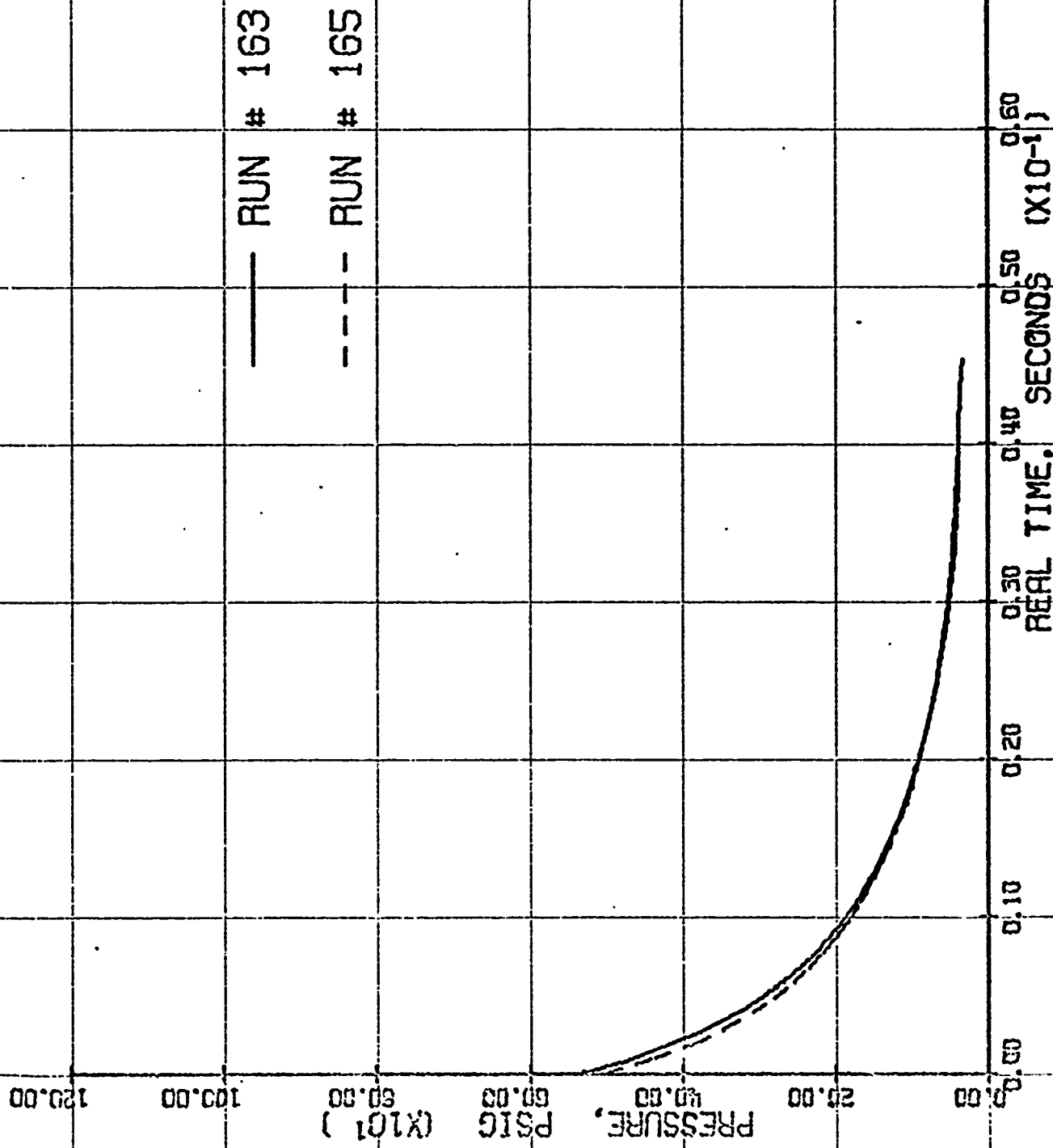
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

$A = -0.9634030410-02$ $D = -0.4088933500-01$
 $B = -0.741424430-00$ $E = 0.4743335760-02$
 $C = 0.1767376510-00$ $F = -0.2201961650-03$

TIME	P	LN(P)
0.0322	50.0	-2.3125
0.0372	40.0	-2.5357
0.0472	30.0	-2.8234



PRESSURE VS TIME DATA FOR BATCH # 945



PRESSURE VS TIME DATA FOR BATCH # 945

DATA FROM RJM # 156

TIME	P	LN(P)
0.0	500.0	0.0
0.0020	410.0	-0.2163
0.0070	280.0	-0.5977
0.0120	197.0	-0.9492
0.0170	147.0	-1.2420
0.0220	115.0	-1.4875
0.0320	80.0	-1.8504

$$T = (TIME * PREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

A = -0.1003569000-01 D = -0.4920661980-02
 B = -0.4387481930 00 E = 0.4070603820-03
 C = 0.5007264830-01 F = -0.1505310690-04

TIME	P	LN(P)
0.0420	62.0	-2.1053
0.0520	52.0	-2.2812
0.0620	40.0	-2.5436

DATA FROM RJM # 157

TIME	P	LN(P)
0.0	700.0	0.0
0.0029	520.0	-0.2973
0.0079	345.0	-0.7075
0.0129	255.0	-1.0098
0.0179	190.0	-1.3041
0.0229	155.0	-1.5077
0.0279	120.0	-1.7636
0.0329	100.0	-1.9459
0.0379	82.0	-2.1444

$$T = (TIME * PREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

A = -0.1053679270-01 E = -0.5034042300-02
 B = -0.4647271000 00 F = 0.3976173760-03
 C = -0.1022281750-01 G = -0.1091502950-04
 D = 0.2450571090-01

TIME	P	LN(P)
0.0479	50.0	-2.6391
0.0579	45.0	-2.7444
0.0679	40.0	-2.8627

DATA FROM RJM # 158

TIME	P	LN(P)
0.0	650.0	0.0
0.0020	530.0	-0.2041
0.0070	350.0	-0.6190
0.0120	252.0	-0.9475
0.0170	185.0	-1.2566
0.0220	145.0	-1.5002
0.0270	120.0	-1.6835
0.0320	100.0	-1.8718
0.0370	85.0	-2.0343

$$T = (TIME * PREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

A = -0.5966811850-02 E = -0.6197248470-03
 B = -0.4385736550 00 F = 0.5400734490-04
 C = 0.3781129430-01 G = -0.1495773070-05
 D = 0.1042223020-02

TIME	P	LN(P)
0.0470	65.0	-2.3026
0.0570	55.0	-2.4696
0.0770	40.0	-2.7881

DATA FROM RJM # 159

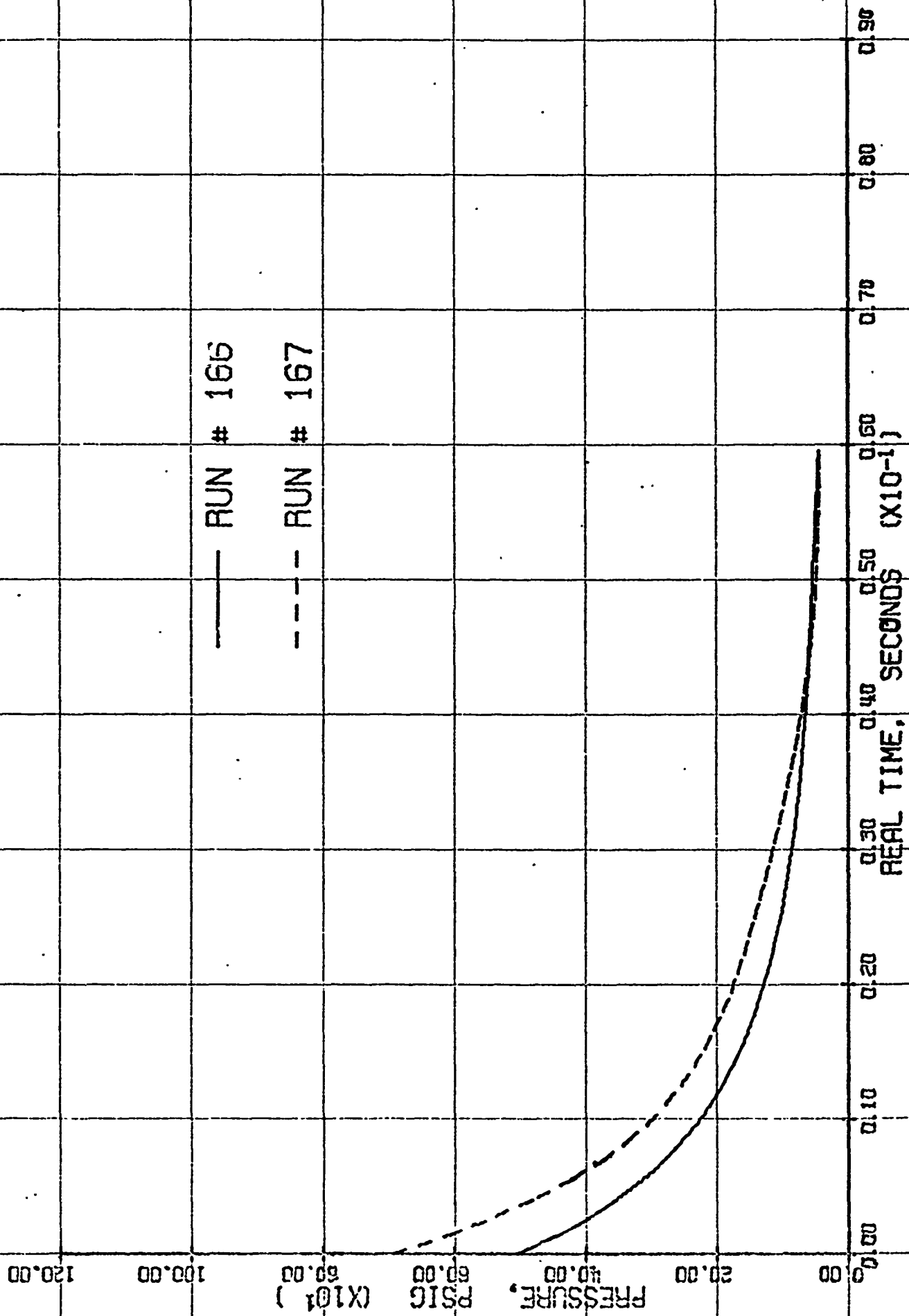
TIME	P	LN(P)
0.0	540.0	0.0
0.0023	440.0	-0.2041
0.0043	350.0	-0.4336
0.0063	255.0	-0.7503
0.0143	185.0	-1.0186
0.0193	152.0	-1.2577
0.0243	122.0	-1.4875
0.0293	100.0	-1.6064
0.0343	82.0	-1.8542

$$T = (TIME * PREF ** 2) / ALPHA$$

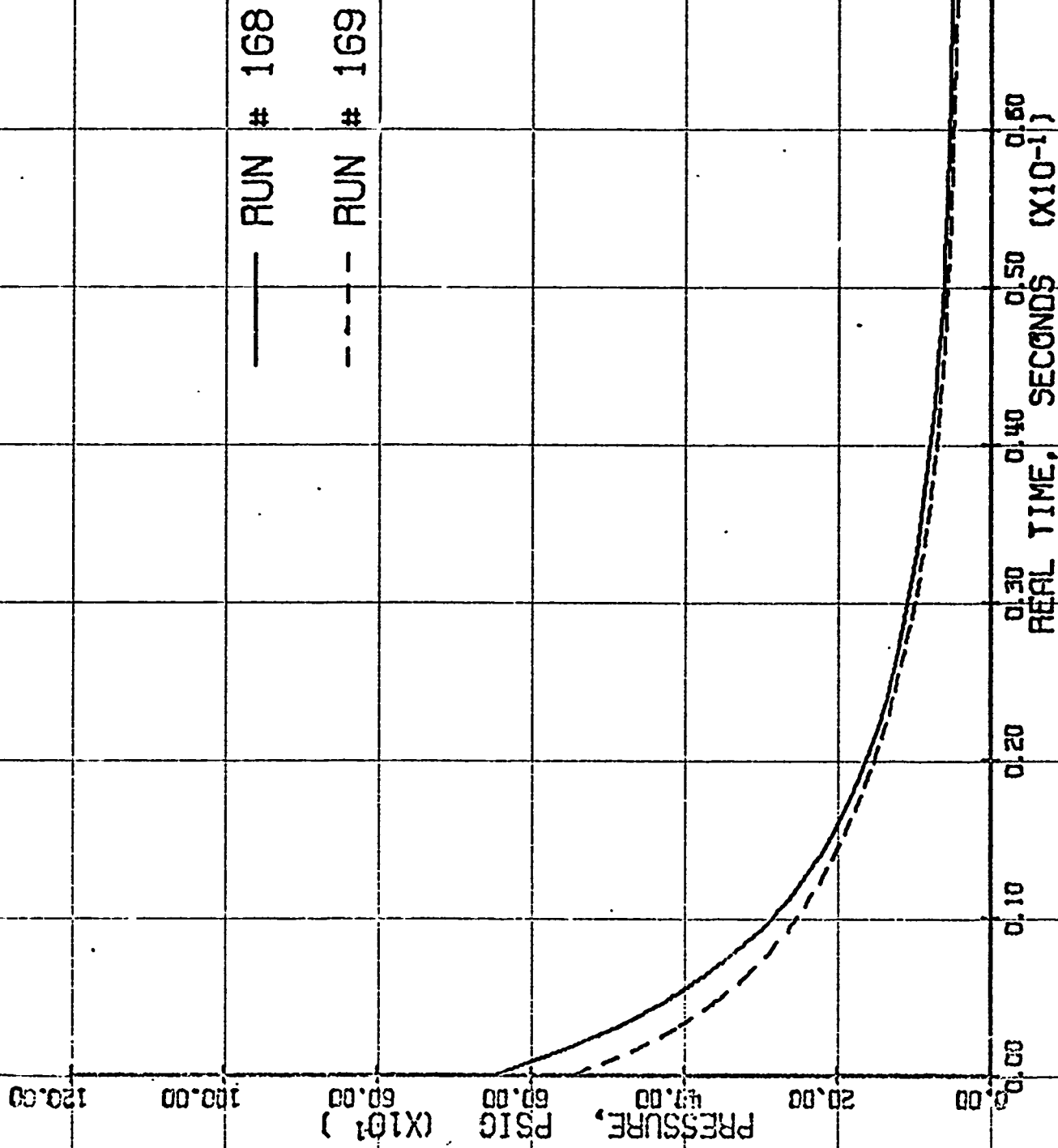
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

A = 0.4283107210-02 F = 0.1957175350-02
 B = -0.5255608370 00 F = -0.9710115450-04
 C = 0.1013794550 00 G = 0.1814333150-05
 D = -0.1853117940-01

TIME	P	LN(P)
0.0443	62.0	-2.1544
0.0543	52.0	-2.3403
0.0743	40.0	-2.5027



PRESSURE VS TIME DATA FOR BATCH # 945



PRESSURE VS TIME DATA FOR BATCH # 945

DATA FROM RUN # 170

TIME	P	LN(P)
0.0	545.0	0.0
0.0011	500.0	-0.0062
0.0041	375.0	-0.3739
0.0091	265.0	-0.7211
0.0141	200.0	-1.0025
0.0191	160.0	-1.2256
0.0241	125.0	-1.4725
0.0291	105.0	-1.6463
0.0341	85.0	-1.8581

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

A = 0.1111631490-01 F = 0.1627541700-02
 B = -0.5364677140 00 F = -0.7049421200-04
 C = 0.1006457090 00 G = 0.1057975420-05
 D = -0.1723516870-01

TIME	P	LN(P)
0.0440	65.0	-2.1264
0.0541	55.0	-2.2935
0.0741	40.0	-2.6119

DATA FROM RUN # 171

TIME	P	LN(P)
0.0	505.0	0.0
0.0035	425.0	-0.1725
0.0085	300.0	-0.5208
0.0135	225.0	-0.8085
0.0185	175.0	-1.0593
0.0235	133.0	-1.2973
0.0285	110.0	-1.5241
0.0335	90.0	-1.7247
0.0435	63.0	-2.0051

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

A = 0.1440407530-01 E = 0.9008902590-03
 B = -0.3243930040 00 F = -0.5613141010-04
 C = 0.1671012470-01 G = 0.1631359720-05
 D = -0.4584757600-02

TIME	P	LN(P)
0.0535	53.0	-2.1641
0.0635	47.0	-2.3744
0.0835	40.0	-2.5357

DATA FROM RUN # 172

TIME	P	LN(P)
0.0	720.0	0.0
0.0052	455.0	-0.4590
0.0102	312.0	-0.8172
0.0152	252.0	-1.0109
0.0202	188.0	-1.3423
0.0252	150.0	-1.5655
0.0302	125.0	-1.7509
0.0352	102.0	-1.9543
0.0402	85.0	-2.1356

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

A = -0.1710937430-02 E = 0.1720385310-02
 B = -0.5215355240 00 F = -0.8215872530-04
 C = 0.9445298620-01 G = 0.1519694970-05
 D = -0.1702978930-01

TIME	P	LN(P)
0.0502	65.0	-2.4049
0.0602	55.0	-2.5719
0.0802	40.0	-2.3904

DATA FROM RUN # 173

TIME	P	LN(P)
0.0	160.0	0.0
0.0023	155.0	-0.0070
0.0073	130.0	-0.3204
0.0123	105.0	-0.5330
0.0173	83.0	-0.7150
0.0223	60.0	-0.8109
0.0273	70.0	-0.9405

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

A = 0.1780046440-01 D = -0.1133396300-02
 B = -0.2463027440 00 F = 0.1122802340-03
 C = 0.1641243360-01 F = -0.4459440530-05

TIME	P	LN(P)
0.0373	55.0	-1.1356
0.0473	50.0	-1.2800
0.0673	40.0	-1.5041

120.00

100.00

80.00
(X10¹)

60.00
PSIG

40.00
PRESSURE

20.00

0.00

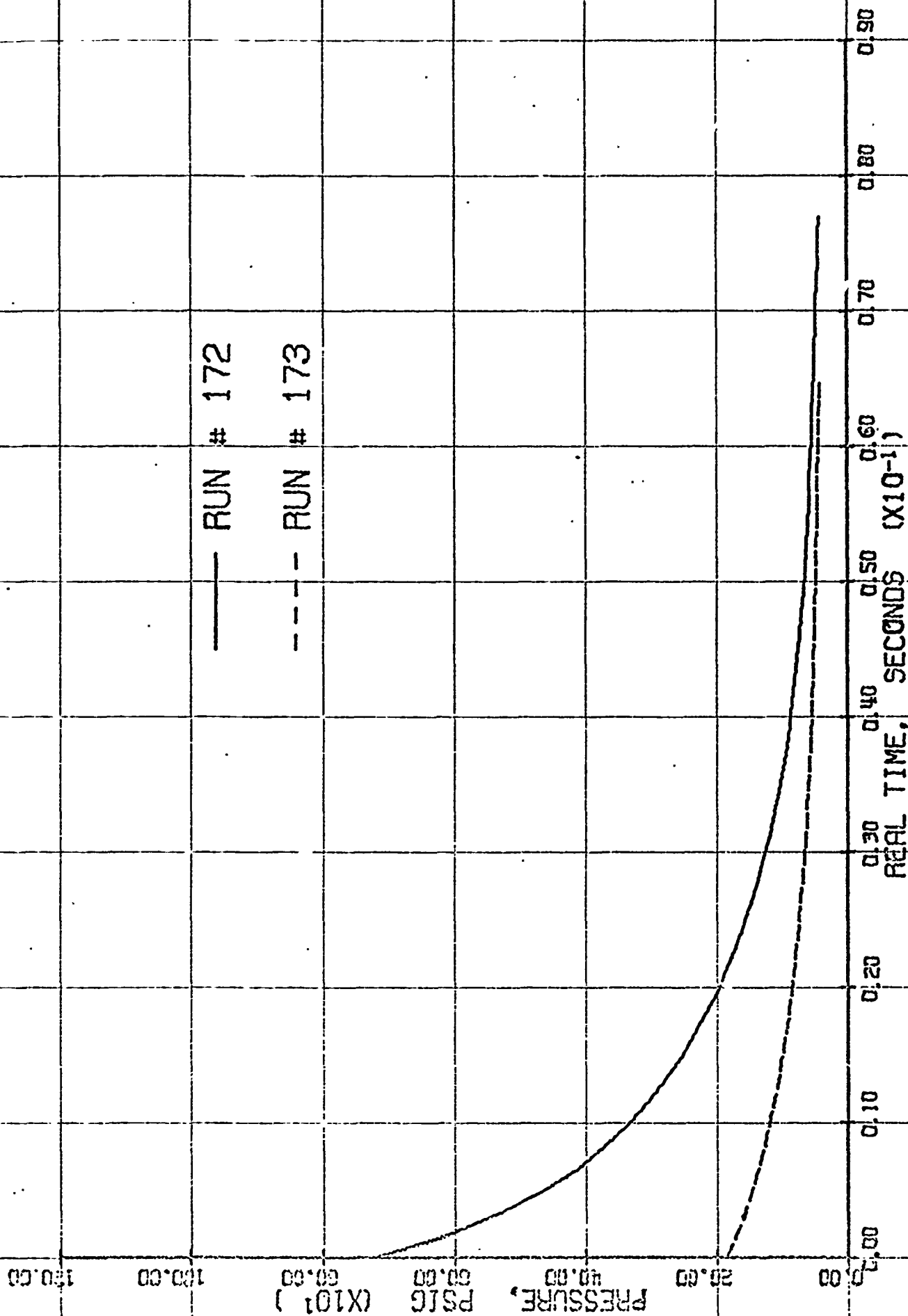
— RUN # 170

--- RUN # 171

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90

REAL TIME, SECONDS (X10⁻¹)

PRESSURE VS TIME DATA FOR BATCH # 945



PRESSURE VS TIME DATA FOR BATCH # 945

DATA FROM RUN # 174

TIME	P	LN(P)
0.0	335.0	0.0
0.0010	305.0	-0.0938
0.0060	205.0	-0.4911
0.0110	152.0	-0.7973
0.0160	120.0	-1.0266
0.0210	95.0	-1.2503
0.0260	81.0	-1.4197
0.0310	70.0	-1.5656
0.0410	60.0	-1.7193

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

$A = -0.3707684880-02$ $E = 0.6058250520-03$
 $B = -0.4561136340-00$ $F = -0.3717053940-04$
 $C = 0.5523093670-01$ $G = 0.9095509560-05$
 $D = -0.6030597400-02$

TIME	P	LN(P)
0.0510	50.0	-1.9021
0.0610	45.0	-2.0075
0.0710	40.0	-2.1253

DATA FROM RUN # 175

TIME	P	LN(P)
0.0	230.0	0.0
0.0022	180.0	-0.2451
0.0042	145.0	-0.4613
0.0092	95.0	-0.3342
0.0142	75.0	-1.1206
0.0192	60.0	-1.3437
0.0242	45.0	-1.6314

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

$A = 0.3031420570-02$ $D = -0.2274017020-01$
 $B = -0.6687223910-00$ $E = 0.1793747240-02$
 $C = 0.1445657540-00$ $F = -0.5490630970-04$

TIME	P	LN(P)
0.0292	40.0	-1.7492
0.0392	27.0	-2.1422
0.0492	20.0	-2.4423

DATA FROM RUN # 176

TIME	P	LN(P)
0.0	280.0	0.0
0.0022	255.0	-0.1112
0.0072	155.0	-0.5465
0.0122	112.0	-0.9340
0.0172	85.0	-1.2098
0.0222	65.0	-1.4781
0.0272	55.0	-1.6361

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

$A = 0.1746397310-01$ $D = 0.3030452570-01$
 $B = -0.3324502050-00$ $E = -0.3781995140-02$
 $C = -0.7402547720-01$ $F = 0.1557060610-03$

TIME	P	LN(P)
0.0322	42.0	-1.9143
0.0422	27.0	-2.3567
0.0522	20.0	-2.6568

DATA FROM RUN # 177

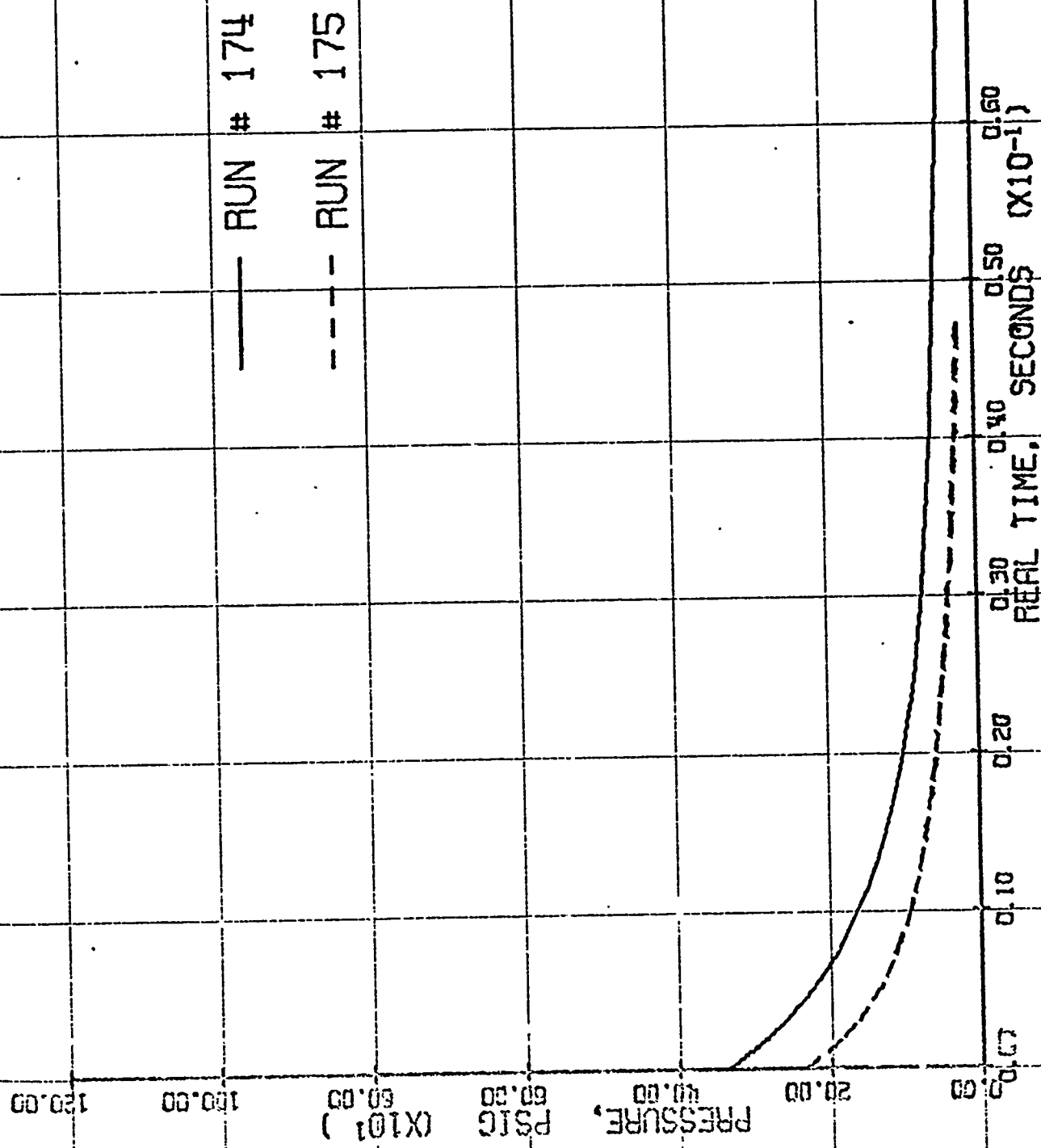
TIME	P	LN(P)
0.0	335.0	0.0
0.0025	300.0	-0.2495
0.0055	205.0	-0.6202
0.0115	115.0	-1.2063
0.0155	95.0	-1.3094
0.0205	75.0	-1.6356
0.0255	55.0	-1.8459

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

$A = 0.2306209520-01$ $D = 0.2136096850-01$
 $B = -0.6705063990-00$ $E = -0.4465717330-02$
 $C = 0.3235429610-01$ $F = 0.2433954390-03$

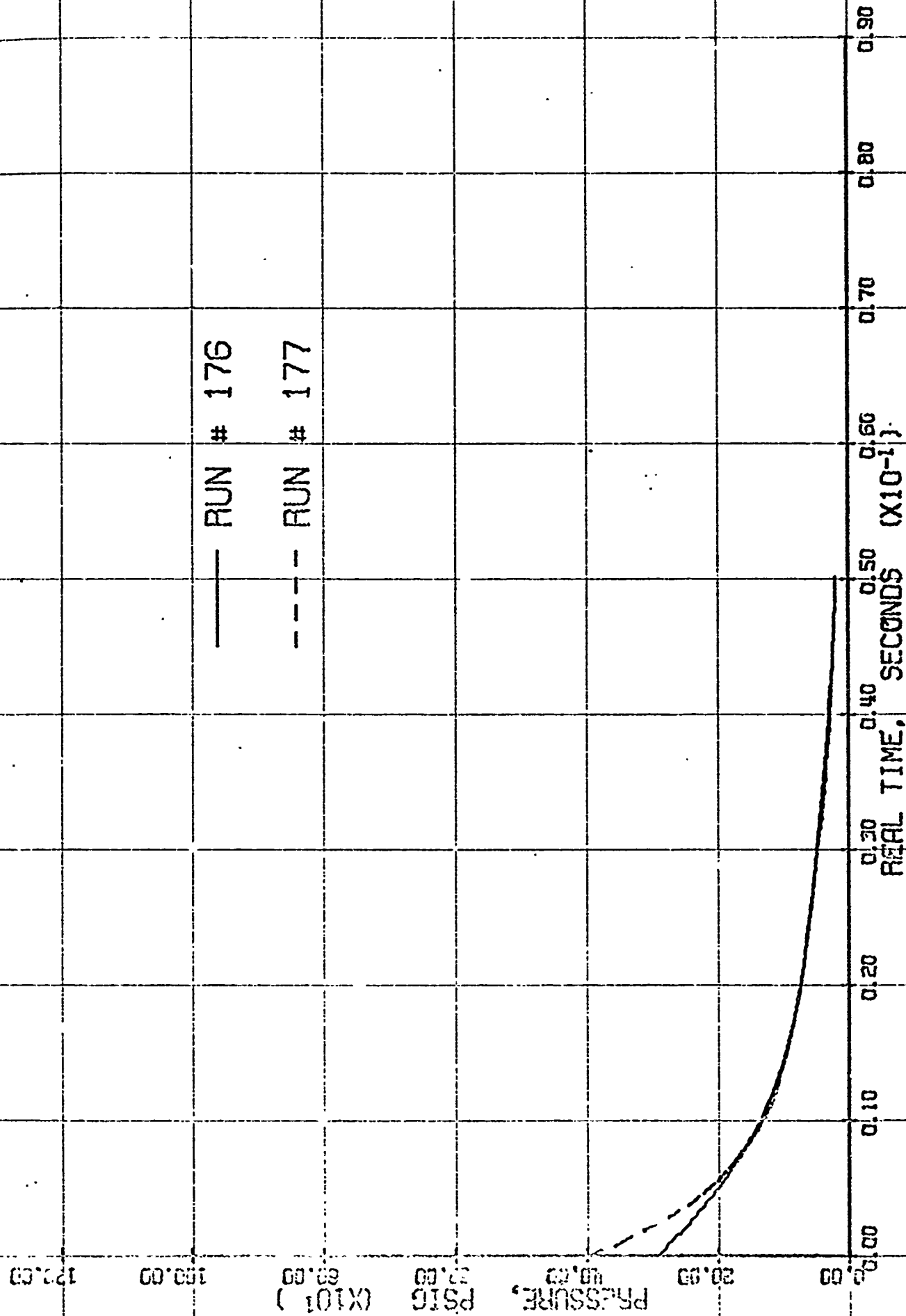
TIME	P	LN(P)
0.0355	45.0	-2.1466
0.0355	35.0	-2.3979
0.0455	25.0	-2.7344



PRESSURE VS TIME DATA FOR BATCH # 945

— RUN # 176

--- RUN # 177



PRESSURE VS TIME DATA FOR BATCH # 945

DATA FROM RUN # 178

TIME	P	LN(P)
0.0	640.0	0.0
0.0003	560.0	-0.1335
0.0054	335.0	-0.6473
0.0104	205.0	-1.1385
0.0154	145.0	-1.4847
0.0204	102.0	-1.9365
0.0254	75.0	-2.1440

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

TIME	P	LN(P)
0.0304	58.0	-2.4010
0.0404	35.0	-2.9061
0.0504	25.0	-3.2426

DATA FROM RUN # 179

TIME	P	LN(P)
0.0	770.0	0.0
0.0033	550.0	-0.3365
0.0083	335.0	-0.6031
0.0133	290.0	-0.9765
0.0183	225.0	-1.2303
0.0233	185.0	-1.4260
0.0283	155.0	-1.5030
0.0333	130.0	-1.7739
0.0383	110.0	-1.9459
0.0433	90.0	-2.2644

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0533	65.0	-2.4720
0.0633	55.0	-2.5391
0.0733	50.0	-2.7344
0.0933	40.0	-2.9575

DATA FROM RUN # 180

TIME	P	LN(P)
0.0	755.0	0.0
0.0032	533.0	-0.3389
0.0082	372.0	-0.7078
0.0132	272.0	-1.0209
0.0182	203.0	-1.2692
0.0232	135.0	-1.7214
0.0282	105.0	-1.9723
0.0332	90.0	-2.1269
0.0382	73.0	-2.2700

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0432	62.0	-2.4996
0.0532	55.0	-2.6194
0.0782	50.0	-2.7147

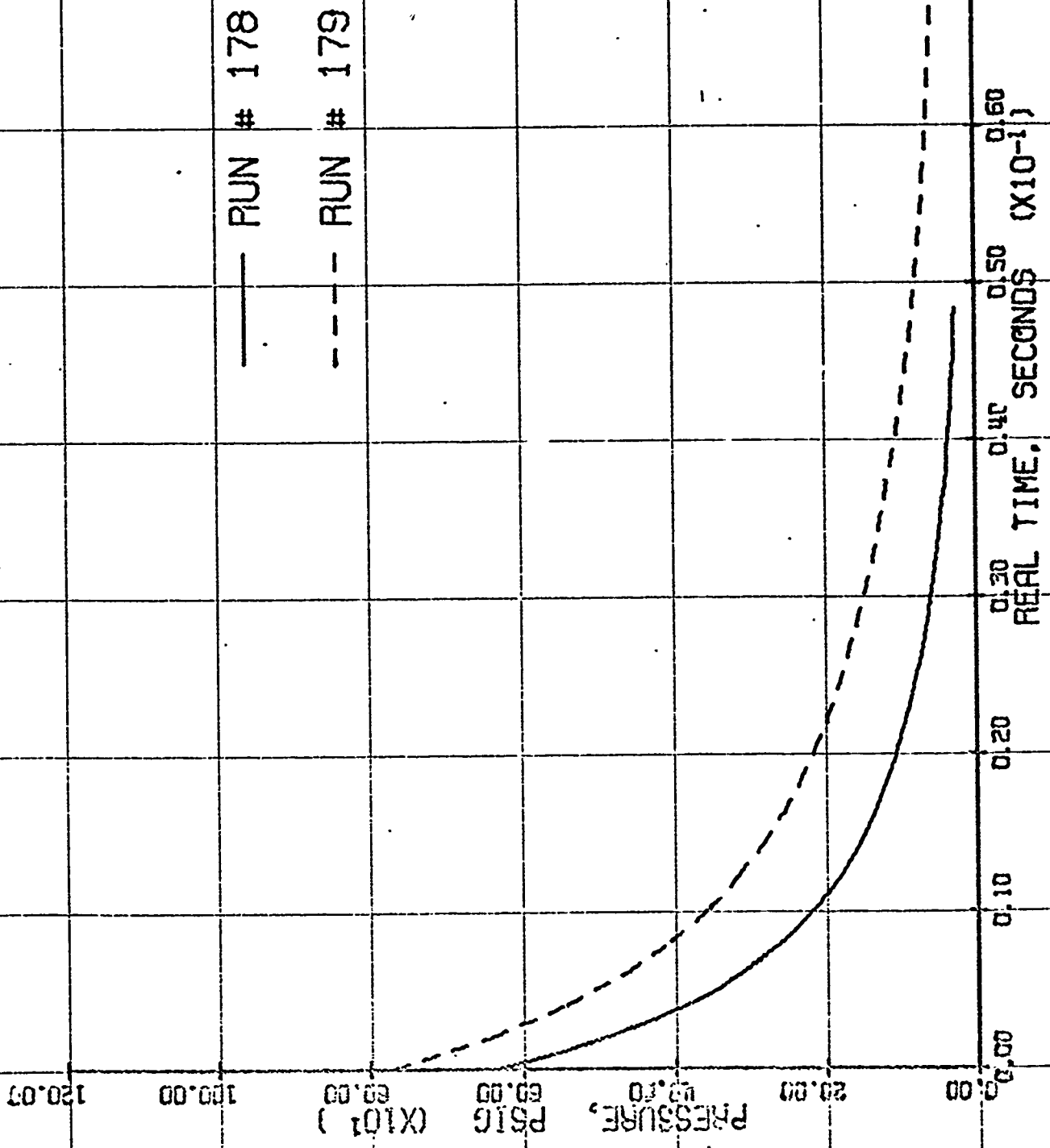
DATA FROM RUN # 181

TIME	P	LN(P)
0.0	665.0	0.0
0.0059	515.0	-0.0732
0.0059	410.0	-0.4236
0.0109	300.0	-0.7260
0.0159	235.0	-1.0402
0.0209	135.0	-1.2794
0.0259	145.0	-1.5025
0.0309	120.0	-1.7123
0.0359	100.0	-1.9240

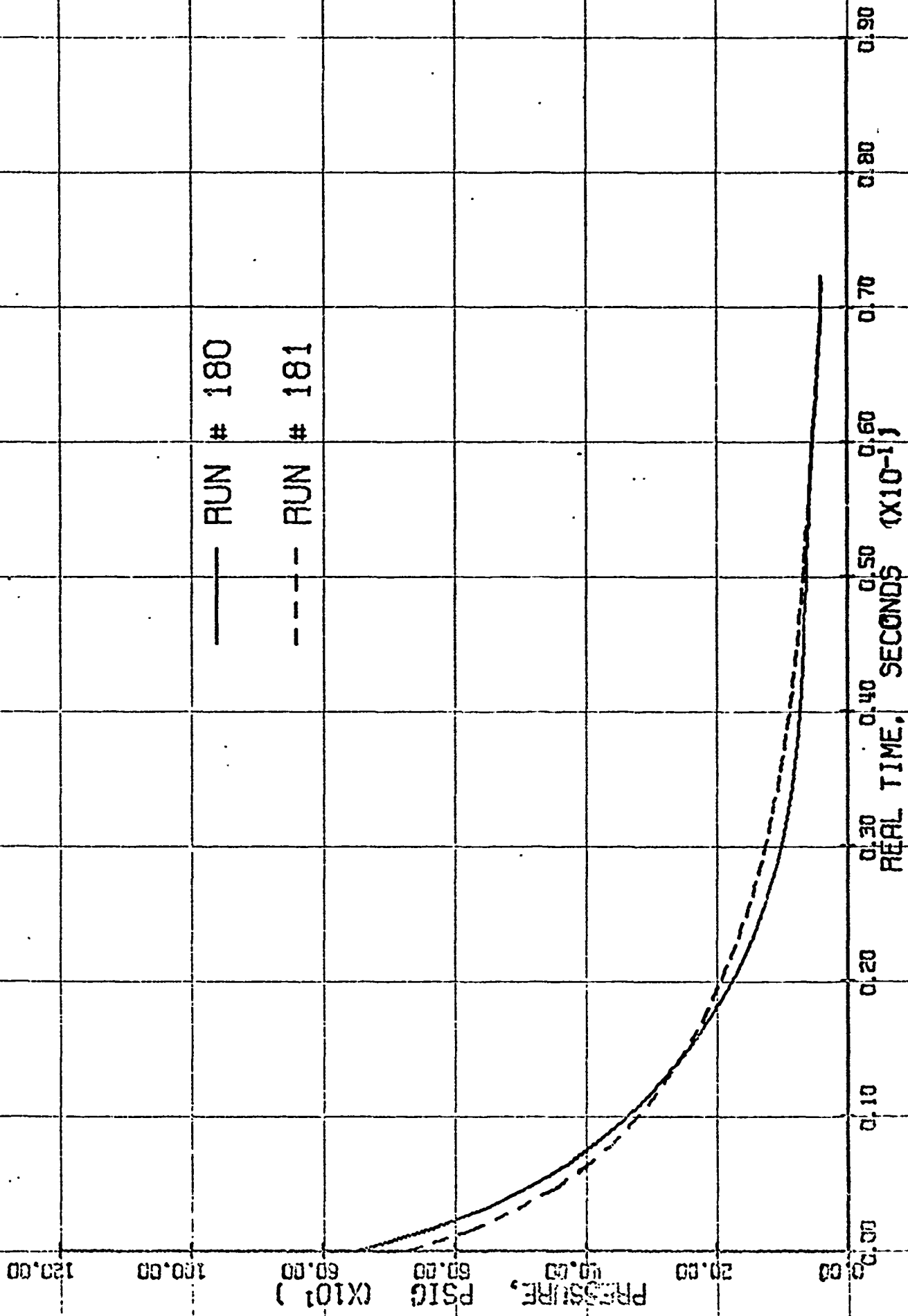
$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0459	75.0	-2.1022
0.0559	63.0	-2.4393
0.0759	40.0	-2.9109



PRESSURE VS TIME DATA FOR BATCH # 945



PRESSURE VS TIME DATA FOR BATCH # 945

DATA FROM RUN # 182

$$T = (TIME * RPEF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	645.0	0.0
0.0020	510.0	-0.2348
0.0050	400.0	-0.4778
0.0070	335.0	-0.6551
0.0120	240.0	-0.9886
0.0170	182.0	-1.2652
0.0220	140.0	-1.5276
0.0270	103.0	-1.7371
0.0320	85.0	-2.0266
0.0370	75.0	-2.1518

A=-0.6734487190-02	E= 0.2297553320-02
B=-0.7056415230 00	F= 0.1001236460-03
C= 0.1591551730 00	G=-0.2469117730-04
D=-0.2891691540-01	H= 0.9631022660-05

TIME	P	LN(P)
0.0470	50.0	-2.5572
0.0570	38.0	-2.8317
0.0670	25.0	-3.2504
0.0770	20.0	-3.4735

DATA FROM RUN # 183

$$T = (TIME * RPEF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	770.0	0.0
0.0008	707.0	-0.0354
0.0058	480.0	-0.4725
0.0108	360.0	-0.7603
0.0153	275.0	-1.0296
0.0203	220.0	-1.2523
0.0253	180.0	-1.4534
0.0303	155.0	-1.5030
0.0403	120.0	-1.8529
0.0503	95.0	-2.0925

A=-0.7485300460-02	F= 0.3566132840-02
B=-0.5661266770 00	F=-0.3543927370-03
C= 0.1009363050 00	G= 0.1796938740-04
D=-0.2137354190-01	H=-0.3557251170-06

TIME	P	LN(P)
0.0603	73.0	-2.2397
0.0703	65.0	-2.4720
0.0803	59.0	-2.5859
0.1003	50.0	-2.7344

DATA FROM RUN # 184

$$T = (TIME * RPEF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	655.0	0.0
0.0021	540.0	-0.1931
0.0071	383.0	-0.5236
0.0121	290.0	-0.8148
0.0171	235.0	-1.0251
0.0221	185.0	-1.2643
0.0271	155.0	-1.4112
0.0371	115.0	-1.7397
0.0471	85.0	-2.0073
0.0571	70.0	-2.2361

A=-0.9654571250-02	E=-0.9543193230-04
B=-0.5249609810 00	F= 0.6539917000-04
C= 0.7030434390-01	G=-0.4505921080-05
D=-0.6132064400-02	H= 0.9729747300-07

TIME	P	LN(P)
0.0671	61.0	-2.3738
0.0771	55.0	-2.4773
0.0871	50.0	-2.5726
0.1071	45.0	-2.6730

DATA FROM RUN # 185

$$T = (TIME * RPEF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0	680.0	0.0
0.0027	605.0	-0.1159
0.0077	480.0	-0.5011
0.0127	375.0	-0.8127
0.0177	295.0	-1.2071
0.0227	245.0	-1.5054
0.0277	215.0	-1.7772
0.0327	190.0	-2.0224
0.0427	150.0	-2.5277

A= 0.2585107100-01	E=-0.3275125800-02
B=-0.4201129350 00	F= 0.2098954480-03
C=-0.3525191000-01	G=-0.4554140110-05
D= 0.2595510710-01	

TIME	P	LN(P)
0.0527	155.0	-2.7156
0.0727	110.0	-3.1209
0.1027	90.0	-3.5254

PRESSURE, PSIG (X10¹)

— RUN # 182
--- RUN # 183

REAL TIME, SECONDS (X10⁻¹)

PRESSURE VS TIME DATA FOR BATCH # 949

0.00

20.00

40.00

60.00

80.00

100.00

120.00

0.00

0.10

0.20

0.30

0.40

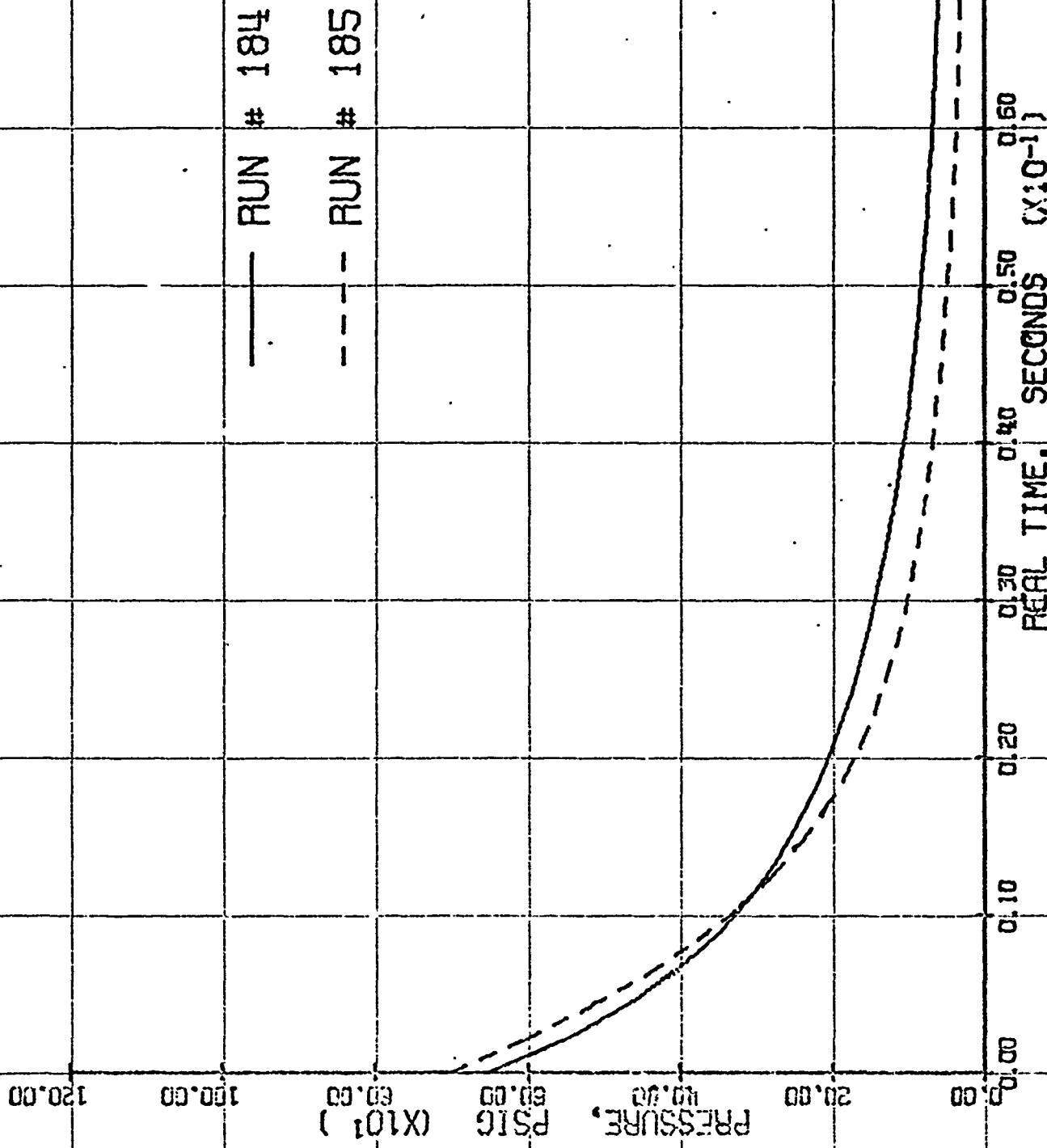
0.50

0.60

0.70

0.80

0.90



PRESSURE VS TIME DATA FOR BATCH # 949

DATA FROM RUN # 185

TIME	P	LN(P)
0.0	725.0	0.0
0.0012	675.0	-0.0715
0.0062	420.0	-0.5459
0.0112	295.0	-0.8992
0.0162	215.0	-1.2155
0.0212	150.0	-1.5110
0.0262	125.0	-1.7579
0.0312	100.0	-1.9210
0.0412	65.0	-2.4113

$T = (TIME * RREF**2) / ALPHA$
 $LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6$
 A= 0.2094195330-01 E= 0.2050359070-02
 B=-0.6418812960 00 F=-0.1169805560-03
 C= 0.9868071020-01 G= 0.2531493650-05
 D=-0.1777583400-01

TIME	P	LN(P)
0.0612	38.0	-2.9486
0.0812	25.0	-3.3673
0.1012	20.0	-3.5904

DATA FROM RUN # 187

TIME	P	LN(P)
0.0	675.0	0.0
0.0021	500.0	-0.3001
0.0043	375.0	-0.5878
0.0093	225.0	-1.0986
0.0143	150.0	-1.5041
0.0193	100.0	-1.9095
0.0243	75.0	-2.1972
0.0293	55.0	-2.5074
0.0343	40.0	-2.8258

$T = (TIME * RREF**2) / ALPHA$
 $LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6$
 A= 0.4959677120-02 E= 0.9504409260-02
 B=-0.1006910820 01 F=-0.5247749160-03
 C= 0.2629381350 00 G= 0.1486686260-04
 D=-0.6710738760-01

TIME	P	LN(P)
0.0443	30.0	-3.1135
0.0543	25.0	-3.2958
0.0643	20.0	-3.5190

DATA FROM RUN # 188

TIME	P	LN(P)
0.0	618.0	0.0
0.0011	545.0	-0.1257
0.0061	340.0	-0.5975
0.0111	240.0	-0.9458
0.0161	180.0	-1.2335
0.0211	138.0	-1.4992
0.0261	105.0	-1.7725
0.0311	85.0	-1.9492
0.0411	65.0	-2.2521
0.0511	47.0	-2.5760

$T = (TIME * RREF**2) / ALPHA$
 $LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$
 A= 0.3318862380-02 E= 0.1434037670-01
 B=-0.7921748310 00 F=-0.1411060930-02
 C= 0.2479123760 00 G= 0.5877395860-04
 D=-0.7777489390-01 H=-0.1303261790-05

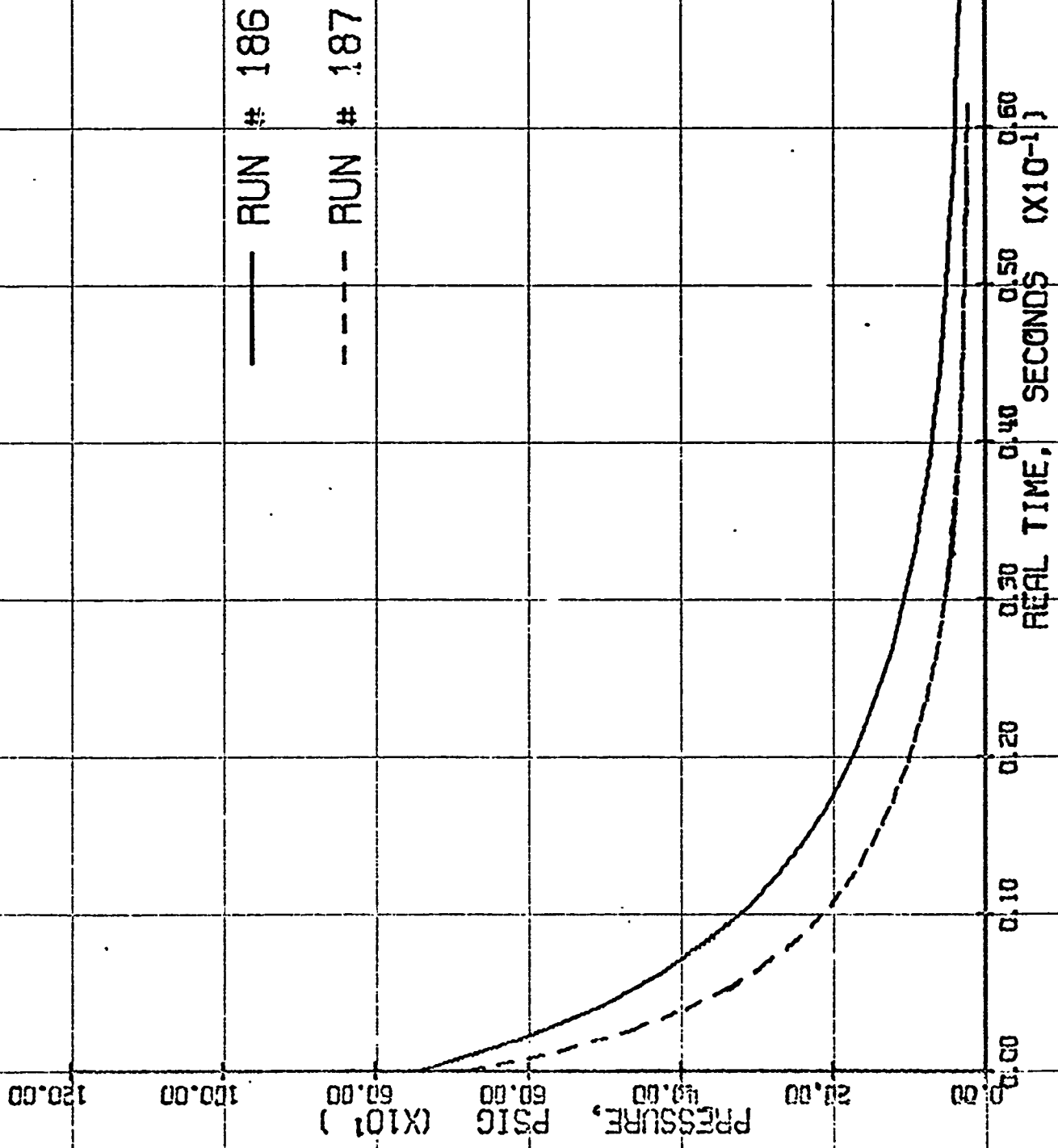
TIME	P	LN(P)
0.0611	38.0	-2.7859
0.0711	25.0	-3.2076
0.0811	20.0	-3.4208
0.1011	15.0	-3.7184

DATA FROM RUN # 189

TIME	P	LN(P)
0.0	605.0	0.0
0.0015	520.0	-0.2152
0.0045	355.0	-0.5277
0.0065	280.0	-0.7960
0.0095	215.0	-1.1291
0.0145	140.0	-1.5531
0.0195	122.0	-1.8720
0.0245	65.0	-2.3254
0.0295	52.0	-2.5455

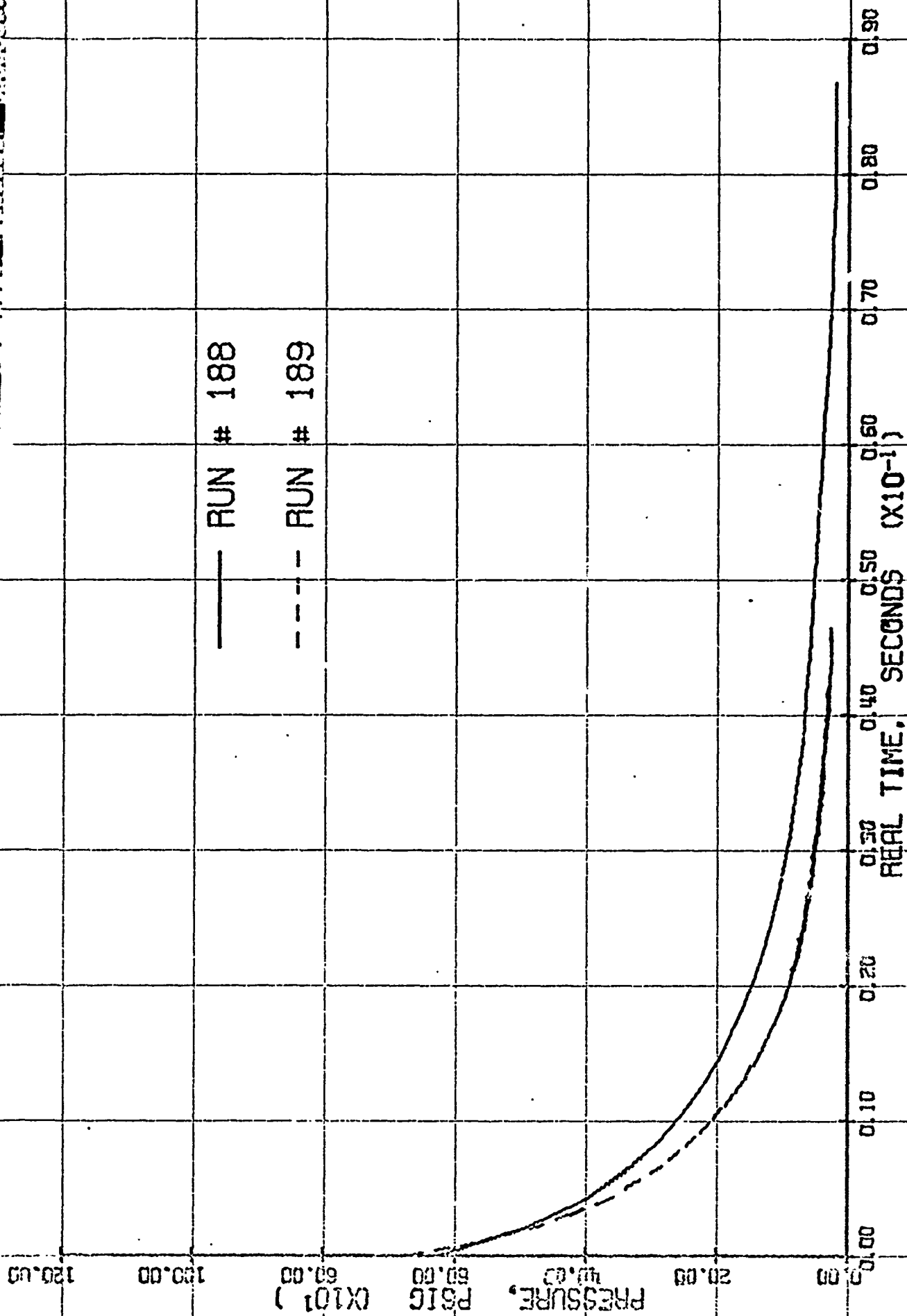
$T = (TIME * RREF**2) / ALPHA$
 $LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6$
 A= 0.2707032930-02 E= 0.5649206620-01
 B=-0.1134213340 01 F=-0.5593344570-02
 C= 0.5056309360 00 G= 0.2718301030-03
 D=-0.2306467490 00

TIME	P	LN(P)
0.0445	40.0	-2.9120
0.0395	32.0	-3.0341
0.0495	30.0	-3.0985



PRESSURE VS TIME DATA FOR BATCH # 949

— RUN # 188
--- RUN # 189



PRESSURE VS TIME DATA FOR BATCH # 949

BATCH # 949 7 75.0% AP, 25.0% PBAA

DATA FROM RUN # 190

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	500.0	0.0
0.0012	450.0	-0.1054
0.0062	325.0	-0.4308
0.0112	245.0	-0.7134
0.0162	200.0	-0.9163
0.0212	165.0	-1.1387
0.0262	140.0	-1.2730
0.0312	120.0	-1.4271
0.0362	105.0	-1.5606
0.0462	85.0	-1.7720

A=-0.3324497470-02	E= 0.2123285870-02
B=-0.5156087200 00	F=-0.1541509610-03
C= 0.9608035150-01	G= 0.6051868890-05
D=-0.1736893090-01	H=-0.9898815230-07

TIME	P	LN(P)
0.0562	70.0	-1.9661
0.0662	62.0	-2.0675
0.0762	56.0	-2.1393
0.0962	50.0	-2.3026

DATA FROM RUN # 191

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6$$

TIME	P	LN(P)
0.0	325.0	0.0
0.0040	245.0	-0.2826
0.0076	200.0	-0.4855
0.0090	185.0	-0.5835
0.0140	150.0	-0.7732
0.0190	125.0	-0.9555
0.0240	107.0	-1.1110
0.0290	95.0	-1.2299
0.0340	85.0	-1.3412

A=-0.1877839200-03	E= 0.1739939690-02
B=-0.4905840950 00	F=-0.1063694050-03
C= 0.9171377290-01	G= 0.2578405630-05
D=-0.1530934740-01	

TIME	P	LN(P)
0.0440	72.0	-1.5072
0.0540	58.0	-1.7234
0.0840	50.0	-1.8718

DATA FROM RUN # 192

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6$$

TIME	P	LN(P)
0.0	305.0	0.0
0.0020	260.0	-0.1596
0.0041	220.0	-0.3267
0.0091	155.0	-0.5769
0.0141	125.0	-0.8920
0.0191	95.0	-1.1664
0.0241	82.0	-1.3126
0.0291	72.0	-1.4436
0.0341	62.0	-1.5932

A= 0.2259954020-02	E=-0.6848473490-03
B=-0.5389794130 00	F= 0.7312589880-04
C= 0.6304530150-01	G=-0.2253795430-05
D=-0.1262326060-02	

TIME	P	LN(P)
0.0441	50.0	-1.8063
0.0541	35.0	-2.1650
0.0841	25.0	-2.5014

DATA FROM RUN # 193

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6$$

TIME	P	LN(P)
0.0	305.0	0.0
0.0011	270.0	-0.1219
0.0029	220.0	-0.3267
0.0061	155.0	-0.5769
0.0111	102.0	-1.0953
0.0161	75.0	-1.4023
0.0211	63.0	-1.5599
0.0261	40.0	-1.9136
0.0311	35.0	-2.1650

A= 0.3221531230-02	E=-0.3091592500-01
B=-0.7347743390 00	F= 0.4047426340-02
C=-0.2107898180-01	G=-0.1562933530-03
D= 0.5304054830-01	

TIME	P	LN(P)
0.0361	30.0	-2.3191
0.0411	23.0	-2.3881
0.0511	20.0	-2.5014

PRESSURE, PSIG (X10¹)

— RUN # 190
--- RUN # 191

REAL TIME, SECONDS (X10⁻¹)

PRESSURE VS TIME DATA FOR BATCH # 949

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90

0.00

20.00

40.00

60.00

80.00

100.00

120.00

PRESSURE, PSIG (X10¹)

— RUN # 192
--- RUN # 193

REAL TIME, SECONDS (X10⁻¹)

PRESSURE VS TIME DATA FOR BATCH # 949

DATA FROM RUN # 196

TIME	P	LN(P)
0.0	410.0	0.0
0.002	360.0	-0.1301
0.0040	325.0	-0.2323
0.0090	205.0	-0.5931
0.0140	148.0	-1.0139
0.0190	115.0	-1.2712
0.0240	83.0	-1.5323
0.0290	75.0	-1.5937
0.0340	60.0	-1.9213
0.0440	45.0	-2.2075

$T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.1977698990-01 E=-0.9490336290-02
 B=-0.3944095450 00 F= 0.8421780540-03
 C=-0.1073910440 00 G=-0.3740668620-04
 D= 0.5338525070-01 H= 0.4647121720-05

TIME	P	LN(P)
0.0540	35.0	-2.4408
0.0640	25.0	-2.7973
0.0740	20.0	-3.0204
0.0940	15.0	-3.3081

DATA FROM RUN # 197

TIME	P	LN(P)
0.0	400.0	0.0
0.0017	375.0	-0.2576
0.0035	300.0	-0.4926
0.0067	200.0	-0.8714
0.0094	160.0	-1.1192
0.0117	125.0	-1.3681
0.0141	100.0	-1.5352

$T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 A=-0.1170355540-02 D=-0.1737763400 00
 E=-0.1046317660 01 F= 0.4312501630-01
 G= 0.3807437510 00 H=-0.3630613640-02
 $T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A=-0.1170355540-02 D=-0.1737763400 00
 E=-0.1046317660 01 F= 0.4312501630-01
 G= 0.3807437510 00 H=-0.3630613640-02
 I= 0.0157 32.0 -1.7377
 J= 0.0217 60.0 -2.1001
 K= 0.0317 40.0 -2.5055

DATA FROM RUN # 199

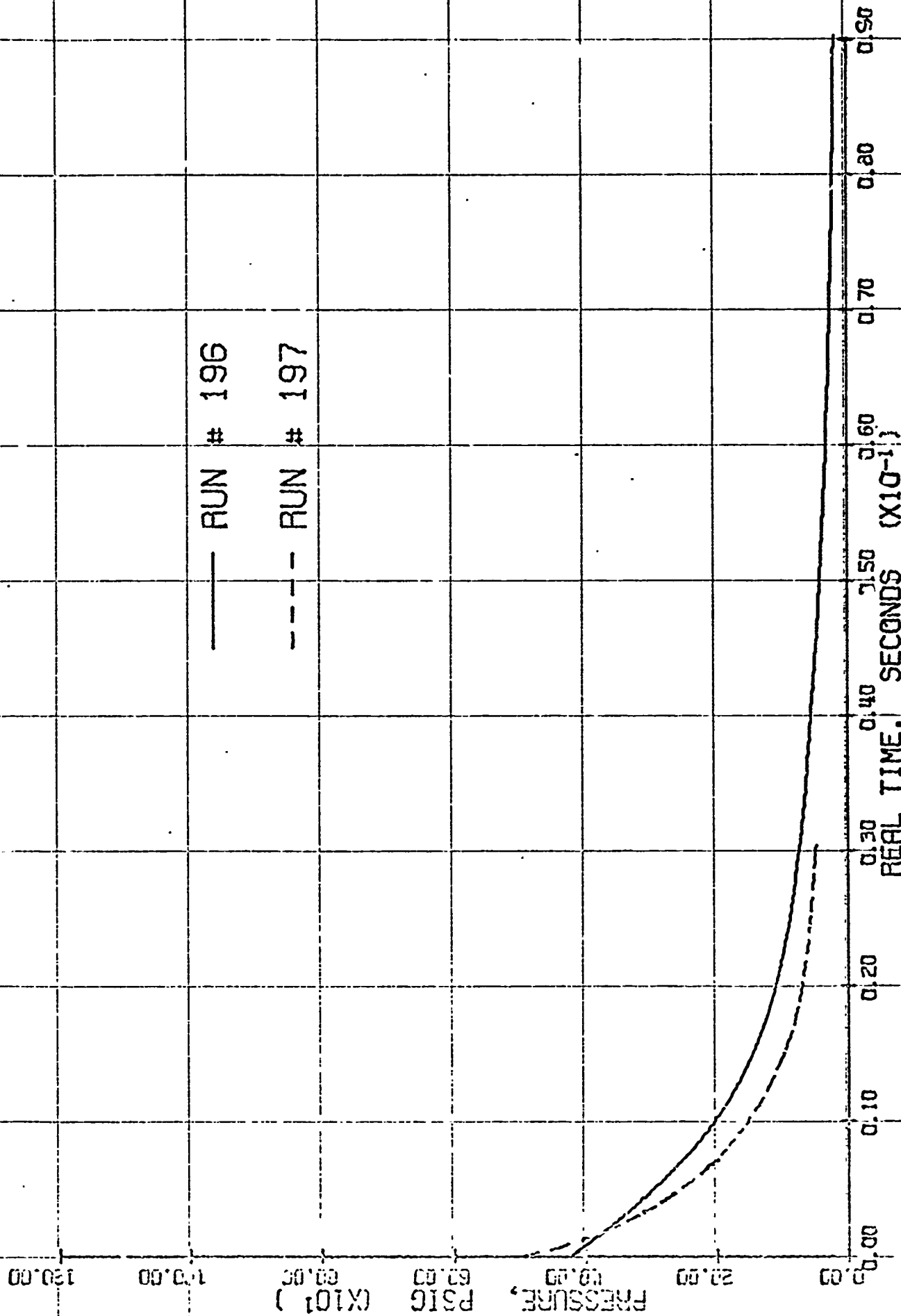
TIME	P	LN(P)
0.0	425.0	0.0
0.0025	470.0	-0.2350
0.0045	400.0	-0.4453
0.0075	365.0	-0.7174
0.0125	215.0	-1.0571
0.0175	155.0	-1.3943
0.0225	122.0	-1.5337
0.0275	95.0	-1.8339
0.0325	73.0	-2.0310
0.0375	55.0	-2.2634

$T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.2357016700-02 E= 0.1981877250-01
 B=-0.7605670580 00 F=-0.2490804110-02
 C= 0.2234127640 00 G= 0.1545313730-03
 D=-0.3425552770-01 H=-0.3722302950-05
 $T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.2357016700-02 E= 0.1981877250-01
 B=-0.7605670580 00 F=-0.2490804110-02
 C= 0.2234127640 00 G= 0.1545313730-03
 D=-0.3425552770-01 H=-0.3722302950-05
 I= 0.0475 48.0 -2.5556
 J= 0.0576 32.0 -2.9720
 K= 0.0675 25.0 -3.2139
 L= 0.0775 20.0 -3.4420

DATA FROM RUN # 200

TIME	P	LN(P)
0.0	405.0	0.0
0.0017	480.0	-0.1946
0.0035	420.0	-0.3950
0.0067	350.0	-0.7051
0.0117	200.0	-1.0246
0.0167	165.0	-1.1969
0.0217	135.0	-1.4285
0.0267	115.0	-1.6023
0.0317	90.0	-1.9019
0.0367	75.0	-2.0920

$T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.1941049514-02 E= 0.2712431230-02
 B=-0.4755255050 00 F=-0.1372859250-03
 C= 0.1401321610 00 G= 0.2334532710-05
 D=-0.2595552720-01 H= 0.1707655330-07
 $T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.1941049514-02 E= 0.2712431230-02
 B=-0.4755255050 00 F=-0.1372859250-03
 C= 0.1401321610 00 G= 0.2334532710-05
 D=-0.2595552720-01 H= 0.1707655330-07
 I= 0.0467 55.0 -2.3970
 J= 0.0567 40.0 -2.5675
 K= 0.0667 25.0 -3.1754
 L= 0.0767 15.0 -3.4972



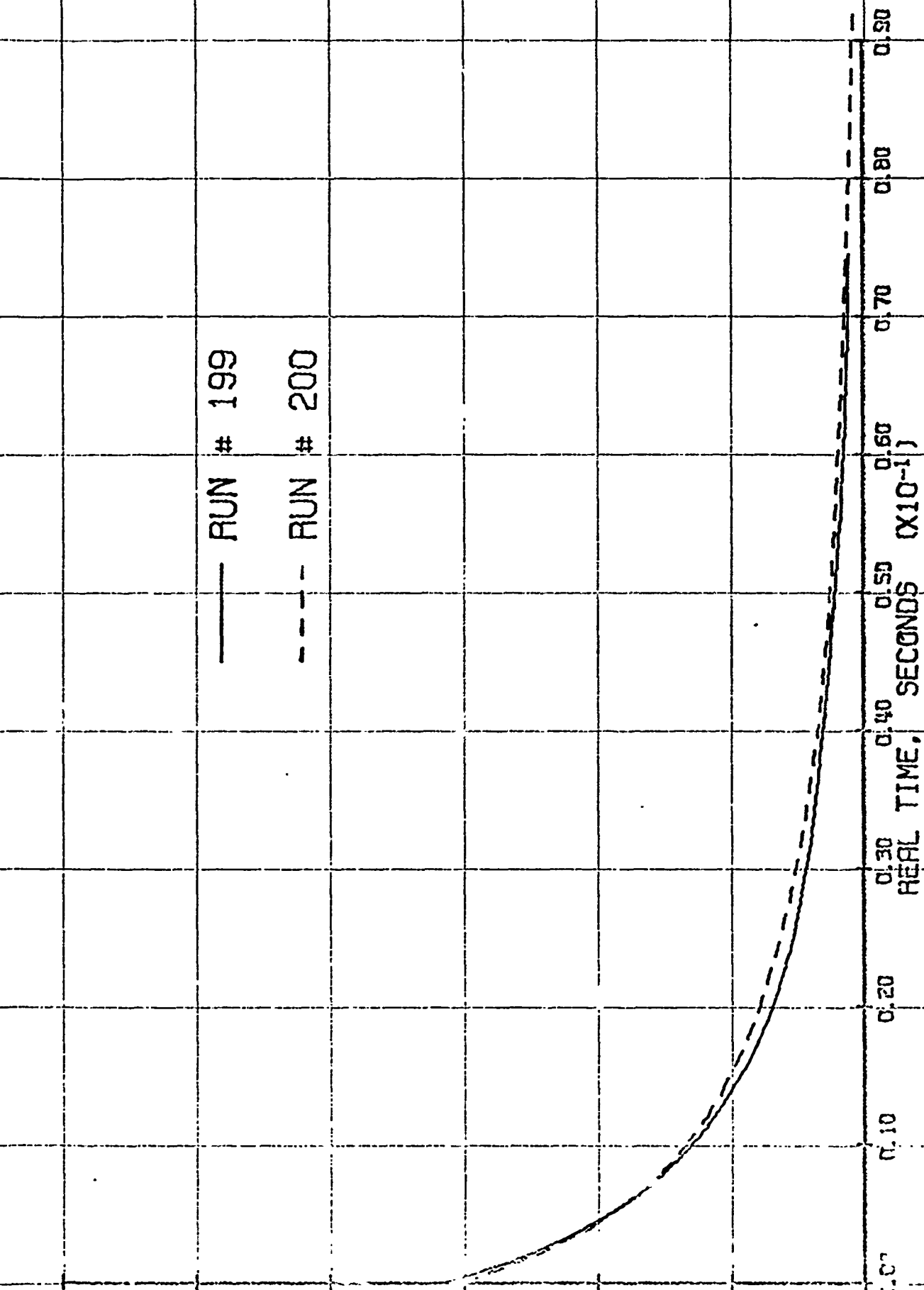
PRESSURE VS TIME DATA FOR BATCH # 949

PRESSURE, PSIG (X101)

— RUN # 199
--- RUN # 200

REAL TIME, SECONDS (X10⁻¹)

PRESSURE VS TIME DATA FOR BATCH # 949



BATCH # 949 / 75.0% AP, 25.0% PSAA

DATA FROM RUN # 201

			$T = (TIME * PREF ** 2) / ALPHA$	
			$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$	
TIME	P	LN(P)		
0.0	480.0	0.0	A = -0.3532703770-02	D = -0.3300728140-03
0.0030	325.0	-0.3900	B = -0.3270910920 00	E = -0.2817725720-02
0.0053	250.0	-0.5131	C = 0.1137329950 00	F = 0.2404415270-03
0.0080	195.0	-0.7008		
0.0130	135.0	-1.2665	TIME	P
0.0160	75.0	-1.6190	0.0280	55.0
0.0230	73.0	-1.3333	0.0380	36.0
			0.0480	20.0
				LN(P)
				-2.1665
				-2.7726
				-3.1781

DATA FROM RUN # 202

			$T = (TIME * PREF ** 2) / ALPHA$	
			$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$	
TIME	P	LN(P)		
0.0	545.0	0.0	A = 0.1670120620-02	E = 0.1263301010-01
0.0031	395.0	-0.3210	B = -0.7584549430 00	F = -0.1176017940-02
0.0091	275.0	-0.4840	C = 0.2521332030 00	G = 0.5590039120-04
0.0131	205.0	-0.9770	D = -0.7444281070-01	H = -0.1060179290-05
0.0181	160.0	-1.2250		
0.0231	130.0	-1.4333	TIME	P
0.0281	105.0	-1.5863	0.0581	40.0
0.0331	85.0	-1.8591	0.0681	30.0
0.0381	70.0	-2.0523	0.0781	24.0
0.0431	53.0	-2.3305	0.0881	20.0
				LN(P)
				-2.6119
				-2.8706
				-3.1227
				-3.3051

DATA FROM RUN # 203

			$T = (TIME * PREF ** 2) / ALPHA$	
			$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$	
TIME	P	LN(P)		
0.0	615.0	0.0	A = -0.4162436720-02	F = -0.5107273920-02
0.0023	255.0	-0.2110	B = -0.5445561760 00	G = 0.7736196410-03
0.0043	220.0	-0.3800	C = 0.5980315330-01	H = -0.4553693470-04
0.0073	180.0	-0.5500	D = 0.1733262320-01	
0.0123	152.0	-0.8190		
0.0173	105.0	-1.0980	TIME	P
0.0223	85.0	-1.2750	0.0523	40.0
0.0273	73.0	-1.3850	0.0623	32.0
0.0323	65.0	-1.5730	0.0723	25.0
0.0423	50.0	-1.6400	0.0923	20.0
				LN(P)
				-2.0637
				-2.2852
				-2.5337
				-2.7555

DATA FROM RUN # 204

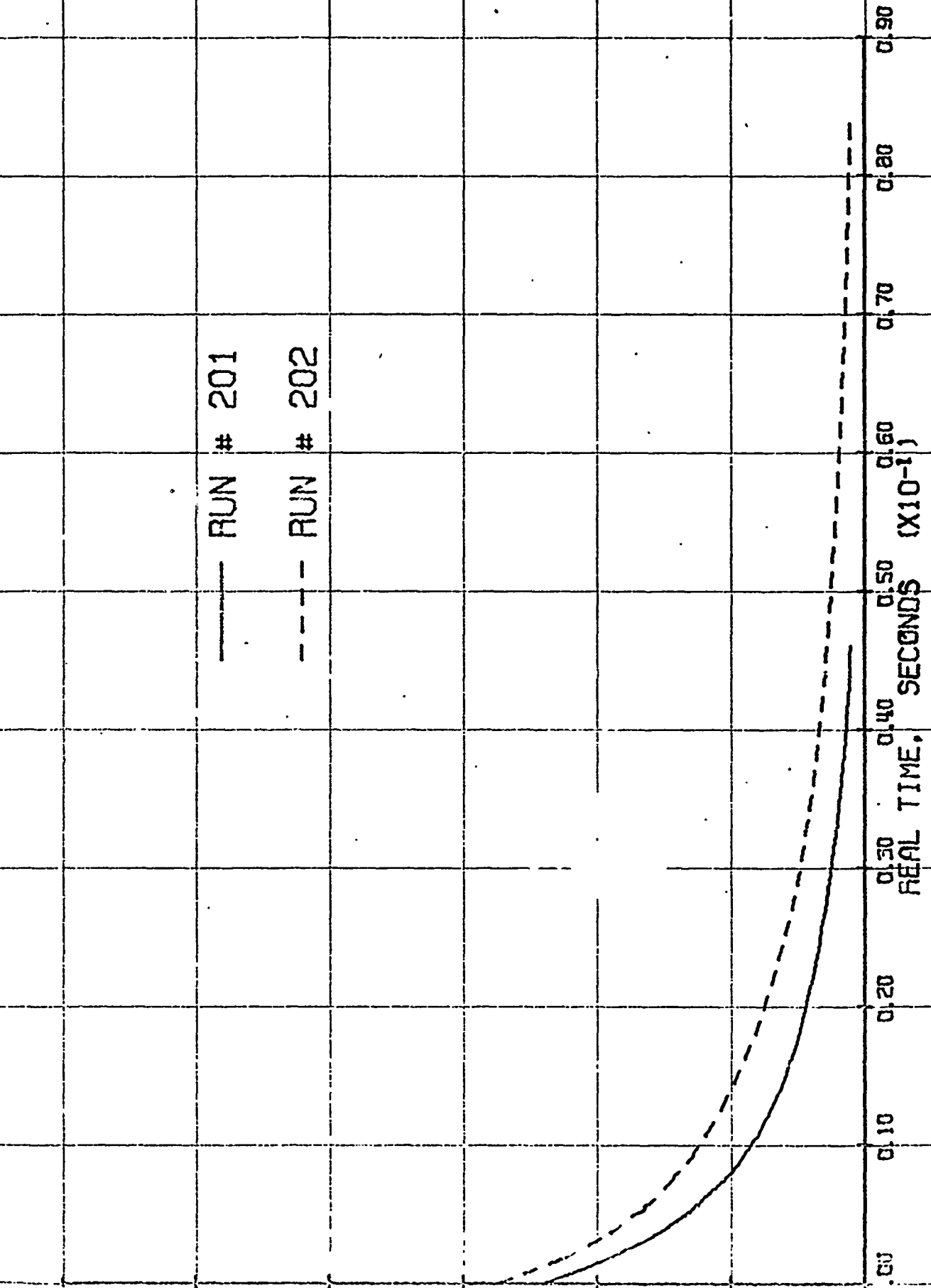
			$T = (TIME * PREF ** 2) / ALPHA$	
			$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$	
TIME	P	LN(P)		
0.0	520.0	0.0	A = -0.512007110-02	D = 0.2952014770-01
0.0010	250.0	-0.2870	B = 0.7500000000 00	E = -0.3320171590-02
0.0043	150.0	-0.5500	C = 0.0000000000 00	F = 0.0000000000-03
0.0083	100.0	-0.6931		
0.0123	75.0	-1.0000	TIME	P
0.0163	50.0	-1.3863	0.0203	50.0
0.0203	25.0	-1.3863	0.0303	20.0
				LN(P)
				-1.7410
				-2.0000
				-2.3027
				-2.5500

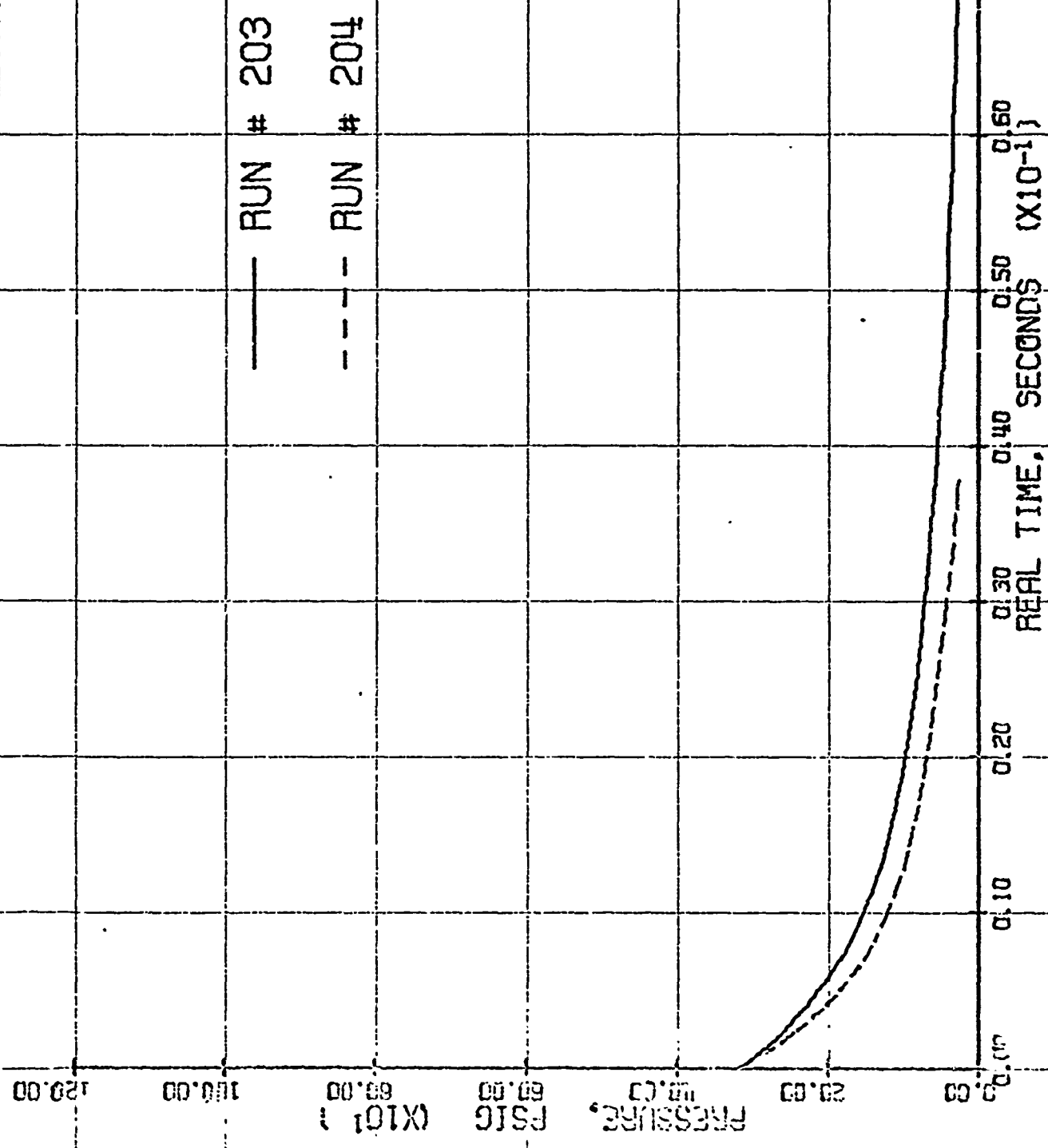
PRESSURE, PSIG (X10¹)

— RUN # 201
--- RUN # 202

REAL TIME, SECONDS (X10⁻¹)

PRESSURE VS TIME DATA FOR BATCH # 949





PRESSURE VS TIME DATA FOR BATCH # 949

DATA FROM RUN # 205

TIME	P	LN(P)
0.0	365.0	0.0
0.0016	300.0	-0.1961
0.0033	230.0	-0.4613
0.0063	150.0	-0.8393
0.0133	105.0	-1.2459
0.0183	80.0	-1.5179
0.0233	62.0	-1.7728

T=(TIME*RREF**2)/ALPHA		
LN(P)=A +B*T +C*T**2 +D*T**3 +E*T**4 +F*T**5		
A= 0.1644606400-02	D=-0.3628555440-01	
B=-0.8436187030 00	E= 0.3925276330-02	
C= 0.1913125400 00	F=-0.1859081680-03	
TIME	P	LN(P)
0.0288	50.0	-1.9879
0.0333	40.0	-2.2110
0.0438	25.0	-2.6810

DATA FROM RUN # 206

TIME	P	LN(P)
0.0	360.0	0.0
0.0023	320.0	-0.1173
0.0037	310.0	-0.1495
0.0055	260.0	-0.3254
0.0087	207.0	-0.5534
0.0127	143.0	-0.8399
0.0137	113.0	-1.1154
0.0237	95.0	-1.3322
0.0297	80.0	-1.5041
0.0337	67.0	-1.6814

T=(TIME*RREF**2)/ALPHA		
LN(P)=A +B*T +C*T**2 +D*T**3 +E*T**4 +F*T**5 +G*T**6 +H*T**7		
A= 0.1183668430-01	E=-0.3301253500-01	
B=-0.1439930650 00	F= 0.4215682650-02	
C=-0.3605861500 00	G=-0.2315458500-03	
D= 0.1756754930 00	H= 0.4950322740-05	
TIME	P	LN(P)
0.0437	50.0	-1.9741
0.0537	40.0	-2.1972
0.0737	20.0	-2.8904
0.0937	15.0	-3.1731

DATA FROM RUN # 207

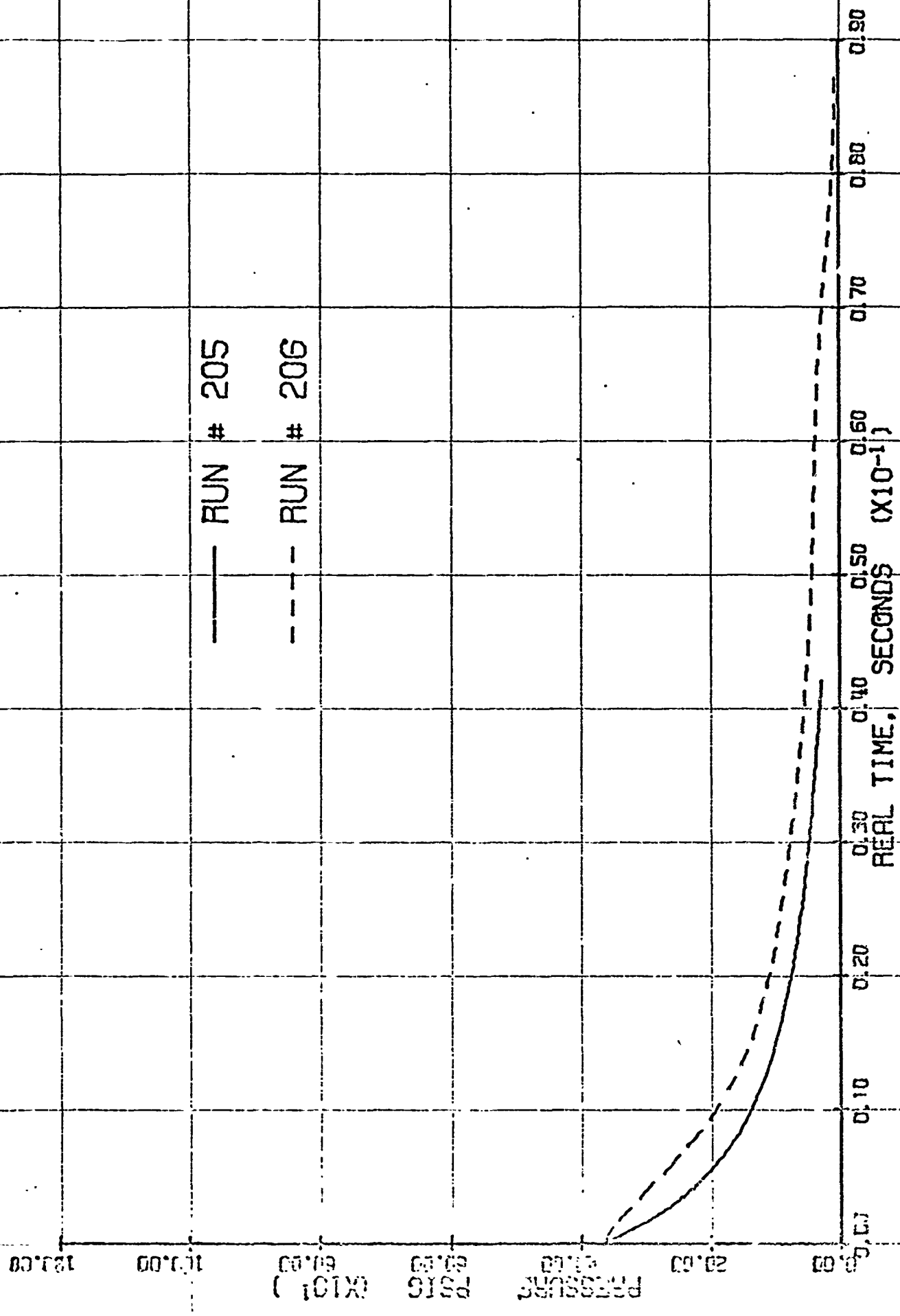
TIME	P	LN(P)
0.0	365.0	0.0
0.0047	335.0	-0.0753
0.0062	260.0	-0.2398
0.0112	495.0	-0.5576
0.0140	400.0	-0.8207
0.0162	345.0	-1.0286
0.0212	265.0	-1.2924
0.0262	207.0	-1.5394
0.0312	165.0	-1.7662
0.0362	130.0	-2.0046

T=(TIME*RREF**2)/ALPHA		
LN(P)=A +B*T +C*T**2 +D*T**3 +E*T**4 +F*T**5 +G*T**6 +H*T**7		
A= 0.5416327920-02	E=-0.5784780660-01	
B= 0.2636692040 00	F= 0.7480312600-02	
C=-0.7523692510 00	G=-0.4165496170-03	
D= 0.3244144720 00	H= 0.9225222290-05	
TIME	P	LN(P)
0.0462	35.0	-2.4295
0.0562	50.0	-2.7778
0.0662	45.0	-3.0655
0.0762	32.0	-3.4064

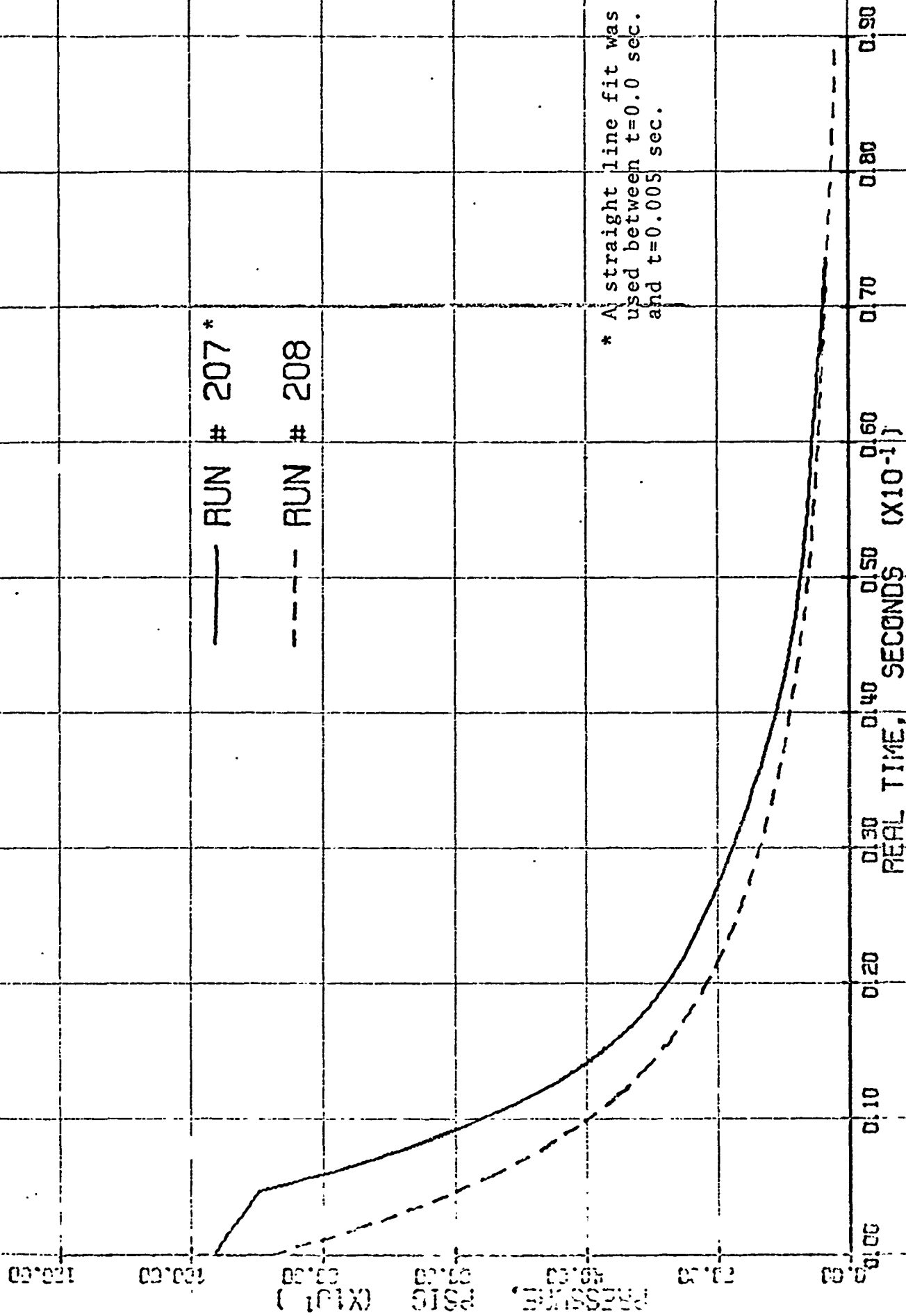
DATA FROM RUN # 208

TIME	P	LN(P)
0.0	470.0	0.0
0.0030	700.0	-0.2174
0.0053	640.0	-0.3709
0.0103	570.0	-0.5591
0.0153	272.0	-1.1227
0.0203	210.0	-1.4214
0.0253	160.0	-1.7215
0.0303	130.0	-2.0211
0.0353	100.0	-2.3214
0.0403	70.0	-2.6211

T=(TIME*RREF**2)/ALPHA		
LN(P)=A +B*T +C*T**2 +D*T**3 +E*T**4 +F*T**5 +G*T**6 +H*T**7		
A= 0.9143353750-02	E=-0.3497301050-02	
B=-0.5007551210 00	F= 0.9600459120-03	
C=-0.2071123720-01	G=-0.5217449500-04	
D= 0.3507043190-01	H= 0.1094932160-05	
TIME	P	LN(P)
0.0503	52.0	-2.8172
0.0553	40.0	-3.0773
0.0603	30.0	-3.3571
0.0653	25.0	-3.5401



PRESSURE VS TIME DATA FOR BATCH # 949



PRESSURE VS TIME DATA FOR BATCH # 949

DATA FROM RUN # 209

TIME	P	LN(P)
0.0	658.0	0.0
0.0029	495.0	-0.2997
0.0052	400.0	-0.5128
0.0077	332.0	-0.6992
0.0120	245.0	-1.0030
0.0179	183.0	-1.2673
0.0229	150.0	-1.4937
0.0279	120.0	-1.7168
0.0329	93.0	-1.9193
0.0379	70.0	-2.1223

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.4339379350-02$ $E = 0.1570726870-01$
 $B = -0.7733517790-00$ $F = -0.1647302710-02$
 $C = 0.2603315670-00$ $G = 0.8824570150-04$
 $D = -0.3295972540-01$ $H = -0.1876544460-05$

TIME	P	LN(P)
0.0479	50.0	-2.4099
0.0579	42.0	-2.7656
0.0679	32.0	-3.0386
0.0879	20.0	-3.5086

DATA FROM RUN # 210

TIME	P	LN(P)
0.0	840.0	0.0
0.0015	730.0	-0.1404
0.0032	640.0	-0.2719
0.0065	515.0	-0.4392
0.0115	385.0	-0.7302
0.0165	310.0	-0.9363
0.0215	255.0	-1.1321
0.0265	215.0	-1.3623
0.0315	175.0	-1.5536
0.0365	150.0	-1.7226

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.3303763900-03$ $F = 0.5468430800-02$
 $B = -0.5076366330-00$ $G = -0.5728430920-03$
 $C = 0.1622143200-00$ $H = 0.2620979020-04$
 $D = -0.4155746500-01$ $H = -0.4846625960-06$

TIME	P	LN(P)
0.0465	115.0	-1.9385
0.0615	80.0	-2.3514
0.0815	60.0	-2.6391
0.1015	50.0	-2.9214

DATA FROM RUN # 211

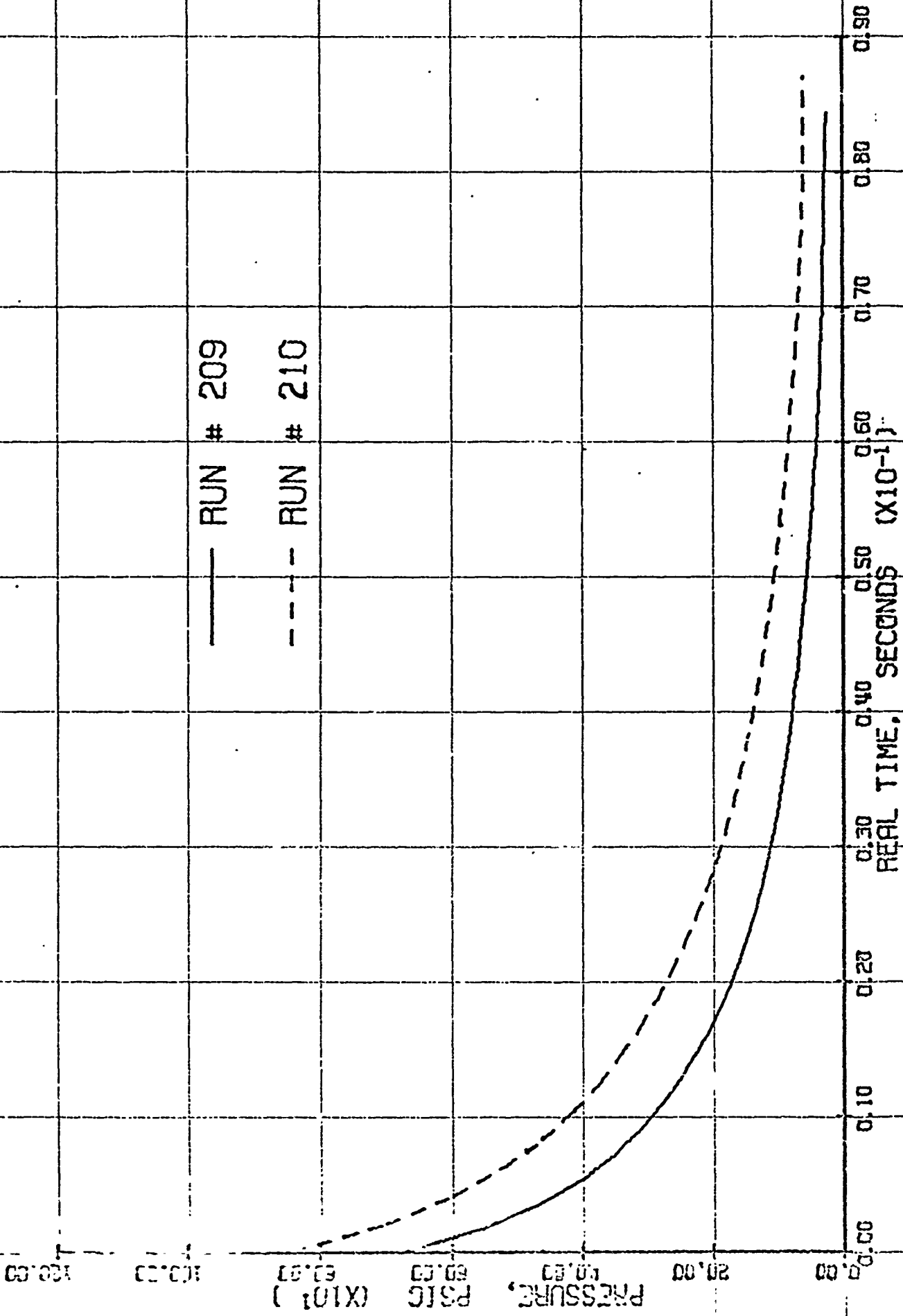
TIME	P	LN(P)
0.0	400.0	0.0
0.0011	430.0	-0.1306
0.0051	285.0	-0.6419
0.0111	200.0	-0.9161
0.0161	150.0	-1.1102
0.0211	120.0	-1.4059
0.0261	90.0	-1.6794
0.0311	70.0	-1.9124
0.0411	50.0	-2.1701

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

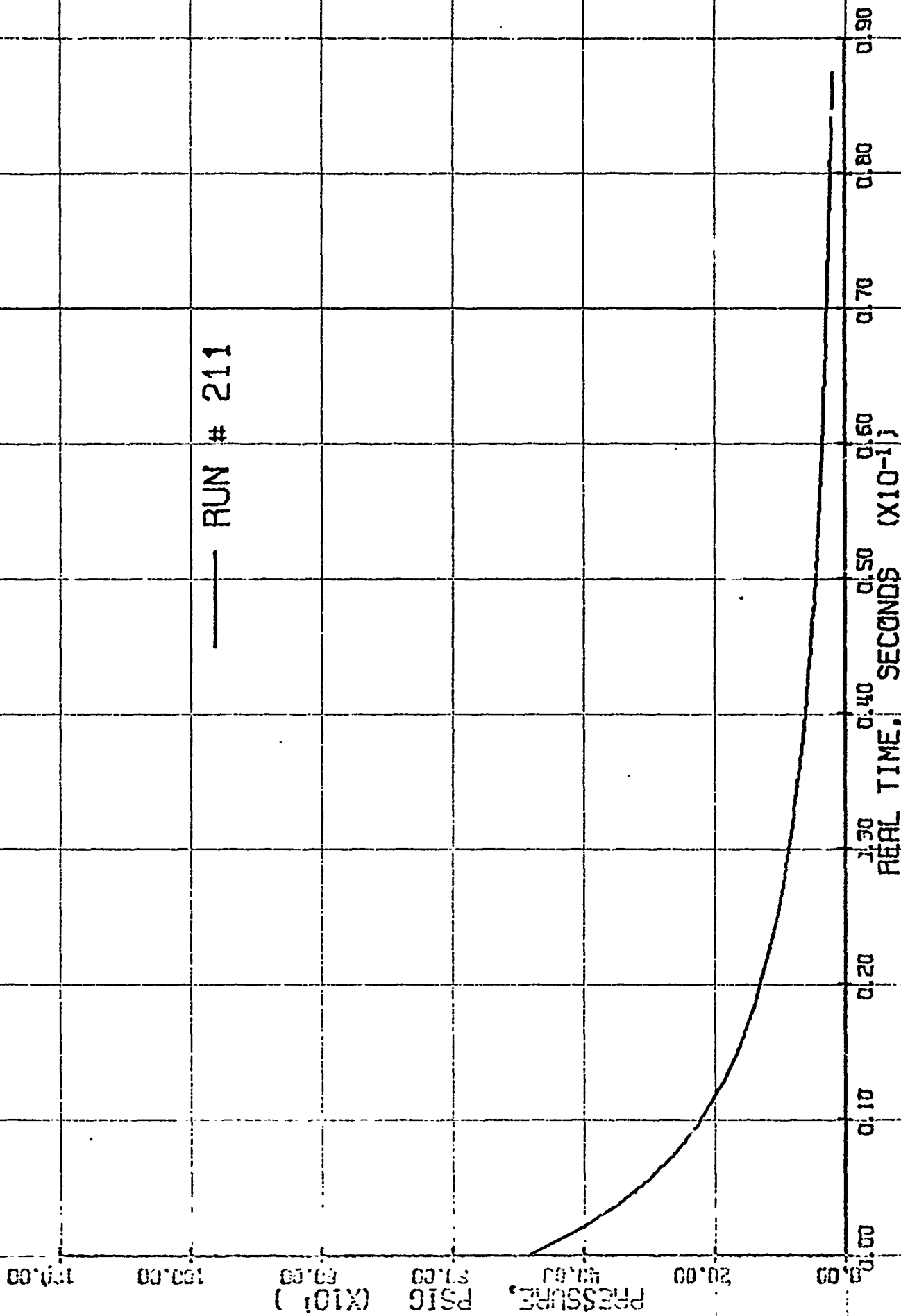
$A = -0.1254914110-01$ $E = 0.5069857840-03$
 $B = -0.6100937950-00$ $F = -0.5402821110-05$
 $C = 0.5672530110-01$ $G = -0.2949974420-06$
 $D = -0.3517415050-02$

TIME	P	LN(P)
0.0511	42.0	-2.4557
0.0611	33.0	-2.6979
0.0911	15.0	-3.4864



PRESSURE VS TIME DATA FOR BATCH # 949

— RUN # 211



PRESSURE VS TIME DATA FOR BATCH # 949

BATCH # 951 / 75.0% AP, 25.0% P&AA, 45 MICRON UNIMODAL

DATA FROM RUN # 212

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	733.0	0.0
0.0046	475.0	-0.4406
0.0096	345.0	-0.7604
0.0146	270.0	-1.0055
0.0196	225.0	-1.1678
0.0246	188.0	-1.3075
0.0296	160.0	-1.5233
0.0346	140.0	-1.6523
0.0446	110.0	-1.7035
0.0546	92.0	-2.0322

A=-0.5266241610-02 E= 0.7344616950-04
 B=-0.2690795820 00 F=-0.1635890340-05
 C= 0.2509372010-01 G= 0.1990175100-07
 D=-0.1770110450-02 H=-0.0431293270-10

TIME	P	LN(P)
0.0746	72.0	-2.3273
0.0946	55.0	-2.4296
0.1146	60.0	-2.5096
0.1446	55.0	-2.5956

DATA FROM RUN # 213

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	525.0	0.0
0.0327	420.0	-0.3975
0.0644	360.0	-0.5516
0.0977	265.0	-0.9580
0.0127	190.0	-1.1907
0.0177	140.0	-1.4361
0.0227	107.0	-1.7649
0.0277	90.0	-1.9379
0.0327	73.0	-2.0310
0.0427	59.0	-2.3602

A=-0.1646987870-01 E= 0.1382608750-03
 B=-0.3543901000 00 F=-0.4198403430-05
 C= 0.3415510140-01 G= 0.6704170870-07
 D=-0.2701642550-02 H=-0.4337233920-09

TIME	P	LN(P)
0.0527	46.0	-2.6091
0.0627	40.0	-2.7489
0.0827	30.0	-3.0366
0.1027	28.0	-3.1055

DATA FROM RUN # 214

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	685.0	0.0
0.0023	500.0	-0.3142
0.0040	410.0	-0.5133
0.0070	300.0	-0.6256
0.0090	252.0	-1.0000
0.0140	195.0	-1.3091
0.0190	135.0	-1.6241
0.0240	105.0	-1.8755
0.0290	85.0	-2.0368
0.0390	60.0	-2.4351

A= 0.4020098840-02 E= 0.3103306330-03
 B=-0.3669423000 00 F=-0.1157767990-04
 C= 0.4637725650-01 G= 0.2269664930-06
 D=-0.4723533550-02 H=-0.1755993520-08

TIME	P	LN(P)
0.0400	45.0	-2.7229
0.0500	35.0	-2.9741
0.0790	27.0	-3.2306
0.0900	25.0	-3.3105

DATA FROM RUN # 215

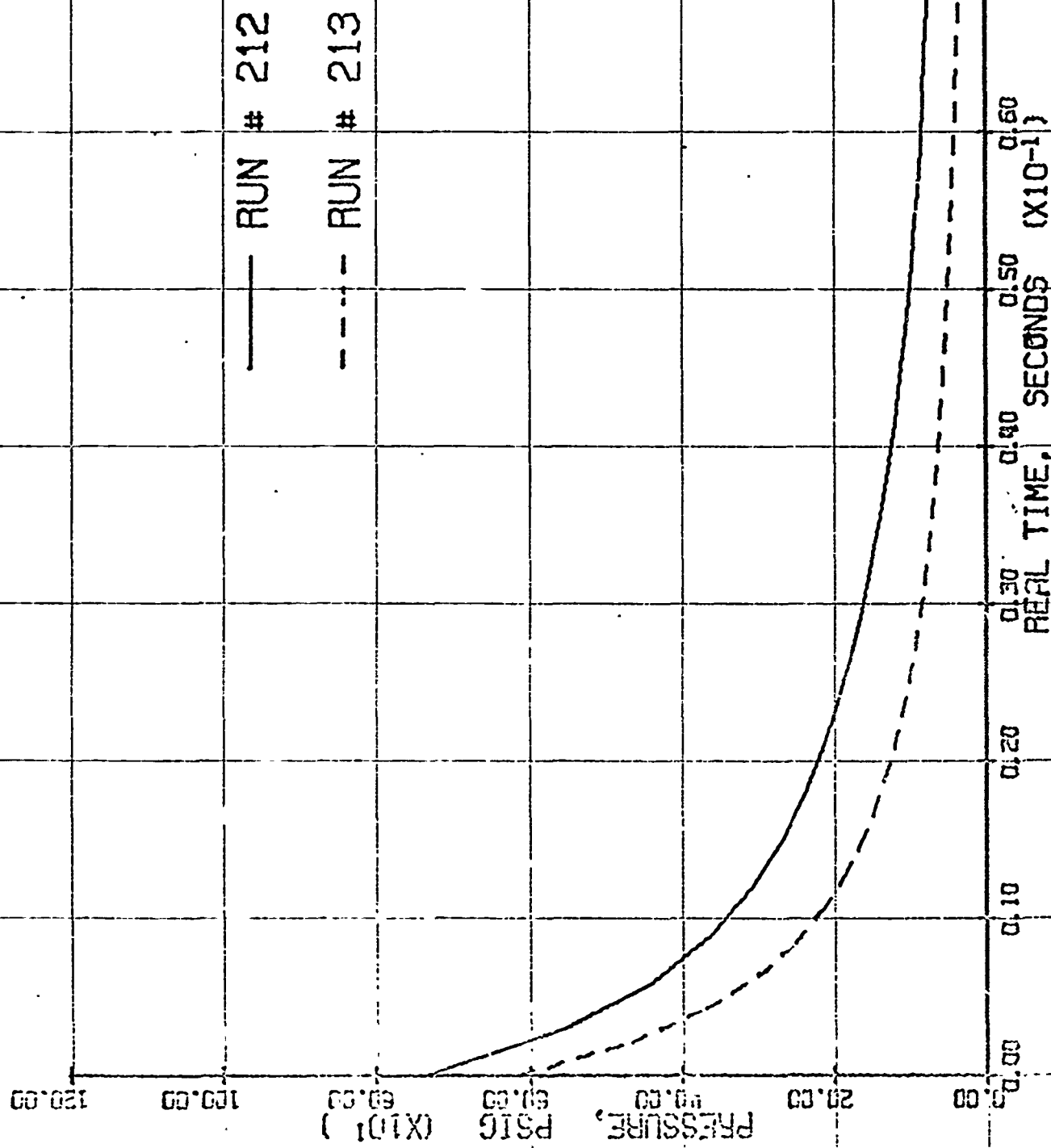
$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

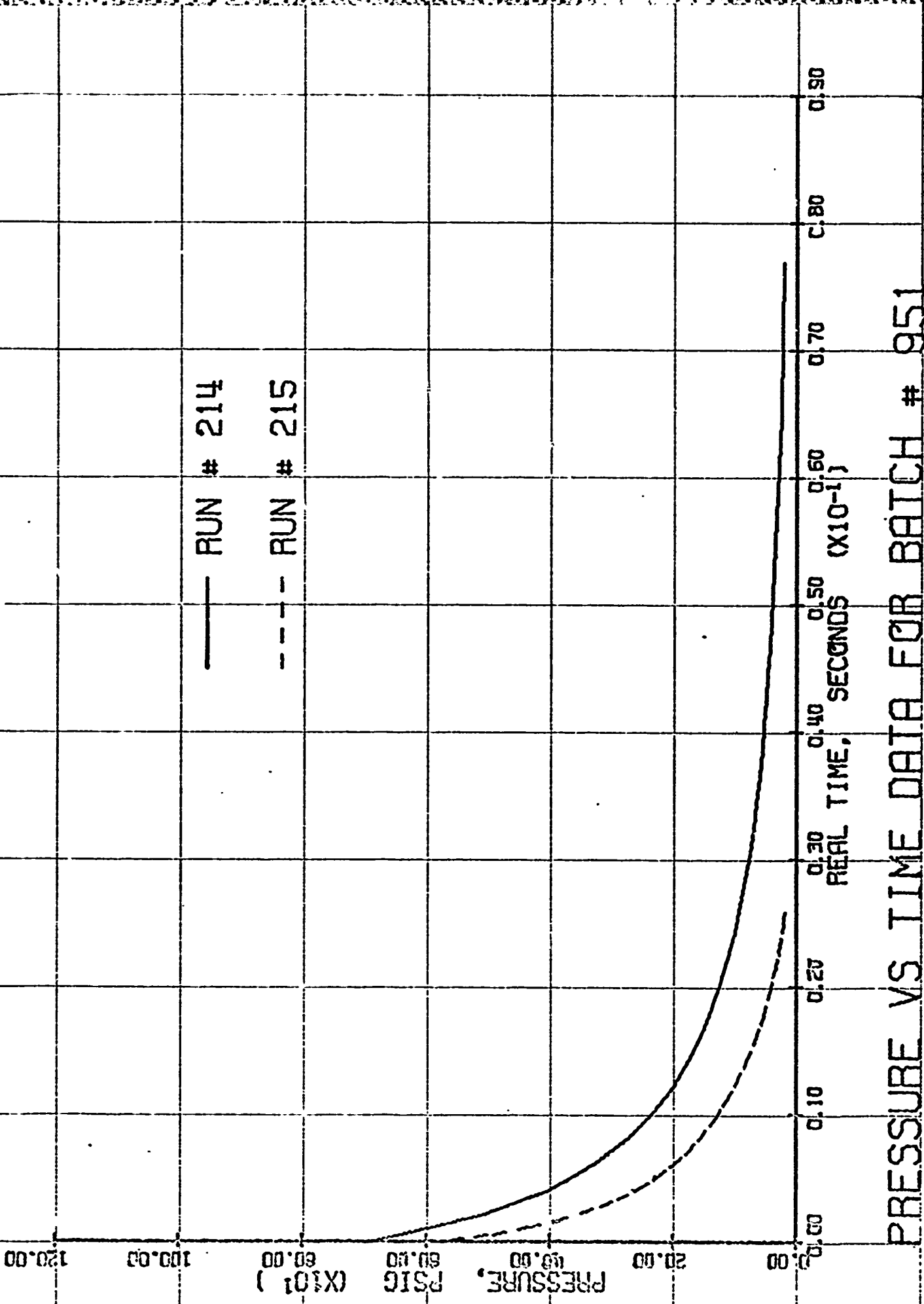
TIME	P	LN(P)
0.0	540.0	0.0
0.0014	500.0	-0.0007
0.0031	450.0	-0.0007
0.0047	400.0	-0.0007
0.0063	350.0	-0.0007
0.0079	300.0	-0.0007
0.0095	250.0	-0.0007
0.0111	200.0	-0.0007
0.0127	150.0	-0.0007
0.0143	100.0	-0.0007

A= 0.9560000000-02 D=-0.2121001970-01
 B=-0.0000000000 00 E= 0.1746045670-02
 C= 0.1000000000 00 F=-0.5000000000-04

TIME	P	LN(P)
0.0159	100.0	-0.0007
0.0175	50.0	-0.0007
0.0191	50.0	-0.0007



PRESSURE VS TIME DATA FOR BATCH # 951



PRESSURE VS TIME DATA FOR BATCH # 951

BATCH # 951 / 75.0% AP, 25.0% P34A, 45 MICKON UNIMODAL

DATA FROM RUN # 216

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0	455.0	0.0
0.0015	380.0	-0.2019
0.0035	295.0	-0.4551
0.0055	240.0	-0.6614
0.0085	188.0	-0.9055
0.0135	135.0	-1.2368
0.0185	93.0	-1.5571
0.0235	80.0	-1.7600
0.0285	65.0	-1.9675

A = -0.2656064520-02 E = 0.1599647000-03
 B = -0.3523093540 00 F = -0.4357916950-05
 C = 0.3490688950-01 G = 0.4591486480-07
 D = -0.2995124110-02

TIME	P	LN(P)
0.0335	48.0	-2.2708
0.0485	40.0	-2.4537
0.0685	28.0	-2.3098

DATA FROM RUN # 218

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

TIME	P	LN(P)
0.0	555.0	0.0
0.0014	440.0	-0.2322
0.0037	305.0	-0.5937
0.0055	240.0	-0.8383
0.0037	152.0	-1.2314
0.0115	120.0	-1.5315
0.0137	88.0	-1.8418

A = -0.2036745700-02 D = 0.7424951390-02
 B = -0.4115036930 00 E = -0.1343202370-02
 C = 0.4349369110-02 F = 0.6440185370-04

TIME	P	LN(P)
0.0187	50.0	-2.4069
0.0237	25.0	-3.1001
0.0287	20.0	-3.3232

DATA FROM RUN # 219

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	1045.0	0.0
0.0005	910.0	-0.1333
0.0015	760.0	-0.3185
0.0031	560.0	-0.4535
0.0058	455.0	-0.7575
0.0051	380.0	-1.0116
0.0108	302.0	-1.2413
0.0160	220.0	-1.5591
0.0205	180.0	-1.6766
0.0308	95.0	-2.3663

A = -0.4474171350-02 E = 0.2967255630-03
 B = -0.4248132790 00 F = -0.9750538610-05
 C = 0.4099918790-01 G = 0.1628355040-06
 D = -0.4359925510-02 H = -0.1078277200-08

TIME	P	LN(P)
0.0408	55.0	-2.7323
0.0608	45.0	-3.1451
0.0808	32.0	-3.4360
0.1108	25.0	-3.7320

DATA FROM RUN # 219A

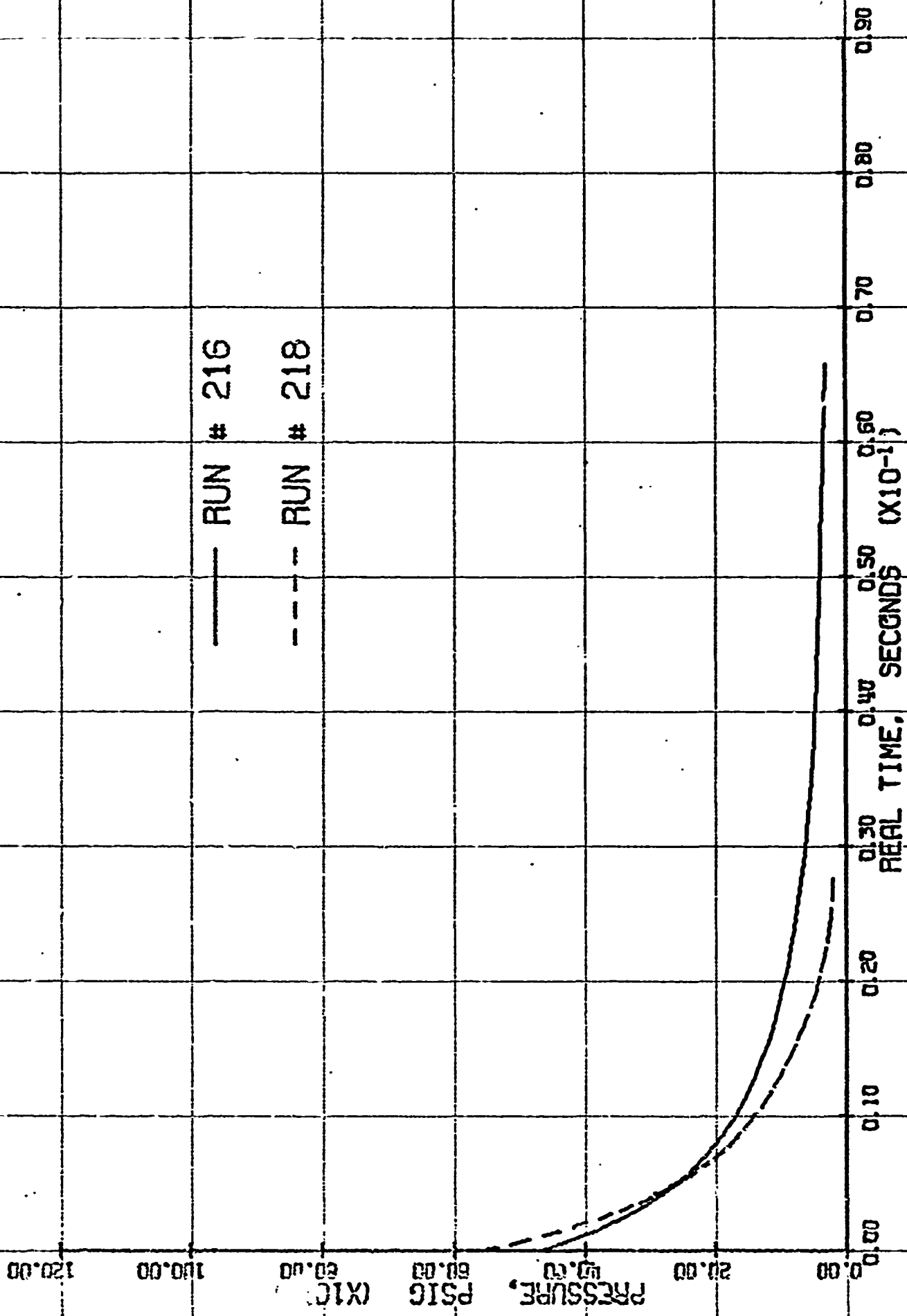
$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

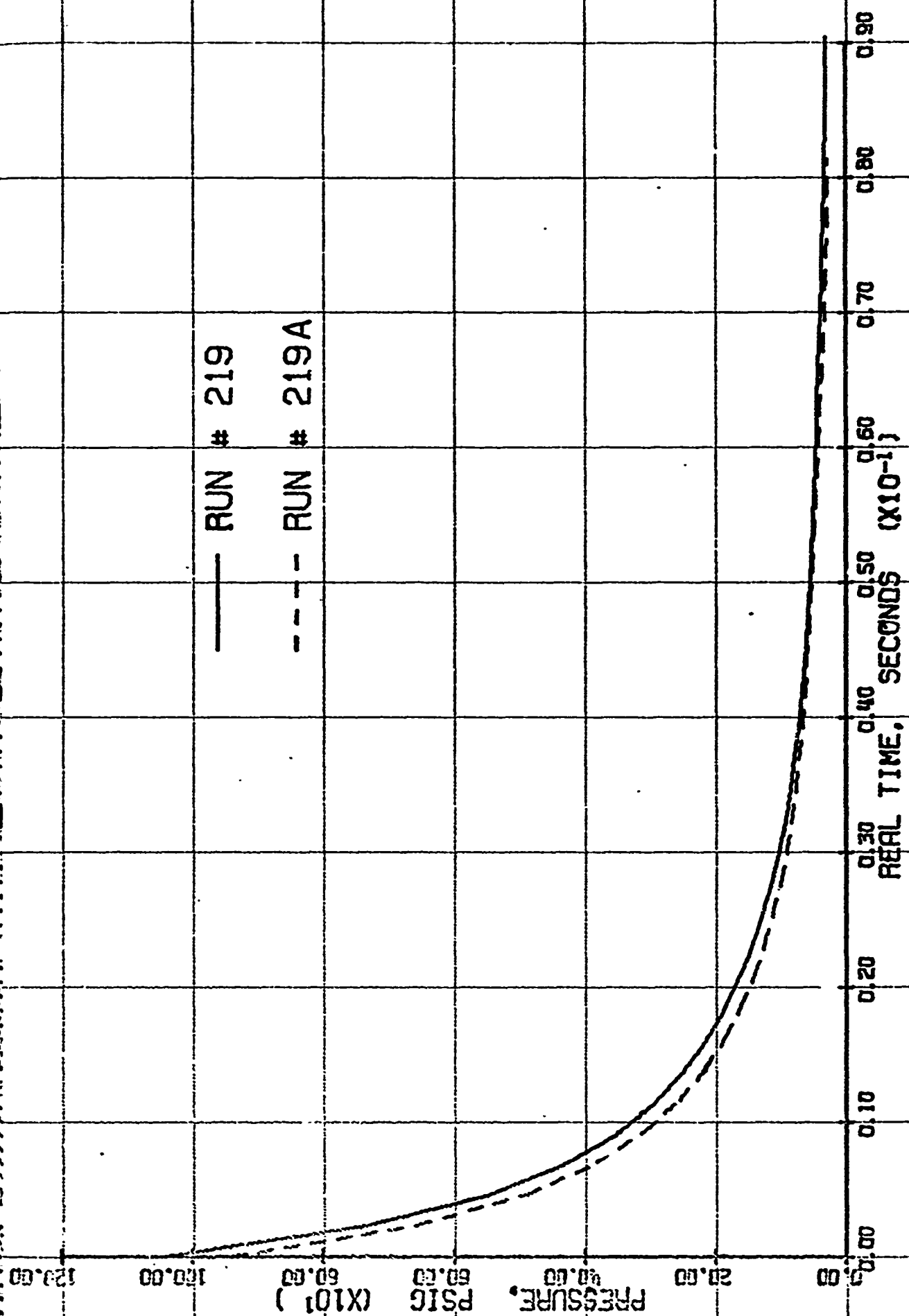
TIME	P	LN(P)
0.0	680.0	0.0
0.0039	530.0	-0.6525
0.0080	315.0	-1.0525
0.0130	215.0	-1.4541
0.0160	160.0	-1.7500
0.0235	115.0	-2.0503
0.0330	80.0	-2.4532
0.0430	50.0	-2.7575
0.0530	30.0	-3.1575
0.0830	25.0	-3.5590

A = 0.7004710540-02 E = 0.3236667890-02
 B = -0.4207325030 00 F = -0.1180237650-04
 C = 0.4750310270-01 G = 0.2167313720-05
 D = -0.4537467390-02 H = -0.1552357170-06

TIME	P	LN(P)
0.1130	25.0	-3.6153
0.0007	834.0	-0.1080
0.0014	754.0	-0.2595
0.0025	620.0	-0.3495



PRESSURE VS TIME DATA FOR BATCH # 951



— RUN # 219

--- RUN # 219A

PRESSURE VS TIME DATA FOR BATCH # 951

BATCH # 951 / 75.0% AP, 25.0% PBAA, 45 MICRON UNIMODAL

DATA FROM RUN # 220

TIME	P	LN(P)
0.0	907.0	0.0
0.0020	625.0	-0.3669
0.0070	310.0	-1.0680
0.0120	195.0	-1.5316
0.0170	125.0	-1.9763
0.0220	85.0	-2.3620
0.0270	65.0	-2.6302
0.0320	50.0	-2.8926
0.0420	35.0	-3.2493
0.0520	23.0	-3.4724

$T = (TIME * PREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A = 0.6075946220-02 E = 0.9959530970-03
 B = -0.5115434510 00 F = -0.5212605520-04
 C = 0.7313634000-01 G = 0.1420062010-05
 D = -0.1072970900-01 H = -0.1556819820-07

TIME	P	LN(P)
0.0620	23.0	-3.6591
0.0011	732.0	-0.2089
0.0017	658.0	-0.3154
0.0020	534.7	-0.5136

DATA FROM RUN # 221

TIME	P	LN(P)
0.0	903.0	0.0
0.0024	520.0	-0.5519
0.0074	235.0	-1.3461
0.0124	125.0	-1.9774
0.0174	65.0	-2.6313
0.0224	32.0	-3.3400
0.0274	20.0	-3.3100
0.0005	792.0	-0.1301
0.0012	463.1	-0.3013
0.0018	520.0	-0.4427

$T = (TIME * PREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A = 0.2910771650-02 E = 0.3093062240-02
 B = -0.6929641340 00 F = -0.2098430350-03
 C = 0.1362148200 00 G = 0.5562574600-05
 D = -0.2666235940-01 H = 0.6375986910-07

TIME	P	LN(P)
0.0024	513.9	-0.5637
0.0037	411.1	-0.7868
0.0049	330.4	-1.0055
0.0062	279.0	-1.1746

DATA FROM RUN # 222

TIME	P	LN(P)
0.0	700.0	0.0
0.0012	540.0	-0.2595
0.0027	335.0	-0.5973
0.0040	300.0	-0.9473
0.0077	175.0	-1.3363
0.0094	140.0	-1.5094
0.0127	80.0	-2.1691

$T = (TIME * PREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 A = 0.1323807590-01 D = -0.2779205620-01
 B = -0.8801904040 00 E = 0.2440785480-02
 C = 0.1394632310 00 F = -0.7521103300-04

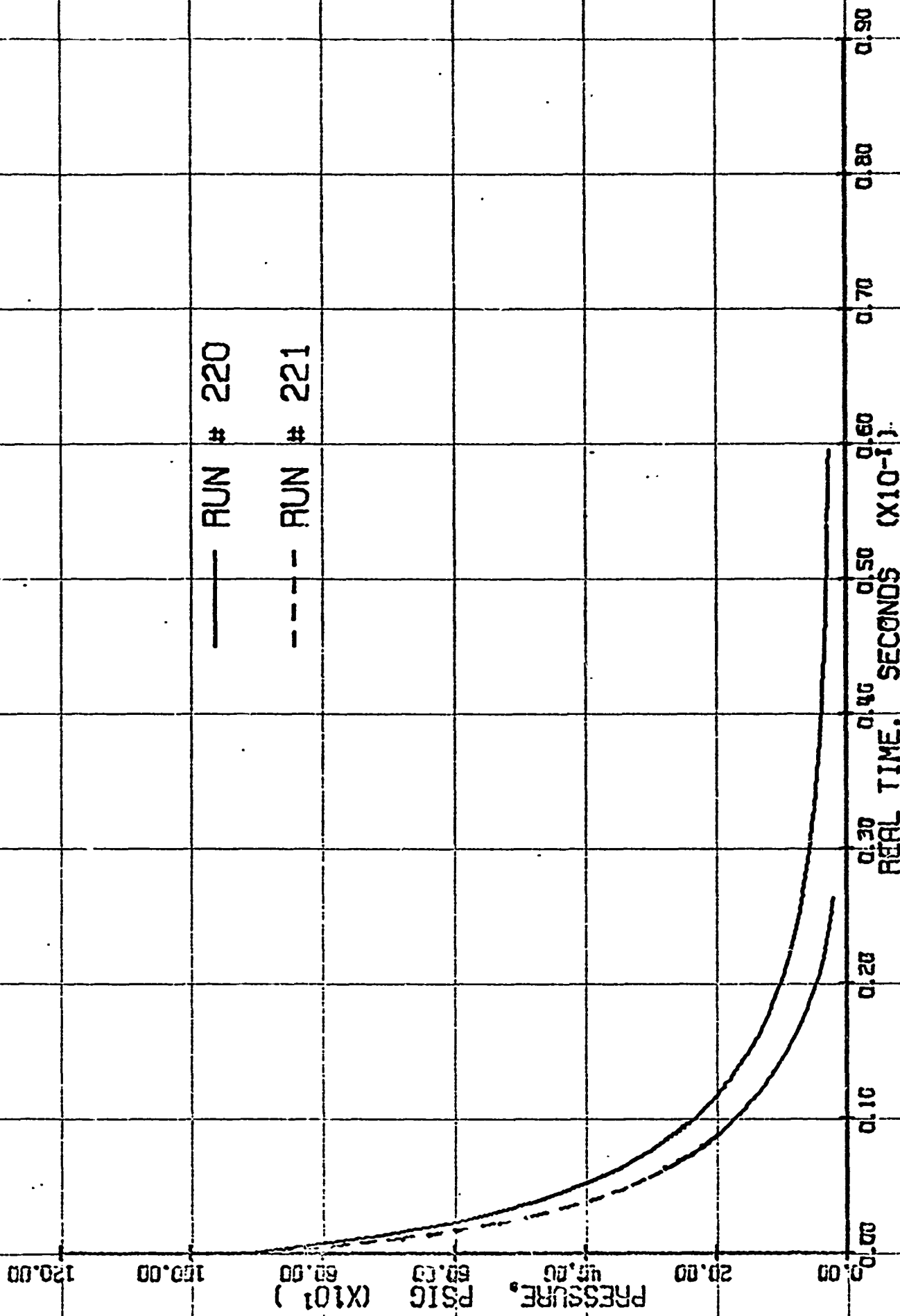
TIME	P	LN(P)
0.0148	60.0	-2.4567
0.0177	39.0	-2.9135
0.0227	20.0	-3.5553

DATA FROM RUN # 224

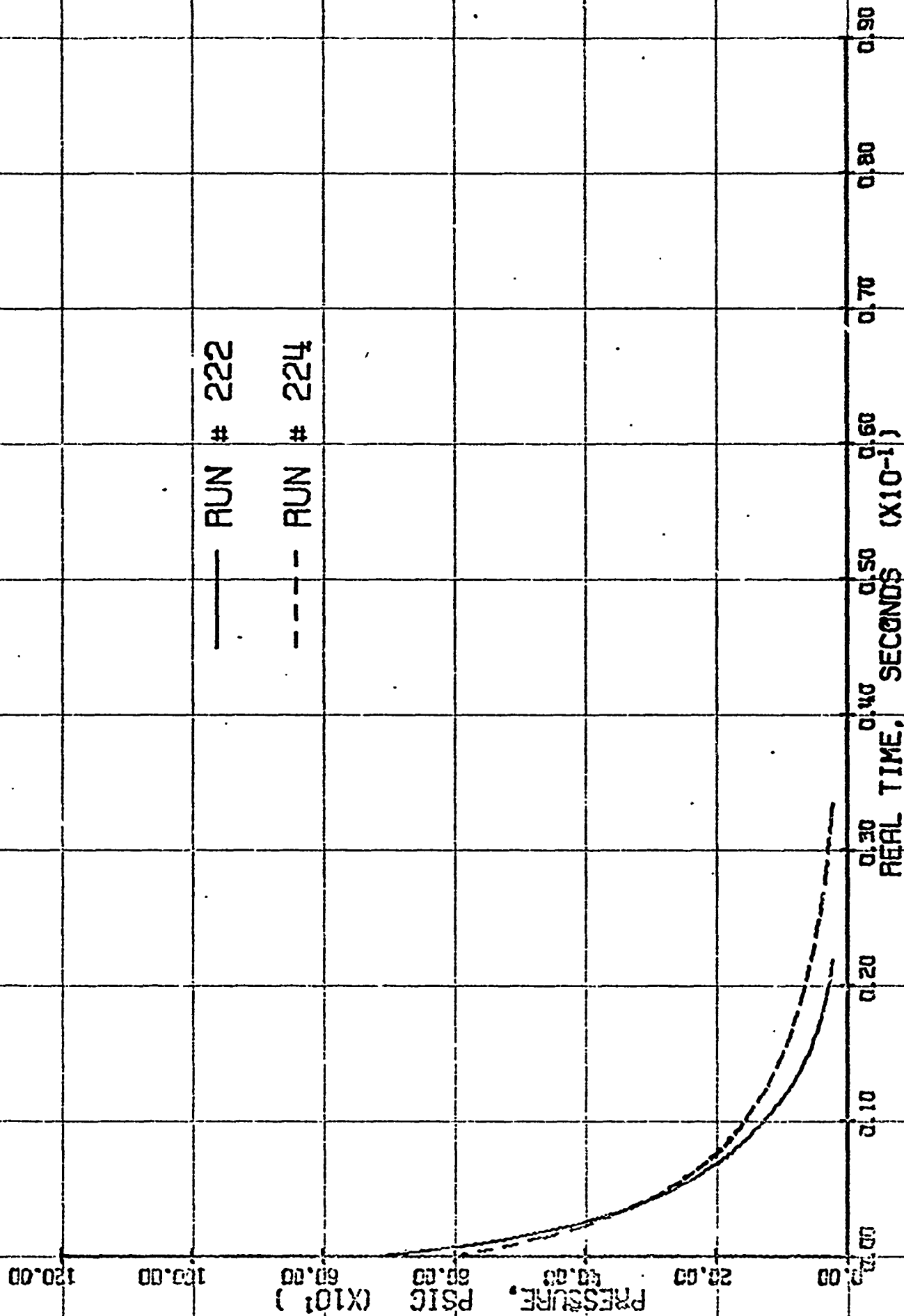
TIME	P	LN(P)
0.0	500.0	0.0
0.0020	400.0	-0.3567
0.0048	277.0	-0.7729
0.0066	220.0	-1.0032
0.0093	160.0	-1.5219
0.0127	120.0	-1.8094
0.0148	93.0	-1.9120

$T = (TIME * PREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 A = 0.1459154640-02 D = -0.6777511510-02
 B = -0.4925843310 00 E = 0.3920144670-03
 C = 0.0040147390-01 F = -0.3933521140-05

TIME	P	LN(P)
0.0198	65.0	-2.2225
0.0248	43.0	-2.4357
0.0348	20.0	-3.4012



PRESSURE VS TIME DATA FOR BATCH # 951



PRESSURE VS TIME DATA FOR BATCH # 951

BATCH # 951 / 75.0% AP, 25.0% PUAA, 45 HICKON UNIMODAL

DATA FROM RUN # 225

TIME	P	LN(P)
0.0	915.0	0.0
0.0014	850.0	-0.0620
0.0027	815.0	-0.1157
0.0037	785.0	-0.1532
0.0050	550.0	-0.4559
0.0057	405.0	-0.9150
0.0115	320.0	-1.1506
0.0187	200.0	-1.6096
0.0237	160.0	-1.7438
0.0287	127.0	-1.9747

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.3475392660-02 E=-0.3212427610-02
 B=-0.4139600030-02 F= 0.1627277040-03
 C=-0.1423271840 00 G=-0.4003468430-05
 D= 0.3198933770-01 H= 0.3763821240-07

TIME	P	LN(P)
0.0337	100.0	-2.2138
0.0437	73.0	-2.5235
0.0637	45.0	-3.0123
0.0937	30.0	-3.4177

DATA FROM RUN # 227

TIME	P	LN(P)
0.0	470.0	0.0
0.0018	365.0	-0.2523
0.0066	215.0	-0.7821
0.0118	135.0	-1.2475
0.0168	90.0	-1.6529
0.0218	62.0	-2.0256
0.0318	33.0	-2.5151

$T = (TIME * PREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 A=-0.1125526810-01 D=-0.4154104460-03
 B=-0.3152012120 00 F= 0.9815371780-05
 C= 0.1315734500-01 E=-0.9688549950-07

TIME	P	LN(P)
0.0418	25.0	-2.9337
0.0518	20.0	-3.1570
0.0718	18.0	-3.2624

DATA FROM RUN # 228

TIME	P	LN(P)
0.0	493.0	0.0
0.0005	415.0	-0.1823
0.0012	340.0	-0.3817
0.0025	300.0	-0.5066
0.0045	220.0	-0.8170
0.0058	150.0	-1.1175
0.0069	140.0	-1.2690

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 A=-0.1047923370-01 D= 0.5194943840-02
 B=-0.5106435190 00 E=-0.1058831790-02
 C= 0.2138794790-01 F= 0.4814691430-04

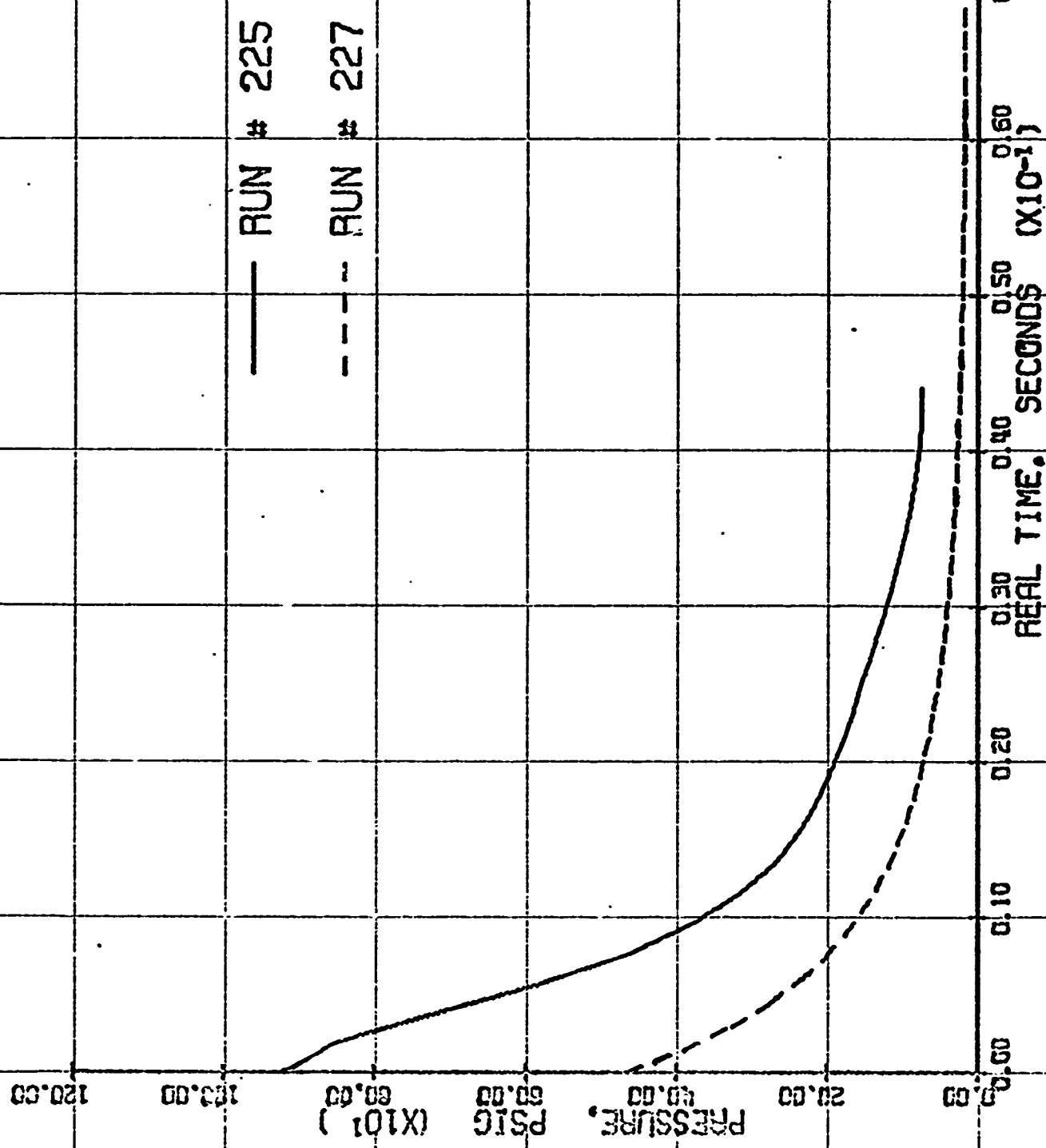
TIME	P	LN(P)
0.0108	92.0	-1.6838
0.0158	50.0	-2.2986
0.0208	25.0	-2.9917

DATA FROM RUN # 230

TIME	P	LN(P)
0.0	505.0	0.0
0.0022	340.0	-0.3854
0.0034	200.0	-0.6039
0.0072	140.0	-0.9775
0.0083	130.0	-1.1484
0.0122	120.0	-1.4371
0.0172	80.0	-1.9426
0.0222	50.0	-2.1302
0.0322	40.0	-2.5357

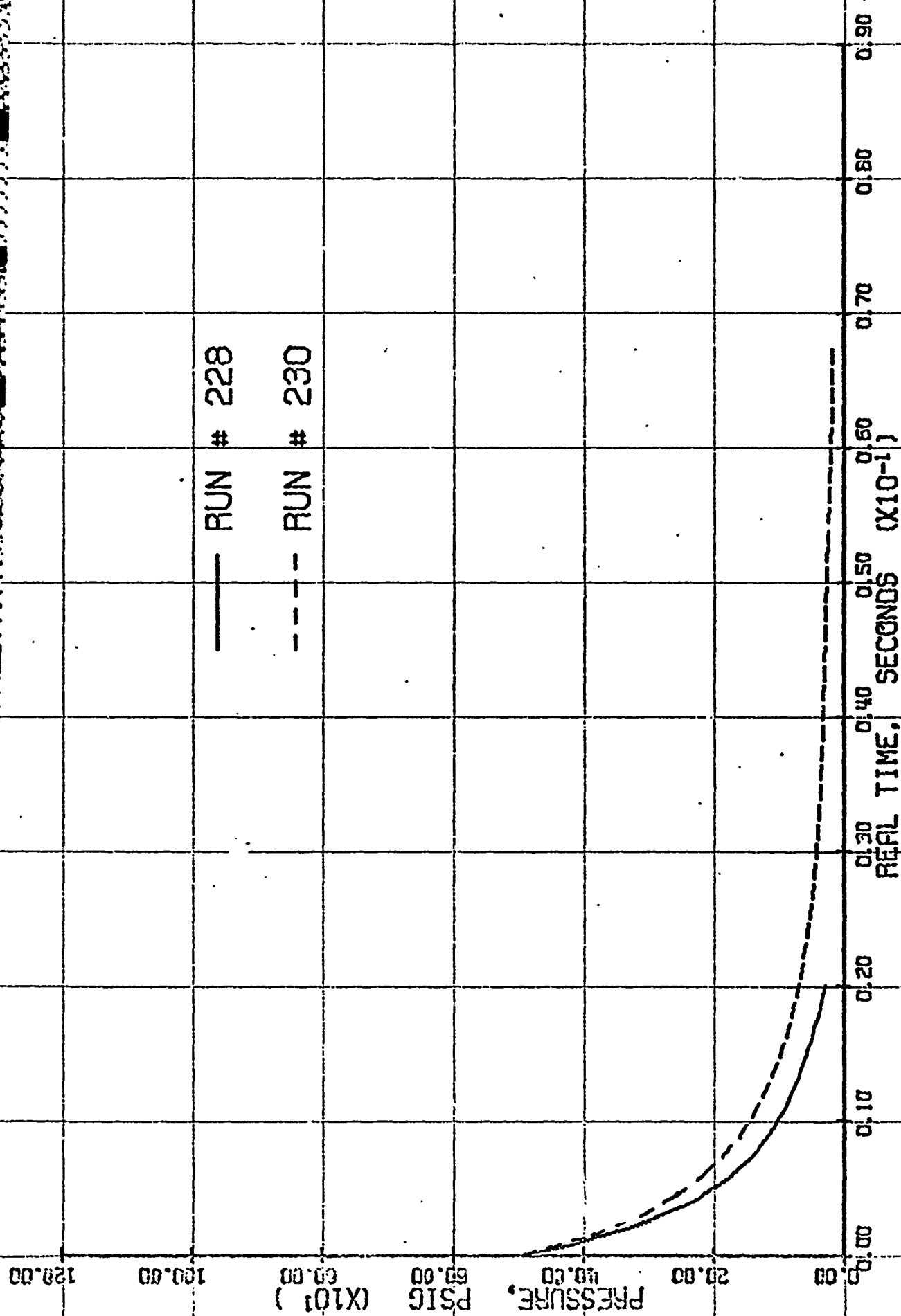
$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$
 A=-0.2470347520-01 F= 0.3323310590-03
 B=-0.4375251230 00 E=-0.1077477470-04
 C= 0.4180341250-01 G= 0.1327597330-06
 D=-0.5111210640-02

TIME	P	LN(P)
0.0422	30.0	-2.8234
0.0522	25.0	-3.0057
0.0722	20.0	-3.2298



PRESSURE VS TIME DATA FOR BATCH # 951

— RUN # 228
--- RUN # 230



PRESSURE VS TIME DATA FOR BATCH # 951

BATCH # 951 / 75.0% AP, 25.0% P6AA, 45 MICRON UNIMODAL

DATA FROM RUN # 231

TIME	P	LN(P)
0.0	750.0	0.0
0.0007	540.0	-0.1586
0.0027	420.0	-0.5798
0.0045	300.0	-0.9163
0.0077	175.0	-1.4553
0.0094	140.0	-1.5784
0.0127	88.0	-2.1427

$T = (TIME * PREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 $A = -0.5288786960-02$ $D = 0.2723535740-01$
 $B = -0.5124379200-00$ $E = -0.4505206700-02$
 $C = -0.3220176700-01$ $F = 0.2253608170-03$

TIME	P	LN(P)
0.0155	60.0	-2.5257
0.0177	40.0	-2.9312
0.0227	20.0	-3.6243

DATA FROM RUN # 232

TIME	P	LN(P)
0.0	933.0	0.0
0.0010	800.0	-0.1591
0.0020	645.0	-0.3745
0.0035	500.0	-0.6291
0.0063	400.0	-0.9123
0.0070	295.0	-1.1548
0.0082	260.0	-1.2831
0.0120	155.0	-1.6234
0.0170	120.0	-2.0562
0.0220	73.0	-2.4870

$T = (TIME * PREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 $A = 0.2079357720-02$ $F = -0.9492193000-03$
 $B = -0.4596440590-00$ $G = 0.3094257910-04$
 $C = 0.2206693740-01$ $H = -0.3060603200-05$
 $D = 0.3737325910-02$ $H = 0.4307867170-07$

TIME	P	LN(P)
0.0270	55.0	-2.8364
0.0320	40.0	-3.1549
0.0420	25.0	-3.6249
0.0620	20.0	-3.9480

DATA FROM RUN # 233

TIME	P	LN(P)
0.0	707.0	0.0
0.0017	540.0	-0.2695
0.0040	370.0	-0.6475
0.0090	200.0	-1.2235
0.0140	127.0	-1.7103
0.0190	85.0	-2.1184
0.0240	60.0	-2.4667

$T = (TIME * PREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 $A = 0.2145805170-02$ $D = -0.2372322170-02$
 $B = -0.4379541120-00$ $E = 0.9400692530-04$
 $C = 0.3443794690-01$ $F = -0.1403050200-05$

TIME	P	LN(P)
0.0340	35.0	-3.0057
0.0440	25.0	-3.3422
0.0640	20.0	-3.5653

DATA FROM RUN # 234

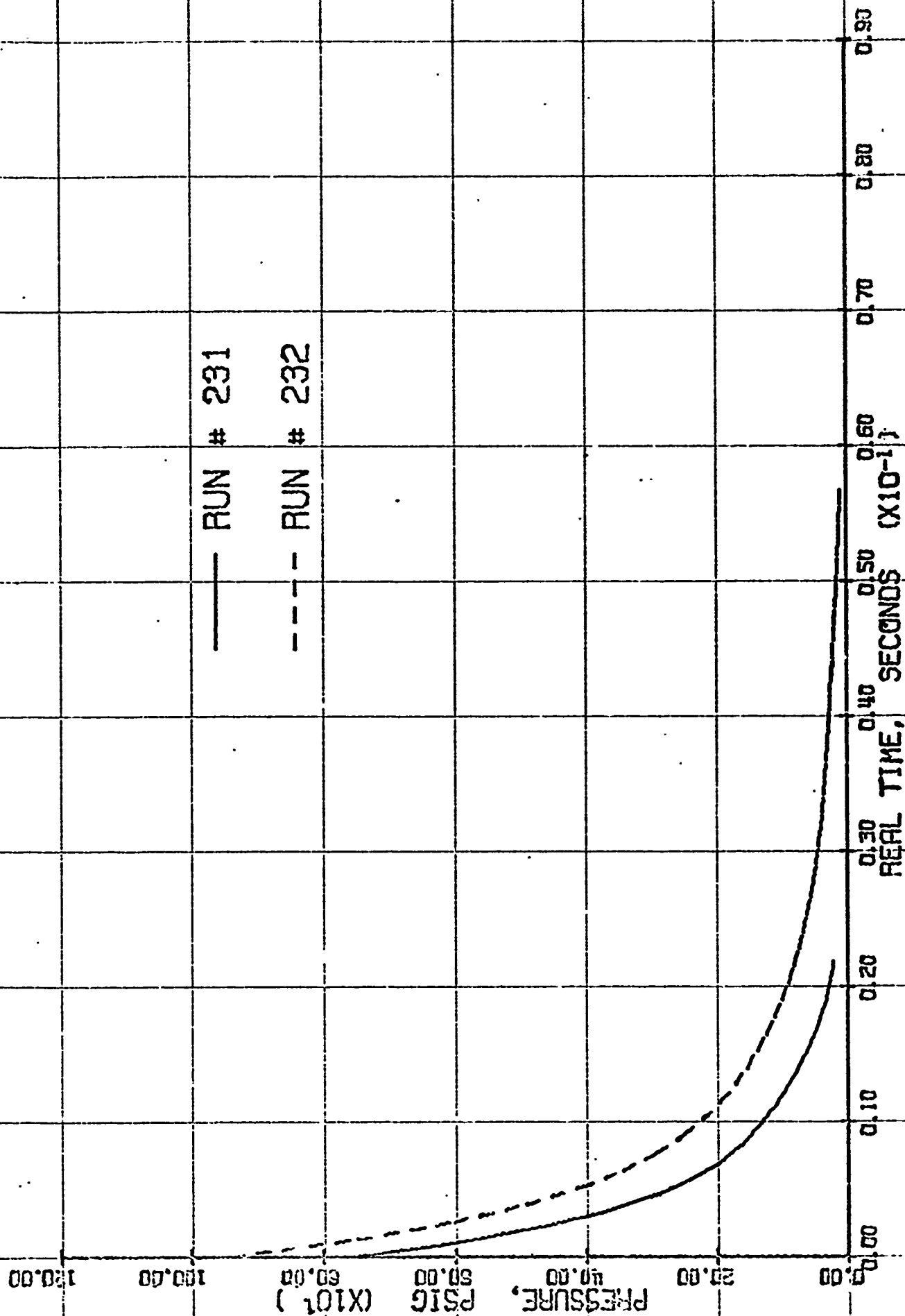
TIME	P	LN(P)
0.0	300.0	0.0
0.0005	300.0	-0.1953
0.0015	250.0	-0.3824
0.0032	200.0	-0.6008
0.0044	150.0	-0.7239
0.0058	120.0	-1.0115
0.0094	55.0	-1.3564

$T = (TIME * PREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$
 $A = -0.8250600040-02$ $D = 0.3267528140-01$
 $B = -0.2665164550-00$ $E = -0.1356319290-01$
 $C = -0.1821267650-00$ $F = 0.7390769490-03$

TIME	P	LN(P)
0.0122	50.0	-1.7647
0.0144	42.0	-2.0614
0.0194	20.0	-2.3034

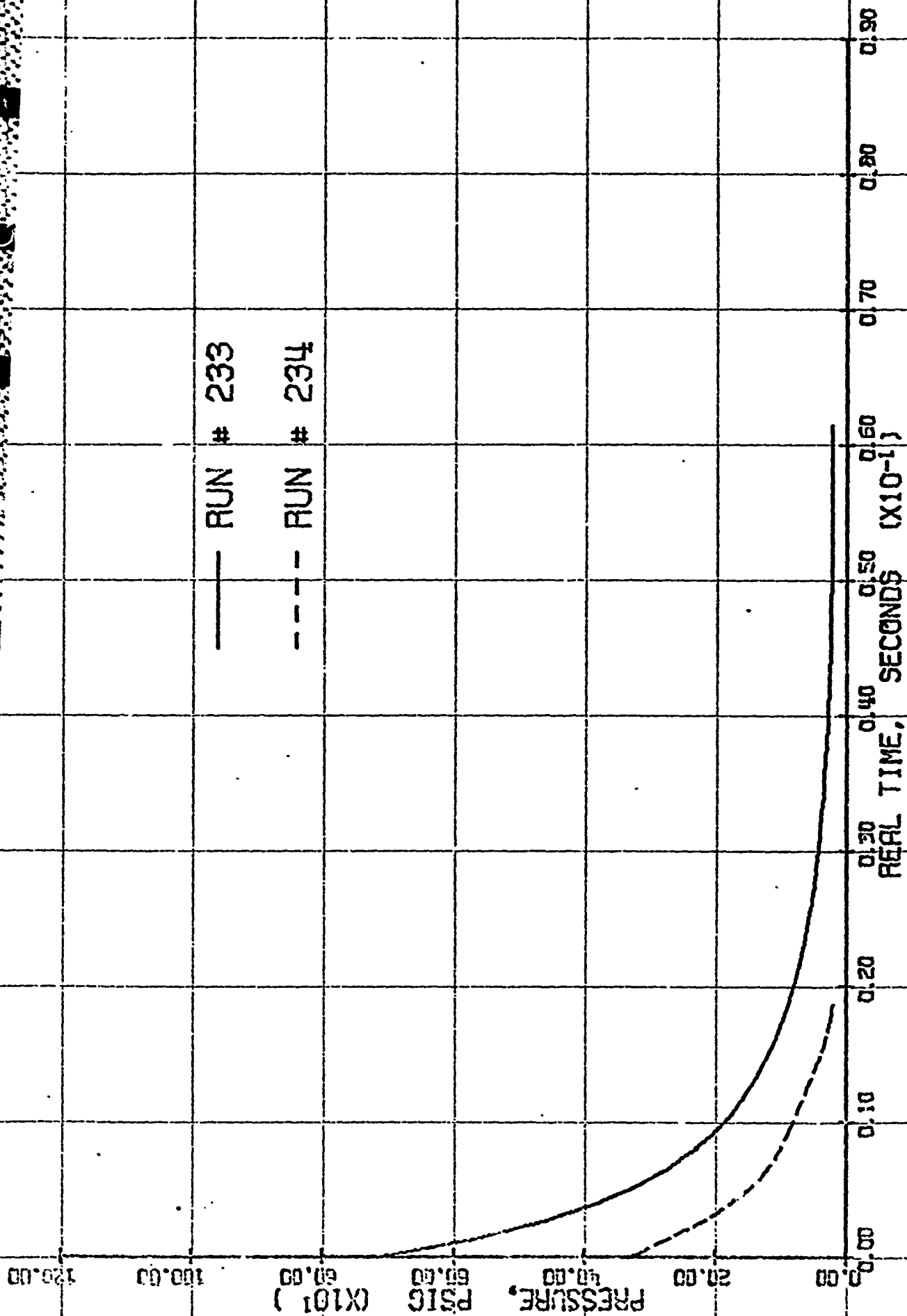
— RUN # 231

--- RUN # 232



PRESSURE VS TIME DATA FOR BATCH # 951

— RUN # 233
--- RUN # 234



PRESSURE VS TIME DATA FOR BATCH # 951

BATCH # 955 / 75.05 AP, 25.0% PMA, 130 MICRON UNIMODAL

DATA FROM RUN # 235

$T = (TIME * REF ** 2) / ALPHA$

$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4$

$+ F * T ** 5 + G * T ** 6 + H * T ** 7$

TIME	P	LN(P)
0.0	740.0	0.0
0.0015	600.0	-0.2097
0.0031	500.0	-0.3920
0.0053	400.0	-0.6152
0.0081	305.0	-0.8363
0.0131	235.0	-1.2336
0.0181	142.0	-1.6504
0.0251	100.0	-2.0015
0.0281	70.0	-2.3582
0.0331	50.0	-2.5946

A=-0.1755754350-02	F= 0.1904513730-01
B=-0.6734611690 00	F=-0.2786021420-02
C= 0.1990979050 00	G= 0.2152930220-03
D=-0.7650961470-01	H=-0.5756092170-05

TIME	P	LN(P)
0.0381	35.0	-3.0513
0.0431	20.0	-3.6109
0.0008	653.6	-0.1165
0.0021	547.6	-0.3011

DATA FROM RUN # 235

$T = (TIME * REF ** 2) / ALPHA$

$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4$

$+ F * T ** 5 + G * T ** 6 + H * T ** 7$

TIME	P	LN(P)
0.0	830.0	0.0
0.0034	645.0	-0.2522
0.0074	440.0	-0.6347
0.0134	310.0	-0.9349
0.0184	235.0	-1.2618
0.0234	202.0	-1.4132
0.0284	145.0	-1.7447
0.0334	117.0	-1.9593
0.0384	95.0	-2.1675
0.0434	78.0	-2.3647

A= 0.4119788030-03	F=-0.8916581830-02
B=-0.2753525130 00	F= 0.8505344430-03
C=-0.3322526590-01	G=-0.3966371560-04
D= 0.4625373130-01	H= 0.7197369570-06

TIME	P	LN(P)
0.0484	64.0	-2.5525
0.0534	55.0	-2.7141
0.0634	35.0	-3.1661
0.0734	25.0	-3.5026

DATA FROM RUN # 237

$T = (TIME * REF ** 2) / ALPHA$

$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4$

$+ F * T ** 5 + G * T ** 6 + H * T ** 7$

TIME	P	LN(P)
0.0	915.0	0.0
0.0015	705.0	-0.1406
0.0055	562.0	-0.4874
0.0115	430.0	-0.7551
0.0155	345.0	-0.9754
0.0215	235.0	-1.1654
0.0265	203.0	-1.3467
0.0315	200.0	-1.5236
0.0365	167.0	-1.7008
0.0435	120.0	-2.0514

A=-0.4049452000-02	F= 0.3277062640-03
B=-0.4005507500 00	F=-0.7812931970-06
C= 0.5844804270-01	G=-0.4142062330-06
D=-0.6557970950-02	H= 0.9924815560-03

TIME	P	LN(P)
0.0565	90.0	-2.3191
0.0665	72.0	-2.5423
0.0865	45.0	-3.0123
0.1165	25.0	-3.6000

DATA FROM RUN # 238

$T = (TIME * REF ** 2) / ALPHA$

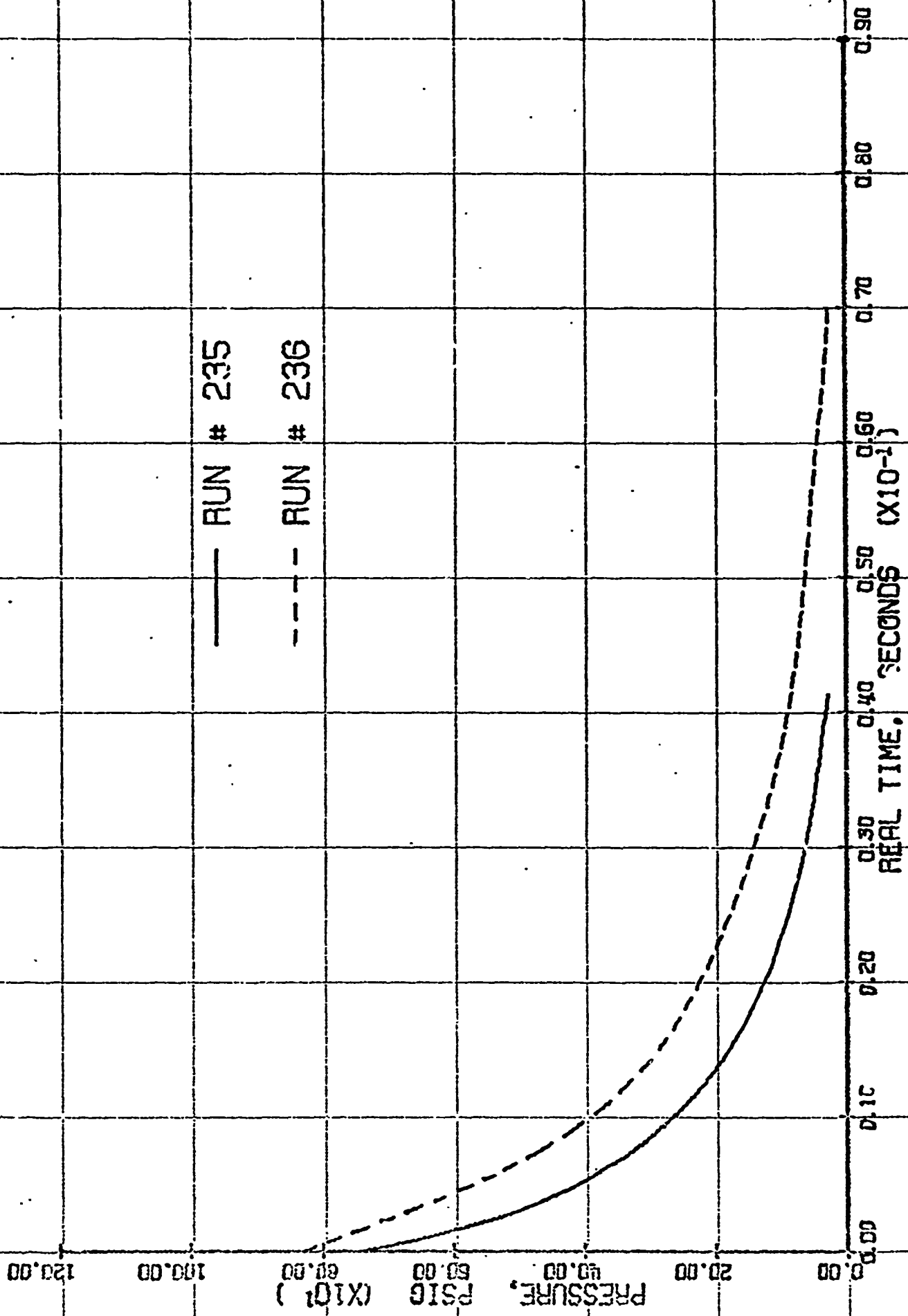
$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4$

$+ F * T ** 5 + G * T ** 6 + H * T ** 7$

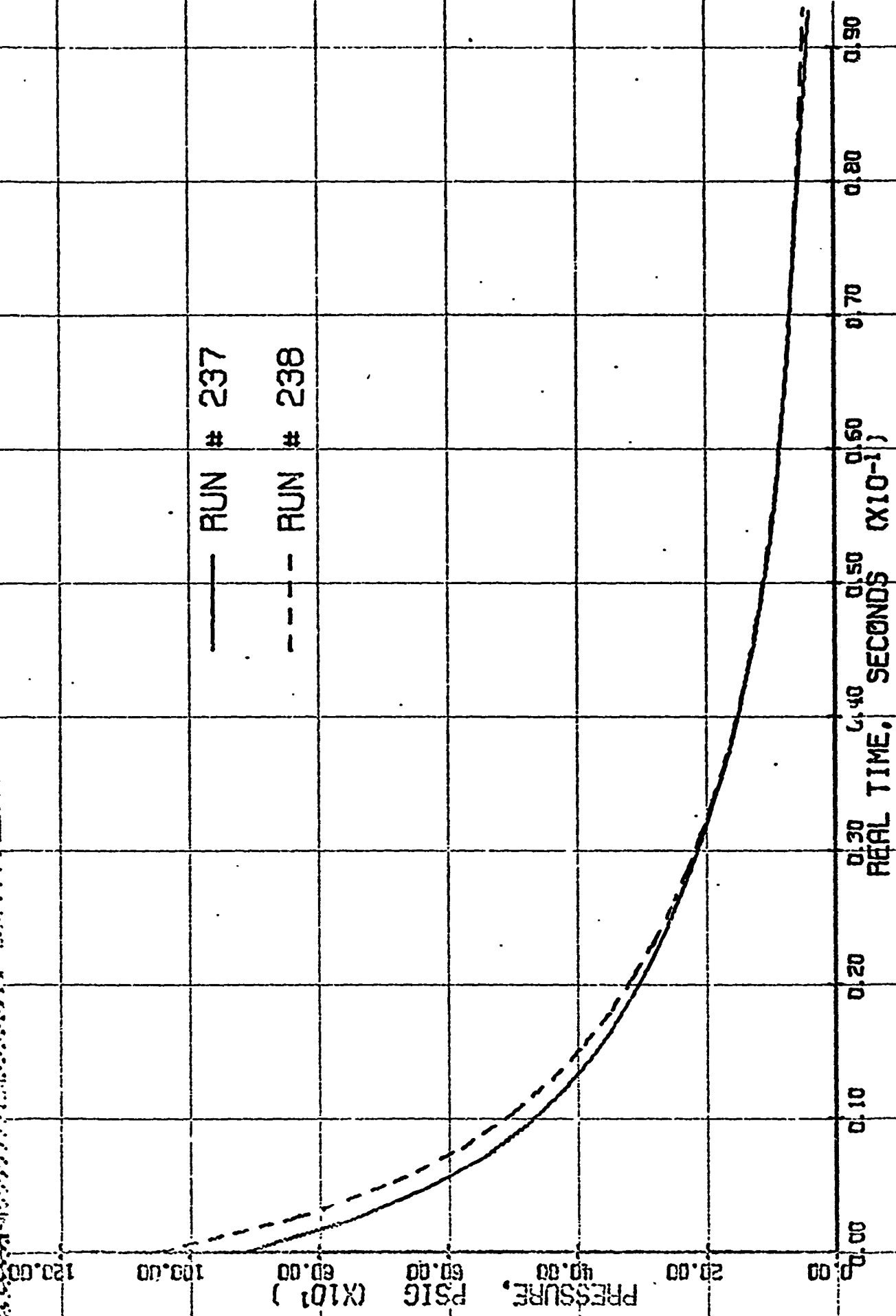
TIME	P	LN(P)
0.0	1000.0	0.0
0.0015	870.0	-0.0854
0.0065	605.0	-0.5075
0.0115	557.0	-0.7554
0.0165	372.0	-0.9058
0.0215	302.0	-1.2022
0.0265	245.0	-1.4115
0.0315	200.0	-1.6144
0.0365	172.0	-1.7682
0.0435	120.0	-2.1252

A= 0.4013881170-01	F= 0.7488100000-03
B=-0.4295696320 00	F=-0.3254031720-04
C= 0.5805525100-01	G= 0.7224141220-06
D=-0.3314093390-02	H=-0.6415294750-02

TIME	P	LN(P)
0.0565	92.0	-2.3910
0.0715	60.0	-2.5134
0.0915	42.0	-2.1751
0.1115	25.0	-3.6934



PRESSURE VS TIME DATA FOR BATCH # 955



PRESSURE VS TIME DATA FOR BATCH # 955

BATCH # 955 / 75.04 AP, 25.03 PHAA, 130 MICRON UNIMODAL

DATA FROM RUN # 239

			$T = (TIME * RREF ** 2) / ALPHA$	
			$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$	
TIME	P	LN(P)		
0.0	915.0	0.0	A = -0.5355057100-03	E = -0.5668997130-02
0.0050	651.5	-0.4397	B = -0.2739004287 00	F = 0.5541262910-03
0.0100	475.3	-0.8539	C = -0.4527413222-01	G = -0.2632003070-04
0.0150	377.7	-0.8848	D = 0.2507565640-01	H = 0.4849962400-06
0.0200	300.1	-1.1147		
0.0250	243.9	-1.3020		
0.0300	212.3	-1.4610		
0.0350	175.7	-1.5503		
0.0400	145.4	-1.8326		
0.0450	124.4	-1.9951		
TIME	P	LN(P)		
0.0512	109.8	-2.1203		
0.0569	90.8	-2.3106		
0.0625	73.2	-2.5257		
0.0687	55.6	-2.8002		

DATA FROM RUN # 240

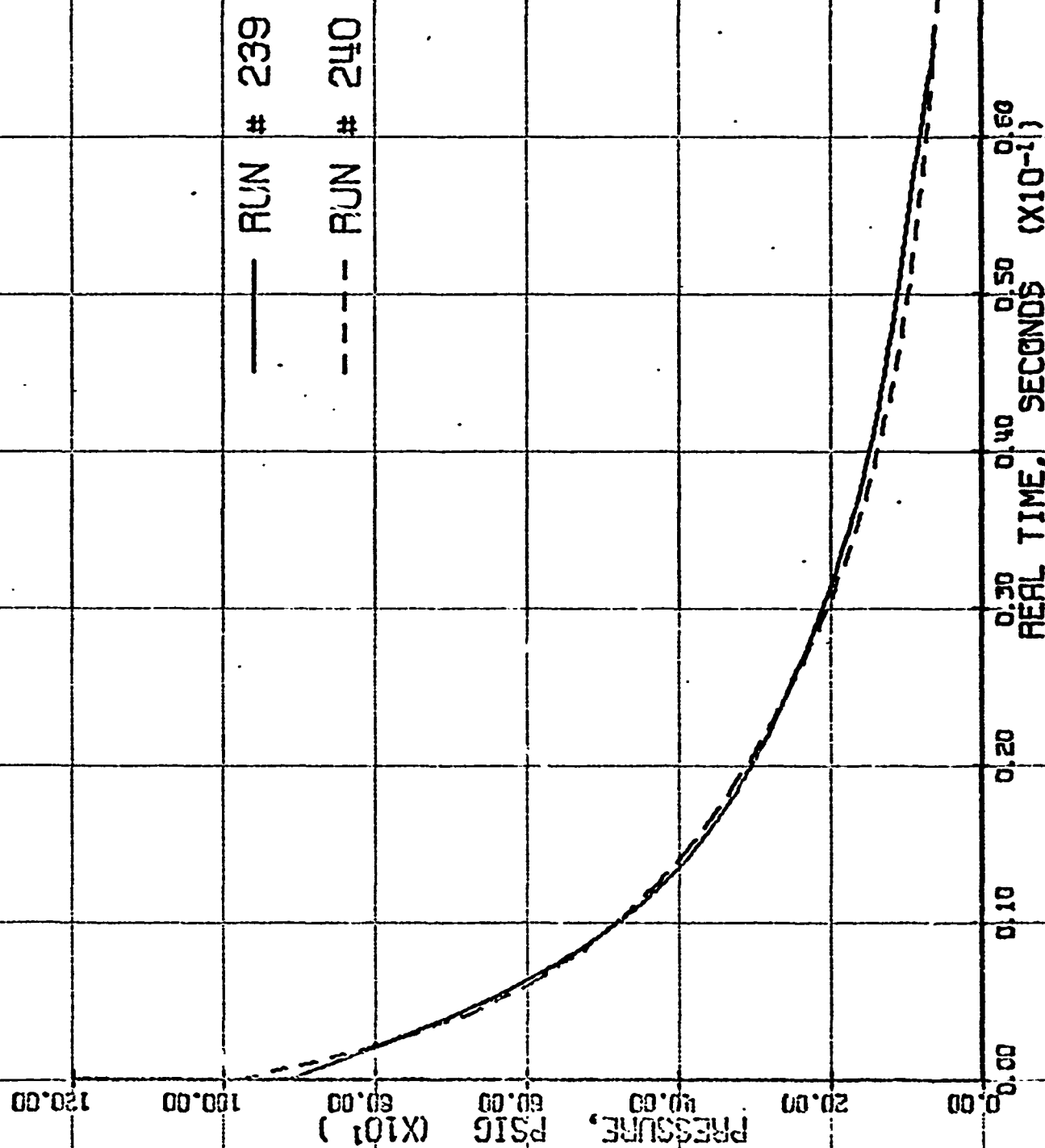
			$T = (TIME * RREF ** 2) / ALPHA$	
			$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$	
TIME	P	LN(P)		
0.0	975.0	0.0	A = 0.6308202337-03	E = 0.2005340720-02
0.0050	600.0	-0.4455	B = -0.4634804230 00	F = -0.1121530660-03
0.0110	455.0	-0.7621	C = 0.1040903770 00	G = 0.3231147070-05
0.0150	365.0	-0.9825	D = -0.1951371020-01	H = -0.3759098670-07
0.0210	293.0	-1.1353		
0.0260	242.0	-1.3935		
0.0310	195.0	-1.6094		
0.0360	160.0	-1.8073		
0.0410	133.0	-1.9921		
0.0460	112.0	-2.1639		
TIME	P	LN(P)		
0.0510	95.0	-2.3296		
0.0610	72.0	-2.6058		
0.0810	45.0	-3.0758		
0.1010	30.0	-3.4812		

DATA FROM RUN # 241

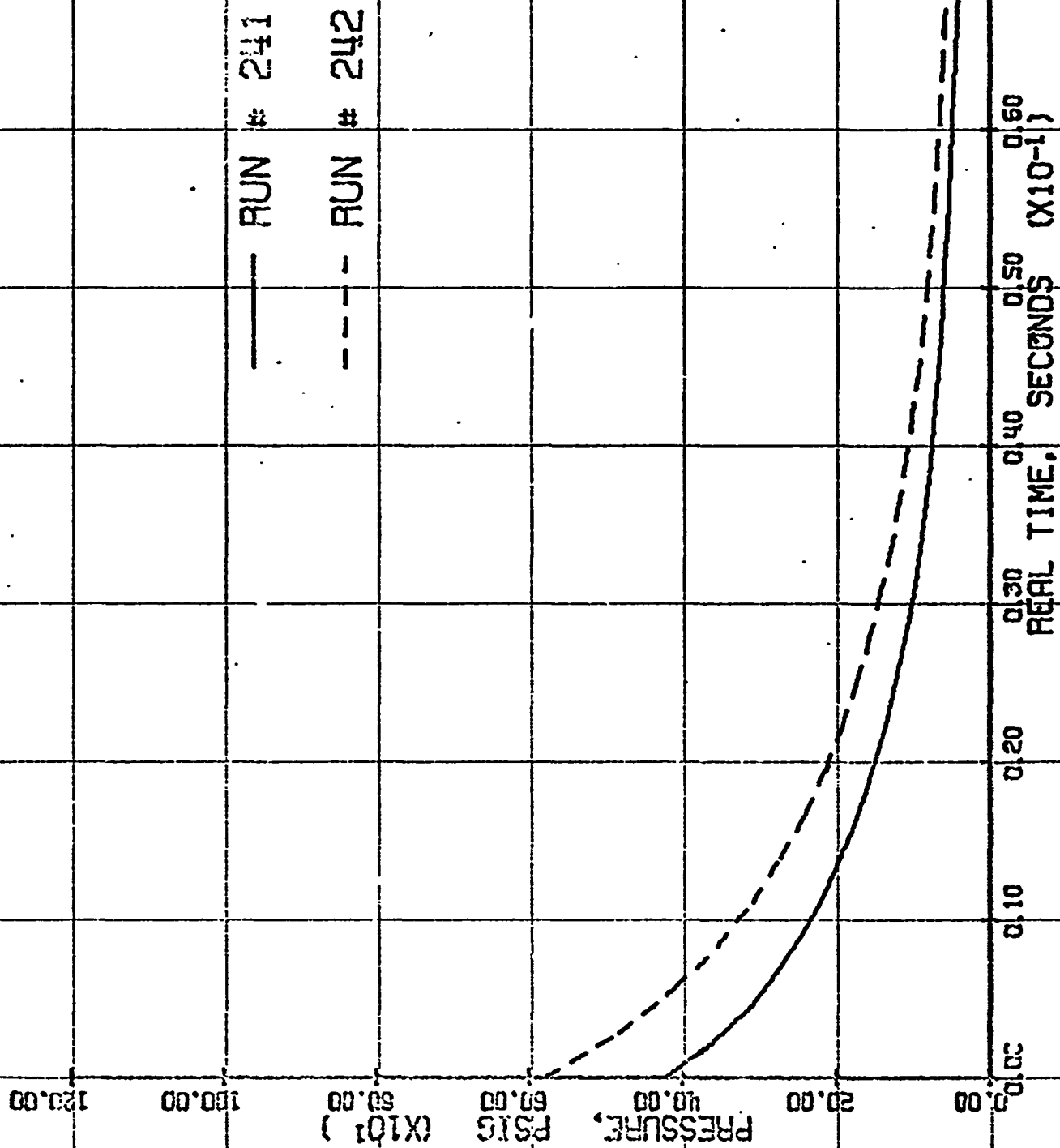
			$T = (TIME * RREF ** 2) / ALPHA$	
			$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$	
TIME	P	LN(P)		
0.0	420.0	0.0	A = -0.6439454910-03	E = 0.1266643337-02
0.0020	340.0	-0.3113	B = -0.3442172030 00	F = -0.7706217950-04
0.0073	240.0	-0.4796	C = 0.5483430530-01	G = 0.2299404230-05
0.0140	150.0	-0.7932	D = -0.1087863710-01	H = -0.2650343680-07
0.0240	125.0	-1.2119		
0.0290	105.0	-1.3863		
0.0390	75.0	-1.7228		
0.0470	60.0	-1.9450		
0.0590	40.0	-2.1434		
0.0690	40.0	-2.3514		
TIME	P	LN(P)		
0.0790	32.0	-2.5745		
0.0890	25.0	-2.9214		
0.0990	22.0	-2.9492		
0.1090	20.0	-3.0445		

DATA FROM RUN # 242

			$T = (TIME * RREF ** 2) / ALPHA$	
			$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$	
TIME	P	LN(P)		
0.0	500.0	0.0	A = -0.2135574950-02	E = 0.2345255770-03
0.0041	345.0	-0.3541	B = -0.3023124230 00	F = -0.1047143810-04
0.0131	280.0	-0.7262	C = 0.2555805420-01	G = 0.2516520160-06
0.0161	245.0	-0.8119	D = -0.2975321030-02	H = -0.2303073870-08
0.0261	155.0	-1.2571		
0.0351	115.0	-1.5923		
0.0451	95.0	-1.7857		
0.0551	71.0	-2.1003		
0.0651	55.0	-2.3020		
0.0751	45.0	-2.4913		
TIME	P	LN(P)		
0.0851	35.0	-2.8077		
0.1051	30.0	-2.9013		
0.1151	25.0	-3.1049		
0.1351	20.0	-3.3573		



PRESSURE VS TIME DATA FOR BATCH # 955



PRESSURE VS TIME DATA FOR BATCH # 955

BATCH # 95F / 75.00 AP, 25.00 PRAA, 180 MICROU UNIMODAL

DATA FROM RUN # 243

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	425.0	0.0
0.0060	300.0	-0.3483
0.0100	250.0	-0.5306
0.0200	165.0	-0.9461
0.0300	115.0	-1.3072
0.0400	90.0	-1.5523
0.0500	73.0	-1.7616
0.0600	60.0	-1.9577
0.0700	52.0	-2.1008
0.0800	45.0	-2.2454

A	= -0.2539454520-02	E	= 0.1231621970-03
B	= -0.2669045240 00	F	= -0.7102375460-05
C	= 0.1698023000-01	G	= 0.2051644280-06
D	= -0.1376135000-02	H	= -0.2270526770-08

TIME	P	LN(P)
0.0900	39.0	-2.3285
0.1000	35.0	-2.4957
0.1100	32.0	-2.5864
0.1200	30.0	-2.6509

DATA FROM RUN # 245

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	505.0	0.0
0.0056	355.0	-0.3524
0.0089	300.0	-0.5208
0.0150	220.0	-0.8309
0.0256	147.0	-1.2341
0.0356	107.0	-1.5517
0.0456	80.0	-1.8425
0.0556	63.0	-2.0314
0.0656	50.0	-2.3125
0.0756	42.0	-2.4859

A	= -0.9097471320-03	E	= 0.2493579350-03
B	= -0.3021461690 00	F	= -0.1207247650-04
C	= 0.2713490440-01	G	= 0.3065068290-06
D	= -0.3052915290-02	H	= -0.3119513370-09

TIME	P	LN(P)
0.0856	35.0	-2.6692
0.0956	30.0	-2.8234
0.1056	27.0	-2.9287
0.1156	25.0	-3.0057

DATA FROM RUN # 246

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	330.0	0.0
0.0023	650.0	-0.2292
0.0053	500.0	-0.5053
0.0113	330.0	-0.7313
0.0163	260.0	-1.0266
0.0211	220.0	-1.3273
0.0263	177.0	-1.5453
0.0310	140.0	-1.7796
0.0363	115.0	-1.9765
0.0405	100.0	-2.1163

A	= -0.3374903900-02	E	= 0.3547729580-02
B	= -0.4367801430 00	F	= -0.2311477410-03
C	= 0.9440771630-01	G	= 0.1130323270-04
D	= -0.2415256750-01	H	= -0.1816429230-06

TIME	P	LN(P)
0.0463	80.0	-2.3394
0.0563	53.0	-2.6610
0.0663	40.0	-3.0325
0.0763	25.0	-3.5026

DATA FROM RUN # 247

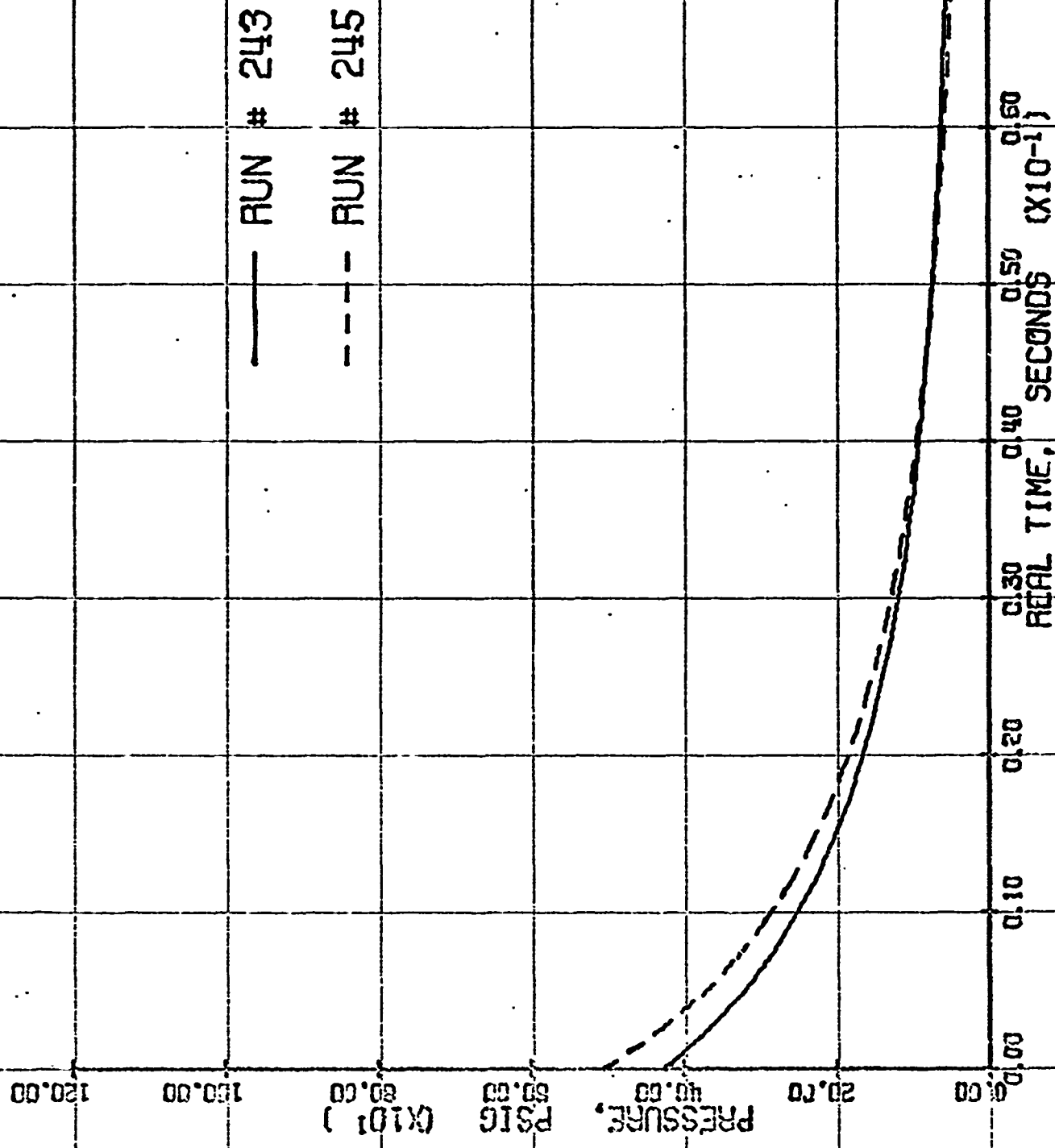
$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

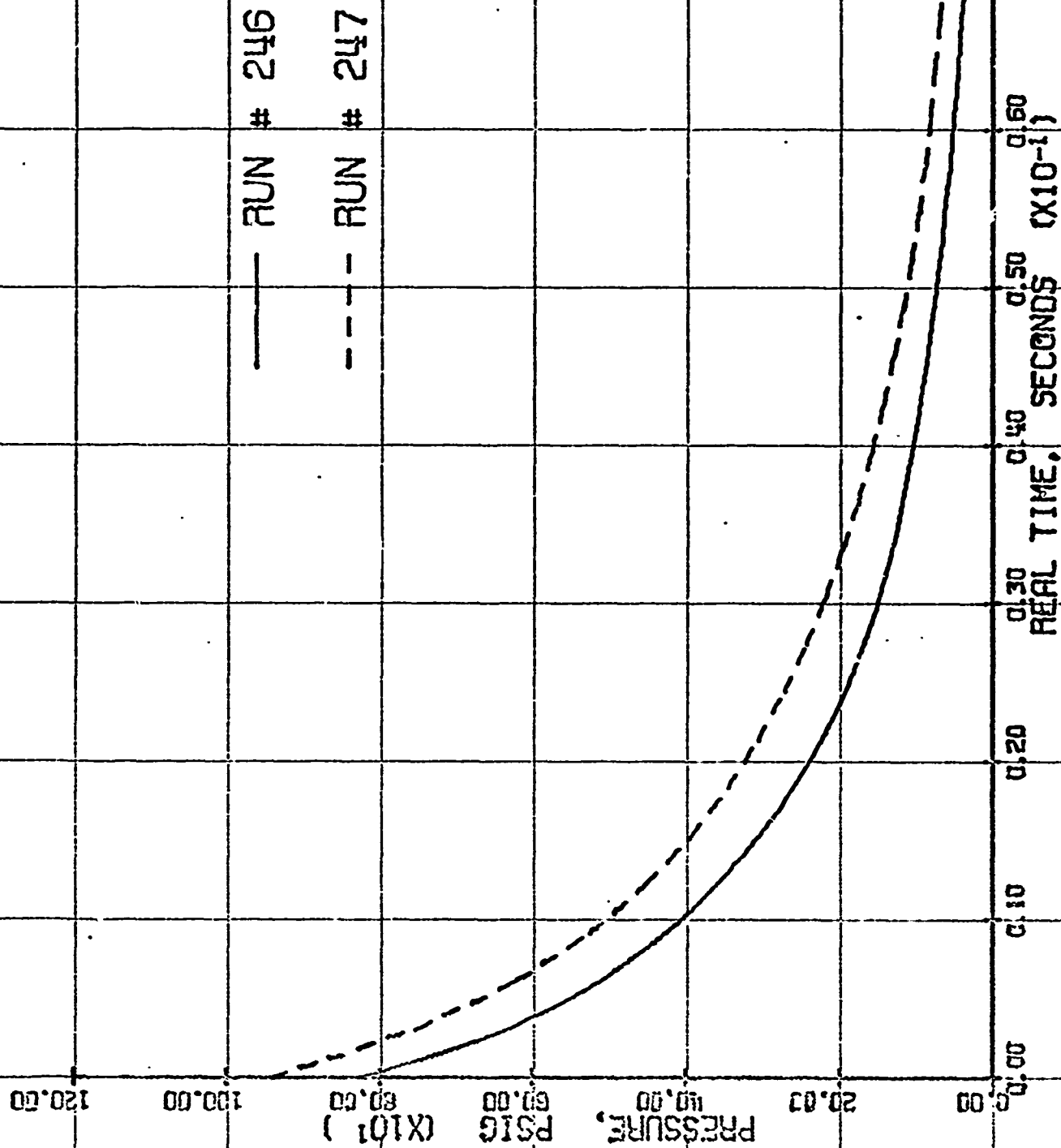
TIME	P	LN(P)
0.0	947.0	0.0
0.0062	635.0	-0.3230
0.0147	415.0	-0.8250
0.0242	225.0	-1.4272
0.0407	113.0	-2.1250
0.0592	63.0	-2.4745
0.0792	55.0	-2.6730
0.0792	50.0	-2.9113
0.0892	42.0	-3.1150
0.0992	35.0	-3.2500

A	= -0.7320824200-02	E	= 0.3343100240-03
B	= -0.3490451560 00	F	= -0.1213505600-04
C	= 0.4153151050-01	G	= 0.2217338720-06
D	= -0.4330994010-02	H	= -0.1601610530-08

TIME	P	LN(P)
0.1092	23.0	-3.5211
0.1292	20.0	-3.6576
0.1372	17.0	-4.0201
0.1492	15.0	-4.1452



PRESSURE VS TIME DATA FOR BATCH # 955



PRESSURE VS TIME DATA FOR BATCH # 955

BATCH # 955 / 75.0% AP, 25.0% PRAA, 190 MICRON UNIMODAL

DATA FROM RUN # 248

TIME	P	LN(P)
0.0	745.0	0.0
0.0059	525.0	-0.3500
0.0159	315.0	-0.8608
0.0209	250.0	-1.0919
0.0309	170.0	-1.4776
0.0409	122.0	-1.9094
0.0509	93.0	-2.0808
0.0609	72.0	-2.3367
0.0809	47.0	-2.7632
0.0909	40.0	-2.9245

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$$A = -0.1924095450-02 \quad E = -0.1833456430-03$$

$$B = -0.2609687190-00 \quad F = 0.9182653840-05$$

$$C = 0.2513630260-02 \quad G = -0.2171563300-06$$

$$D = 0.1583138440-02 \quad H = 0.1970567510-08$$

TIME	P	LN(P)
0.1009	35.0	-3.0580
0.1129	31.0	-3.1794
0.1209	23.0	-3.2812
0.1309	25.0	-3.3945

DATA FROM RUN # 249

TIME	P	LN(P)
0.0	645.0	0.0
0.0024	510.0	-0.2010
0.0074	390.0	-0.5077
0.0124	290.0	-0.8040
0.0174	230.0	-1.0358
0.0224	160.0	-1.2809
0.0324	120.0	-1.5864
0.0424	85.0	-2.0312
0.0524	60.0	-2.3795

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$$A = -0.4944277600-02 \quad E = 0.5553940320-03$$

$$B = -0.3592252850-00 \quad F = -0.2525451600-04$$

$$C = 0.4117715520-01 \quad G = 0.4795392160-06$$

$$D = -0.5030795400-02$$

TIME	P	LN(P)
0.0624	45.0	-2.6472
0.0724	32.0	-3.0082
0.0824	25.0	-3.2550

DATA FROM RUN # 250

TIME	P	LN(P)
0.0	715.0	0.0
0.0040	512.0	-0.3340
0.0090	370.0	-0.5588
0.0140	275.0	-0.9555
0.0190	215.0	-1.2016
0.0240	167.0	-1.4543
0.0290	135.0	-1.6570
0.0340	110.0	-1.8718
0.0390	92.0	-2.0397
0.0440	75.0	-2.2156

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$$A = -0.7531552750-03 \quad E = 0.8849111810-03$$

$$B = -0.4062708820-00 \quad F = -0.3332053940-04$$

$$C = 0.5618508320-01 \quad G = -0.1518566640-05$$

$$D = -0.9379085570-02 \quad H = 0.2564733700-07$$

TIME	P	LN(P)
0.0490	68.0	-2.3528
0.0540	53.0	-2.5118
0.0640	40.0	-2.8934
0.0740	27.0	-3.2764

DATA FROM RUN # 251

TIME	P	LN(P)
0.0	520.0	0.0
0.0031	425.0	-0.2017
0.0081	305.0	-0.5335
0.0131	200.0	-0.8155
0.0181	175.0	-1.0300
0.0231	140.0	-1.3122
0.0281	110.0	-1.5533
0.0331	75.0	-1.8971
0.0431	55.0	-2.1531

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

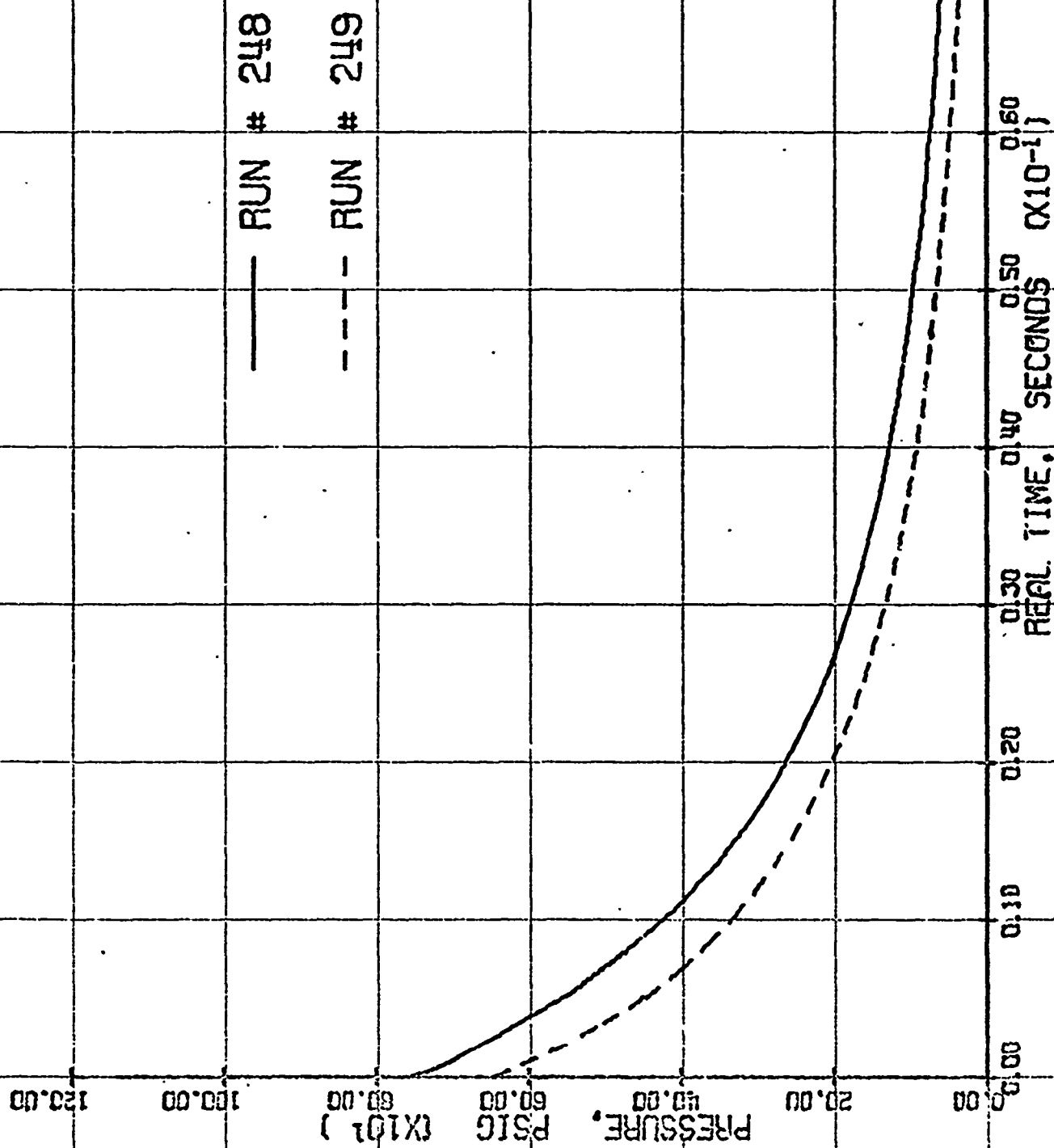
$$A = 0.5337703470-02 \quad E = 0.9344460280-03$$

$$B = -0.3281671790-00 \quad F = -0.5929270400-04$$

$$C = 0.3090643730-01 \quad G = 0.1335340590-05$$

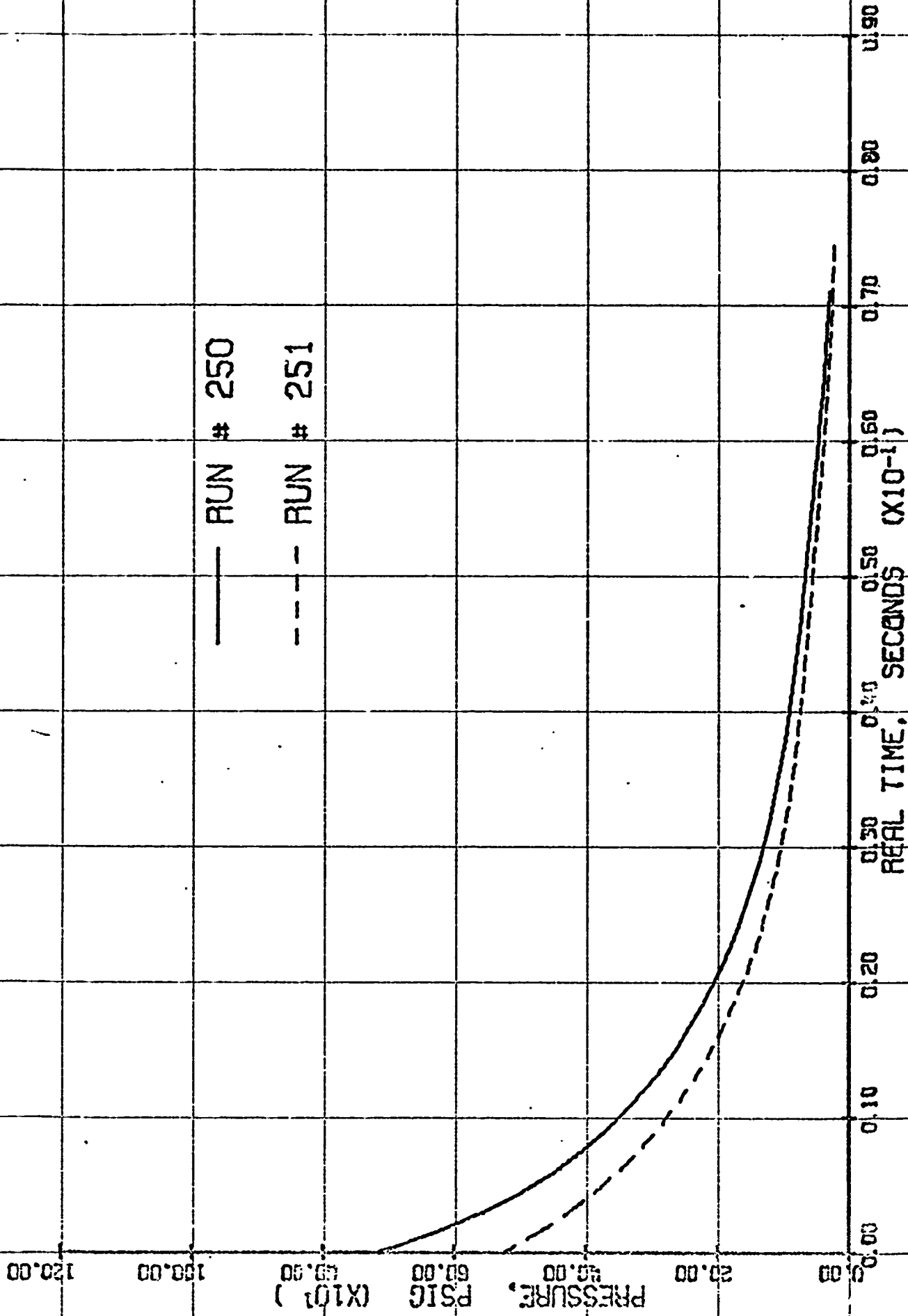
$$D = -0.5635100720-02$$

TIME	P	LN(P)
0.0531	42.0	-2.5152
0.0631	28.0	-2.9216
0.0731	25.0	-3.3350



PRESSURE VS TIME DATA FOR BATCH # 955

— RUN # 250
--- RUN # 251



PRESSURE VS TIME DATA FOR BATCH # 955

BATCH # 955 / 75.0% AP, 25.0% PRAA, 180 MICRON UNIMODAL

DATA FROM RUN # 252

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	365.0	0.0
0.0042	290.0	-0.2934
0.0092	220.0	-0.5596
0.0142	170.0	-0.8174
0.0192	140.0	-1.0116
0.0292	98.0	-1.3683
0.0342	85.0	-1.5105
0.0392	72.0	-1.6766
0.0442	64.0	-1.7944
0.0492	58.0	-1.8928

A = 0.1940934470-02 F = 0.8933762190-03
 B = -0.3372520620-00 G = -0.6003341790-04
 C = 0.4405766030-01 H = 0.2036011590-05
 D = -0.7505016710-02

TIME	P	LN(P)
0.0592	46.0	-2.1246
0.0692	35.0	-2.3979
0.0792	27.0	-2.6574
0.0892	20.0	-2.9575

DATA FROM RUN # 253

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	285.0	0.0
0.0024	241.0	-0.1677
0.0074	185.0	-0.4321
0.0124	145.0	-0.6758
0.0174	120.0	-0.8650
0.0224	100.0	-1.0473
0.0324	77.0	-1.3087
0.0424	62.0	-1.5254
0.0524	50.0	-1.7405
0.0624	43.0	-1.8913

A = -0.5730936330-02 F = -0.4342236050-03
 B = -0.2338792710-00 G = 0.3433415370-04
 C = 0.1429677320-01 H = -0.1222436190-05
 D = 0.1811547260-02

TIME	P	LN(P)
0.0724	38.0	-2.0149
0.0824	33.0	-2.1560
0.0924	28.0	-2.3203
0.1024	24.0	-2.4744

DATA FROM RUN # 255

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0	280.0	0.0
0.0024	240.0	-0.1542
0.0050	200.0	-0.3365
0.0100	145.0	-0.6581
0.0150	105.0	-0.9403
0.0200	75.0	-1.2761
0.0250	62.0	-1.5077
0.0300	48.0	-1.7636
0.0350	40.0	-1.9459

A = 0.1775281030-02 F = 0.1904619140-02
 B = -0.2997477120-00 G = -0.1871370930-03
 C = 0.1233161870-01 H = 0.6185567160-05
 D = -0.7112939390-02

TIME	P	LN(P)
0.0400	32.0	-2.1691
0.0450	25.0	-2.4159
0.0500	20.0	-2.6391

DATA FROM RUN # 257

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

TIME	P	LN(P)
0.0	302.0	0.0
0.0030	260.0	-0.1497
0.0060	200.0	-0.4121
0.0131	160.0	-0.5353
0.0180	125.0	-0.8221
0.0230	100.0	-1.1055
0.0280	82.0	-1.3037
0.0330	60.0	-1.5161
0.0400	45.0	-1.8053
0.0500	35.0	-2.1551

A = -0.4380525000-02 F = -0.6095716340-03
 B = -0.1913863310-00 G = 0.3433052150-04
 C = -0.2019003870-01 H = -0.9864160280-05
 D = 0.6581161540-02

TIME	P	LN(P)
0.0600	29.0	-2.3431
0.0700	25.0	-2.4015
0.0800	22.0	-2.5194
0.0900	20.0	-2.7147

— RUN # 252

--- RUN # 253

PRESSURE, PSIG (X10¹)REAL TIME, SECONDS (X10⁻¹)

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90

PRESSURE VS TIME DATA FOR BATCH # 955

— RUN # 255

--- RUN # 257

120.00

100.00

PRESSURE, PSIG (X10¹)

80.00

60.00

40.00

20.00

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0.70

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34.80

34.90

35.00

35.10

35.20

35.30

35.40

35.50

BATCH : 955 / 75.03 AP, 25.03 PBAA, 190 MICRON UNIMODAL

DATA FROM RUN : 258

			$T = (TIME * RREF ** 2) / ALPHA$			
			$LN(P) = A + 3 * T + C * T ** 2 + D * T ** 3 + E * T ** 4$			
			$+ F * T ** 5 + G * T ** 6 + H * T ** 7$			
TIME	P	LN(P)	A	B	C	D
0.0	975.0	0.0	A = 0.2483765270-02	E = -0.3079406570-03		
0.0024	840.7	-0.1482	B = -0.3901311940-00	F = 0.5673937170-04		
0.0067	642.8	-0.4166	C = 0.2211934620-01	G = -0.4392016420-05		
0.0124	475.7	-0.7156	D = -0.1400395770-02	H = 0.9572632650-07		
0.0181	371.2	-0.9656				
0.0236	274.4	-1.2677				
0.0292	223.9	-1.4713				
0.0349	173.3	-1.7272				
0.0405	144.4	-1.9095				
0.0467	115.0	-2.1327				

DATA FROM RUN # 259

			$T = (TIME * RREF ** 2) / ALPHA$			
			$LN(P) = A + 3 * T + C * T ** 2 + D * T ** 3 + E * T ** 4$			
			$+ F * T ** 5 + G * T ** 6 + H * T ** 7$			
TIME	P	LN(P)	A	B	C	D
0.0	895.0	0.0	A = 0.1956488950-02	E = -0.4701350000-05		
0.0065	775.0	-0.2821	B = -0.2045401780-00	F = 0.8397271720-06		
0.0165	458.0	-0.6700	C = 0.7680254690-02	G = -0.2796343380-07		
0.0265	325.0	-1.0130	D = -0.2511173400-03	H = 0.2982654610-09		
0.0365	240.0	-1.3162				
0.0545	145.0	-1.8201				
0.0665	112.0	-2.0783				
0.0865	75.0	-2.4793				
0.0965	63.0	-2.6537				
0.1065	53.0	-2.8265				

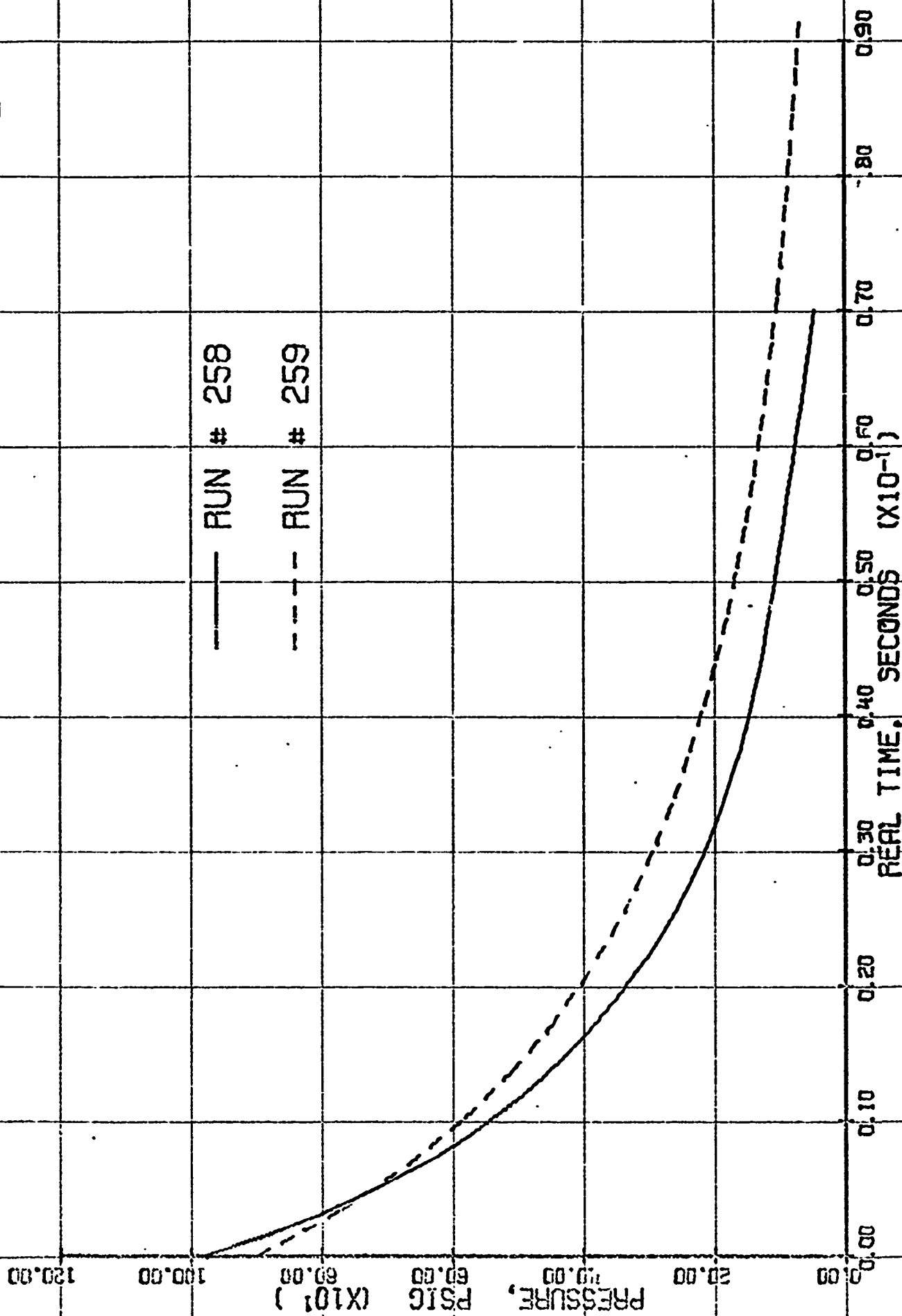
DATA FROM RUN # 260

			$T = (TIME * RREF ** 2) / ALPHA$			
			$LN(P) = A + 3 * T + C * T ** 2 + D * T ** 3 + E * T ** 4$			
			$+ F * T ** 5 + G * T ** 6 + H * T ** 7$			
TIME	P	LN(P)	A	B	C	D
0.0	1040.0	0.0	A = -0.4742046300-03	E = -0.2127800320-05		
0.0079	735.0	-0.2813	B = -0.1632052870-00	F = 0.1241610670-05		
0.0179	575.0	-0.5925	C = 0.4697328100-02	G = -0.1993793640-08		
0.0379	340.0	-1.1180	D = -0.3116950110-04	H = 0.1090053230-10		
0.0629	200.0	-1.6487				
0.0829	140.0	-2.0053				
0.1029	100.0	-2.3418				
0.1229	73.0	-2.6565				
0.1429	50.0	-2.9390				
0.1629	43.0	-2.1858				

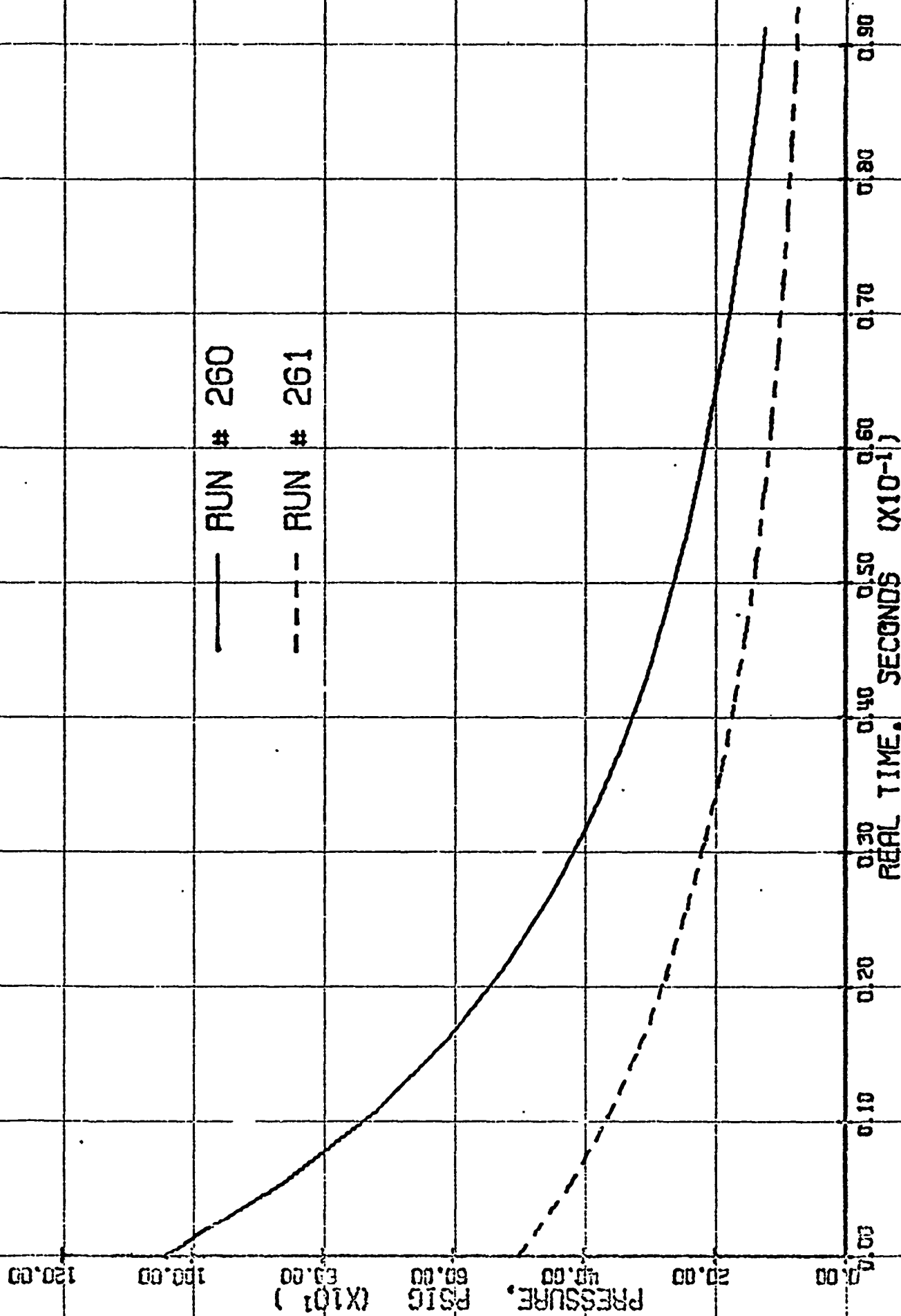
DATA FROM RUN # 261

			$T = (TIME * RREF ** 2) / ALPHA$			
			$LN(P) = A + 3 * T + C * T ** 2 + D * T ** 3 + E * T ** 4$			
			$+ F * T ** 5 + G * T ** 6 + H * T ** 7$			
TIME	P	LN(P)	A	B	C	D
0.0	405.0	0.0	A = 0.4391037520-02	E = 0.3548829340-04		
0.0123	250.0	-0.3754	B = -0.1420267220-00	F = -0.1069092470-05		
0.0223	160.0	-0.6439	C = 0.6715362310-02	G = 0.1525733240-07		
0.0323	100.0	-0.8463	D = -0.5417072120-03	H = -0.3275106180-10		
0.0523	65.0	-1.5570				
0.0723	45.0	-1.9141				
0.1123	30.0	-2.1102				
0.1323	20.0	-2.2925				
0.1523	15.0	-2.4635				

— RUN # 258
--- RUN # 259



PRESSURE VS TIME DATA FOR BATCH # 955



PRESSURE VS TIME DATA FOR BATCH # 955

BATCH # 955 / 75.0% AP, 25.0% PBAA, 180 MICRON UNIMODAL

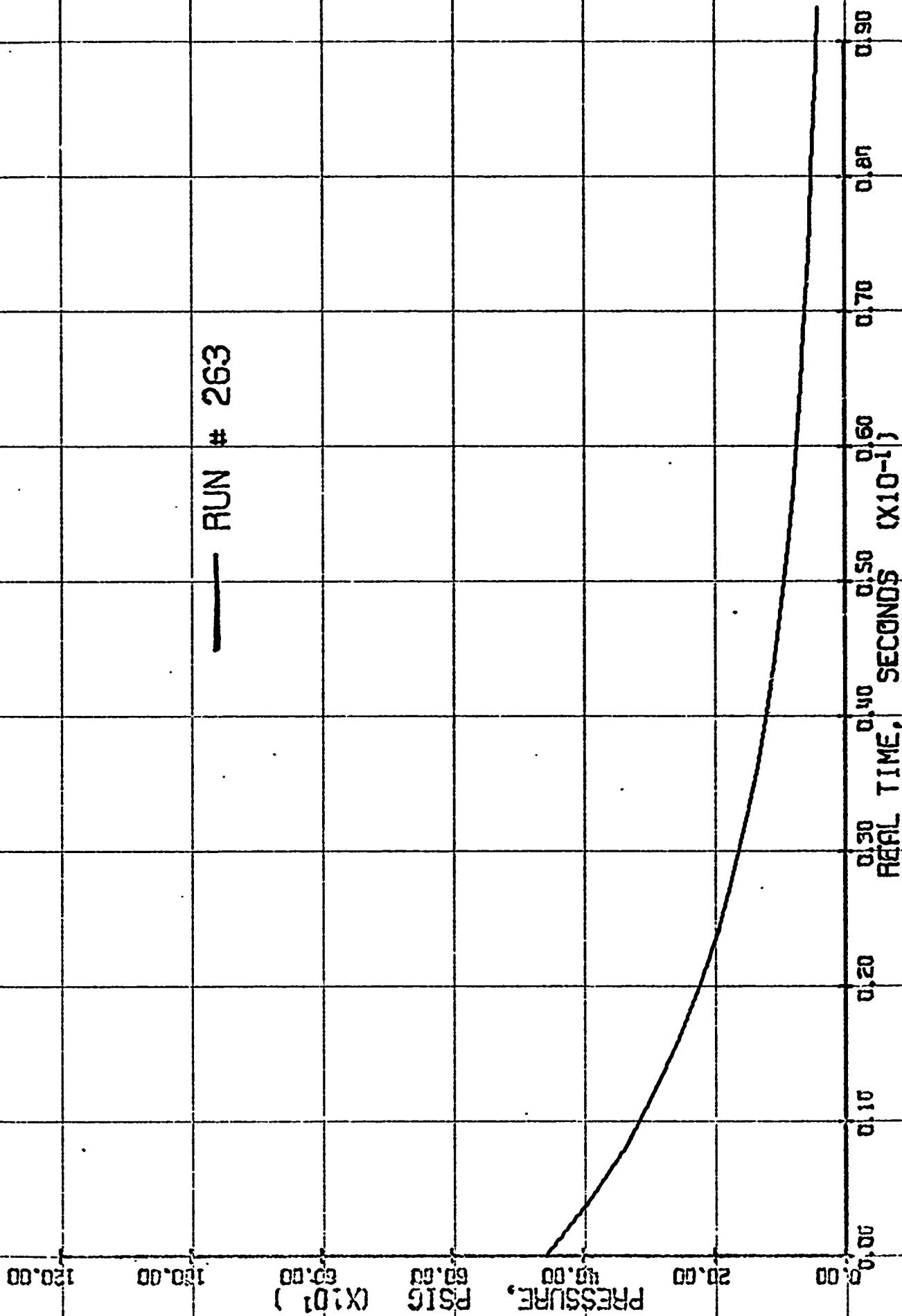
DATA FROM RJN # 253

TIME	P	LN(P)
0.0	455.0	0.0
0.0071	350.0	-0.2624
0.0171	242.0	-0.5314
0.0371	123.0	-1.2633
0.0471	98.0	-1.5353
0.0571	79.0	-1.7503
0.0771	52.0	-2.1691
0.0971	35.0	-2.5649
0.1171	25.0	-2.9014
0.1371	13.0	-3.5553

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4$
 $+ F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.3873004700-02 E= 0.8920480100-04
 B=-0.1799025490 00 F=-0.3977491570-05
 C= 0.7250177160-02 G= 0.8046633260-07
 D=-0.9478238230-03 H=-0.6014838590-09

TIME	P	LN(P)
0.1571	9.0	-3.9231
0.1671	8.0	-4.0409
0.1771	7.0	-4.1744
0.1971	5.0	-4.5109

— RUN # 263



PRESSURE VS TIME DATA FOR BATCH # 955

PATCH # 906 / 80.0% AP, 20.0% PACT

DATA FROM RUN # 367

TIME	P	LN(P)
0.0	540.0	0.0
0.0008	480.0	-0.1173
0.0025	390.0	-0.3254
0.0035	330.0	-0.4925
0.0053	255.5	-0.7483
0.0074	210.0	-0.9445
0.0103	145.0	-1.3148
0.0153	95.0	-1.7377
0.0203	70.0	-2.0431
0.0253	50.0	-2.3795

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = 0.4062584610-02 E = 0.1356018290-01
 B = -0.5741995270 00 F = -0.1777874070-02
 C = 0.1125490110 00 G = 0.1103095840-03
 D = -0.5047487910-01 H = -0.2604505980-05

TIME	P	LN(P)
0.0308	45.0	-2.4849
0.0358	30.0	-2.8904
0.0408	27.0	-2.9957
0.0458	25.0	-3.0727

DATA FROM RUN # 368

TIME	P	LN(P)
0.0	530.0	0.0
0.0035	352.0	-0.3312
0.0085	245.0	-0.7716
0.0135	175.0	-1.1081
0.0185	135.0	-1.3675
0.0235	103.0	-1.5381
0.0285	90.0	-1.7731
0.0335	75.0	-1.9554
0.0385	63.0	-2.0534
0.0435	57.0	-2.2298

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = -0.4955328750-02 E = 0.5768270010-03
 B = -0.4222099190 00 F = -0.3511441800-04
 C = 0.4869903590-01 G = 0.1132980790-05
 D = -0.5922410420-02 H = -0.1469003330-07

TIME	P	LN(P)
0.0535	48.0	-2.4017
0.0635	40.0	-2.5840
0.0735	35.0	-2.7175
0.0835	30.0	-2.8717

DATA FROM RUN # 369

TIME	P	LN(P)
0.0	380.0	0.0
0.0017	317.0	-0.1513
0.0067	207.0	-0.5975
0.0117	152.0	-0.9153
0.0167	119.0	-1.1610
0.0217	94.0	-1.3552
0.0267	85.0	-1.4975
0.0317	72.0	-1.6635
0.0367	65.0	-1.7658
0.0467	52.0	-1.9249

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

A = -0.7323096150-02 E = 0.9330760010-04
 B = -0.4035936820 00 F = 0.5641285820-05
 C = 0.4842441100-01 G = -0.4008744350-06
 D = -0.3696421900-02 H = 0.6840291050-03

TIME	P	LN(P)
0.0567	46.0	-2.1115
0.0667	41.0	-2.2256
0.0767	37.0	-2.3293
0.0867	35.0	-2.3348

DATA FROM RUN # 370

TIME	P	LN(P)
0.0	427.0	0.0
0.0019	327.0	-0.2358
0.0049	282.0	-0.5130
0.0089	197.0	-0.9283
0.0099	137.0	-1.1362
0.0129	107.0	-1.3540
0.0149	92.0	-1.5250
0.0199	65.0	-1.8524
0.0249	47.0	-2.2054

$$T = (TIME * RREF ** 2) / ALPHA$$

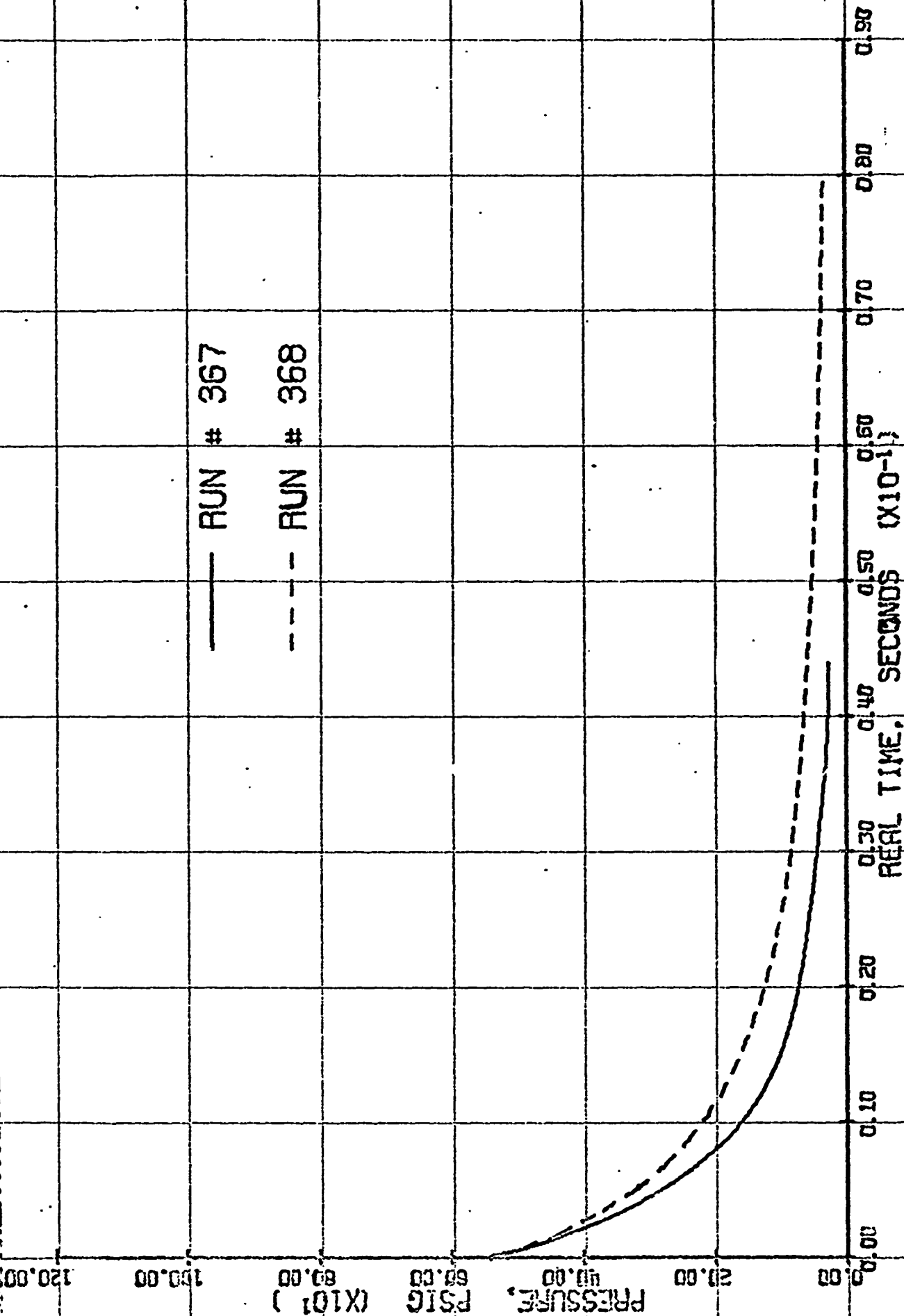
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

A = -0.5893007150-02 F = -0.4623535530-02
 B = -0.4791725940 00 G = 0.4373349690-02
 C = -0.3579995190-02 D = -0.1465352460-04
 E = 0.1975453590-01

TIME	P	LN(P)
0.0299	37.0	-2.4459
0.0349	33.0	-2.6103
0.0399	30.0	-2.6551

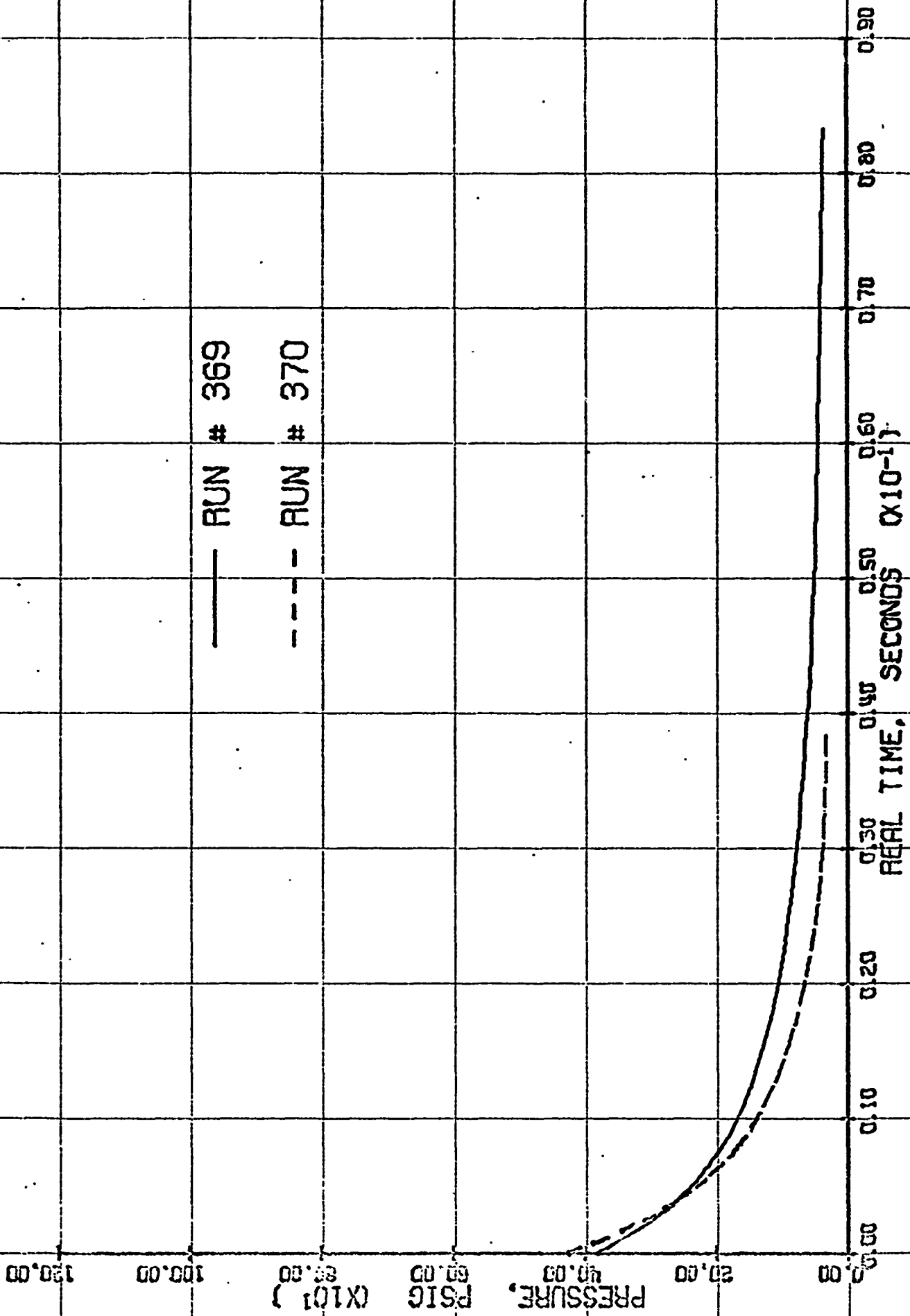
— RUN # 367

--- RUN # 368



PRESSURE VS TIME DATA FOR BATCH # 966

— RUN # 369
--- RUN # 370



PRESSURE VS TIME DATA FOR BATCH # 966

RATCH # 946 / 60.0% AP, 20.0% PBCT

DATA FROM RUN # 372

TIME	P	LN(P)
0.0	670.0	0.0
0.0016	565.0	-0.1705
0.0043	427.0	-0.4505
0.0093	280.0	-0.3725
0.0143	200.0	-1.2090
0.0193	150.0	-1.4956
0.0243	120.0	-1.7198
0.0293	97.0	-1.7326
0.0343	84.0	-2.0765
0.0393	70.0	-2.2588

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.1305356990-02$ $E = -0.5613185710-03$
 $B = -0.4010691800-00$ $F = 0.3829200070-04$
 $C = 0.1630812060-01$ $G = -0.1165217500-05$
 $D = 0.2321388220-02$ $H = 0.1320275910-07$

TIME	P	LN(P)
0.0493	50.0	-2.5953
0.0593	40.0	-2.8184
0.0693	33.0	-3.0108
0.0793	27.0	-3.2114

DATA FROM RUN # 373

TIME	P	LN(P)
0.0	640.0	0.0
0.0011	532.0	-0.1343
0.0032	407.0	-0.4527
0.0061	297.0	-0.7677
0.0111	187.0	-1.2304
0.0161	127.0	-1.5173
0.0211	89.0	-1.9723
0.0261	68.0	-2.2420
0.0311	50.0	-2.5494
0.0361	40.0	-2.7726

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.7713295700-02$ $E = 0.2055920400-02$
 $B = -0.5604262370-00$ $F = -0.1400398150-03$
 $C = 0.9559940440-01$ $G = 0.5057776450-05$
 $D = -0.1742286540-01$ $H = -0.7379732590-07$

TIME	P	LN(P)
0.0411	33.0	-2.9650
0.0461	28.0	-3.1293
0.0511	25.0	-3.2426
0.0561	24.0	-3.2834

DATA FROM RUN # 375

TIME	P	LN(P)
0.0	624.0	0.0
0.0016	507.0	-0.2075
0.0052	360.0	-0.5500
0.0102	237.0	-0.9331
0.0152	170.0	-1.3004
0.0202	130.0	-1.5685
0.0252	105.0	-1.7822
0.0302	85.0	-1.9935
0.0402	60.0	-2.3413
0.0502	48.0	-2.5349

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.4959140990-02$ $E = 0.4197936520-03$
 $B = -0.4564535740-00$ $F = -0.1306465510-04$
 $C = 0.5344833430-01$ $G = 0.4126914240-06$
 $D = -0.5743365450-02$ $H = -0.3851163840-08$

TIME	P	LN(P)
0.0602	40.0	-2.7473
0.0702	35.0	-2.8808
0.0802	32.0	-2.9704
0.0902	30.0	-3.0350

DATA FROM RUN # 376

TIME	P	LN(P)
0.0	645.0	0.0
0.0025	467.0	-0.2310
0.0056	350.0	-0.6113
0.0106	236.0	-1.0122
0.0156	167.0	-1.3513
0.0206	120.0	-1.6094
0.0256	105.0	-1.8153
0.0306	87.0	-2.0033
0.0356	72.0	-2.1925
0.0406	65.0	-2.4803

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.3374417100-04$ $E = -0.4000666410-03$
 $B = -0.4322559470-00$ $F = 0.3164725030-04$
 $C = 0.2257200830-01$ $G = -0.1875060940-05$
 $D = 0.1030392770-02$ $H = 0.1271012270-07$

TIME	P	LN(P)
0.0556	42.0	-2.7316
0.0656	35.0	-2.9139
0.0756	30.0	-3.0431
0.0856	27.0	-3.1734

— RUN # 372

--- RUN # 373

PRESSURE, PSIG ($\times 10^1$)REAL TIME, SECONDS ($\times 10^{-1}$)

PRESSURE VS TIME DATA FOR BATCH # 966

120.00

100.00

60.00

40.00

20.00

0.00

0.00

0.10

0.20

0.30

0.40

0.50

0.60

0.70

0.80

0.90

— RUN # 375

--- RUN # 376

PRESSURE, PSIG (X10¹)REAL TIME, SECONDS (X10⁻¹)

PRESSURE VS TIME DATA FOR BATCH # 966

0.90

0.80

0.70

0.60

0.50

0.40

0.30

0.20

0.10

0.00

0.00

20.00

40.00

60.00

80.00

100.00

120.00

BATCH # 956 / 80.0% AP, 20.0% PBCT

DATA FROM RUN # 379

 $T = (TIME * RREF**2) / ALPHA$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	672.0	0.0
0.0015	500.0	-0.2957
0.0030	400.0	-0.5183
0.0052	300.0	-0.8065
0.0084	200.0	-1.2119
0.0104	150.0	-1.4396
0.0143	100.0	-1.9051
0.0175	75.0	-2.1923
0.0206	55.0	-2.5029
0.0247	40.0	-2.8214

A=-0.2237026340-02	E= 0.4448349960-01
B=-0.6181134400 00	F=-0.6242172190-02
C= 0.3372803930 00	G= 0.4358215670-03
D=-0.1654161970 00	H=-0.1189797060-04

TIME	P	LN(P)
0.0280	30.0	-3.1091
0.0306	25.0	-3.2914
0.0356	22.0	-3.4192
0.0406	20.0	-3.5145

DATA FROM RUN # 382

 $T = (TIME * RREF**2) / ALPHA$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	1067.0	0.0
0.0020	748.0	-0.3552
0.0040	560.0	-0.6447
0.0050	448.0	-0.8678
0.0090	313.0	-1.2106
0.0140	193.0	-1.7099
0.0190	123.0	-2.1206
0.0240	90.0	-2.4728
0.0290	72.0	-2.6959
0.0340	60.0	-2.8783

A=-0.6219110030-03	E= 0.3785093070-02
B=-0.7376710300 00	F=-0.7650327160-03
C= 0.1371305870 00	G= 0.3313606240-04
D=-0.5314030030-01	H=-0.5655040180-06

TIME	P	LN(P)
0.0390	50.0	-3.0606
0.0440	42.0	-3.2349
0.0490	34.0	-3.4462
0.0540	23.0	-3.6404

DATA FROM RUN # 333

 $T = (TIME * RREF**2) / ALPHA$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

TIME	P	LN(P)
0.0	320.0	0.0
0.0025	507.0	-0.3908
0.0042	507.0	-0.4808
0.0062	420.0	-0.5690
0.0112	280.0	-1.0745
0.0162	200.0	-1.4110
0.0212	143.0	-1.7121
0.0262	115.0	-1.9644
0.0362	75.0	-2.3912
0.0462	53.0	-2.7390

A=-0.1397010710-02	E= 0.4643441140-03
B=-0.4693695050 00	F=-0.2126713650-04
C= 0.5316372860-01	G= 0.5377263150-06
D=-0.6023307750-02	H=-0.5848814220-08

TIME	P	LN(P)
0.0562	42.0	-2.9716
0.0662	36.0	-3.1258
0.0762	33.0	-3.2123
0.0862	30.0	-3.3031

DATA FROM RUN # 324

 $T = (TIME * RREF**2) / ALPHA$

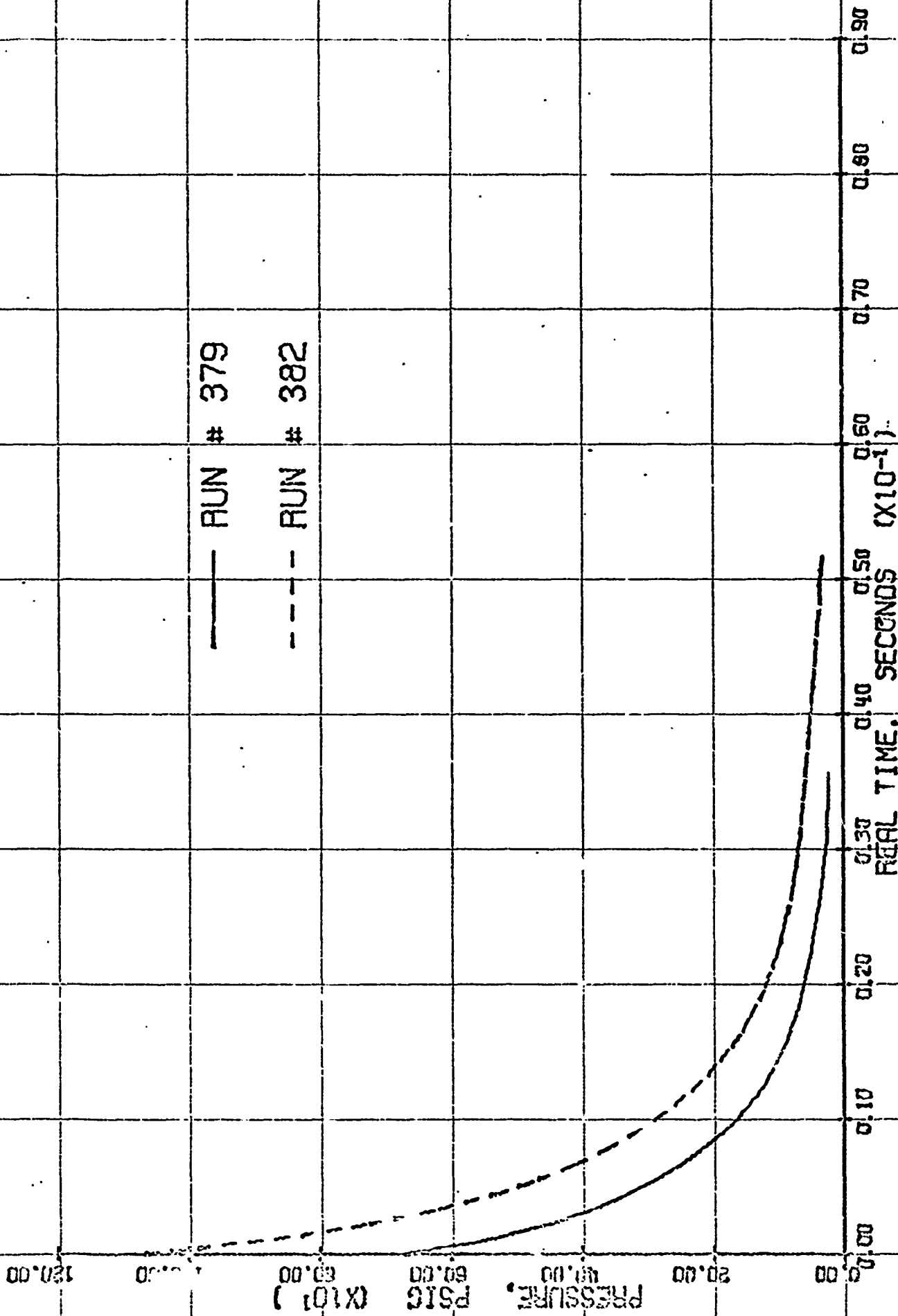
$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6$$

TIME	P	LN(P)
0.0	655.0	0.0
0.0015	645.0	-0.0010
0.0037	495.0	-0.5465
0.0054	405.0	-0.7472
0.0067	305.0	-1.1092
0.0112	215.0	-1.3350
0.0167	175.0	-1.5566
0.0193	145.0	-1.7764
0.0197	115.0	-2.0062

A= 0.3792017700-03	E= 0.2121443300-02
B=-0.6309022350 00	F=-0.5713325940-04
C= 0.1101044300 00	G=-0.1359577430-05
D=-0.2140001150-01	

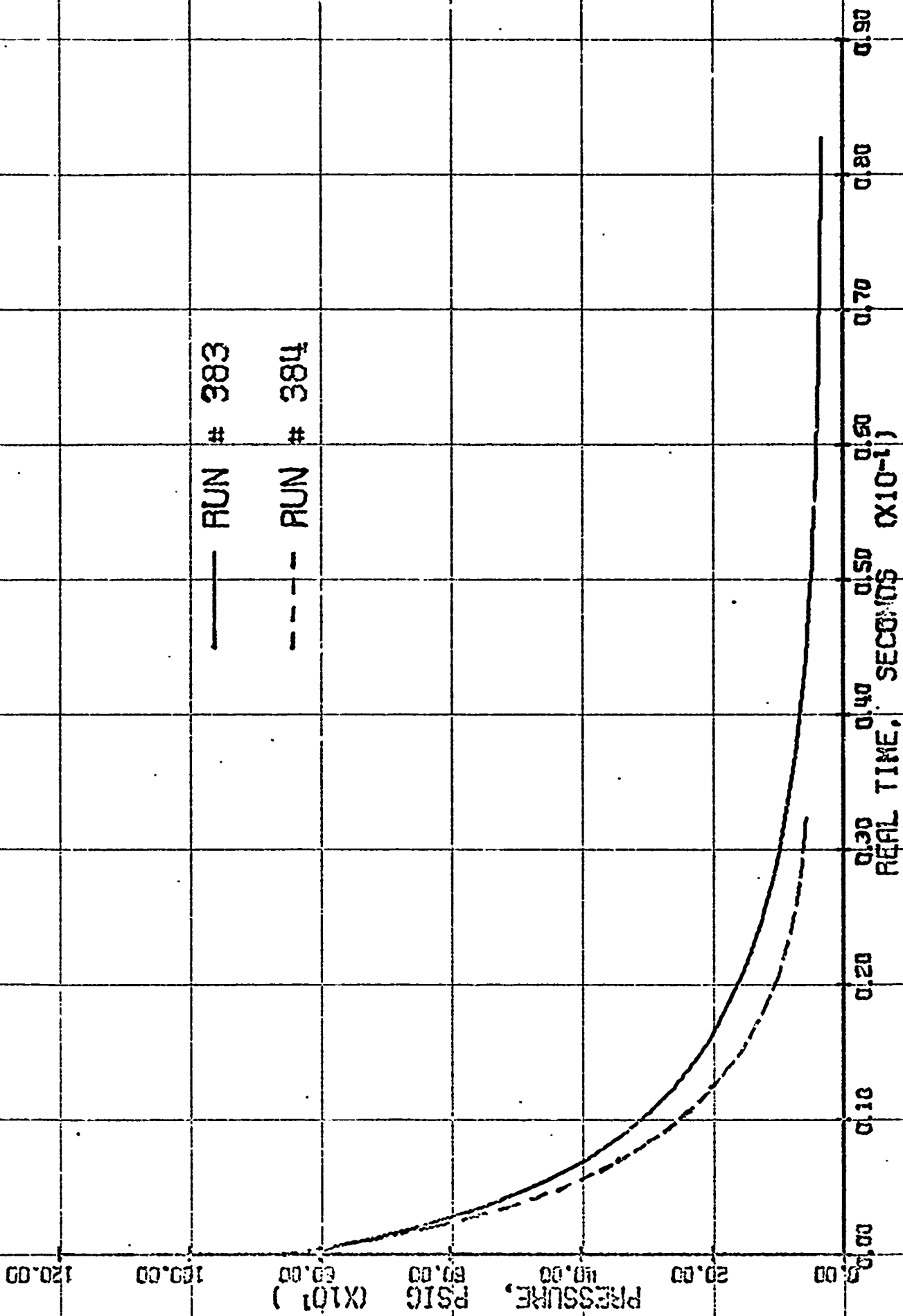
TIME	P	LN(P)
0.0237	100.0	-2.3021
0.0237	93.0	-2.4080
0.0337	55.0	-2.7630

— RUN # 379
--- RUN # 382



PRESSURE VS TIME DATA FOR BATCH # 966

— RUN # 383
--- RUN # 384



PRESSURE VS TIME DATA FOR BATCH # 966

BATCH # 966 / 80.0% AP, 20.0% PBCT

DATA RUN # 385

TIME	P	LN(P)
0.0	1010.0	0.0
0.0011	900.0	-0.1153
0.0030	700.0	-0.3660
0.0067	492.0	-0.7192
0.0117	330.0	-1.1186
0.0167	230.0	-1.4796
0.0217	170.0	-1.7813
0.0267	127.0	-2.0735
0.0317	93.0	-2.3327
0.0367	80.0	-2.5357

$T = (TIME * RPEF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 $A = 0.8053735440-02$ $F = 0.7133391380-03$
 $B = -0.4394961960-00$ $G = -0.2820950240-04$
 $C = 0.5374360000-01$ $H = 0.4428257890-06$
 $D = -0.8782635630-02$ $H = -0.7679147590-09$

TIME	P	LN(P)
0.0467	58.0	-2.8573
0.0567	49.0	-3.0259
0.0667	43.0	-3.1565
0.0767	38.0	-3.2801

DATA FROM RUN # 386

TIME	P	LN(P)
0.0	1045.0	0.0
0.0041	650.0	-0.4595
0.0091	420.0	-0.9115
0.0141	308.0	-1.2217
0.0191	229.0	-1.5181
0.0241	175.0	-1.7370
0.0291	135.0	-2.0465
0.0341	110.0	-2.2513
0.0391	89.0	-2.4631
0.0491	65.0	-2.7774

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 $A = 0.4677453310-02$ $F = 0.1547693890-02$
 $B = -0.5146475030-00$ $G = -0.3519239950-04$
 $C = 0.9149630200-01$ $H = 0.2394067810-05$
 $D = -0.1545753650-01$ $H = -0.2683174110-07$

TIME	P	LN(P)
0.0591	50.0	-3.0397
0.0691	38.0	-3.3142
0.0791	32.0	-3.4360
0.0891	28.0	-3.6196

DATA FROM RUN # 387

TIME	P	LN(P)
0.0	490.0	0.0
0.0015	335.0	-0.2412
0.0032	310.0	-0.4573
0.0054	245.0	-0.7931
0.0082	180.0	-1.0014
0.0132	120.0	-1.4049
0.0182	82.0	-1.7877
0.0232	62.0	-2.0573
0.0282	45.0	-2.3577

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$
 $A = -0.6109831340-02$ $F = -0.3691557000-03$
 $B = -0.5449901020-00$ $G = 0.6582008310-04$
 $C = 0.4505043740-01$ $H = -0.1244943390-05$
 $D = 0.1324391620-02$

TIME	P	LN(P)
0.0332	32.0	-2.7297
0.0382	26.0	-2.9363
0.0432	24.0	-3.0164

DATA FROM RUN # 388

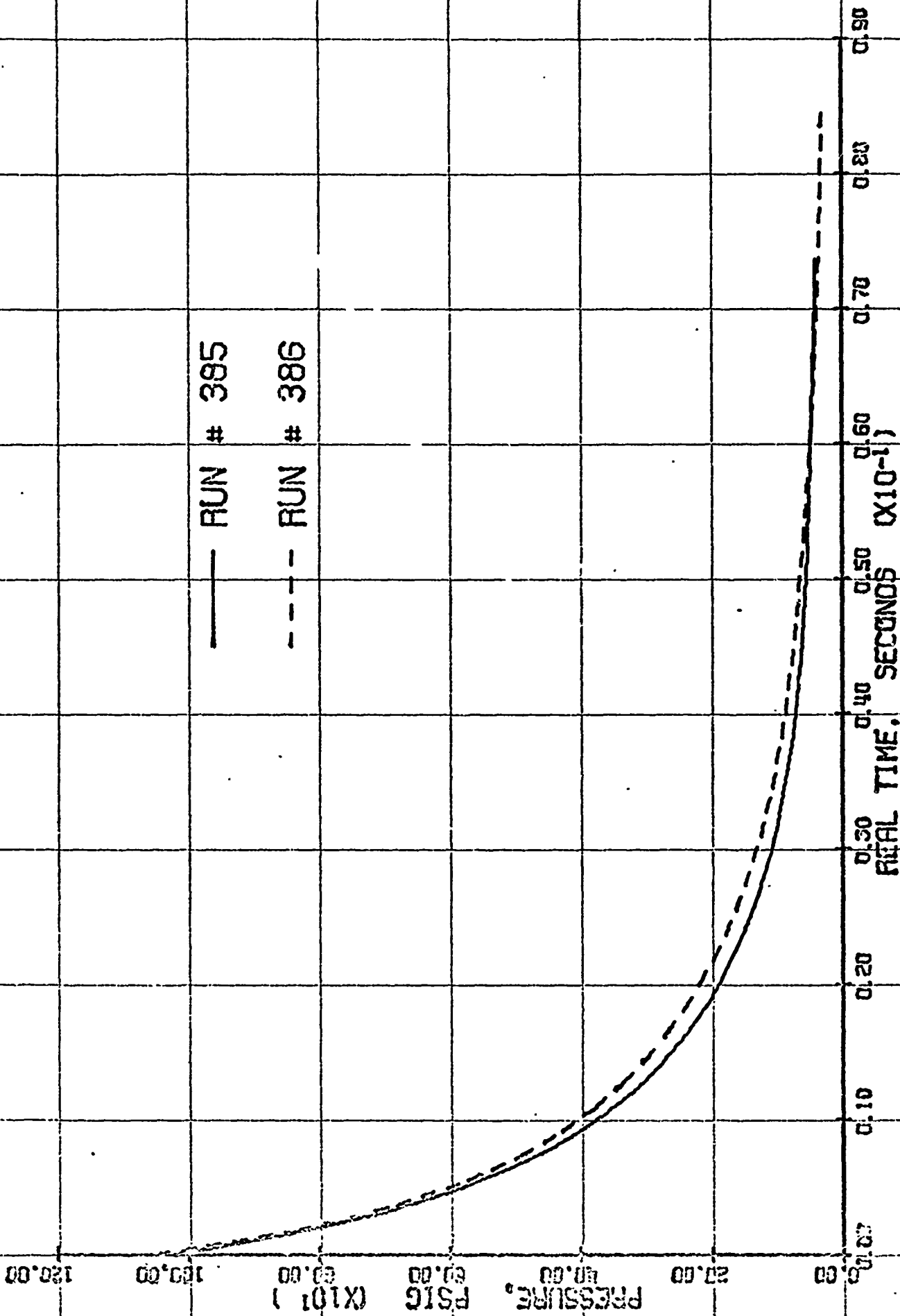
TIME	P	LN(P)
0.0	345.0	0.0
0.0011	347.0	-0.1285
0.0033	247.0	-0.4895
0.0061	197.0	-0.7473
0.0086	147.0	-0.9885
0.0111	110.0	-1.1922
0.0161	82.0	-1.5722
0.0211	60.0	-1.8045
0.0261	47.0	-2.1297

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$
 $A = 0.6740413830-02$ $F = -0.1357643840-02$
 $B = -0.4913904510-00$ $G = 0.1015013180-03$
 $C = 0.2024419000-01$ $H = -0.2712551360-05$
 $D = 0.6412609570-02$

TIME	P	LN(P)
0.0311	37.0	-2.3530
0.0361	30.0	-2.5777
0.0411	25.0	-2.7600

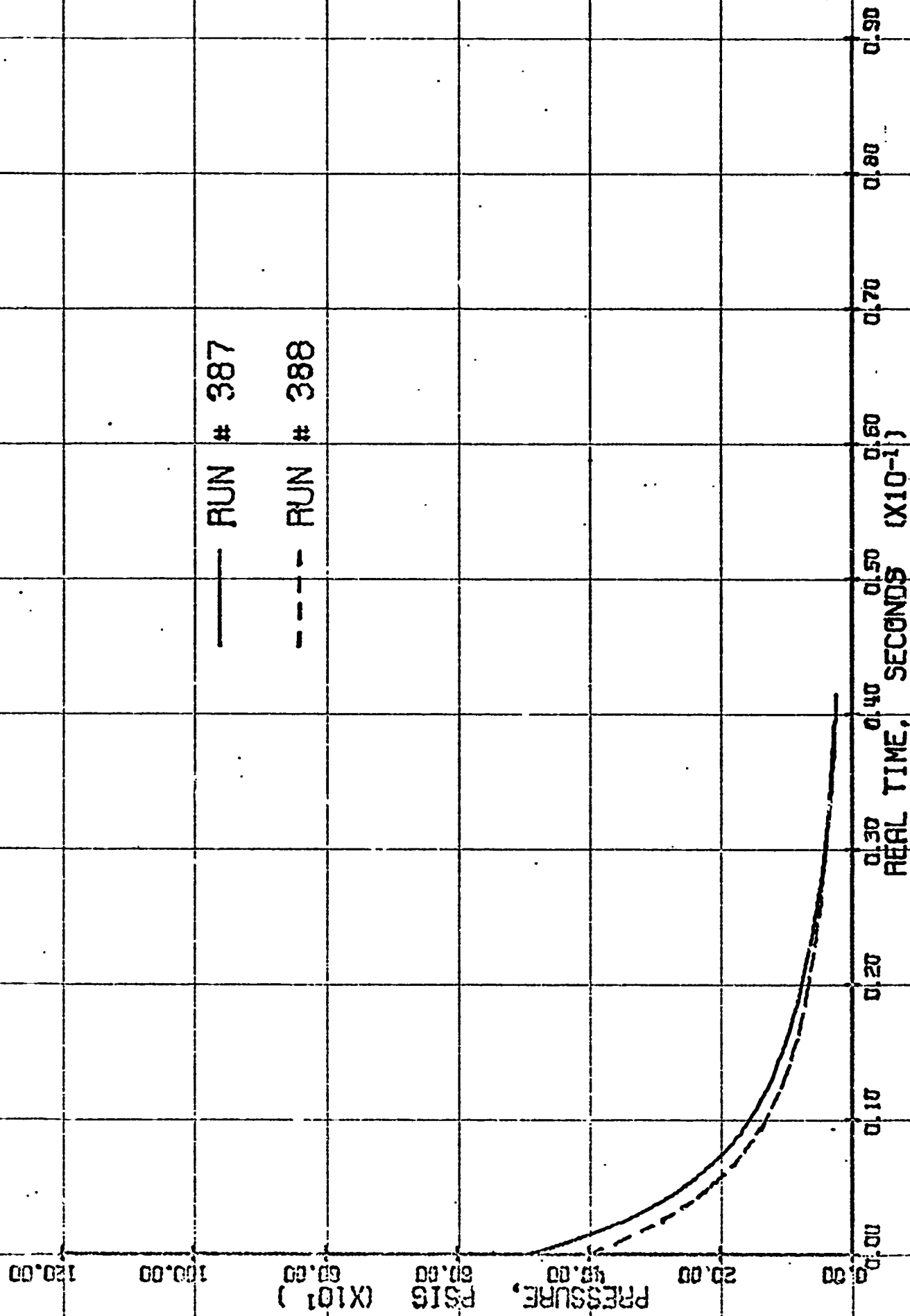
— RUN # 385

--- RUN # 386



PRESSURE VS TIME DATA FOR BATCH # 966

— RUN # 387
--- RUN # 388



PRESSURE VS TIME DATA FOR BATCH # 966

BATCH # 970 / 80.00 AP, 20.00 PU

DATA FROM RUN # 390

DATA FROM RUN # 399			T=(TIME*RREF**2)/ALPHA			
			LN(P)=A +B*T +C*T**2 +D*T**3 +E*T**4 +F*T**5 +G*T**6 +H*T**7			
TIME	P	LN(P)				
0.0	858.0	0.0	A=-0.1984031340-01		E= 0.9107603590-03	
0.0023	598.0	-0.3725	B=-0.6133283450 00		F=-0.3688887750-04	
0.0123	255.0	-1.2249	C= 0.1022400020 00		G= 0.7699701400-06	
0.0223	150.0	-1.7555	D=-0.1253160990-01		H=-0.6450511350-08	
0.0323	102.0	-2.1412				
0.0423	75.0	-2.4487				
0.0523	60.0	-2.6718	TIME	P	LN(P)	
0.0623	50.0	-2.8542	0.0923	37.0	-3.1553	
0.0723	45.0	-2.9595	0.1023	33.0	-3.2597	
0.0823	40.0	-3.0773	0.1123	31.0	-3.3322	
			0.1323	26.0	-3.5081	

DATA FROM RUN # 400

DATA FROM RUN # 400			T=(TIME*PREF**2)/ALPHA			
			LN(P)=A +B*T +C*T**2 +D*T**3 +E*T**4 +F*T**5 +G*T**6 +H*T**7			
TIME	P	LN(P)				
0.0	835.0	0.0	A= 0.4025475500-02	E= 0.1164897150-02		
0.0029	550.0	-0.4175	B=-0.5738513600 00	F=-0.4771778930-04		
0.0079	320.0	-0.9591	C= 0.1245109310 00	G= 0.1010762860-05		
0.0179	175.0	-1.5525	D=-0.1581751980-01	H=-0.3633820290-08		
0.0329	100.0	-2.1223				
0.0379	85.0	-2.2348				
0.0479	65.0	-2.5530	TIME	P	LN(P)	
0.0579	55.0	-2.7201	0.0879	40.0	-3.0386	
0.0679	47.0	-2.8773	0.0979	35.0	-3.1721	
0.0779	43.0	-2.9562	0.1079	33.0	-3.2309	
			0.1279	25.0	-3.5086	

DATA FROM RUN # 402

DATA FROM RUN # 402			T = (TIME#RREF**2)/ALPHA			
			LN(P)=A +B*T +C*T**2 +D*T**3 +E*T**4 +F*T**5 +G*T**6 +H*T**7			
TIME	P	LN(P)				
0.0	822.0	0.0	A=-0.1041747360-01	E= 0.6300719790-03		
0.0019	602.0	-0.3115	B=-0.6429133460 00	F=-0.2193433590-04		
0.0045	445.0	-0.6137	C= 0.9673901930-01	G= 0.3943065640-06		
0.0095	270.0	-1.1133	D=-0.1012761050-01	H=-0.2930335690-08		
0.0145	195.0	-1.4387				
0.0295	100.0	-2.1066	TIME	P	LN(P)	
0.0395	73.0	-2.4213	0.0795	33.0	-3.0742	
0.0495	60.0	-2.5174	0.0895	34.0	-3.1454	
0.0595	47.0	-2.8516	0.0995	30.0	-3.3105	
0.0695	42.0	-2.9741	0.1195	22.0	-3.6207	

DATA FROM RUN # 403

DATA FOR RUN = 403			T=(TIME**2)/ALPHA			
			LN(P)=A +B*T +C*T**2 +D*T**3 +E*T**4 +F*T**5 +G*T**6 +H*T**7			
TIME	P	LN(P)				
0.0	430.0	0.0	A= 0.1318091920-01	E= 0.1625766520-01		
0.0020	303.0	-0.3267	B=-0.3210871950 00	F=-0.1623351960-02		
0.0050	200.0	-0.7655	C= 0.2175434450 00	G= 0.5134053410-04		
0.0071	143.0	-1.0566	D=-0.3826104290-01	H=-0.1405013230-06		
0.0100	125.0	-1.2275				
0.0150	82.0	-1.5540				
0.0200	55.0	-2.0354	TIME	P	LN(P)	
0.0250	45.0	-2.1926	0.0400	30.0	-2.6525	
0.0300	41.0	-2.3502	0.0450	26.0	-2.8057	
0.0350	35.0	-2.5084	0.0500	23.0	-2.9288	
			0.0550	22.0	-2.9727	

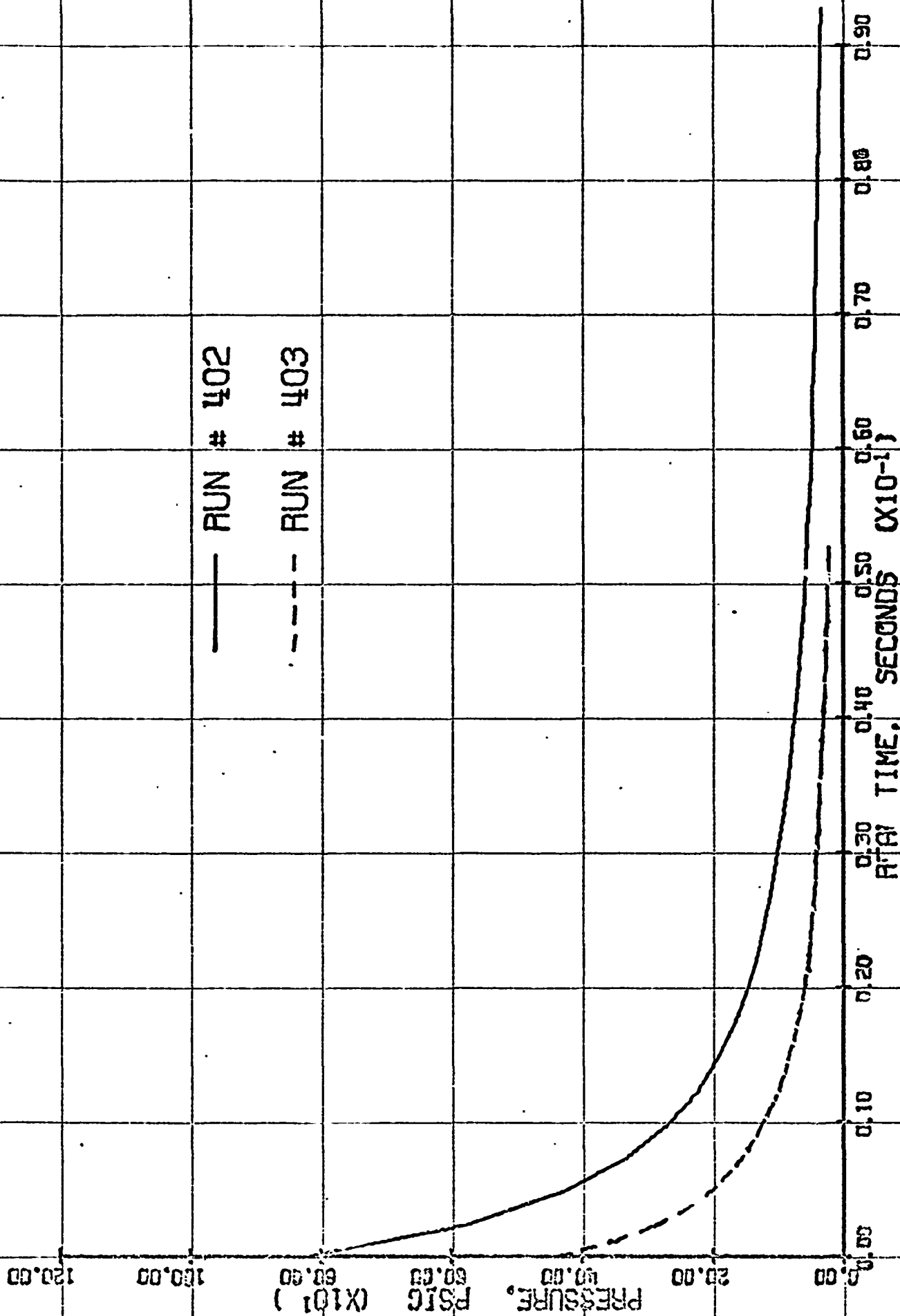
— RUN # 399
--- RUN # 400

PRESSURE, PSIG (X10¹)

REAL TIME, SECONDS (X10⁻¹)

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90

PRESSURE VS TIME DATA FOR BATCH # 970



PRESSURE VS TIME DATA FOR BATCH # 970

BATCH # 970 / 30.0% AP, 20.0% PU

DATA FROM RUN # 404

TIME	P	LN(P)
0.0	430.0	0.0
0.0024	302.0	-0.3534
0.0050	230.0	-0.6257
0.0080	182.0	-0.8598
0.0100	160.0	-0.9886
0.0150	120.0	-1.2763
0.0200	90.0	-1.5640
0.0250	73.0	-1.7733
0.0300	60.0	-1.9694
0.0350	50.0	-2.1518

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

$A = -0.1336557960-02$ $E = 0.8142809980-02$
 $B = -0.6386591300-00$ $F = -0.5695324900-03$
 $C = 0.2162945530-00$ $G = 0.2822351690-04$
 $D = -0.5493251130-01$ $H = -0.4736020900-05$

TIME	P	LN(P)
0.0400	42.0	-2.3261
0.0500	30.0	-2.6625
0.0600	25.0	-2.8449
0.0700	22.2	-2.9637

DATA FROM RUN # 405

TIME	P	LN(P)
0.0	415.0	0.0
0.0031	260.0	-0.4676
0.0081	162.0	-0.9407
0.0131	120.0	-1.2408
0.0181	90.0	-1.5285
0.0231	70.0	-1.7798
0.0281	55.0	-2.0209
0.0331	43.0	-2.2671
0.0381	38.0	-2.3907
0.0431	34.0	-2.5019

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

$A = 0.1826857210-02$ $E = 0.5564837510-02$
 $B = -0.7519510690-00$ $F = -0.3585538430-03$
 $C = 0.2239127260-00$ $G = 0.1149893240-04$
 $D = -0.4305620430-01$ $H = -0.1461043180-05$

TIME	P	LN(P)
0.0431	31.0	-2.5943
0.0531	29.0	-2.6610
0.0581	28.0	-2.6951
0.0631	27.0	-2.7324

DATA FROM RUN # 406

TIME	P	LN(P)
0.0	547.0	0.0
0.0033	400.0	-0.3130
0.0113	252.0	-0.7750
0.0213	193.0	-1.0418
0.0263	175.0	-1.1397
0.0363	153.0	-1.2740
0.0463	140.0	-1.3528
0.0563	125.0	-1.4524
0.0663	125.0	-1.4761
0.0763	113.0	-1.5338

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

$A = -0.5062280040-03$ $E = 0.6532503260-03$
 $B = -0.4409804280-00$ $F = -0.2573204130-04$
 $C = 0.5106556020-01$ $G = 0.5317074220-05$
 $D = -0.9455454050-02$ $H = -0.4461979440-08$

TIME	P	LN(P)
0.0863	114.0	-1.5583
0.0963	109.0	-1.6131
0.1063	104.0	-1.6501
0.1163	102.0	-1.6795

DATA FROM RUN # 407

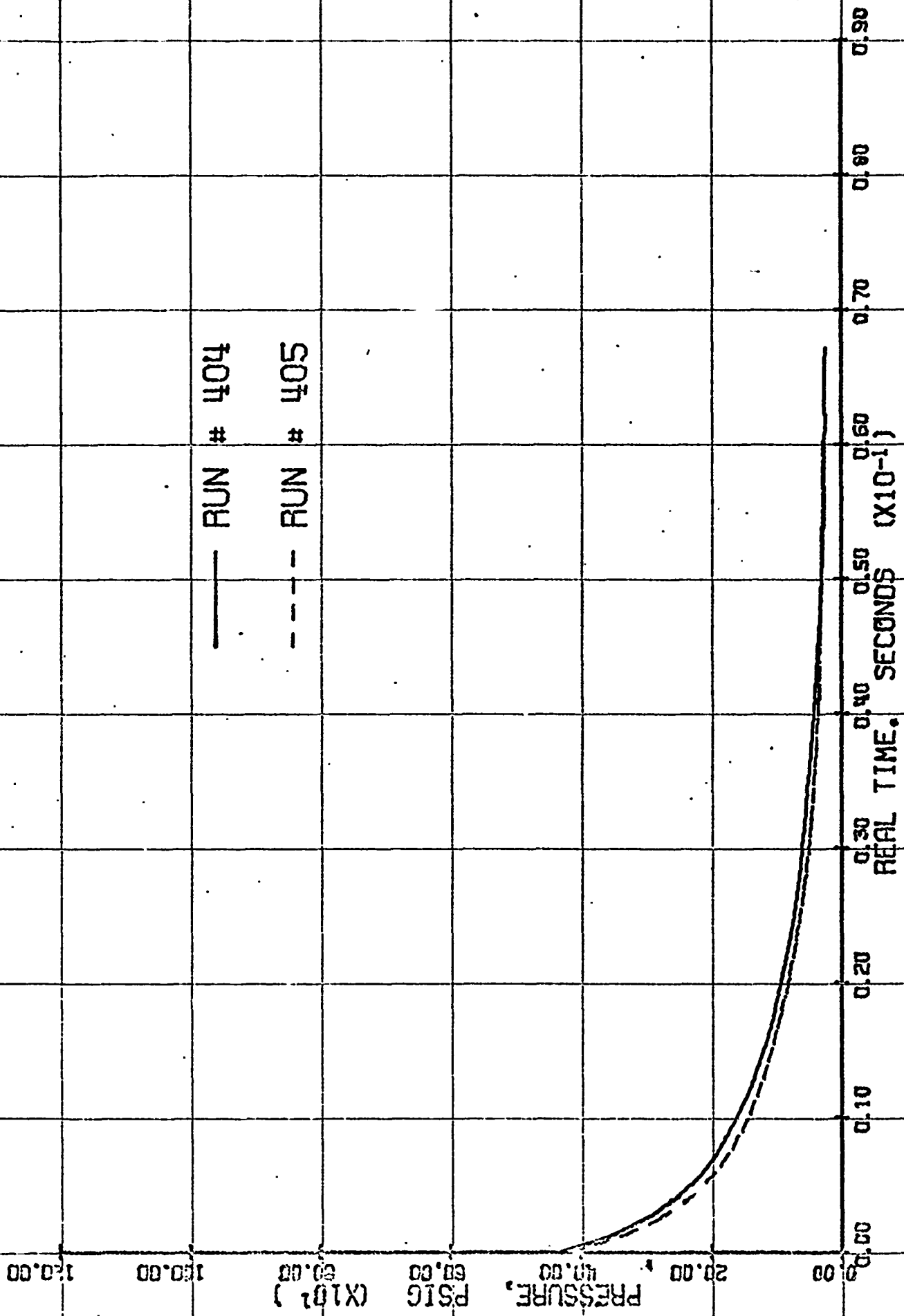
TIME	P	LN(P)
0.0	445.0	0.0
0.0023	215.0	-0.3455
0.0083	215.0	-0.7274
0.0133	165.0	-0.9971
0.0183	140.0	-1.1554
0.0233	125.0	-1.2695
0.0283	115.0	-1.3511
0.0333	93.0	-1.5055
0.0483	32.0	-1.6014
0.0583	74.0	-1.7950

$$T = (TIME * RREF**2) / ALPHA$$

$$LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$$

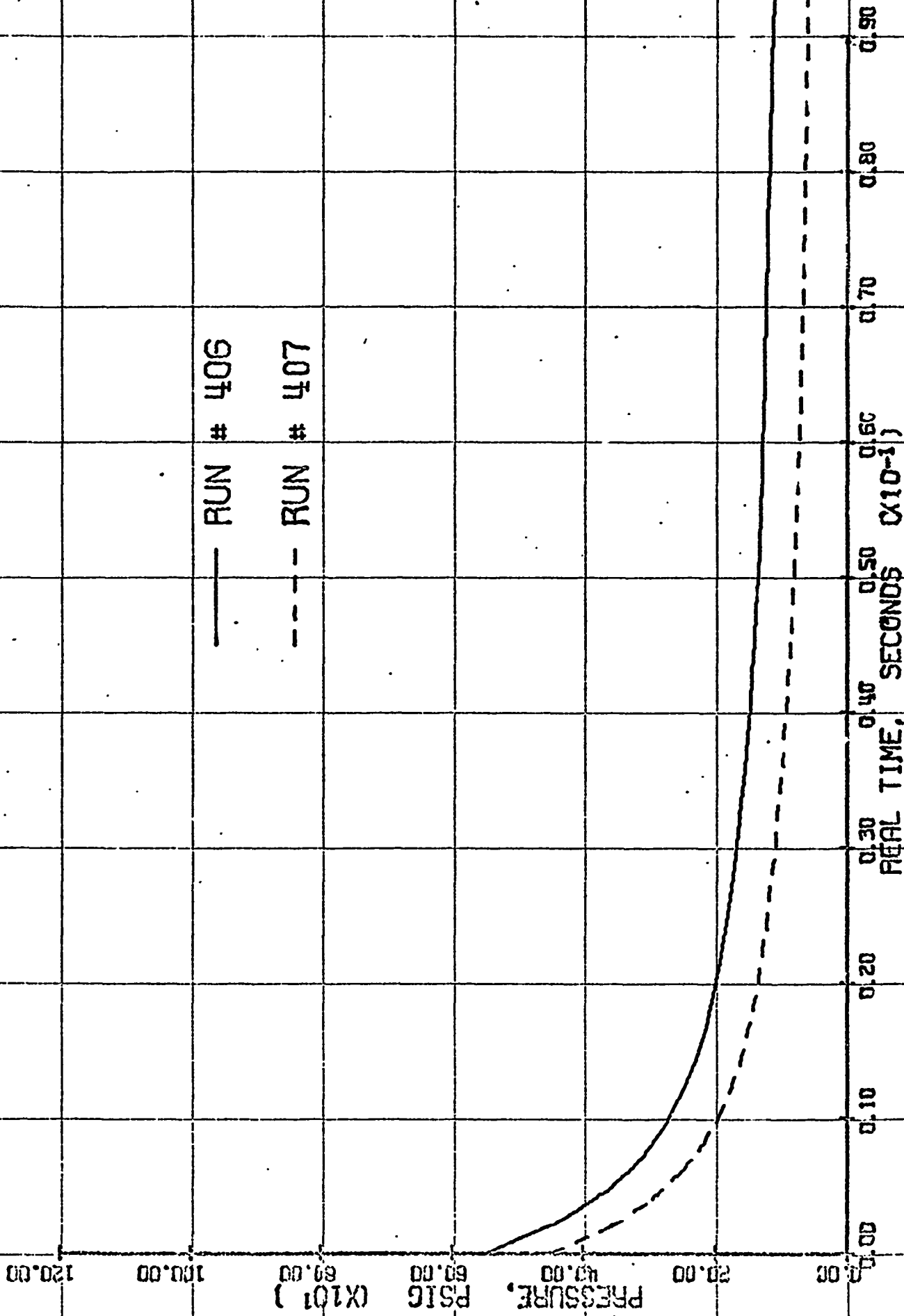
$A = 0.4519147250-02$ $E = 0.5741301400-03$
 $B = -0.5014276120-00$ $F = -0.1184349390-04$
 $C = 0.5703732720-01$ $G = 0.2940322520-05$
 $D = -0.0405333630-02$ $H = -0.1452005550-08$

TIME	P	LN(P)
0.0683	67.0	-1.3934
0.0783	64.0	-1.3992
0.0883	61.0	-1.4372
0.0983	60.0	-2.0037



PRESSURE VS TIME DATA FOR BATCH # 970

— RUN # 406
--- RUN # 407



PRESSURE VS TIME DATA FOR BATCH # 970

BATCH 1 970 / 30.0% AP, 20.0% PU

DATA FROM RJ: # 403

TIME	P	LN(P)
0.0	435.0	0.0
0.0040	309.0	-0.3716
0.0090	210.0	-0.7282
0.0140	165.0	-0.9694
0.0190	139.0	-1.1409
0.0240	125.0	-1.2470
0.0290	110.0	-1.3749
0.0390	93.0	-1.5427
0.0490	82.0	-1.6685
0.0590	73.0	-1.7649

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.2713301230-02 E= 0.2035758910-03
 B=-0.4412652760 00 F=-0.8774597250-06
 C= 0.6274333850-01 G=-0.1547431010-06
 D=-0.5242300750-02 H= 0.3043706850-08

TIME	P	LN(P)
0.0690	68.0	-1.8558
0.0790	55.0	-1.9010
0.0890	52.0	-1.9432
0.0990	60.0	-1.9810

DATA FROM RJ: # 409

TIME	P	LN(P)
0.0	445.0	0.0
0.0007	410.0	-0.0819
0.0057	225.0	-0.6320
0.0107	155.0	-1.0546
0.0157	118.0	-1.3274
0.0207	94.0	-1.5548
0.0257	75.0	-1.7806
0.0307	62.0	-1.9709
0.0407	47.0	-2.2479

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$
 A= 0.1235473110-01 E= 0.2298590020-02
 B=-0.5525199130 00 F=-0.1069597770-03
 C= 0.1460553100 00 G= 0.1936383560-05
 D=-0.245506770-01

TIME	P	LN(P)
0.0507	39.0	-2.4345
0.0607	33.0	-2.6016
0.0707	32.0	-2.6323

DATA FROM RJ: # 411

TIME	P	LN(P)
0.0	565.0	0.0
0.0011	435.0	-0.1527
0.0061	267.0	-0.7496
0.0111	173.0	-1.1550
0.0161	135.0	-1.4316
0.0211	107.0	-1.6840
0.0261	90.0	-1.8370
0.0361	65.0	-2.1524
0.0461	54.0	-2.3478
0.0561	45.0	-2.5302

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A= 0.6125331540-02 F= 0.1360345690-02
 B=-0.6413574250 00 F=-0.5938474330-04
 C= 0.1152175860 00 G= 0.1879471550-05
 D=-0.1569728050-01 H=-0.2073559230-07

TIME	P	LN(P)
0.0661	38.0	-2.6992
0.0761	34.0	-2.8105
0.0861	31.0	-2.9028
0.0961	30.0	-2.9356

DATA FROM RJ: # 412

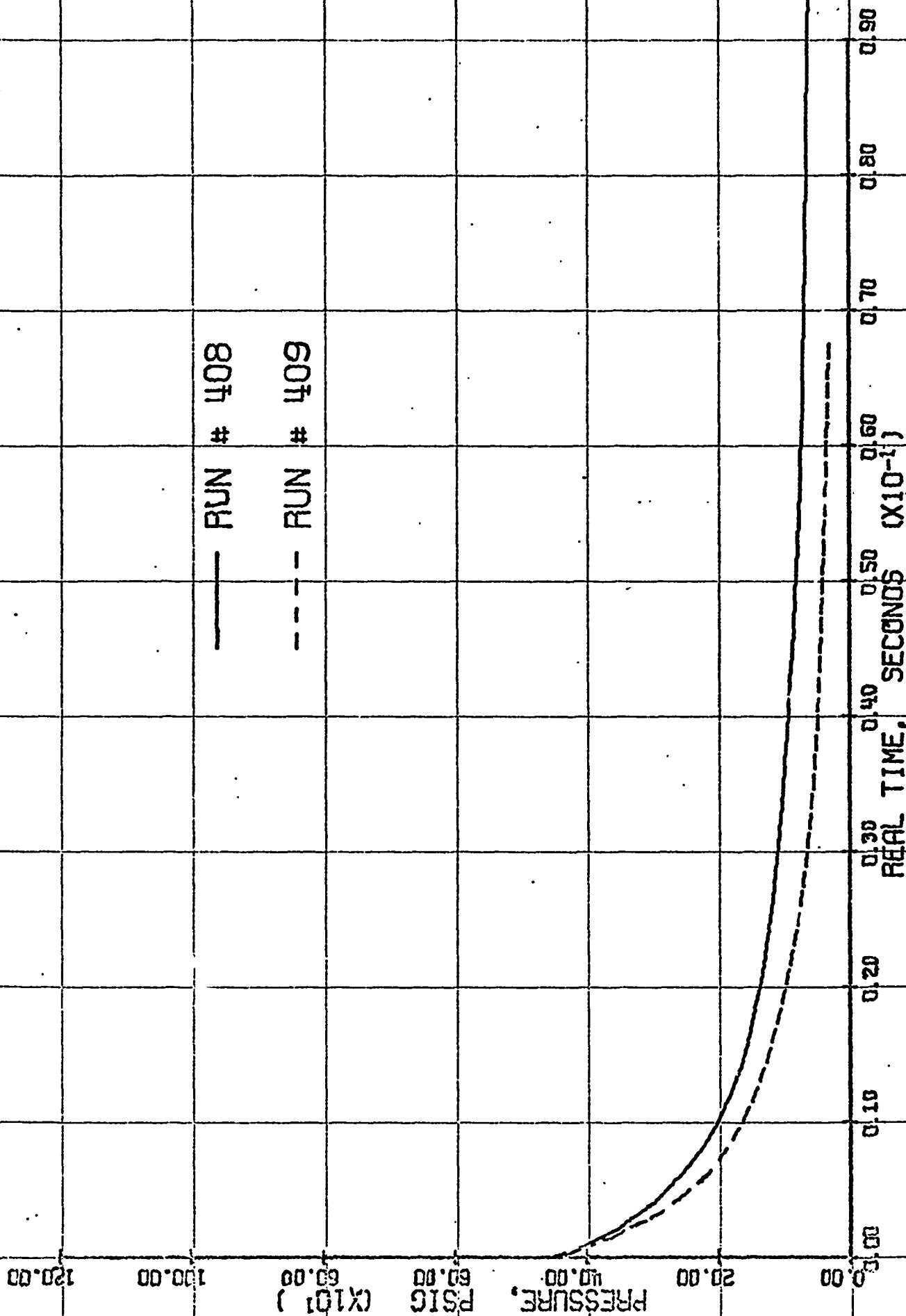
TIME	P	LN(P)
0.0	585.0	0.0
0.0033	360.0	-0.4855
0.0093	212.0	-1.0150
0.0183	115.0	-1.5267
0.0283	73.0	-2.0149
0.0383	50.0	-2.3112
0.0483	40.0	-2.5149
0.0583	30.0	-2.7340
0.0683	33.0	-2.1751
0.0783	29.0	-2.9043

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 A=-0.1019190020-03 F= 0.1014663130-02
 B=-0.5312417130 00 F=-0.4146627150-04
 C= 0.1179208490 00 G= 0.2911795010-05
 D=-0.1415737950-01 H=-0.7803693030-09

TIME	P	LN(P)
0.0883	25.0	-3.1135
0.0983	24.0	-3.1936
0.1083	22.0	-3.2206
0.1183	20.0	-3.3759

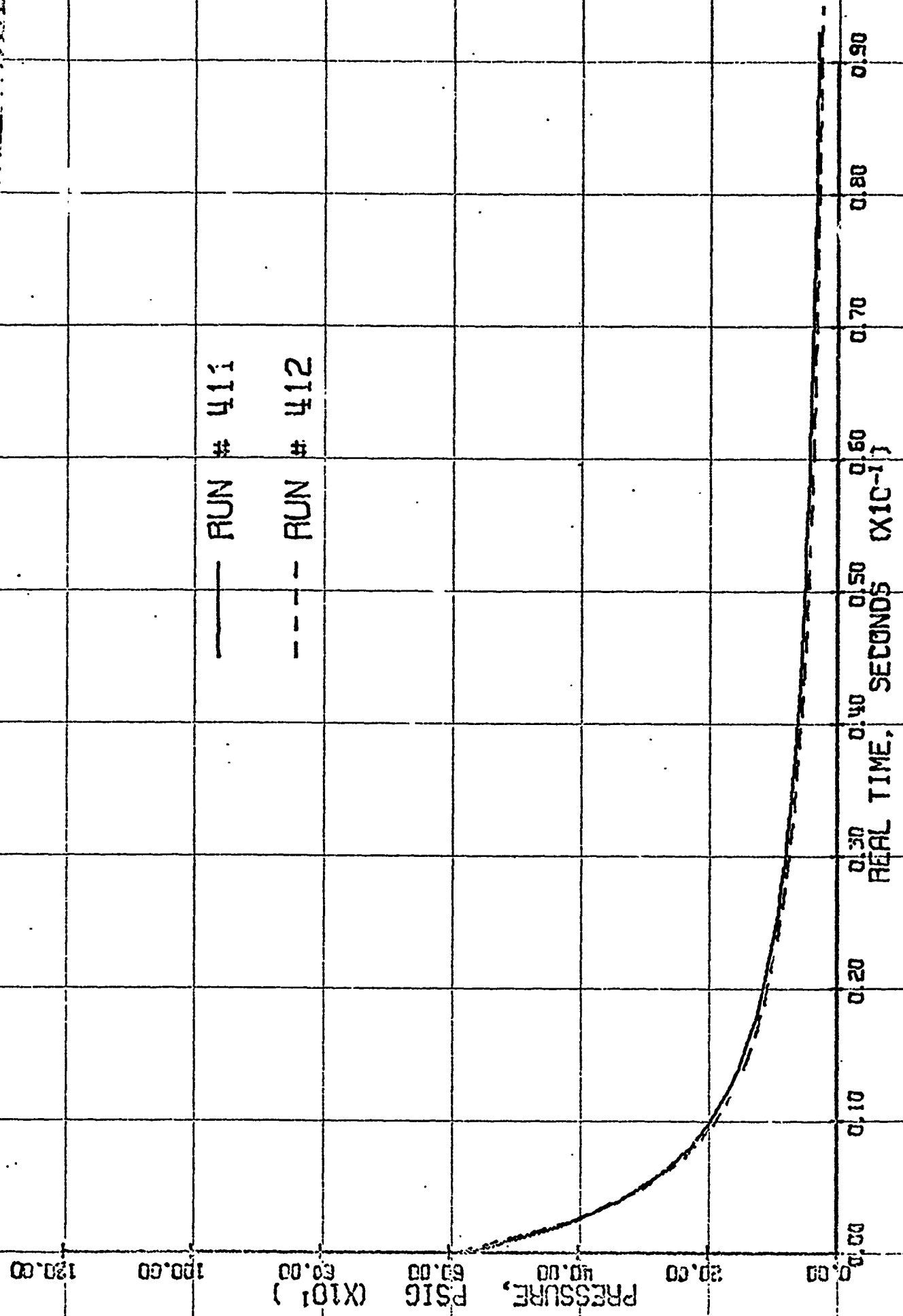
— RUN # 408

--- RUN # 409



PRESSURE VS TIME DATA FOR BATCH # 970

— RUN # 411
--- RUN # 412



PRESSURE VS TIME DATA FOR BATCH # 970

BATCH # 974 / 30.0% AP, 20.0% PU

DATA FROM RUN # 413

TIME	P	LN(P)
0.0	575.0	0.0
0.0007	515.0	-0.1102
0.0057	275.0	-0.7375
0.0107	155.0	-1.1340
0.0157	135.0	-1.4491
0.0257	90.0	-1.8545
0.0357	65.0	-2.1300
0.0457	52.0	-2.4031
0.0557	42.0	-2.6157
0.0657	33.0	-2.7163

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.4787436220-03$ $F = 0.1125451000-02$
 $B = -0.6535422700-00$ $G = -0.4897230830-04$
 $C = 0.1153658540-00$ $H = 0.1115286680-05$
 $D = -0.1471248800-01$ $H = -0.1033493640-07$

TIME	P	LN(P)
0.0757	33.0	-2.8579
0.0857	29.0	-2.9871
0.0957	25.0	-3.1355
0.1057	21.0	-3.3098

DATA FROM RUN # 414

TIME	P	LN(P)
0.0	680.0	0.0
0.0023	440.0	-0.4353
0.0073	235.0	-1.0625
0.0123	149.0	-1.5249
0.0173	100.0	-1.9169
0.0223	70.0	-2.2735
0.0323	50.0	-2.6101

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5$$

$A = -0.2594639470-01$ $D = -0.6010282660-02$
 $B = -0.6711208840-00$ $E = 0.2999533930-03$
 $C = 0.7527207510-01$ $F = -0.6842565930-05$

TIME	P	LN(P)
0.0423	40.0	-2.8332
0.0523	35.0	-2.9657
0.0623	30.0	-3.1209

DATA FROM RUN # 415

TIME	P	LN(P)
0.0	943.0	0.0
0.0024	630.0	-0.4295
0.0054	400.0	-0.9168
0.0074	307.0	-1.1434
0.0124	155.0	-1.6425
0.0174	125.0	-2.0333
0.0224	95.0	-2.3214
0.0274	70.0	-2.6257
0.0374	52.0	-2.9240

$$T = (TIME * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

$A = 0.4803939270-02$ $E = 0.2193102340-02$
 $B = -0.3305524240-00$ $F = -0.1086067230-03$
 $C = 0.1477624950-00$ $G = 0.2034615630-05$
 $D = -0.2261181830-01$

TIME	P	LN(P)
0.0474	45.0	-3.0585
0.0574	40.0	-3.1864
0.0674	33.0	-3.2375

DATA FROM RUN # 417

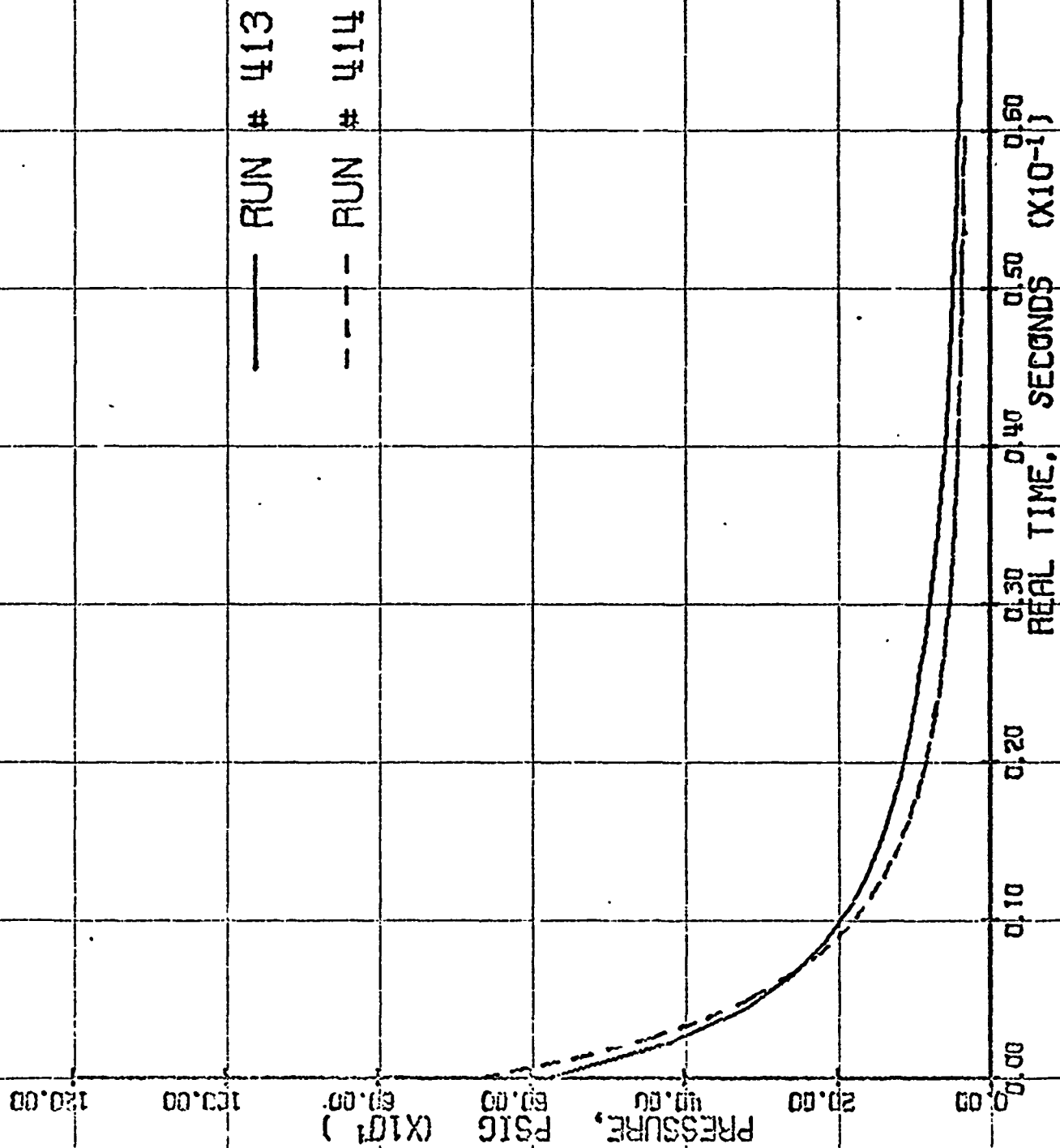
TIME	P	LN(P)
0.0	242.0	0.0
0.0005	150.0	-0.1911
0.0025	100.0	-0.4611
0.0055	50.0	-0.9163
0.0075	320.0	-1.0737
0.0155	235.0	-1.3214
0.0155	155.0	-1.7240
0.0255	112.0	-1.9582
0.0355	70.0	-2.3257
0.0455	50.0	-2.6101

$$T = (TIME * REF ** 2) / ALPHA$$

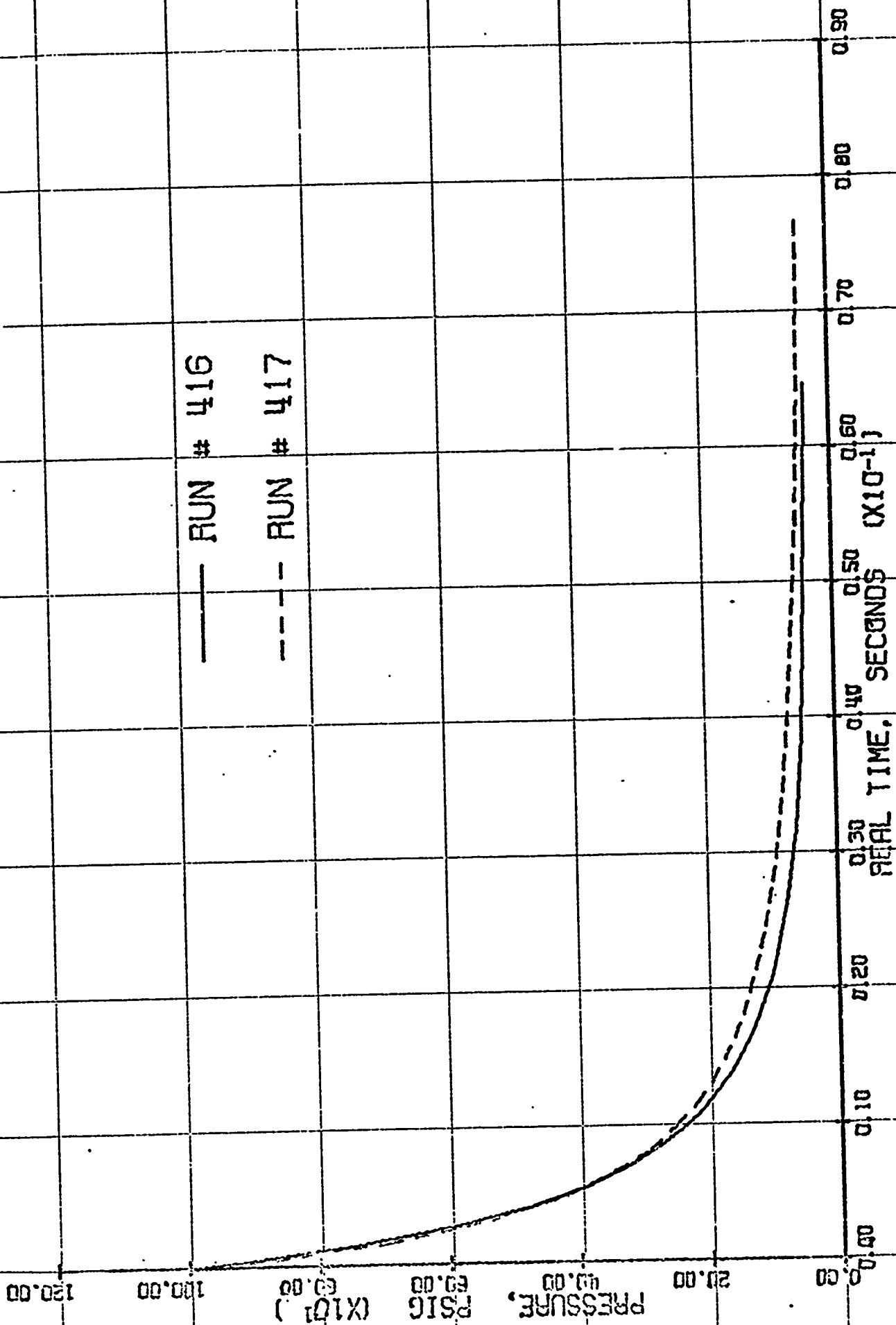
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.5352711900-02$ $F = 0.2565442920-02$
 $B = -0.3239234800-00$ $G = -0.1575353050-03$
 $C = 0.1553544500-00$ $H = 0.5244236660-05$
 $D = -0.2541597530-01$ $H = -0.7134383240-07$

TIME	P	LN(P)
0.0505	50.0	-2.7705
0.0605	50.0	-2.7705
0.0705	47.0	-2.9575
0.0805	44.0	-3.0628



PRESSURE VS TIME DATA FOR BATCH # 970



PRESSURE VS TIME DATA FOR BATCH # 970

BATCH # 970 / 20.03 AP, 20.03 PU

DATA FROM RUN # 418

TIME	P	LN(P)
0.0	900.0	0.0
0.0003	820.0	-0.1659
0.0024	600.0	-0.4733
0.0043	440.0	-0.7385
0.0073	300.0	-1.1714
0.0103	210.0	-1.4907
0.0151	151.0	-1.7939
0.0206	112.0	-2.1547
0.0303	75.0	-2.5577
0.0403	50.0	-2.9332

$T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 $A = -0.6553042490-02$ $E = -0.2832992300-03$
 $B = -0.7337512140-00$ $F = 0.6369524470-04$
 $C = 0.1069405230-00$ $G = -0.3167829150-05$
 $D = -0.6503704740-02$ $H = 0.5257653130-07$

TIME	P	LN(P)
0.0503	40.0	-3.1364
0.0603	33.0	-3.3767
0.0703	29.0	-3.5079
0.0803	26.0	-3.6171

DATA FROM RUN # 419

TIME	P	LN(P)
0.0	712.0	0.0
0.0043	375.0	-0.5892
0.0093	220.0	-1.1744
0.0143	172.0	-1.4206
0.0193	132.0	-1.6353
0.0243	105.0	-1.9141
0.0293	87.0	-2.1022
0.0393	60.0	-2.4737
0.0493	46.0	-2.7394
0.0593	39.0	-2.9045

$T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 $A = 0.1328902770-01$ $E = 0.1951347580-02$
 $B = -0.7513556400-00$ $F = -0.9152756650-04$
 $C = 0.1578012290-00$ $G = 0.2193986720-05$
 $D = -0.2321862750-01$ $H = -0.2105459710-07$

TIME	P	LN(P)
0.0693	33.0	-3.0716
0.0793	28.0	-3.2359
0.0893	24.0	-3.3900
0.0993	22.0	-3.4770

DATA FROM RUN # 421

TIME	P	LN(P)
0.0	712.0	0.0
0.0012	500.0	-0.3535
0.0053	300.0	-0.9642
0.0125	165.0	-1.3477
0.0225	115.0	-1.8231
0.0325	82.0	-2.1614
0.0425	64.0	-2.4092
0.0525	55.0	-2.5807
0.0625	46.0	-2.7614
0.0725	40.0	-2.9722

$T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 $A = -0.5320930140-01$ $E = 0.1506566960-02$
 $B = -0.7344056440-00$ $F = -0.7141491260-04$
 $C = 0.1402242950-00$ $G = 0.1550326290-05$
 $D = -0.2028930790-01$ $H = -0.1543356270-07$

TIME	P	LN(P)
0.0825	35.0	-3.0127
0.0925	30.0	-3.1669
0.1025	25.0	-3.3492
0.1125	20.0	-3.5723

DATA FROM RUN # 423

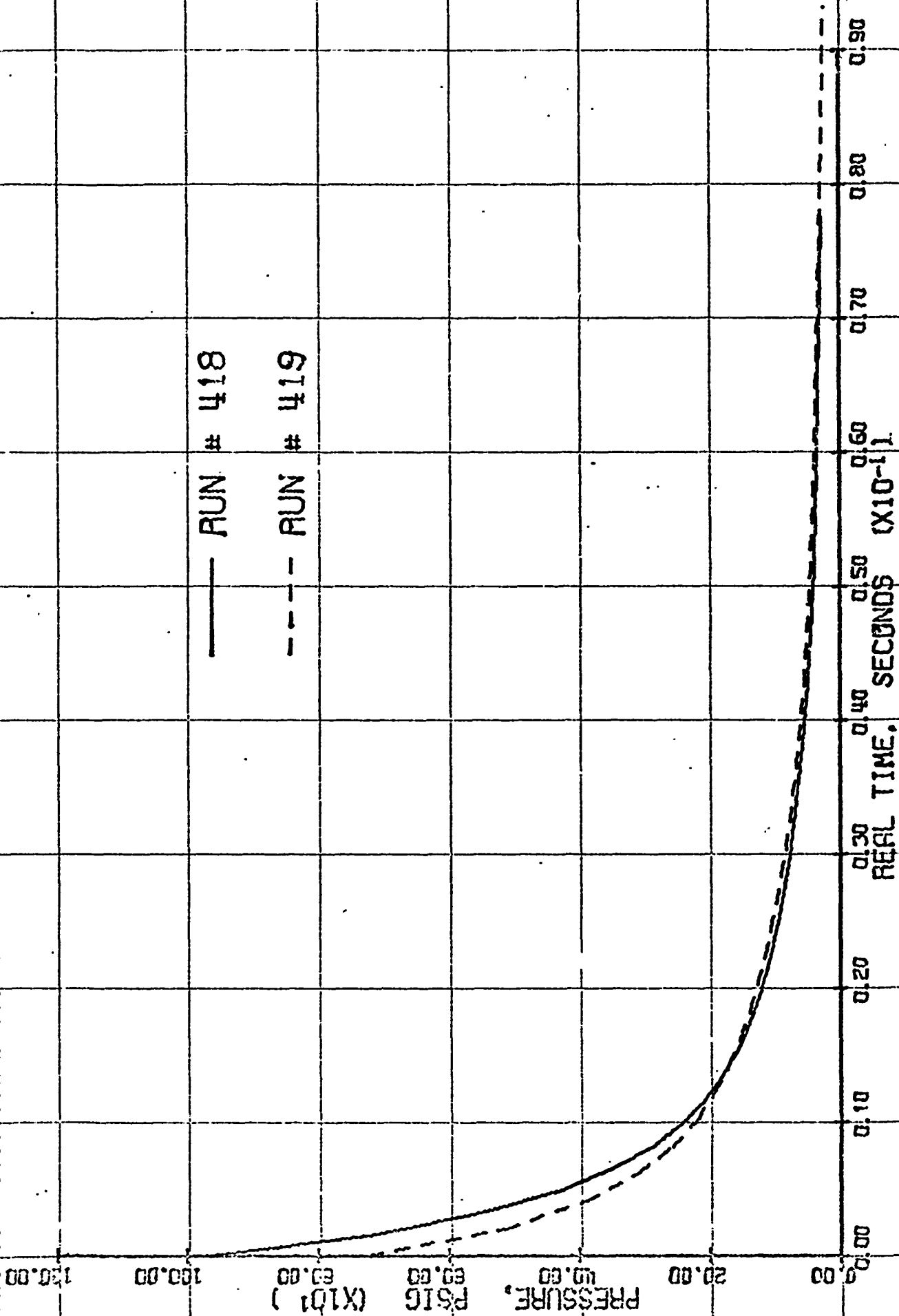
TIME	P	LN(P)
0.0	533.0	0.0
0.0022	355.0	-0.4101
0.0073	212.0	-0.9257
0.0125	155.0	-1.3313
0.0175	120.0	-1.4945
0.0225	100.0	-1.6094
0.0275	83.0	-1.7487
0.0375	60.0	-2.1670
0.0475	45.0	-2.2749
0.0575	30.0	-2.5137

$T = (TIME * REF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
 $A = -0.1946551030-02$ $E = 0.1113008620-02$
 $B = -0.4522672000-00$ $F = -0.4571441840-04$
 $C = 0.1233323230-00$ $G = 0.1042695150-05$
 $D = -0.1526725900-01$ $H = -0.0510235450-06$

TIME	P	LN(P)
0.0675	32.0	-2.8165
0.0775	27.0	-2.9264
0.0875	22.0	-3.1812
0.0975	20.0	-3.2955

— RUN # 418

--- RUN # 419



PRESSURE VS TIME DATA FOR BATCH # 970

— RUN # 421

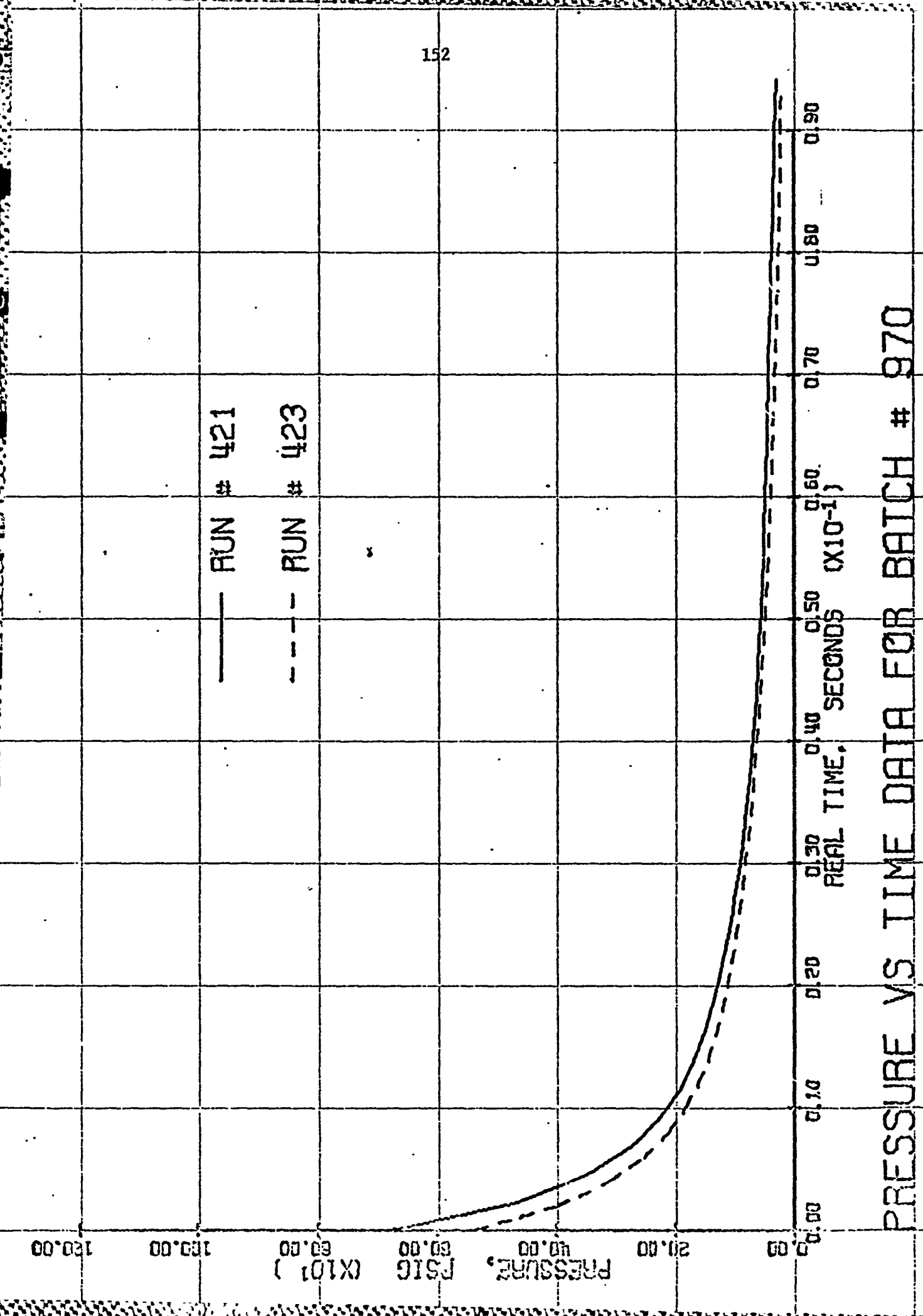
--- RUN # 423

PRESSURE, PSIG (X10¹)

REAL TIME, SECONDS (X10⁻¹)

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90

PRESSURE VS TIME DATA FOR BATCH # 970



BATCH # 941 / 65.9% AP, 19.1% PBAA, 15.0% FINE AL

DATA FROM RUN # 322

TIME	P	LN(P)
0.0	530.0	0.0
0.0010	455.0	-0.1526
0.0019	390.0	-0.3067
0.0043	295.0	-0.5859
0.0069	228.0	-0.8435
0.0086	195.0	-0.9999
0.0119	147.0	-1.2824
0.0169	103.0	-1.5381
0.0219	75.0	-1.9554

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$
A= 0.4107516970-03 E= 0.5165310760-01
B=-0.1137001430 01 F=-0.8725205420-02
C= 0.4394294350 00 G= 0.4796973010-03
D=-0.2236931120 00

TIME	P	LN(P)
0.0269	55.0	-2.2555
0.0319	40.0	-2.5840
0.0369	28.0	-2.9407

DATA FROM RUN # 323

TIME	P	LN(P)
0.0	542.0	0.0
0.0039	355.0	-0.3954
0.0099	245.0	-0.7940
0.0139	175.0	-1.1305
0.0159	135.0	-1.3900
0.0239	105.0	-1.6413
0.0289	83.0	-1.8179
0.0369	62.0	-2.1681
0.0499	47.0	-2.4451
0.0569	33.0	-2.5577

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
A=-0.5341233660-02 E=-0.9206582450-04
B=-0.6917165320 00 F= 0.4206353030-04
C= 0.3982608870-01 G=-0.2251053800-05
D=-0.6301472790-02 H= 0.3300867220-07

TIME	P	LN(P)
0.0789	25.0	-3.0764
0.0939	20.0	-3.2995
0.1139	15.0	-3.5872
0.1389	10.0	-3.9927

DATA FROM RUN # 324

TIME	P	LN(P)
0.0	545.0	0.0
0.0200	480.0	-0.1270
0.0300	440.0	-0.2140
0.0400	355.0	-0.3475
0.0500	325.0	-0.5170
0.0600	270.0	-0.7024
0.0800	192.0	-1.0433
0.1000	145.0	-1.3241
0.1200	105.0	-1.6463
0.1600	65.0	-1.8331

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$
A=-0.2179135310-02 F= 0.8353935550-04
B=-0.1448587130-01 F=-0.3470444060-05
C=-0.6149480830-02 G= 0.6121714670-07
D=-0.5725495040-03 H=-0.3948289130-09

TIME	P	LN(P)
0.2000	55.0	-2.1264
0.2200	55.0	-2.2935
0.2400	47.0	-2.4506
0.2500	45.0	-2.4941

DATA FROM RUN # 325

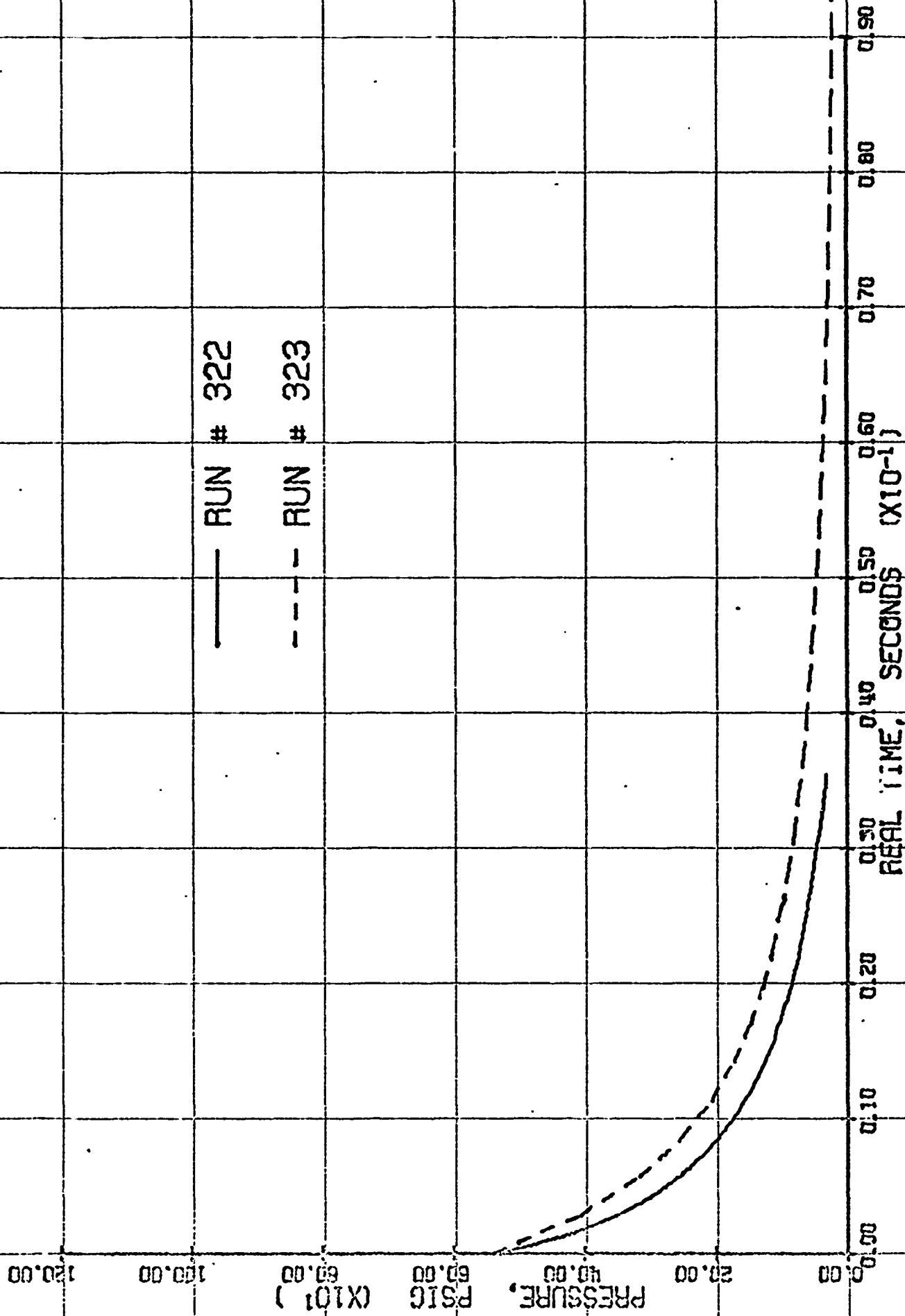
TIME	P	LN(P)
0.0	584.0	0.0
0.0024	443.0	-0.2526
0.0042	391.0	-0.3944
0.0061	339.0	-0.5438
0.0086	290.0	-0.6921
0.0111	242.0	-0.8354
0.0199	174.0	-1.1273
0.0239	145.0	-1.3622
0.0305	124.0	-1.5123

$T = (TIME * RREF ** 2) / ALPHA$
 $LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$
A=-0.1263557830-01 E=-0.6256556170-02
B=-0.6491130340 00 F= 0.7599225570-03
C= 0.7426220720-01 G=-0.3149740530-04
D= 0.1462273730-01

TIME	P	LN(P)
0.0300	102.0	-1.7295
0.0455	92.0	-1.8413
0.0530	82.0	-1.9557

— RUN # 322

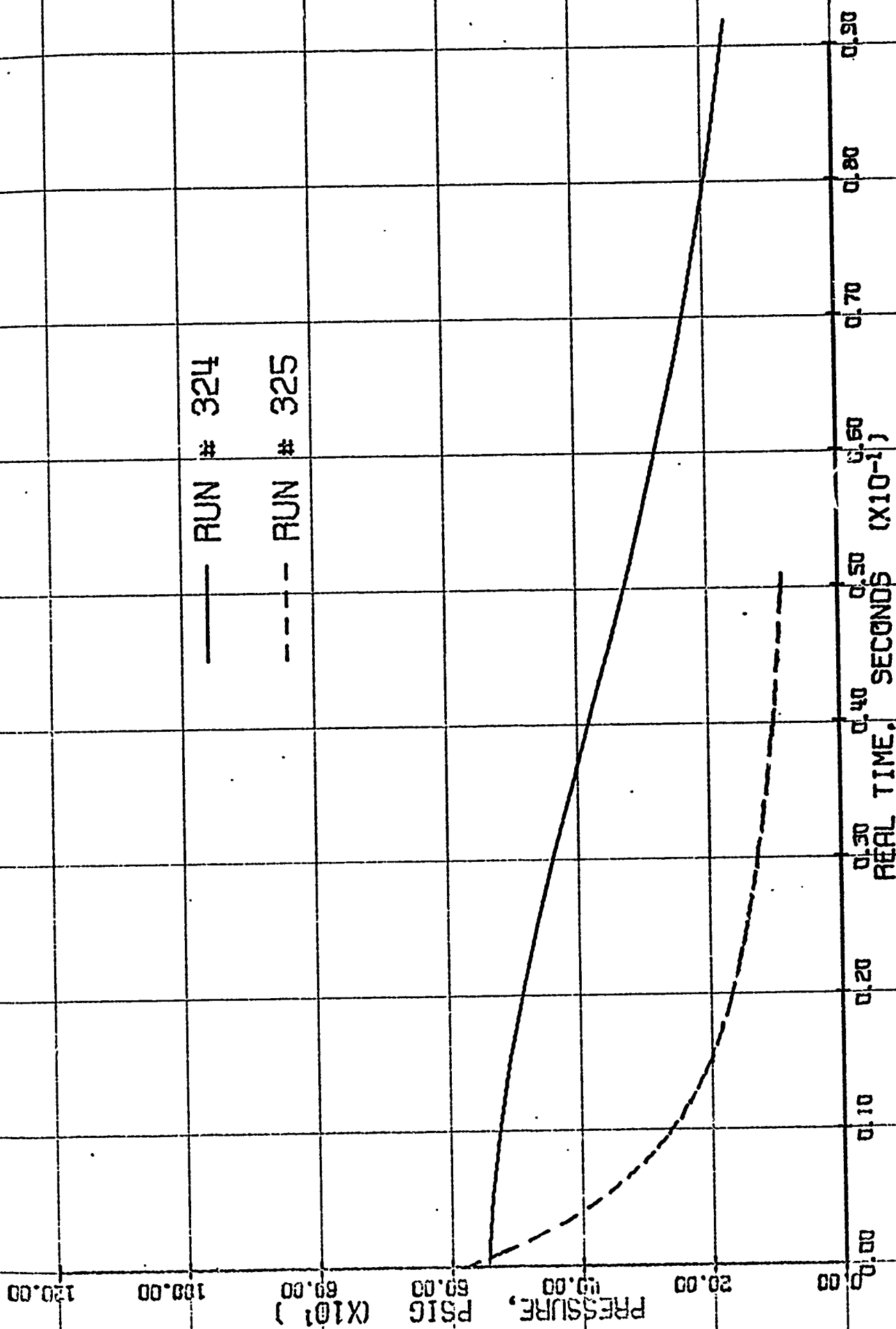
--- RUN # 323



PRESSURE VS TIME DATA FOR BATCH # 961

— RUN # 324

--- RUN # 325



PRESSURE VS TIME DATA FOR BATCH # 961

BATCH # 961 / 65.9% AD, 19.1% PRAA, 15.0% FINE AL

DATA FROM RUN # 326

TIME	P	LN(P)
0.0	653.0	0.0
0.0033	395.0	-0.5027
0.0088	240.0	-1.0009
0.0133	160.0	-1.4064
0.0183	110.0	-1.7811
0.0233	75.0	-2.1641
0.0283	55.0	-2.4742
0.0333	35.0	-2.9262
0.0383	25.0	-3.2235
0.0433	20.0	-3.4853

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.9336700350 - 02$ $E = 0.3369238840 - 00$
 $B = -0.1252175210 - 01$ $F = -0.7273600640 - 01$
 $C = 0.1059060210 - 01$ $G = 0.7864488870 - 02$
 $D = -0.8244983530 - 00$ $H = -0.3349492620 - 03$

TIME	P	LN(P)
0.0004	573.2	-0.1304
0.0022	474.5	-0.3193
0.0059	333.8	-0.6712
0.0091	268.5	-0.9889

DATA FROM RUN # 327

TIME	P	LN(P)
0.0	680.0	0.0
0.0013	550.0	-0.2122
0.0063	307.0	-0.7952
0.0113	200.0	-1.2233
0.0163	137.0	-1.6021
0.0213	95.0	-1.9462
0.0263	68.0	-2.3026
0.0313	53.0	-2.5513
0.0363	34.0	-2.9957
0.0413	32.0	-3.0564

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.3133240220 - 02$ $E = 0.1092839560 - 00$
 $B = -0.1055223010 - 01$ $F = -0.2233676150 - 01$
 $C = 0.4727243020 - 00$ $G = 0.2392311030 - 02$
 $D = -0.2376005090 - 00$ $H = -0.9745255470 - 04$

TIME	P	LN(P)
0.0463	30.0	-3.1209
0.0513	27.0	-3.2263
0.0021	499.1	-0.3392
0.0052	363.9	-0.6115

DATA FROM RUN # 328

TIME	P	LN(P)
0.0	743.0	0.0
0.0027	540.0	-0.3191
0.0077	355.0	-0.7385
0.0127	230.0	-1.0500
0.0227	153.0	-1.5303
0.0327	100.0	-2.0055
0.0427	70.0	-2.3622
0.0524	55.0	-2.5034
0.0627	43.0	-2.8495
0.0727	37.0	-2.9993

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.1234107150 - 01$ $E = 0.2672473360 - 02$
 $B = -0.7504425330 - 00$ $F = -0.1445998680 - 03$
 $C = 0.1532448650 - 00$ $G = 0.3859437970 - 05$
 $D = -0.2632970100 - 01$ $H = -0.3958947630 - 07$

TIME	P	LN(P)
0.0827	35.5	-3.0412
0.0927	34.0	-3.0243
0.1027	32.0	-3.1450
0.1127	30.0	-3.2095

DATA FROM RUN # 329

TIME	P	LN(P)
0.0	740.0	0.0
0.0017	560.0	-0.2787
0.0030	440.0	-0.5562
0.0030	430.0	-0.5420
0.0049	372.0	-0.5873
0.0054	355.0	-0.7345
0.0067	315.0	-0.8541
0.0104	223.0	-1.1935
0.0154	155.0	-1.5622
0.0204	103.0	-1.9527

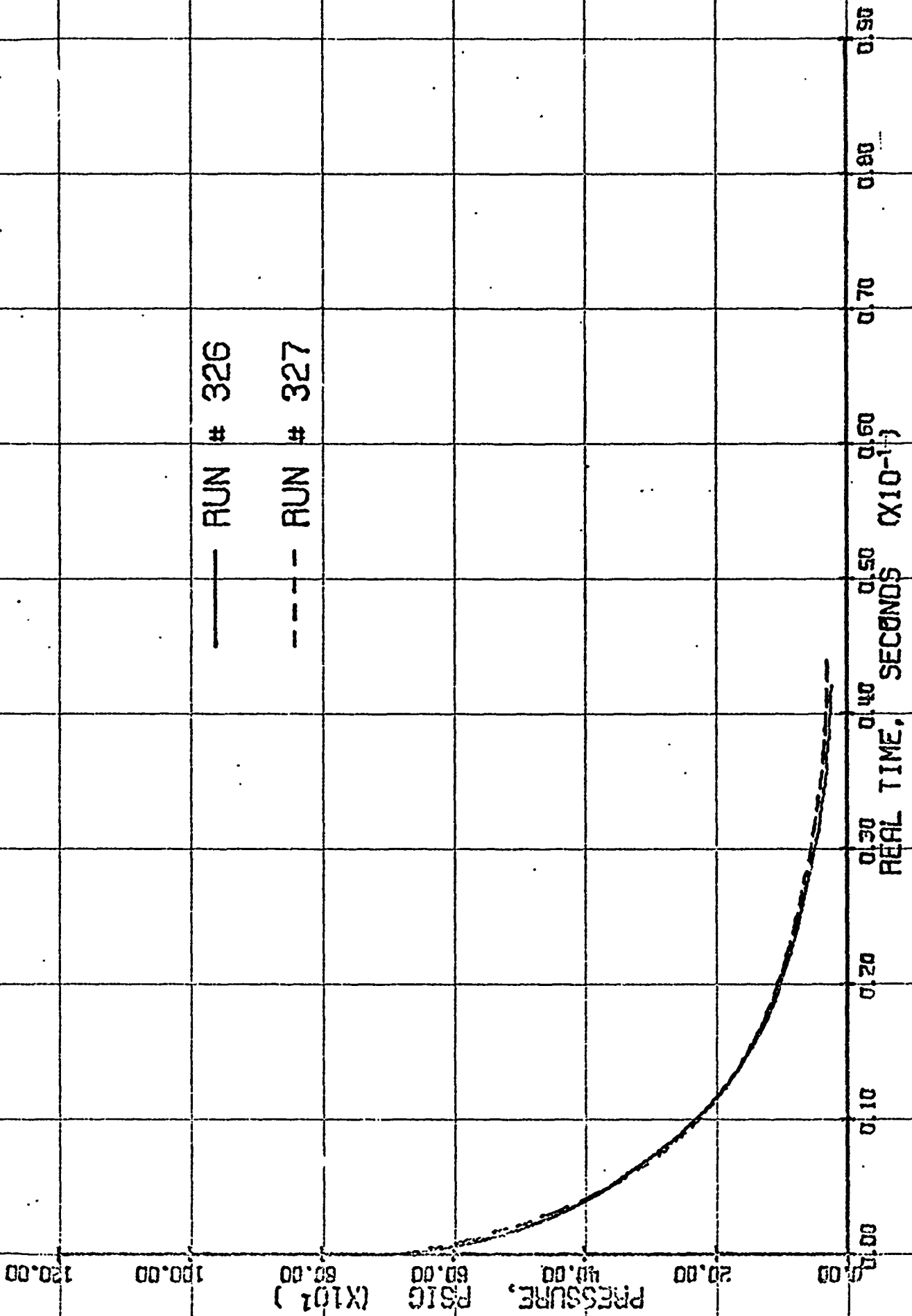
$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

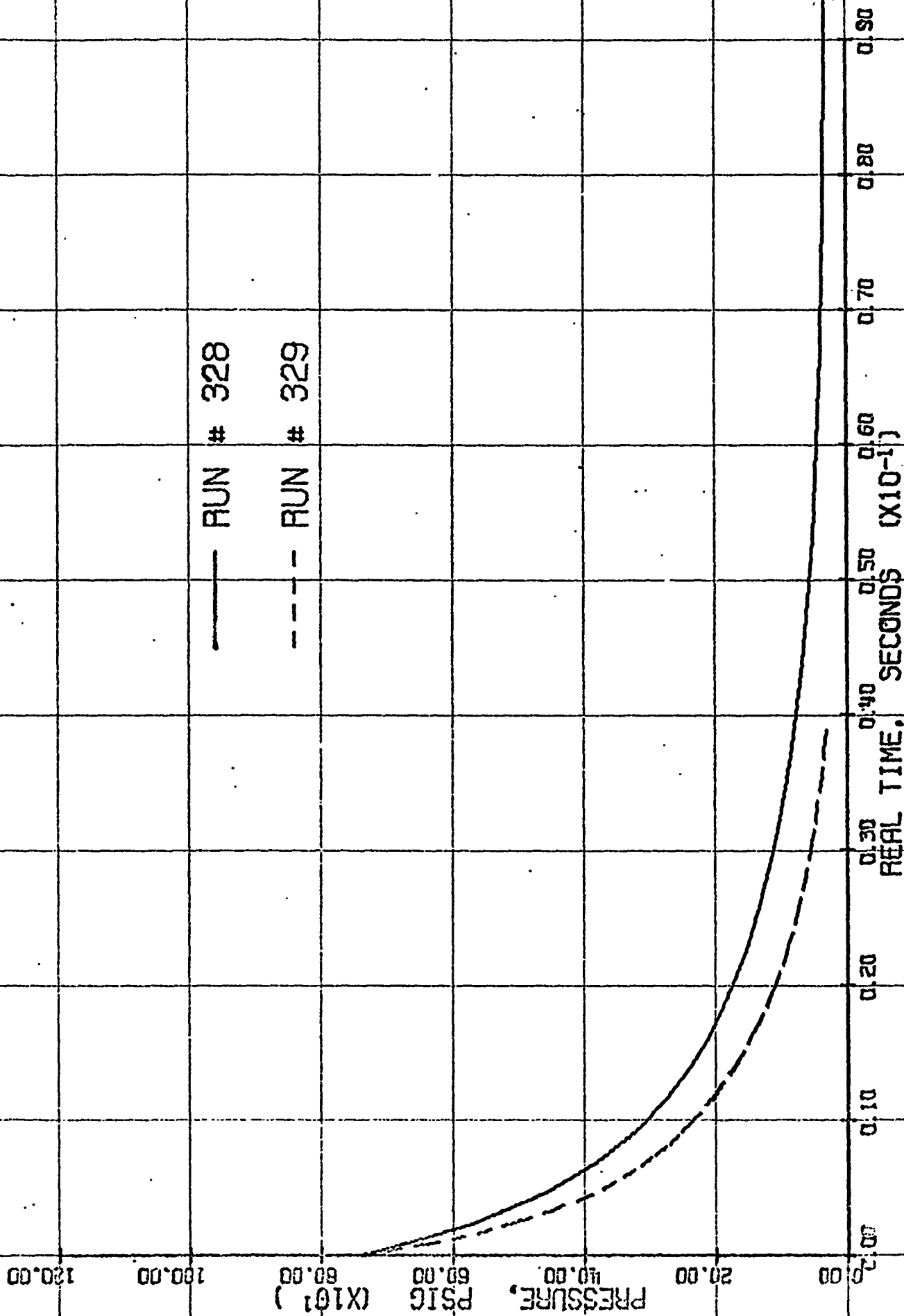
$A = -0.4783966160 - 03$ $E = -0.7251417540 - 02$
 $B = -0.1131117640 - 01$ $F = 0.9581482900 - 02$
 $C = 0.4345607200 - 00$ $G = -0.1753268950 - 02$
 $D = -0.1030107420 - 00$ $H = 0.1054099130 - 03$

TIME	P	LN(P)
0.0254	75.0	-2.2392
0.0304	64.0	-2.6177
0.0354	50.0	-2.9431
0.0404	32.0	-3.1409

— RUN # 326
--- RUN # 327



PRESSURE VS TIME DATA FOR BATCH # 961



PRESSURE VS TIME DATA FOR BATCH # 961

BATCH # 961 / 65.93 AP, 12.12 PBAA, 15.0% FINE AL

DATA FROM RJM # 331

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0	360.0	0.0
0.0004	345.0	-0.0426
0.0023	255.0	-0.3448
0.0054	170.0	-0.7503
0.0079	135.0	-0.9808
0.0104	105.0	-1.2321
0.0154	73.0	-1.5956
0.0204	47.0	-2.0360
0.0254	35.0	-2.3308

A=	0.1331700520-01	E=	0.3404645850-01
B=	-0.1164978130 01	F=	-0.4571532020-02
C=	0.4097011340 00	G=	0.2664957110-03
D=	-0.1477042840 00		

TIME	P	LN(P)
0.0304	23.0	-2.7506
0.0354	17.0	-3.0529
0.0404	15.0	-3.1781

DATA FROM RJM # 333

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0	305.0	0.0
0.0029	230.0	-0.2822
0.0053	175.0	-0.5555
0.0079	142.0	-0.7645
0.0129	105.0	-1.0664
0.0179	75.0	-1.4023
0.0229	60.0	-1.6260
0.0279	47.0	-1.8702
0.0304	37.0	-2.1094

A=	-0.2602244140-03	E=	-0.8595484350-01
B=	-0.5807698180 00	F=	0.1164671690-01
C=	-0.2637437050 00	G=	-0.5662949900-03
D=	0.2673881190 00		

TIME	P	LN(P)
0.0329	30.0	-2.3191
0.0379	27.0	-2.4245
0.0429	25.0	-2.5014

DATA FROM RJM # 334

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6$$

TIME	P	LN(P)
0.0	421.0	0.0
0.0023	345.0	-0.1991
0.0073	252.0	-0.5132
0.0128	135.0	-0.8223
0.0178	142.0	-1.0863
0.0228	115.0	-1.2977
0.0278	95.0	-1.4899
0.0328	80.0	-1.6606
0.0428	65.0	-1.8682

A=	-0.3236910530-02	E=	-0.2598481910-02
B=	-0.4395727370 00	F=	0.1981150700-03
C=	-0.1062877920-01	G=	-0.5791492910-05
D=	0.1532401690-01		

TIME	P	LN(P)
0.0528	55.0	-2.0353
0.0628	52.0	-2.0914
0.0728	50.0	-2.1306

DATA FROM RJM # 335

$$T = (TIME * RREF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

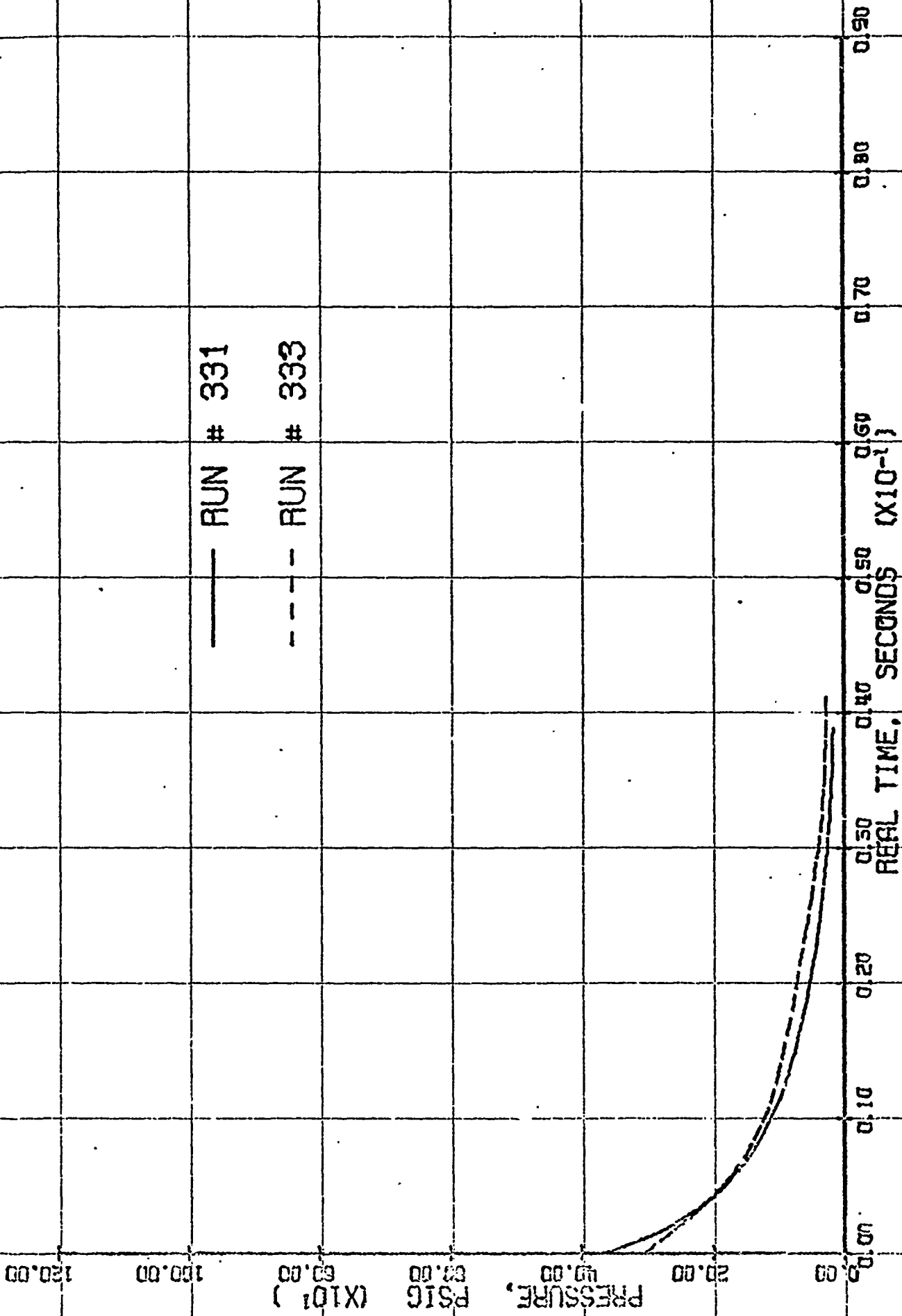
TIME	P	LN(P)
0.0	605.0	0.0
0.0077	450.0	-0.2560
0.0077	305.0	-0.5844
0.0127	225.0	-0.8691
0.0177	185.0	-1.1349
0.0227	155.0	-1.3614
0.0277	122.0	-1.5812
0.0327	102.0	-1.7703
0.0427	80.0	-2.0222
0.0527	72.0	-2.1236

A=	-0.2354007100-02	E=	0.3417632090-02
B=	-0.7393539460 00	F=	-0.7581131520-03
C=	0.2476221440 00	G=	0.3070180230-04
D=	-0.6323375930-01	H=	-0.4293563230-06

TIME	P	LN(P)
0.0627	60.0	-2.3107
0.0827	50.0	-2.4932
0.1027	45.0	-2.5936
0.1227	40.0	-2.7153

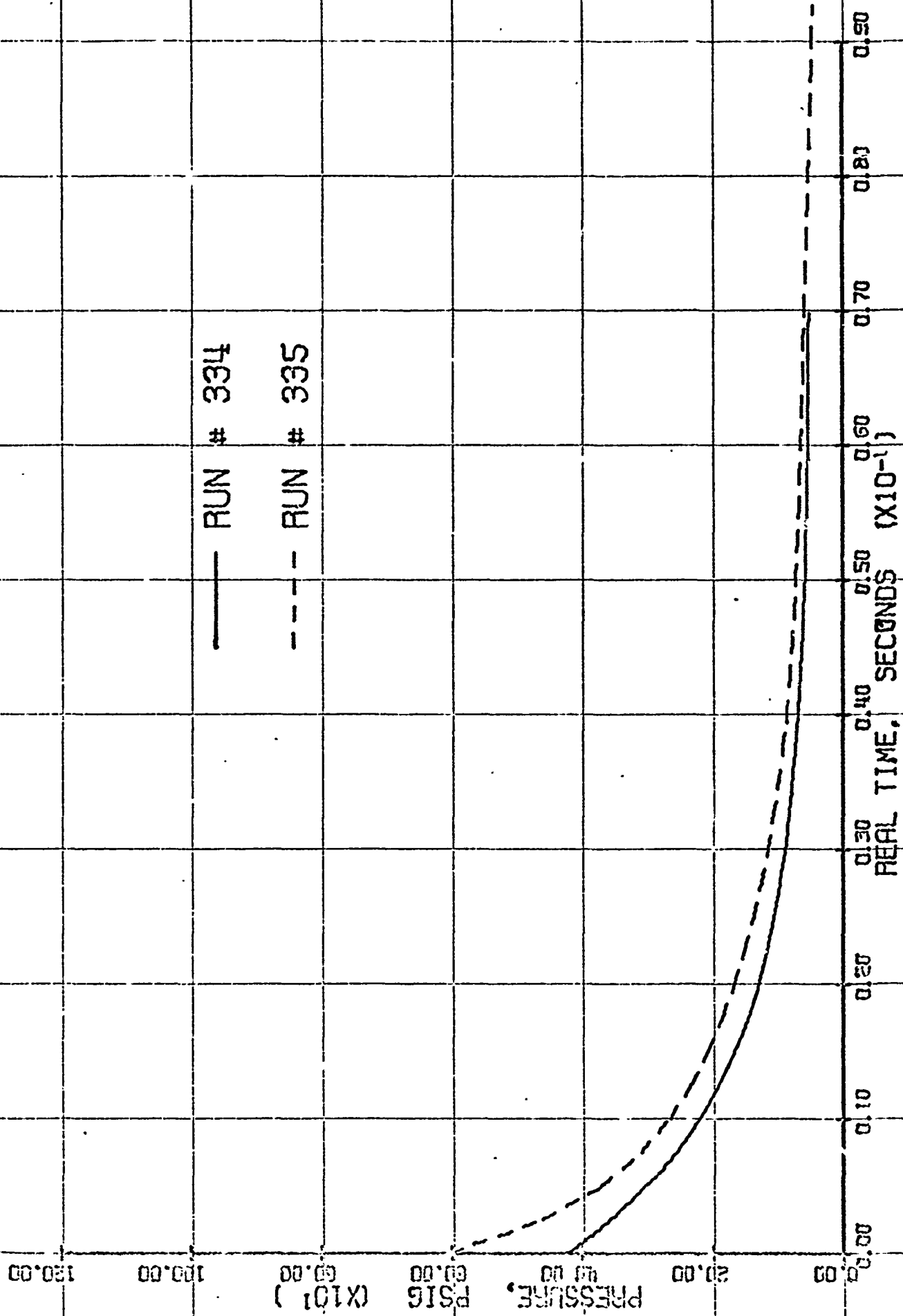
— RUN # 331

--- RUN # 333



PRESSURE VS TIME DATA FOR BATCH # 961

— RUN # 334
--- RUN # 335



PRESSURE VS TIME DATA FOR BATCH # 961

BATCH # 961 / 65.9% AP, 19.1% P3AA, 15.0% FINE AI

DATA FROM RUN # 336

TIME	P	LN(P)
0.0	633.0	0.0
0.0042	350.0	-0.5925
0.0092	215.0	-1.0798
0.0142	137.0	-1.5305
0.0191	90.0	-1.9507
0.0242	60.0	-2.3561
0.0292	40.0	-2.7616
0.0342	30.0	-3.0493
0.0392	27.0	-3.1546
0.044	25.0	-3.2316

$$T = (TIME * RPEF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.7778490310 - 02$ $E = 0.9413409050 - 01$
 $B = -0.9714449360 - 00$ $F = -0.2388189340 - 01$
 $C = 0.3228511740 - 00$ $G = 0.3029510080 - 02$
 $D = -0.2090132690 - 00$ $H = -0.1478576790 - 03$

TIME	P	LN(P)
0.0003	574.8	-0.0965
0.0033	414.7	-0.4229
0.0046	360.9	-0.5619
0.0058	320.1	-0.6917

DATA FROM RUN # 337

TIME	P	LN(P)
0.0	720.0	0.0
0.0024	443.0	-0.3992
0.0074	247.0	-0.9920
0.0124	170.0	-1.4435
0.0174	117.0	-1.8171
0.0224	83.0	-2.1504
0.0274	60.0	-2.4849
0.0324	43.0	-2.8181
0.0374	33.0	-3.0827
0.0424	27.0	-3.2834

$$T = (TIME * RPEF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.3798350300 - 02$ $E = -0.5837274980 - 01$
 $B = -0.9492240050 - 00$ $F = 0.9930659770 - 02$
 $C = -0.3506143430 - 01$ $G = -0.7767255170 - 03$
 $D = 0.1438823080 - 00$ $H = 0.2248727940 - 04$

TIME	P	LN(P)
0.0007	651.8	-0.0343
0.0013	596.4	-0.1384
0.0020	523.6	-0.3135
0.0051	363.6	-0.6831

DATA FROM RUN # 338

TIME	P	LN(P)
0.0	600.0	0.0
0.0005	560.0	-0.0239
0.0055	340.0	-0.5530
0.0105	220.0	-0.9576
0.0155	165.0	-1.2910
0.0205	130.0	-1.5294
0.0255	107.0	-1.7241
0.0305	85.0	-1.9543
0.0405	67.0	-2.1322
0.0505	60.0	-2.3026

$$T = (TIME * RPEF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.1334563460 - 01$ $E = 0.4384209630 - 02$
 $B = -0.8165219470 - 00$ $F = -0.3058605510 - 03$
 $C = 0.1727210330 - 00$ $G = 0.9458453540 - 05$
 $D = -0.3343204060 - 01$ $H = -0.8167277160 - 07$

TIME	P	LN(P)
0.0505	55.0	-2.3196
0.0705	52.0	-2.4457
0.0805	45.0	-2.5903
0.1005	42.0	-2.5593

DATA FROM RUN # 339

TIME	P	LN(P)
0.0	750.0	0.0
0.0022	440.0	-0.4462
0.0072	255.0	-1.0708
0.0122	133.0	-1.5380
0.0172	85.0	-2.0632
0.0222	60.0	-2.4785
0.0272	41.0	-2.8065
0.0322	25.0	-3.4012
0.0372	172.0	-0.1111
0.0422	653.0	-0.3090

$$T = (TIME * RPEF ** 2) / ALPHA$$

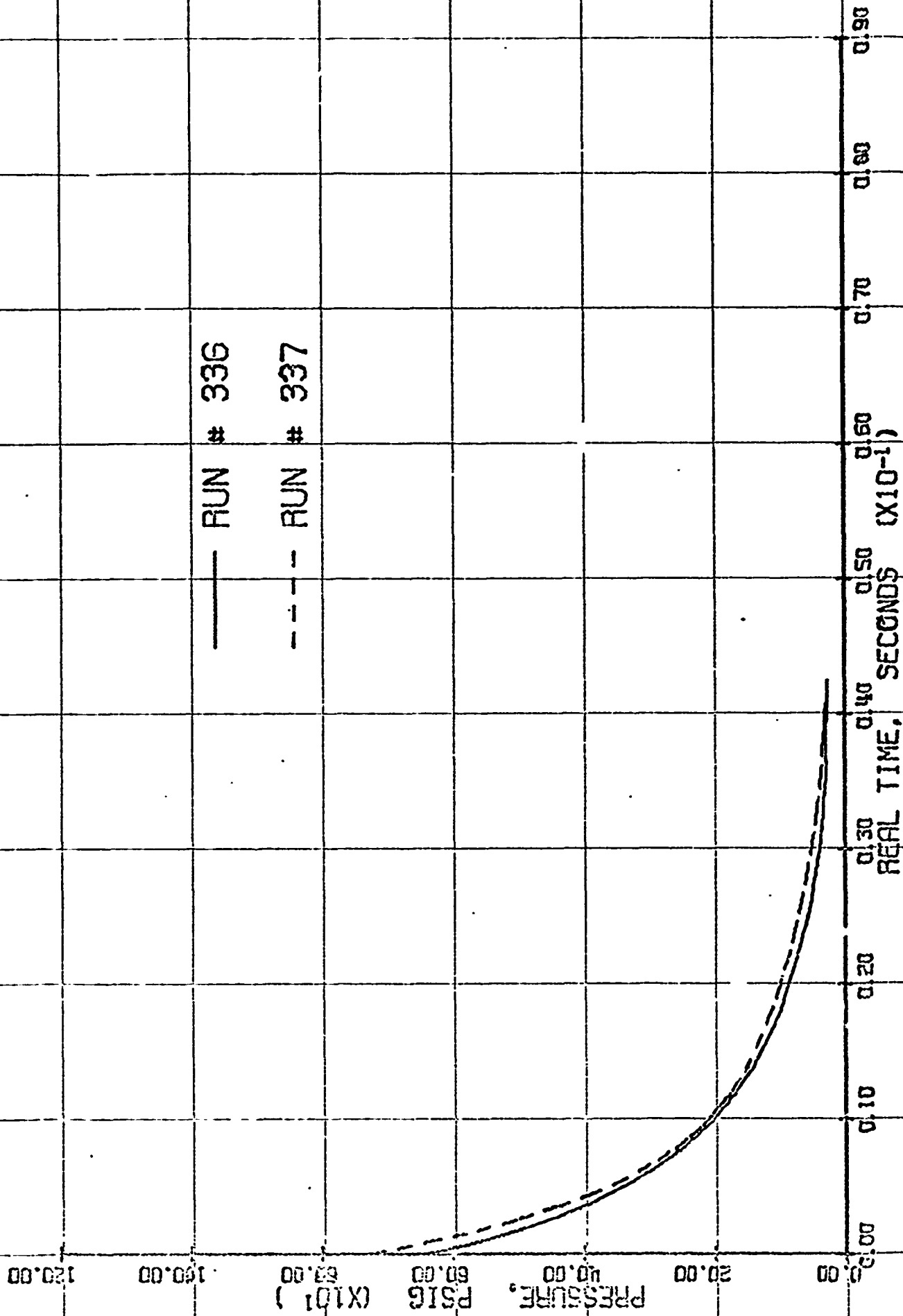
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.5817990250 - 02$ $E = 0.4196340760 - 00$
 $B = -0.1205015000 - 01$ $F = -0.1139205450 - 00$
 $C = 0.8152740500 - 00$ $G = 0.1536243440 - 01$
 $D = -0.7975627950 - 00$ $H = -0.8126083630 - 03$

TIME	P	LN(P)
0.0032	473.3	-0.4603
0.0045	407.0	-0.5034
0.0057	340.1	-0.7435
0.0075	284.0	-0.9712

— RUN # 336

--- RUN # 337



PRESSURE VS TIME DATA FOR BATCH # 961

— RUN # 338
--- RUN # 339

PRESSURE, PSIG (X10¹)

REAL TIME, SECONDS (X10⁻¹)

PRESSURE VS TIME DATA FOR BATCH # 961

0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00

0.30 0.40 0.50 0.60 0.70 0.80 0.90

BATCH / 951 / 65.83 AP, 19.15 PBAA, 15.05 FINE AL

DATA FROM RUN # 340

TIME	P	LN(P)
0.0	945.0	0.0
0.0030	665.0	-0.3514
0.0080	412.0	-0.8302
0.0130	270.0	-1.1813
0.0180	208.0	-1.5136
0.0230	155.0	-1.8078
0.0280	113.0	-2.0305
0.0330	93.0	-2.2562
0.0380	85.0	-2.4035
0.0480	72.0	-2.5745

$$T = (TIME * P * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.5219090900 - 02$ $E = 0.6716363520 - 02$
 $B = -0.8172935730 - 00$ $F = -0.5837114030 - 03$
 $C = 0.1672947030 - 00$ $G = 0.2430060370 - 04$
 $D = -0.4052415140 - 01$ $H = -0.3822163060 - 05$

TIME	P	LN(P)
0.0580	65.0	-2.6748
0.0780	55.0	-2.8439
0.1080	50.0	-2.9392
0.1480	45.0	-3.0445

DATA FROM RUN # 341

TIME	P	LN(P)
0.0	757.0	0.0
0.0020	560.0	-0.3014
0.0070	315.0	-0.8768
0.0120	193.0	-1.3667
0.0170	125.0	-1.8010
0.0220	90.0	-2.2473
0.0270	60.0	-2.5350
0.0320	47.0	-2.7792
0.0370	35.0	-3.0740
0.0390	30.0	-3.2282

$$T = (TIME * P * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = -0.1060832360 - 02$ $E = -0.1134953540 - 00$
 $B = -0.9907033990 - 00$ $F = 0.3654782730 - 01$
 $C = 0.1037917500 - 00$ $G = -0.4961377670 - 02$
 $D = 0.1399924660 - 00$ $H = 0.2485157330 - 03$

TIME	P	LN(P)
0.0420	25.0	-3.4105
0.0007	684.2	-0.1011
0.0013	623.1	-0.1947
0.0032	487.7	-0.4397

DATA FROM RUN # 342

TIME	P	LN(P)
0.0	340.0	0.0
0.0024	420.0	-0.4212
0.0074	270.0	-1.0234
0.0124	140.0	-1.5193
0.0174	93.0	-1.9293
0.0224	60.0	-2.3671
0.0274	51.0	-2.5275
0.0324	23.0	-3.2260
0.0374	21.0	-3.4149
0.0424	20.0	-3.4657

$$T = (TIME * P * REF ** 2) / ALPHA$$

$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.2526945340 - 01$ $E = 0.8541617260 - 00$
 $B = -0.1522977400 - 01$ $F = -0.2104725320 - 00$
 $C = 0.1806873100 - 01$ $G = 0.2522139510 - 01$
 $D = -0.1755550330 - 01$ $H = -0.1156934060 - 02$

TIME	P	LN(P)
0.0000	552.7	-0.1464
0.0015	501.3	-0.2422
0.0021	450.9	-0.3502
0.0034	355.5	-0.5070

DATA FROM RUN # 343

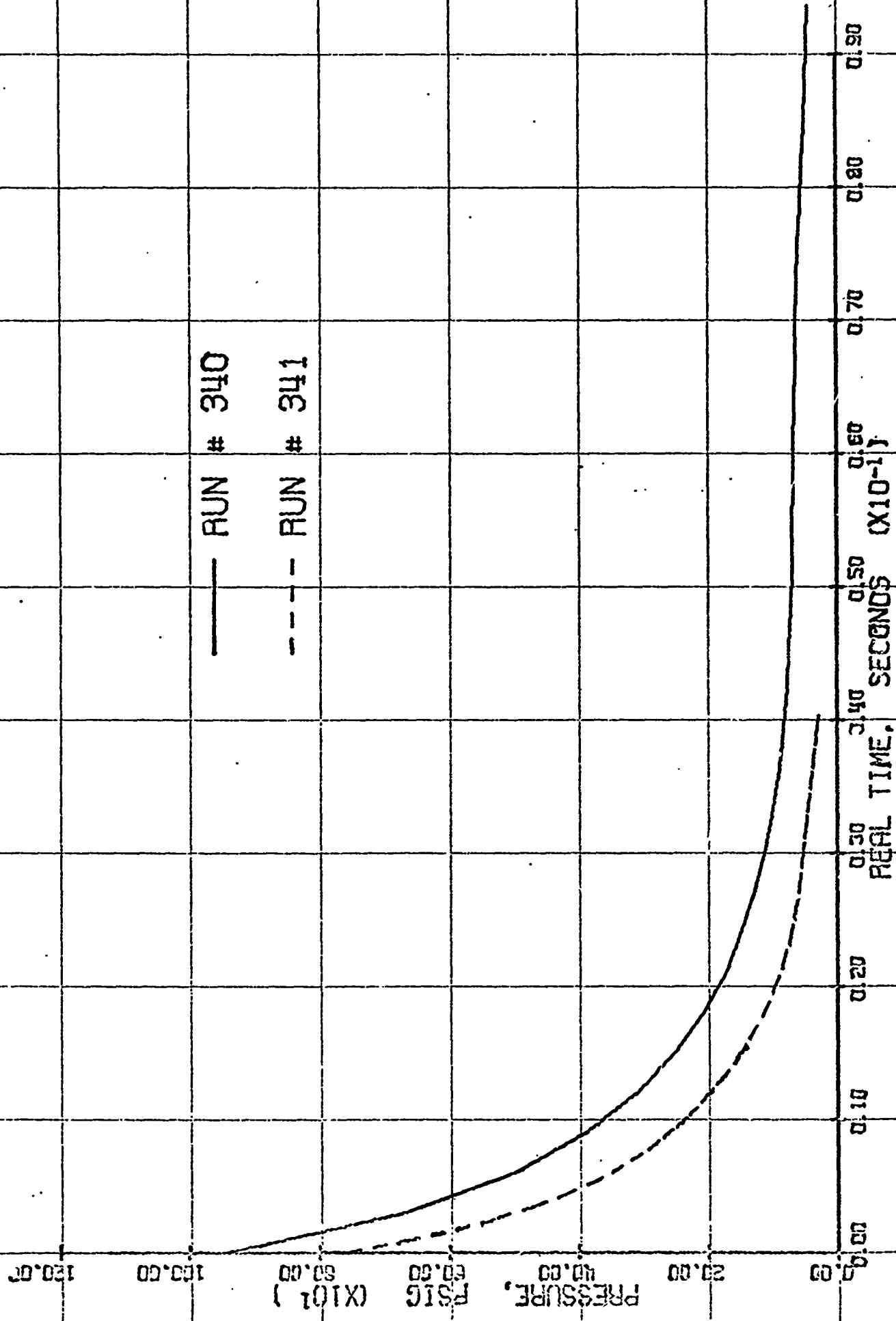
TIME	P	LN(P)
0.0	1053.0	0.0
0.0022	750.0	-0.3448
0.0072	405.0	-0.8450
0.0122	247.0	-1.4095
0.0172	173.0	-1.7741
0.0222	113.0	-2.2209
0.0272	80.0	-2.5250
0.0322	55.0	-2.8425
0.0372	40.0	-3.2140
0.0422	35.0	-3.4500

$$T = (TIME * P * REF ** 2) / ALPHA$$

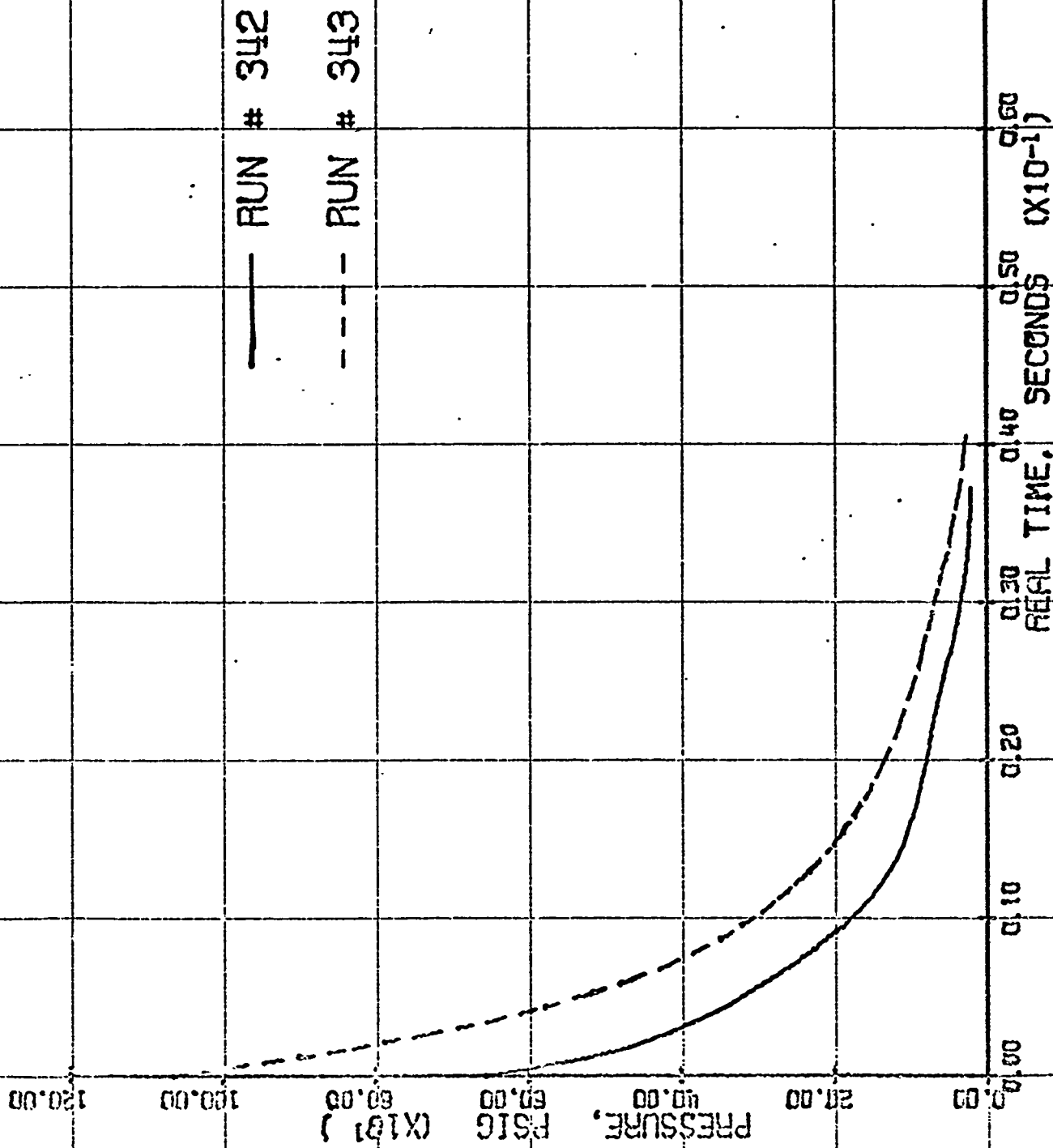
$$LN(P) = A + B * T + C * T ** 2 + D * T ** 3 + E * T ** 4 + F * T ** 5 + G * T ** 6 + H * T ** 7$$

$A = 0.2051959470 - 02$ $E = -0.1275099520 - 00$
 $B = -0.9539359750 - 00$ $F = 0.3341961340 - 01$
 $C = -0.7311379690 - 01$ $G = -0.4322333850 - 02$
 $D = 0.2351159500 - 00$ $H = 0.2131973250 - 03$

TIME	P	LN(P)
0.0000	951.1	-0.1000
0.0014	859.1	-0.2120
0.0027	725.2	-0.3824
0.0040	618.0	-0.5410



PRESSURE VS TIME DATA FOR BATCH # 961



PRESSURE VS TIME DATA FOR BATCH # 961

BATCH # 961 / 55.9% AP, 19.1% PSAA, 15.0% FINE AL

DATA FROM RUN # 344

TIME	P	LN(P)
0.0	1048.0	0.0
0.0015	992.0	-0.0549
0.0052	665.0	-0.4549
0.0102	432.0	-0.8862
0.0152	303.0	-1.2409
0.0202	220.0	-1.5010
0.0252	170.0	-1.8103
0.0302	132.0	-2.0718
0.0452	103.0	-2.2725
0.0502	90.0	-2.4548

$T = (TIME * RREF**2) / ALPHA$
 $LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$
 $A = 0.1555402940-01$ $E = -0.1426104690-01$
 $B = -0.4354268370-00$ $F = 0.1134865140-02$
 $C = -0.1896775520-00$ $G = -0.4361605030-04$
 $D = 0.8672683020-01$ $H = 0.6469016360-06$

TIME	P	LN(P)
0.0602	63.0	-2.7351
0.0802	50.0	-3.0426
0.1102	45.0	-3.1480
0.1402	40.0	-3.2653

DATA FROM RUN # 345

TIME	P	LN(P)
0.0	372.0	0.0
0.0010	315.0	-0.1663
0.0020	275.0	-0.3021
0.0049	195.0	-0.6450
0.0070	180.0	-0.8437
0.0120	107.0	-1.2461
0.0170	75.0	-1.6014
0.0220	54.0	-1.9299
0.0250	45.0	-2.1122

$T = (TIME * RREF**2) / ALPHA$
 $LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6$
 $A = -0.3125485780-02$ $E = 0.4207457270-01$
 $B = -0.1089270830-01$ $F = -0.5311235990-02$
 $C = 0.4249959570-06$ $G = 0.4030839120-03$
 $D = -0.1653943910-00$

TIME	P	LN(P)
0.0270	37.0	-2.3080
0.0320	27.0	-2.6231
0.0370	22.0	-2.8279

DATA FROM RUN # 346

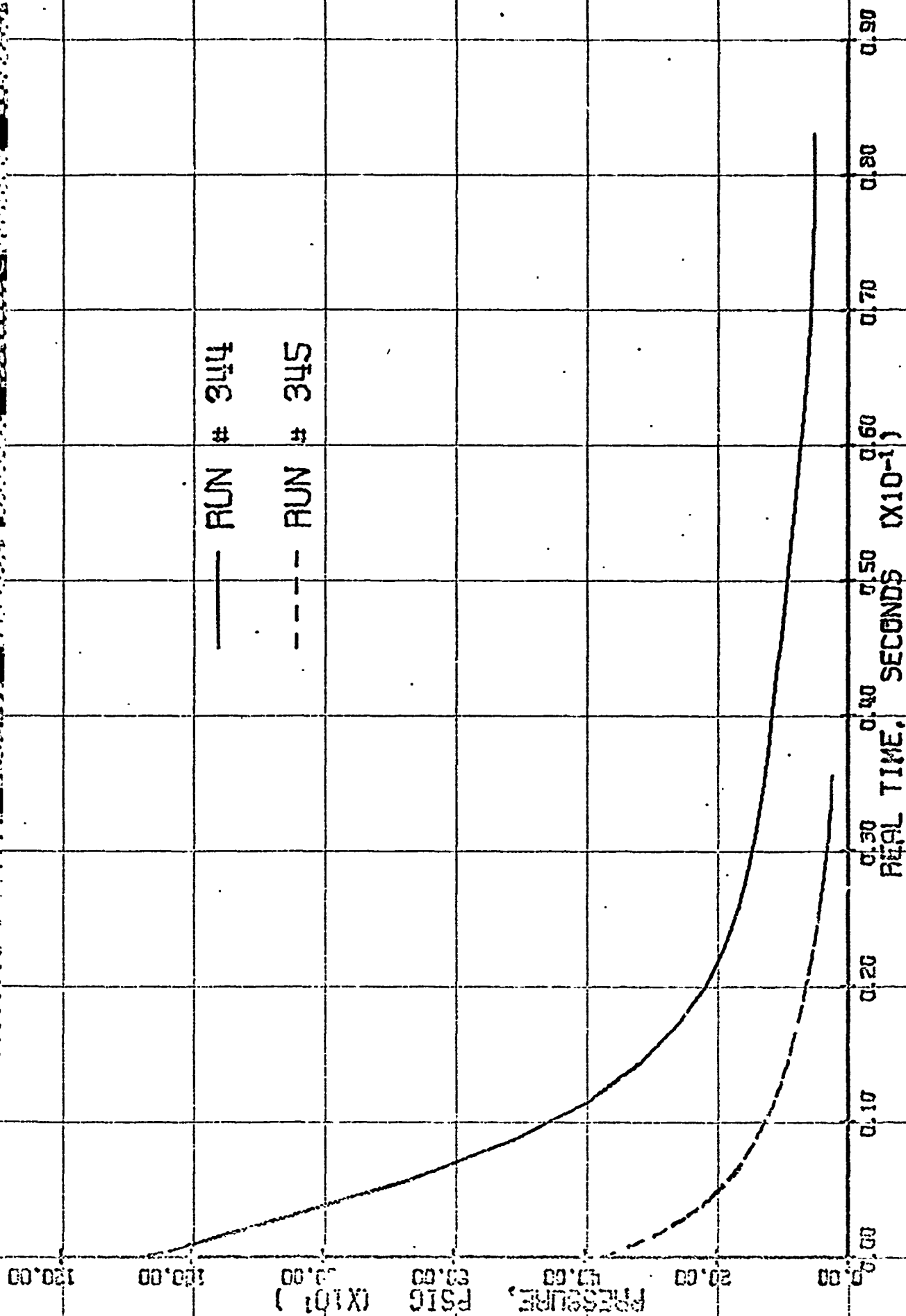
TIME	P	LN(P)
0.0	305.0	0.0
0.0020	230.0	-0.2222
0.0051	195.0	-0.4422
0.0079	160.0	-0.6451
0.0129	123.0	-0.9031
0.0179	95.0	-1.1664
0.0229	70.0	-1.3383
0.0279	70.0	-1.4713
0.0379	55.0	-1.7130
0.0479	45.0	-1.8917

$T = (TIME * RREF**2) / ALPHA$
 $LN(P) = A + B*T + C*T**2 + D*T**3 + E*T**4 + F*T**5 + G*T**6 + H*T**7$
 $A = -0.5995138820-02$ $E = -0.3721441520-02$
 $B = -0.6343037930-00$ $F = 0.6150375480-03$
 $C = 0.3895048310-01$ $G = -0.4172329730-04$
 $D = 0.2587972110-02$ $H = 0.1031047990-05$

TIME	P	LN(P)
0.0579	43.0	-1.9591
0.0679	41.0	-2.0067
0.0779	37.0	-2.1094
0.0879	35.0	-2.1550

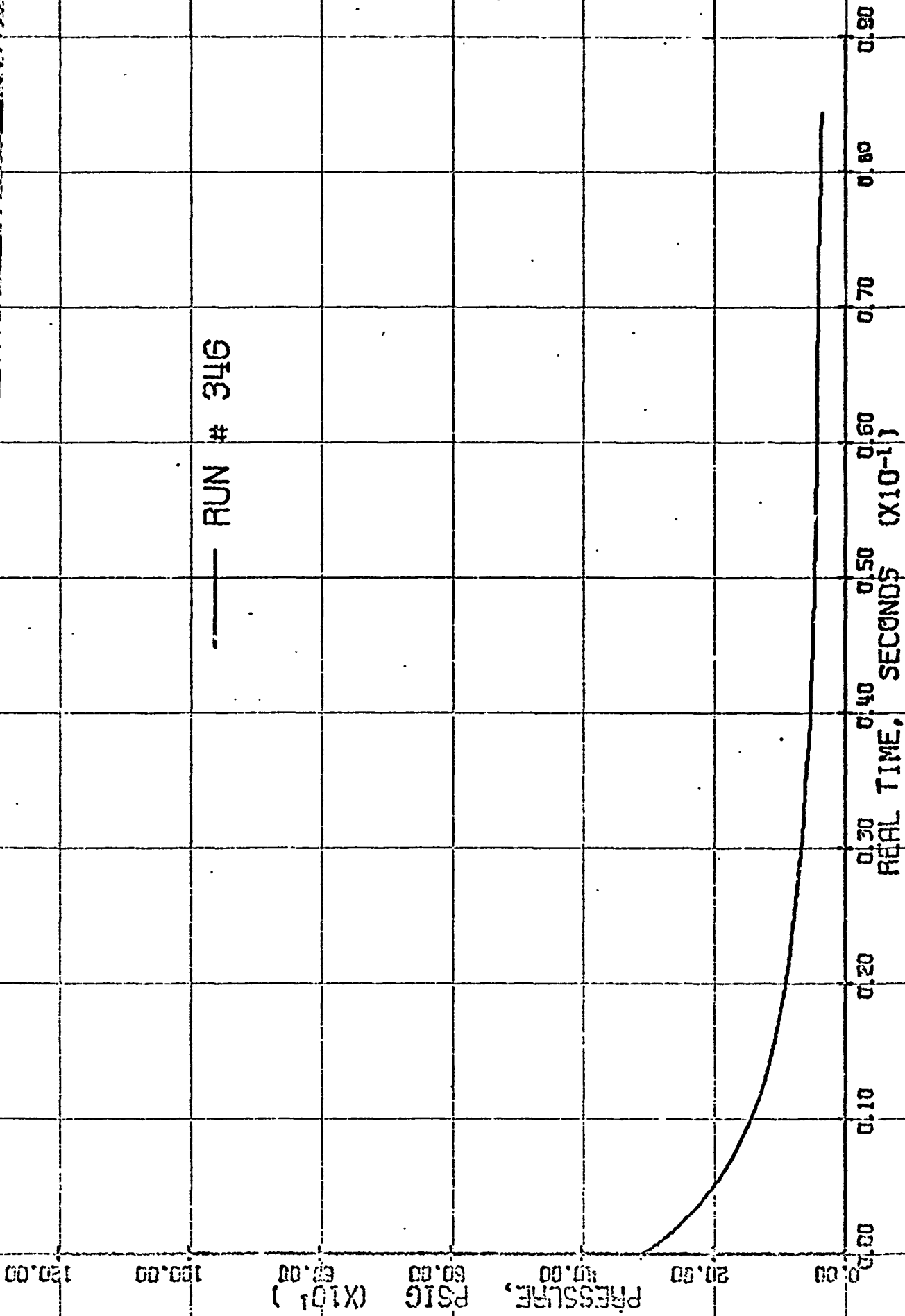
NOT REPRODUCIBLE

— RUN # 344
--- RUN # 345



PRESSURE VS TIME DATA FOR BATCH # 961

— RUN # 346



PRESSURE VS TIME DATA FOR BATCH # 961

C. Table of Initial Pressure, Initial Depressurization Rate, and
Whether or Not the Experimental Run Extinguished

BATCH #944

Run No.	p_o (psia)	$(dp/dt)_o$ (psia/sec)	Extinguished	Run No.	p_o (psia)	$(dp/dt)_o$ (psia/sec)	Extinguished
119	1110	180,000	No	133	430	76,000	No
120	1105	232,000	No	134	665	121,500	Yes
121	1105	301,000	Yes	135	395	62,500	No
122	820	253,000	Yes	136	340	59,000	Yes
123	990	276,000	Yes	137	950	176,000	No
124	920	276,000	Yes	138	1105	277,000	Yes
125	895	210,000	Yes	139	835	152,000	No
126	930	248,000	Yes	140	660	127,000	No
127	900	196,000	Yes	141	665	115,500	Yes
128	940	155,000	No	142	520	93,500	No
129	895	233,000	No	143	405	67,500	Yes
130	950	230,000	Yes	145	855	175,000	No
131	565	103,500	No	146	610	115,000	No
132	450	94,500	Yes	147	875	171,000	Yes

BATCH #941

87	650	70,000	Yes	104	560	77,000	No
88	535	62,500	No	105	710	132,000	Yes
89	715	121,000	Yes	106	735	120,000	No
90	430	67,000	Yes	107	765	113,500	No
91	690	140,000	Yes	108	865	186,000	Yes
92	430	71,500	Yes	109	905	147,500	No
93	475	130,500	Yes	110	1070	187,000	No
94	515	70,000	No	111	1085	190,000	Yes
97	435	57,500	No	112	1080	210,000	Yes
98	935	130,500	No	113	815	174,000	Yes
99	560	60,000	No	114	885	144,000	No
100	465	59,000	No	115	510	74,000	No
101	470	74,500	Yes	116	1155	178,000	No
102	490	87,500	Yes	117	810	109,500	No
103	460	59,000	No	118	570	74,000	No

BATCH #945

Run No.	P_0 (psia)	$(dp/dt)_0$ (psia/sec)	Extinguished	Run No.	P_0 (psia)	$(dp/dt)_0$ (psia/sec)	Extinguished
148	875	135,500	Yes	167	715	82,000	No
149	775	95,500	No	168	665	80,000	No
150	755	82,000	Yes	169	555	54,500	No
151	690	71,000	No	170	560	56,000	No
153	1100	152,000	Yes	171	620	64,500	No
154	880	108,500	Yes	172	720	72,500	No
155	670	65,000	No	173	195	7,500	No
156	755	76,000	No	174	355	32,250	No
157	630	82,000	Yes	175	225	24,600	No
158	550	72,000	Yes	176	300	20,800	No
159	500	45,500	No	177	400	51,175	Yes
160	455	30,500	No	178	655	96,500	Yes
163	550	70,000	Yes	179	790	77,500	No
165	520	72,000	Yes	180	770	85,500	No
166	520	56,000	No	181	680	64,500	No

BATCH #949

182	660	79,000	Yes	197	505	75,500	Yes
183	785	62,500	No	199	640	73,000	Yes
184	670	52,500	No	200	620	64,500	No
185	695	46,000	No	201	495	67,750	Yes
186	740	52,000	No	202	560	58,000	Yes
187	690	96,000	Yes	203	335	27,000	No
188	630	64,000	No	204	335	39,500	Yes
189	680	95,500	Yes	205	380	47,500	Yes
190	515	38,000	No	206	375	28,300	No
191	340	22,125	No	207	91	102,000	Yes
192	320	25,830	No	208	885	96,000	Yes
193	320	36,750	Yes	209	685	74,000	No
196	425	27,375	No				

BATCH #951

212	750	74,000	No	222	715	184,000	Yes
213	630	86,500	No	224	615	105,500	Yes
214	700	100,000	No	225	930	104,500	No
215	575	109,000	Yes	227	490	71,500	No
216	480	69,000	No	228	515	117,700	Yes
218	570	83,500	Yes	230	515	90,500	No
219	1060	159,000	No	231	765	186,800	Yes
219A	950	150,700	No	232	955	168,800	No
220	915	179,500	No	233	720	127,000	No
221	920	215,500	Yes	234	345	54,750	Yes

BATCH #955

Run No.	P _o (psia)	(dp/dt) _o (psia/sec)	Extinguished	Run No.	P _o (psia)	(dp/dt) _o (psia/sec)	Extinguished
235	755	128,200	Yes	249	660	51,750	Yes
236	845	87,500	Yes	250	730	64,500	Yes
237	930	84,000	Yes	251	535	40,500	Yes
238	1020	91,000	No	252	400	26,800	Yes
239	930	71,600	Yes	253	300	18,000	No
240	1025	105,200	Yes	255	295	17,900	Yes
241	435	32,000	Yes	257	315	15,300	Yes
242	595	39,000	No	258	990	59,400	Yes
243	440	25,800	No	259	910	39,750	Yes
245	520	36,000	No	260	1055	37,170	No
246	830	82,500	Yes	261	510	17,100	No
247	965	76,500	No	263	470	16,100	No
248	760	48,500	No				

BATCH #966

367	545	88,000	Yes	379	685	131,000	Yes
368	535	63,500	No	382	1075	197,300	Yes
369	395	43,200	No	383	825	117,000	No
370	435	66,500	Yes	384	865	138,500	Yes
372	680	91,500	No	385	1025	119,500	No
373	645	92,000	Yes	386	1050	124,500	No
375	630	87,500	No	387	500	71,000	Yes
376	650	81,500	No	388	400	54,000	Yes

BATCH #970

399	880	137,000	No	411	575	92,500	No
400	845	120,500	No	412	600	95,200	Yes
402	835	121,500	No	413	590	89,000	No
403	440	80,500	Yes	414	690	145,800	Yes
404	445	64,500	Yes	416	985	175,000	Yes
405	430	65,000	Yes	417	955	159,000	Yes
406	560	61,750	No	418	985	233,000	Yes
407	460	52,000	No	419	725	108,500	Yes
408	450	45,000	No	421	725	106,500	No
409	460	64,000	Yes	423	550	78,200	Yes

BATCH #961

322	550	86,000	Yes	336	655	103,500	Yes
323	555	69,500	No	337	740	116,700	Yes
324	610	No Break	No	338	615	72,000	No
325	585	45,200	No	339	770	125,200	Yes
326	675	111,500	Yes	340	960	123,500	No
327	690	125,000	Yes	341	775	120,500	Yes
328	765	106,000	No	342	660	120,500	Yes
329	760	114,700	Yes	343	1085	162,800	Yes
331	380	59,000	Yes	344	1065	129,500	No
333	325	29,100	Yes	345	390	54,000	Yes
334	435	28,250	No	346	325	32,500	No
335	620	73,500	No				

SECTION II

PROGRAM TO CALCULATE CONSTANTS IN THE CHARACTERISTIC TIME EQUATIONS FOR THE CHEMICAL AND DIFFUSIONAL PROCESSES

A. Description

This program, entitled ABDETRMN, solves Equations 53-57 in Section IV - C of AMS Report No. 880. The program uses the method described on pages 37 and 38 of the report to determine the proper values of the constants 'A' and 'B' in Equations 35 and 36. The input is comprised of the physical properties of the propellant in question and the table of steady state burning rate versus pressure data for that propellant. Provision is made for inputting the adiabatic flame temperature as a function of pressure, although for several of the propellants considered in this report the flame temperatures were nearly constant in the regions of concern, i.e., from one to seventy atmospheres. It is important to note that these constants 'A' and 'B' do not represent the intercept and slope terms in the burning rate law

$$\frac{P}{R} = a' + b' P^{2/3}$$

i.e., they may not be determined by plotting the steady state burning rate versus pressure data on P/R versus $P^{2/3}$ coordinates and drawing a straight line through the points. The output includes, in addition to 'A' and 'B', calculations of the surface temperature, the temperature gradient in the gaseous phase, $P^{2/3}$, P/R , the square roots of the characteristic times for the chemically and diffusion controlled processes, and the steady state burning rate all in non-dimensional form and all as a function of decreasing non-dimensional pressure. This data is presented to facilitate a check of the 'A' and 'B' constants with the granular diffusion flame theory. If the calculated steady state burning rate, RSS^* , corresponding to $P = 1.000$ is not within a half of one percent of 1.000, RO^* must be changed slightly until this condition is met.

* See Section II-D

•

66

```

IF (PDIM(I) .GT. 200.) GO TO 602
TFMIN = TF100
PMIN = P100
DTDP = (TF300 - TF100)/(P300 - P100)
IF (PDIM(I) .GT. 100.) GO TO 602
TFMIN = TF000
PMIN = P000
DTDP = (TF100 - TF000)/(P100 - P000)
602 TFO = TFMIN + (PDIM(I) - PMIN)*DTDP
799 TFOIM(I) = TFO

```

C

C

```

      CALCULATION OF NON-DIMENSIONAL SURFACE HEAT RELEASE
HI = AP*750./(.333*(TSO-TINF))
HS = (AP*495. + FUEL*225. + AL*53.)/(.333*(TSO - TINF))
H = HI - HS
HAL = H
TFO = TF1000
HSN = (AP*495. + FUEL*225. )/(.333*(TSO - TINF))
HNOVAL = HI - HSN
ALMFLT = .033./TSO
THEFO = (TFO - TINF)/(TSO - TINF)
Q = (TFO - TINF)/(TSO - TINF) - H
KOUNT = 0
RG1 = 0.
PSSI = 0.

```

773 CONTINUE

C

```

      NON-DIMENSIONALIZE INPUT DATA

```

```

DO 774 I=1,N
R(I) = RDIM(I)/P0
P(I) = PDIM(I)/P0
TFRED(I) = TFOIM(I)/TFO
TSRED(I) = 1./(1. - (RGAS*TSO/ESURF)*ALTG(P(I)))
TS = TSRED(I)*TSO
THEIS(I) = (TS - TINF)/(TSO - TINF)
P23 = P(I)*.8(2./3.)
POVERR = P(I)/P(I)
WRITE (5,132) R(I),P(I),TFRED(I),TSRED(I),P23,POVERR

```

774 CONTINUE

```

WRITE (5,135)

```

799 CONTINUE

C

C

```

      EVALUATE SURFACE PRESSURE

```

```

DO 775 J=1,N
KKK = -1
KI = -1
TCHAZI = 0.
TCH11 = 0.
TFOCP = TFO - (J)*P100
THEFO = (TFOCP - TINF)/(TSO - TINF)
K = HAL
IF (TSRED(J) .LT. TCH11) K = 4.0*E-4
Q = THEFO - K
PCH12 = (1.0 - THEFO)/(1.0 - TCH11) (1.75 - TCH(J) - 1.0)
PCH12 = 0.

```

C

```

      PRINT OUT RESULTS
TCH2 = (PCH12/200)*TFO - (J)*P100

```

```

Q12 = (TFED(J)**(5./6.))/IP(J)**(1./3.)*TSRED(J)**(7./8.)
Q11 = Q/(R(J)*(TH-TS(J) - H))
TCHAR2 = (Q/(TH-TS(J) - H))**.5/R(J)

```

C ITERATION ON EQUATIONS 55 & 57 TO FIND B

830 CONTINUE

```

TDIF2 = TCHAR2 - TCH2
IF (TCHAR2 .LT. .01) TCHAR2 = .01
Q4 = (R(J)*TCHAR2)**2
TCH22 = TCH21
TCH21 = TCHAR2
KT = KT + 1
Q3 = EXP(-Q4)

```

C FROM EQUATION 57

```

TCHAR2 = Q11*(R(J)*TCH2*Q3 + (1. - Q3)*(TDIF2/(R(J)*TCHAR2**2)))

```

1835 FORMAT (4F15.6)

```

TCH212 = TCH21
TCH211 = TCH22
Q3 = TCH21 - TCH22
ABSQ3 = ABS(Q3/TCH21)
IF (ABSQ3 .LT. .001) GO TO 840
IF (KT .GT. 30) GO TO 839
IF (KKK .GT. 0) GO TO 834
IF (Q3 .GT. 0.) GO TO 835
TCHAR2 = 1.1*TCH21
GO TO 830

```

835 CONTINUE

```

TCHAR2 = 1.05*TCH21
KKK = 1
GO TO 830

```

834 IF (K1 .LE. 1) GO TO 836

```

TCHAR2 = (TCH212*TCH21 - TCH211*TCH22)/(TCH212 - TCH211 - TCH22
1 + TCH21+.0000001)
GO TO 830

```

830 WRITE (4,1234) TCH22,TCH21

1839 FORMAT (' TCH2 - ITERATION FAILURE',2F20.6)

840 CONTINUE

C FROM EQUATIONS 55 & 56

```

B(J) = (TCH22 - TCH2)/Q12
B(J+1) = B(J)

```

775 CONTINUE

C FIND B FOR DIFFERENT PRESSURES

C

C

C CHECK FOR AVERAGE OF ALL B'S FROM AVG.

```

SUMB = 0.
SUMB43 = 0.
DO 752 I = 1,4
B43 = B(I)
SUMB = SUMB + B(I)*B43

```

752 SUMB43 = SUMB43 + B43

```

B43 = SUMB/3.0

```

```

B43 = 0.

```

```

DO 751 I=1,

```

```

B1 = (B1 + B(I))/2.

```

751 B1 = (B1 + B(I))/2.

```

IF (B1 - B43) 752, 753, 754

```

```

802 CONTINUE
  AM = A
  BM = PAVG
  GO TO 804
803 CONTINUE
  LCCOUNT = LCCOUNT + 1
  IF (LCCOUNT .GT. 5) GO TO 1999
804 CONTINUE
  ERROR = EPROR
  WRITE (6,136)      BAVG,ERROR,A
C      INCREMENT A GUESS
  A = A + .002
  GO TO 769
C
C      GDF THEORY FIT--EVALUATION OF EQUATION
C
1999 CONTINUE
  BAVG = BM
  A = AM
  WRITE (6,137) BAVG,A
  WRITE (6,137) HAL,HTOTAL
  WRITE (6,1313)
1813 FORMAT (9X,'INS',9X,'GRAD',10X,'P23',9X,'TC42',9X,'TDIF?',8X,'PRES
15',9X,'PSS',10X,'PSM',9X,'ACIF')
  M = 50
  PRESS = 1.02
  DO 819 I=1,M
    PRESS = PRESS - .02
    KTSU = 0
CC    STRAIGHT LINE INTERPOLATION OF FLAME TEMP AS FUNCTION OF PRESS.
    TFMH = TF600
    PMH = P600*.001
    DTDP = (TF1000 - TF600)/(P1000 - P600)
    IF (PRESS .GT. .6) GO TO 603
    TFMH = TF300
    PMH = P300*.001
    DTDP = (TF600 - TF300)/(P600 - P300)
    IF (PRESS .GT. .3) GO TO 603
    TFMH = TF100
    PMH = P100*.001
    DTDP = (TF300 - TF100)/(P300 - P100)
    IF (PRESS .GT. .1) GO TO 603
    TFMH = TF100
    PMH = P100
    DTDP = (TF100 - TF100)/(P100 - P100)
603 TFCF2 = TFMH + (PRESS - PMH)*DTDP
    TFCF2P = (TFCF2 - 11.5)/(150 - 11.5)
    Q = TFCF2P - .01
    TFC = TFCF2/15
CC    FROM 503 TO 61
    POLSS = (Q/(1. - 0.0018/(1./PRESS + .005/PRESS**2(1./3.)))
C
C      IF ALL CALCD FI = 5000 STAY 5000
800 CONTINUE
  IF (LCCOUNT .GT. 5) GO TO 1999

```


G. Sample Problem Input

Equation Symbol	Fortran Symbol	Description	Units	Location	
				Card	Col's.
Batch #	NBATCH	Identifies propellant batch If NBATCH < 0., signifies end of data	-	1	1-5
	N	Number of R vs P points	-	1	6-10
r_o	RO	Burning rate @ p_o	in/sec	1	11-20
$T_{f,o}$	TFO	Flame temperature @ p_o	$^{\circ}\text{K}$	1	21-30
	AP	Decimal fraction AP content	%/100	1	31-40
	FUEL	Decimal fraction fuel content	%/100	1	41-50
	AL	Decimal fraction aluminum content	%/100	1	51-60
$T_{s,o}$	TSO	Surface temperature of 80/20 PBAA propellant @ p_o	$^{\circ}\text{K}$	1	61-70
p_o	PO	Reference pressure	psia	2	1-10
E_s	ESURF	Surface activation energy	cal/mole	2	11-20
E_f	EFLAME	Flame activation energy	cal/mole	2	21-30
T_{∞}	TINF	Ambient propellant temperature	$^{\circ}\text{K}$	2	31-40
	AGUESS	First guess of A value	-	2	41-50
	TF1000	Adiabatic flame temperature @ P1000	$^{\circ}\text{K}$	3	1-10
	TF600	Adiabatic flame temperature @ P600	$^{\circ}\text{K}$	3	11-20
	TF300	Adiabatic flame temperature @ P300	$^{\circ}\text{K}$	3	21-30
	TF100	Adiabatic flame temperature @ P100	$^{\circ}\text{K}$	3	31-40
	TF000	Adiabatic flame temperature @ P000	$^{\circ}\text{K}$	3	41-50
	P1000	Pressure for TF1000 (p/p_o)	-	4	1-10
	P600	Pressure for TF600 (p/p_o)	-	4	11-20
	P300	Pressure for TF300 (p/p_o)	-	4	21-30

<u>Equation Symbol</u>	<u>Fortran Symbol</u>	<u>Description</u>	<u>Units</u>	<u>Location</u>	
				<u>Card</u>	<u>Col's.</u>
	P100	Pressure for TF100 (p/p_o)	-	4	31-40
	P000	Pressure for TF000 (p/p_o)	-	4	41-50
r	RDIM(J), J=1→N	Steady state burning rate @ PDIM (J)	in/sec	5→(N+5)	1-10
p	PDIM(J), J=1→N	Pressure corresponding to RDIM(J)	psia	5→(N+5)	11-20

1-5,6-10,11-20,21-30,31-40,41-50,51-60,61-70

//DATA

NBATCH	N	RO	TFD	AP	FUEL	AL	TSO
951	12	.3485	1840.	.75	.25	0.0	1000.
PO		ESURF	EFLAME	TINF	AGUESS		
1000.		16000.	20000.	300.	.07		
TF1000		TF600	TF300	TF100	TF000		
1840.		1840.	1840.	1840.	1840.		
P1000		P600	P300	P100	P000		
1.		.6	.3	.1	0.0		
RDIM(1)		PDIM(1)					
.0657		18.5					
RDIM(2)		PDIM(2)					
.1001		42.					
.1268		70.					
.1518		106.					
.1821		165.5					
.2158		257.					
.2548		404.					
.2953		613.					
.2954		620.					
.324		803.					
.3493		1003.					
RDIM(N)		PDIM(N)					
.3623		1119.					
NBATCH	N	RO	TFD	AP	FUEL	AL	TSO
949	11	.2162	1840.	.75	.25	0.0	1000.
PO		ESURF	EFLAME	TINF	AGUESS		
1000.		16000.	20000.	300.	.067		
TF1000		TF600	TF300	TF100	TF000		
1840.		1840.	1840.	1840.	1840.		
P1000		P600	P300	P100	P000		
1.		.6	.3	.1	0.0		
RDIM(1)		PDIM(1)					
.0614		35.5					
RDIM(2)		PDIM(2)					
.0753		56.2					
.0848		74.5					
.0945		97.1					
.0982		106.3					
.114		157.5					
.1381		265.					
.1602		403.					
.1775		544.					
RDIM(N-1)		PDIM(N-1)					
.2027		810.					

RDIM(N)

.2223

NBATCH

-1

PDIM(N)

1072.

N

etc.

//END

//STOP

/*

-1. signifies end of the
data set.

D. Sample Problem Output

<u>Equation Symbol</u>	<u>Fortran Symbol</u>	<u>Description</u>	<u>Units</u>
Batch #	NBATCH	Identifies Propellant Batch	-
	N	Number of R vs. P data points	-
r_o	RO	Steady state burning rate @ p_o	in/sec
$T_{f,o}$	TFO	Flame temperature @ p_o	$^{\circ}K$
$T_{s,o}$	TSO	Surface temperature @ p_o	$^{\circ}K$
	AP	Decimal fraction oxidizer	-
	FUEL	Decimal fraction fuel	-
	AL	Decimal fraction aluminum	-
R	R	Non-dimensional burning rate (r/r_o)	-
P	P	Non-dimensional pressure (p/p_o)	-
T_{fRED}	TFRED	$T_f/T_{f,o}$	-
T_{sRED}	TSRED	$T_s/T_{s,o}$	-
$P^{2/3}$	$P^{**2/3}$	$P(J)^{2/3}$	-
P/R	P/R	$P(J)/R(J)$	-
	BAVG	$\sum_{J=1}^N B(J)P(J) / \sum_{J=1}^N P(J)$	-
	ERROR	$\sum_{J=1}^N \{ [BAVG - B(J)]^2 P(J) \}$	-
	A	Current guess A value	-
	BM	BAVG with smallest ERROR	-
	AM	A corresponding to BM	-
	HAL	Surface heat release term that includes contribution of aluminum	-
	HNONAL	Surface heat release term without aluminum	-
θ_s	THS	Non-dimensional surface temperature	-

<u>Equation Symbol</u>	<u>Fortran Symbol</u>	<u>Description</u>	<u>Units</u>
$\lambda_g/\lambda_p(\partial\theta/\partial x)_{s,g}$	GRAD	Heat feedback from gas phase	-
$P^{2/3}$	P23	PRESS ^{2/3}	-
	TCH2	Characteristic time, chemical process	-
	TDIF2	Characteristic time, diffusion process	-
P	PRESS	Pressure	-
$\bar{R}$	RSS	Steady state burning rate @ PRESS	-
P/ $\bar{R}$	PSR	PRESS/RSS	-
r	RDIM	RSS*RO	in/sec

ALPHA # 951 NUMBER OF DATA POINTS: 12 KQ = 0.3435 IFD = 1440. ISD = 1031.
0.750 AP 0.250 FUFL 0.000 AL

Q	P	IFCJ	TSREJ	P**2/3	P/2
1.189522	0.018503	1.000000	0.822055	0.069559	0.098132
0.287231	0.042000	1.000000	0.861444	0.120828	0.116224
0.363845	0.070000	1.000000	0.884676	0.169850	0.127391
0.435581	0.106000	1.000000	0.903217	0.223977	0.243354
0.522525	0.165500	1.000000	0.922774	0.301438	0.316731
0.619225	0.257000	1.000000	0.941800	0.404224	0.415035
0.731133	0.406000	1.000000	0.951173	0.545497	0.552567
0.847346	0.613000	1.000000	0.979089	0.721617	0.723435
0.850502	0.620000	1.000000	0.979549	0.727100	0.728381
0.929699	0.803000	1.000000	0.990689	0.863927	0.853721
1.002295	1.002999	1.000000	1.000296	1.001938	1.003702
1.039598	1.118999	1.000000	1.005032	1.077837	1.076377

BAVS	ERROR	A
1.732550	0.002075	0.070000
1.727893	0.001340	0.072000
1.723231	0.000761	0.074000
1.718574	0.000347	0.076000
1.713898	0.000090	0.078000
1.709215	0.000000	0.080000
1.704527	0.000082	0.082000
1.699830	0.000339	0.084000
1.695126	0.000774	0.086000
1.690414	0.001393	0.088000
1.685698	0.002201	0.090000
	1.709215	0.090000
	0.554225	0.554225

THS	GRAD	P23	TCH2	HAL	BM (Final 'B' value determined by program.)	AM (Final 'A' value determined by program.)
1.0002	0.4465	1.0000	0.0800	0.080000	0.080000	0.080000
0.9990	0.4423	0.9866	0.0816	1.7092	0.554225	0.554225
0.9978	0.4380	0.9732	0.0833	1.7218	1.7092	1.7092
0.9965	0.4336	0.9596	0.0851	1.7350	1.7218	1.7218
0.9952	0.4292	0.9459	0.0870	1.7487	1.7350	1.7350
0.9938	0.4247	0.9322	0.0889	1.7627	1.7487	1.7487
0.9925	0.4202	0.9183	0.0909	1.7771	1.7627	1.7627
0.9911	0.4155	0.9043	0.0930	1.7920	1.7771	1.7771
0.9896	0.4110	0.8903	0.0952	1.8074	1.7920	1.8074
0.9882	0.4063	0.8761	0.0976	1.8396	1.8074	1.8396
0.9867	0.4015	0.8618	0.1000	1.8566	1.8396	1.8566
0.9851	0.3966	0.8474	0.1026	1.8741	1.8566	1.8741
0.9836	0.3917	0.8328	0.1053	1.8923	1.8741	1.8923
0.9819	0.3866	0.8181	0.1081	1.9111	1.8923	1.9111
0.9803	0.3815	0.8033	0.1111	1.9306	1.9111	1.9306
0.9786	0.3764	0.7884	0.1143	1.9510	1.9306	1.9510
0.9768	0.3711	0.7733	0.1176	1.9721	1.9510	1.9721
0.9750	0.3657	0.7580	0.1212	1.9941	1.9721	1.9941
0.9732	0.3602	0.7427	0.1250	2.0170	1.9941	2.0170
0.9712	0.3547	0.7271	0.1290	2.0409	2.0170	2.0409
0.9693	0.3490	0.7114	0.1333	2.0650	2.0409	2.0650
0.9672	0.3432	0.6955	0.1379	2.0922	2.0650	2.0922
0.9651	0.3373	0.6794	0.1429	2.1196	2.0922	2.1196
0.9629	0.3312	0.6631	0.1481	2.1485	2.1196	2.1485
0.9606	0.3250	0.6466	0.1538	2.1789	2.1485	2.1789

PSR	RSS	RUM
0.9989	1.0311	0.3499
0.9856	0.9843	0.3465
0.9722	0.9874	0.3441
0.9587	0.9835	0.3417
0.9452	0.9734	0.3392
0.9315	0.9662	0.3367
0.9177	0.9589	0.3342
0.9039	0.9514	0.3316
0.8899	0.9439	0.3289
0.8759	0.9362	0.3263
0.8617	0.9284	0.3235
0.8475	0.9204	0.3208
0.8331	0.9123	0.3179
0.8186	0.9040	0.3150
0.8040	0.8955	0.3121
0.7893	0.8869	0.3091
0.7744	0.8781	0.3060
0.7594	0.8691	0.3029
0.7443	0.8599	0.2997
0.7290	0.8505	0.2964
0.7135	0.8409	0.2930
0.6980	0.8310	0.2896
0.6826	0.8209	0.2861
0.6663	0.8105	0.2825
0.6501	0.7998	0.2787

THS	GRAD	P23	TCH2	TDIF2	PRESS	ASS	PSR	RDM
0.9582	0.3187	0.6306	0.1599	2.2109	0.5000	0.7853	0.6338	0.2749
0.9553	0.3122	0.6130	0.1567	2.2447	0.4800	0.7775	0.6173	0.2710
0.9532	0.3056	0.5959	0.1739	2.2805	0.4600	0.7659	0.6106	0.2655
0.9505	0.2987	0.5785	0.1818	2.3186	0.4400	0.7539	0.5937	0.2627
0.9477	0.2917	0.5608	0.1995	2.3591	0.4200	0.7414	0.5665	0.2584
0.9444	0.2845	0.5429	0.2000	2.4023	0.4000	0.7286	0.5490	0.2533
0.9417	0.2771	0.5246	0.2105	2.4487	0.3800	0.7152	0.5313	0.2492
0.9384	0.2694	0.5061	0.2222	2.4985	0.3600	0.7013	0.5133	0.2444
0.9353	0.2615	0.4871	0.2353	2.5523	0.3400	0.6869	0.4953	0.2394
0.9313	0.2533	0.4673	0.2500	2.6106	0.3200	0.6718	0.4763	0.2341
0.9273	0.2448	0.4481	0.2667	2.6742	0.3000	0.6560	0.4573	0.2290
0.9232	0.2359	0.4289	0.2857	2.7439	0.2800	0.6394	0.4373	0.2228
0.9187	0.2266	0.4074	0.3077	2.8209	0.2600	0.6219	0.4181	0.2167
0.9138	0.2170	0.3862	0.3333	2.9055	0.2400	0.6034	0.3977	0.2103
0.9085	0.2068	0.3644	0.3636	3.0025	0.2200	0.5837	0.3769	0.2034
0.9027	0.1961	0.3420	0.4000	3.1114	0.2000	0.5627	0.3554	0.1961
0.8963	0.1847	0.3199	0.4444	3.2365	0.1800	0.5400	0.3333	0.1882
0.8890	0.1726	0.2947	0.5000	3.3825	0.1600	0.5154	0.3104	0.1796
0.8808	0.1595	0.2696	0.5714	3.5551	0.1400	0.4885	0.2866	0.1702
0.8713	0.1454	0.2433	0.6667	3.7680	0.1200	0.4586	0.2617	0.1598
0.8600	0.1299	0.2154	0.8000	4.0353	0.1000	0.4249	0.2354	0.1481
0.8459	0.1126	0.1857	1.0000	4.3894	0.0800	0.3859	0.2073	0.1345
0.8277	0.0928	0.1533	1.3334	4.8935	0.0600	0.3394	0.1768	0.1183
0.8014	0.0593	0.1170	2.0001	5.7077	0.0400	0.2805	0.1426	0.0978
0.7556	0.0396	0.0737	4.0004	7.4381	0.0200	0.1967	0.1016	0.0686

THS	GRAD	P23	TCM2	TDIF2	PRESS	RSS	PSR	RDIM
0.9590	0.2796	0.6130	0.1604	2.5150	0.4803	0.7905	0.1111	0.1171
0.9566	0.2737	0.5959	0.1574	2.5547	0.4570	0.7732	0.1111	0.1171
0.9541	0.2676	0.5785	0.1544	2.5970	0.4333	0.7565	0.1111	0.1171
0.9514	0.2614	0.5608	0.1513	2.6419	0.4100	0.7398	0.1111	0.1171
0.9487	0.2550	0.5429	0.1482	2.6879	0.3867	0.7231	0.1111	0.1171
0.9458	0.2483	0.5246	0.1451	2.7342	0.3633	0.7064	0.1111	0.1171
0.9427	0.2415	0.5061	0.1420	2.7805	0.3400	0.6897	0.1111	0.1171
0.9395	0.2345	0.4871	0.1389	2.8268	0.3167	0.6730	0.1111	0.1171
0.9361	0.2272	0.4678	0.1358	2.8731	0.2933	0.6563	0.1111	0.1171
0.9324	0.2196	0.4481	0.1327	2.9194	0.2700	0.6396	0.1111	0.1171
0.9285	0.2117	0.4280	0.1296	2.9657	0.2467	0.6229	0.1111	0.1171
0.9243	0.2035	0.4074	0.1265	3.0120	0.2233	0.6062	0.1111	0.1171
0.9198	0.1949	0.3862	0.1234	3.0583	0.2000	0.5895	0.1111	0.1171
0.9149	0.1859	0.3644	0.1203	3.1046	0.1767	0.5728	0.1111	0.1171
0.9094	0.1763	0.3420	0.1172	3.1509	0.1533	0.5561	0.1111	0.1171
0.9034	0.1663	0.3188	0.1141	3.1972	0.1300	0.5394	0.1111	0.1171
0.8967	0.1555	0.2947	0.1110	3.2435	0.1067	0.5227	0.1111	0.1171
0.8890	0.1439	0.2696	0.1079	3.2898	0.0833	0.5060	0.1111	0.1171
0.8802	0.1314	0.2433	0.1048	3.3361	0.0600	0.4893	0.1111	0.1171
0.8696	0.1177	0.2154	0.1017	3.3824	0.0367	0.4726	0.1111	0.1171
0.8566	0.1022	0.1857	0.0986	3.4287	0.0133	0.4559	0.1111	0.1171
0.8396	0.0846	0.1533	0.0955	3.4750	0.0000	0.4392	0.1111	0.1171
0.8154	0.0635	0.1170	0.0924	3.5213	0.0000	0.4225	0.1111	0.1171
0.7731	0.0366	0.0737	0.0893	3.5676	0.0000	0.4058	0.1111	0.1171

COMPILE TIME=

0.66 SEC, EXECUTION TIME=

1.16 SEC, OBJECT CODE=

10523 BYTES, ARRAY AREA=

1160 BYTES, UNUSED=

128312 BYTES

SECTION IIIPROGRAM TO PREDICT EXTINGUISHMENT AND CALCULATE DYNAMIC BURNING
PROPERTIES FROM PRESSURE VERSUS TIME DATA INPUTA. Description

This program, entitled PREDICTR, utilizes the combustion model detailed in Section IV of AMS Report No. 880 to predict whether or not a specific depressurization will extinguish a burning solid propellant. The program requires input of the constants 'A' and 'B' determined by a separate program entitled ABDETRMN, the physical properties of the propellant, and pressure as a function of time. The output includes a listing of pressure, burning rate, temperature gradient, flame temperature, temperature profile, surface temperature, and the characteristic times of the diffusion and chemically controlled processes in the model all in non-dimensional form as a function of time, as well as burning rate in cm/sec, pressure in atm., and surface temperature in degrees Kelvin as a function of time in seconds. The criterion for extinguishment used in the computer was that the surface temperature must fall below an 'extinction temperature' specified as 600°K.

B. LISTING

```

// EXEC FORTHOLD
//SOURCE.SYSIN DD *
  DIMENSION TAU1(1500),TAU2(1500),TAU3(1500),SI(1500),TH(1500)
  DIMENSION DEF(15 ),T(15 ),TAU(15 ),XLMP(15 )
  DOUBLE PRECISION DPM1(15,12),DPM1(15,12),DPM2(15,12),DDO(15),
  1 DAA(15),DPA1(15),DPA(15),DEXT(15),DDX(15),DEXP
C
C   N=PREDICTR
C   PHYSICAL COORDINATE SYSTEM USED FOR INTEGRATION OF THE SOLID
C   PHASE. CONTAINS GRANULAR DIFFUSION MODEL USING WEIGHTED STEP-
C   IMPULSE INTEGRATION OF THE GAS PHASE.
C
C
COMMON      A,      B,      TPEQ, THS,      J,      ESURF, ALMELT,
1 EFFLAME, KGAS,      TEO,      TSO,      TIME,      HAL,      HNONAL
14 FORMAT (1X,'P=*(2/3) =',F10.6,10X,'P/R =',F10.6)
102 FORMAT (3F14.3,/,10X,'ITERATION ON PHI FAILED',/)
103 FORMAT (2X,'IF ITERATION FAILED',2F18.8)
113 FORMAT(4X,4F12.5,4X)
114 FORMAT (20X,'DEPRESSORIZATION MODEL:',/,85X,'H =',F8.3,/,10X,
1 'E-ACT (SURF) =',F2.0,5X,'A =',F7.3,5X,'HI =',F8.4,/,70X,
2 'PRESSURE VS. TIME DATA FROM RUN #',I5,/,
3 '10X,'PO =',F7.0,17X,'B =',F7.3,5X,'HS =',
4 F8.4,/,75X,'NO. OF DATA POINTS USED =',I5,/,
5 '7X,I6,' POINTS WERE USED IN THE SPACE
5 COORDINATE',/,//)
115 FORMAT(F10.3,2F8.4,2F8.4,F7.3,2F6.2,5F8.4, F10.6,F7.2,F7.3,F7.1)
116 FORMAT (4X,'TIME',2X,'PRESSURE',2X,'BURNING',2X,'FLAME',
10X,'TEMP',3X,'RZ/RO',2X,'TDIF2',1X,'TCH2',7X,
2 'TEMPERATURE PROFILE IN EVENLY',9X,'REAL '
3,4X,'0 ', 'BURNING TEMP '
4 '/,21X,'RATE',4X,'TEMP',4X,'GRAD',34X, 'SPACED
6 INCREMENTS',14X,'TIME',4X,'ATM',3X,'RATE SURF',/110X,'C'/SFC
6 DEGR',/)
117 FORMAT (15I,1X,'* ',/)
118 FORMAT (//,10X,'CASE DID NOT EXTINGUISH.',30(' '))
119 FORMAT (//,10X,'CASE EXTINGUISHED.',10X,20(' '),10X,20(' '))
170 FORMAT (2F10.0)
171 FORMAT (10X,20.10,/)
172 FORMAT (10X,'TID =',F10.4,10X,'DEF =',F15.7)
173 FORMAT (10X,'20.0)
174 FORMAT (1X,7017.0)
175 FORMAT (15)
176 FORMAT (F10.0)
583 FORMAT (3F14.3,/,10X,'ITERATION ON PHI FAILED',/)
1793 FORMAT (14I,/,1X,100(' '),/)
1795 FORMAT (10X,'GRANULAR DIFFUSION MODEL USING WEIGHTED STEP-IMPULSE
2 INTEGRATION OF THE GAS PHASE',/)
  KGAS = 0
C   TO RUN ALUMINIZED CASE, SET C = 1.
C   YOU MUST ALSO CHANGE ALMELT TO 1.0 ALUMINIZED PROPELLANT.
  C = 1.
  C = 0.

```

605 CONTINUE

C
C INPUT DATA FOR A NEW BATCH OF PROPELLANT.
C

READ (5,126) A,R,AP,FUEL,ESURF,AL,ALPHA
READ(5,126) EFLAME,PREF,TFD,TINF,TSO,PREF
READ (5,126) TF1000,TF600,TF300,TF100,TF000
READ (5,126) P1000,P600,P300,P100,P000

C THE SURFACE TEMPERATURE AT 1000 PSIA IS CALCULATED FROM THE
C SURFACE TEMPERATURE OF 80-20 PBA AT 1000 PSIA, WHICH IS TAKEN
C TO BE 1000 DEGREES K (IE, THE INPUT VALUE FOR TSO.)
C .273 IS THE BURNING RATE OF 80-20 PBA AT 1000 PSIA.

PREFXP = .273*EXP(ESURF/(R*GAS*TSO))
TSO = (ESURF/R*GAS)/ALOG(PREFXP/PREF)

191 CONTINUE
ISLUP = 0

C
C INPUT DATA FOR A PARTICULAR DEPRESSURIZATION RUN.
C IJL1 = EVEN NUMBER OF POINTS.
C IF ANY DATA IS INCLUDED FROM THE TAPE, IT MUST BE PRECEDED BY A
C CARD HAVING A NEGATIVE NUMBER IN THE FIRST TEN COLUMNS AND THE
C MAGNITUDE OF THE TAPE DEFLECTION AT ZERO TIME IN COLUMNS 11-20.
C

READ (5,120) RUN,CIJL1
IF (CIJL1 .LT.0) GO TO 605
IF (RUN .LT. 0.) GO TO 44

VRUN = RUN
IJL1 = CIJL1
IJL2 = IJL1/2
IJL3 = IJL2 + 1
IJL4 = IJL2 + 2
K10 = 1

WRITE (6,117)
DO 201 I=1,IJL1

195 CONTINUE
READ (5,120) T(I),DEF(I)
IF (K10) 196,196,197
196 T(I) = T(I)/16.
DEF(I) = DEF(I)*DEF(1)/DTAPE
GO TO 199

197 CONTINUE
IF (T(I)) 198,199,199

198 K10 = -1
TAU(I) = T(I-1)*R*GAS*2/ALPHA
DEF(I) = DEF(I-1)
DTAPE = DEF(I)
GO TO 195

199 CONTINUE
C NOTE: T(I) IS SPECIFIED IN HUNDRETHS OF SECONDS, I.E. IN TENS
C OF MILLISECONDS. THIS STEP CONVERTS THE INPUT TO ACTUAL SECONDS
T(I) = T(I)*.01
WRITE (6,121) T(I),DEF(I)
XUNP(I) = M*GAS*T(I)/R*DEF(I)
TAU(I) = T(I)*R*GAS*2/ALPHA

```

C
C      SET UP COEFFICIENT MATRIX:
DO 200 J=1,IJK2
  JJ = J + 1
200 DPMA(I,JJ) = TAU(I)*J
  DPMA(I,1) = 1.
  DPMA(I,IJK4) = XLMP(I)
201 CONTINUE
  DFFO = DEF(1)
  IF (K10) 192,192,193
193 CONTINUE
  TAJFIN = TAJ(IJK1)
  DFIV = DEF(IJK1)
192 CONTINUE
  BETA = -XLMP(2)/TAU(2)
  BETA = BETA*4.

C
C      FIND NORMAL EQUATIONS:
DO 203 I=1,IJK3
  DO 202 J=1,IJK4
202 DPW1(I,J) = 0.
203 CONTINUE
  DO 206 K=1,IJK3
  DO 205 L=1,IJK4
  DO 204 M=1,IJK1
204 DPV1(K,L) = DPW1(K,L) + DPMA(M,K)*DPMA(M,L)
205 CONTINUE
206 CONTINUE

C
C      BEGIN SOLUTION OF SIMULTANEOUS EQUATIONS:
DO 217 N=1,IJK4
  NN = N - 1
  DO 208 I=1,IJK3
  K = IJK4 - I
  DO 207 J=1,IJK4
207 DP42(I,J) = DPW1(I,J)
208 CONTINUE
  IF (NN) 211,211,209

C
C      CRAMER'S RULE:
209 DO 210 L=1,IJK3
  DP42(L,NN) = DPW2(L,IJK4)
210 CONTINUE
211 CONTINUE

C
C      EVALUATE DEFINITIVES:
DO 214 I=1,IJK2
  II = I + 1
  DO 213 J=II,IJK3
  DP411(J) = DPW2(J,1)/DPW2(1,1)
  DO 212 K=1,IJK3
212 DPW2(J,K) = DPW2(J,K) - DP411(J)*DPW2(1,K)
213 CONTINUE
214 CONTINUE

```

```

DDA(N) = 1.
IF (IJK1 - 12) 236,235,237
237 DO 239 I=1,5
235 DDA(N) = DDA(N)*DPM2(1,1)
DDO(N) = DDA(N)
DDA(N) = 1.
DO 239 I=5,IJK3
239 DDA(N) = DDA(N)*DPM2(1,1)
DDOX(N) = DDA(N)
GO TO 240
236 CONTINUE
DO 216 I 1,IJK3
216 DDA(N) = DDA(N)*DPM2(1,1)
DDO(N) = DDA(N)
DDOX(N) = 1.
240 CONTINUE
217 CONTINUE

```

```

C
C      ANSWER, I.E. UNKNOWN COLUMN MATRIX:
DO 218 N=2,IJK4
DAA(N) = DDO(N)/DDO(1)/DDOX(1)*DDOX(N)
218 WRITE (6,121) DAA(N)

```

```

C
PO = DEF(1)*100.
PFIN = (DEFIN*100. + 15.)/PREF
R2BYAL = RREF*RREF/ALPHA
LCOUNT = 0
ICOUNT = 1
C      CALCULATION OF NON-DIMENSIONAL SURFACE HEAT RELEASE
HI = AP*750./(.333*(TSO - TIME))
HS = (AP*495. + FUEL*225. + AL*63.)/(.333*(TSO - TIME))
H = HI-HS
HAL = H
HSN = (AP*495. + FUEL*225. + AL*63.)/(.333*(TSO - TIME))
HNDVAL = HI - HSN
ALMELT = 933./TSO
XI = 1.
DELTIM = 3.025/Delta

```

```

150 CONTINUE
DELX = .06
TTTT = -DELTIM
R1 = 1.
FPI = 1.
RFO = 1.
P = (PO + 14.7) / PREF

```

```

C      STRAIGHT LINE INTERPOLATION OF FLAME TEMP AS FUNCTION OF PRESS.
TEVIN = T5000
P4IN = 2400
DTOP = (T5100 - T5000)/(P1000 - P500)
IF (P .GT. .4) GO TO 502
TEMI = T5000
P4IN = 2300
DTOP = (T5000 - T5300)/(P400 - P300)
IF (P .GT. .3) GO TO 502

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TFMIN = TF100
PFIN = P100
DTDP = (TF300 - TF100)/(P300 - P100)
IF(P .GT. .1) GO TO 602
TFMIN = TF000
PFIN = P000
DTDP = (TF100 - TF000)/(P100 - P000)
602 TDFP = TFIN + (P - PFIN)*DTDP
THDFP = (TDFP - TIME)/(ISO - TIME)
TFR = TDFP/TF0
TREQ = TFR
Q = THDFP - H
C      FIND STEADY STATE BURNING RATE FOR THIS PRESSURE
CALL REQL(P,REQ)
RSTAR1 = REQ
RSTAR = RSTAR1
RO = REQ
THPREV = THS
MM = .12./(RO*DELX)
NUM = MM - 1
MM1 = MM + 1
WRITE (6,1793)
WRITE (6,1795)
WRITE (6,114) H,ESJAF,A,HI,RPUN,P0,4,HS,IJK1,NUM
WRITE (6,116)
LINES = 15
C
C
C      INITIAL TEMPERATURE PROFILE
DO 7 I = 1,MM
  ZI = I
  7 SI(I) = EXP((1. - ZI)*DELX*RO)*THS
  TH(121) = 0.
  TH(161) = 0.
  5 CONTINUE
  3 KOUNT = 0
  TITI = JITI + DELTIM
C
C
P = PFIN
REALT = TITI/RTAYM
IF (TITI - TDFIN) 222,223,231
223 CONTINUE
DO 222 I=1,IJK1
222 DEXI(I) = TAI(I)
DO 200 I=1,IJK2
  IJ = I + 1
  IK = I + 2
200 DEXI(IK) = DEXI(IJ) + DEXI(IK)*TITI*PI
C
C      P0 IS THE PRESSURE DIVIDED BY THE INITIAL PRESSURE.
C      P IS THE PRESSURE DIVIDED BY 1000.PSIA. I. E. P IS THE
C      CASE IN WHICH THE BURNING RATE IS FIT.
C      R IS THE BURNING RATE DIVIDED BY 2056, THE BURNING RATE AT

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NOT REPRODUCIBLE

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C      1000. PSIA.
      PPO = DEXP(DEXT(TNK))
      P = (PPO**2) 414.71/PLEF
C      PPO IMPLIES PGAUSS / PO GAUSE
C
C
C
231 CONTINUE
C      STRAIGHT LINE INTERPOLATION OF FLAME TEMP AS FUNCTION OF PRESS.
      TFMN = TF600
      PMN = P600
      DTDP = (TF1000 - TF600)/(P1000 - P600)
      IF (P .GT. .4) GO TO 603
      TFMN = TF300
      PMN = P300
      DTDP = (TF600 - TF300)/(P600 - P300)
      IF (P .GT. .3) GO TO 603
      TFMN = TF100
      PMN = P100
      DTDP = (TF300 - TF100)/(P300 - P100)
      IF (P .GT. .1) GO TO 603
      TFMN = TF000
      PMN = P000
      DTDP = (TF100 - TF000)/(P100 - P000)
603 TFCFP = TFMN + (P - PMN)*DTDP
      TFCFQ = TFCFP/TF0
      THFCFP = (TFCFP - TINF)/(TS0 - TINF)
      Q = THFCFP - H
      R = 2.*RSTAR - ASTAR1
      IF (R .LT. .0001) R = .0001
      MWOLD = MW
C      KEEP MAX > 10.
      MW = 12.7/(R*DELX)
      IF (MW .LT. MWOLD) MW = MWOLD
      IF (MW .GT. 1593) MW = 1593
      NUM = MW - 1
      DEN = MW + 1
      DO 243 I = MWOLD, MW
243 SI(I) = 0.
      TFR21 = 0.
      TFR1 = 0.
      IJK = 0
      IF (P .LT. .0001) R = .0001
      KTF = -1
C      EQUATION 15, WITH DIMENSIONALIZE
      TSR = 1./(1. - (P*15*152/P3000)*ALD5(R))
      TS = TS*TSR
      TFS = (TS - TINF)/(TS0 - TINF)
297 TF = TFS*TF0
      THF = (TF - TINF)/(TS0 - TINF)
      REF = EXP((E-LAM)/(GAS*TF0**2.))*((1./TSP - 1.))
C      TDR2 IMPLIES THE SQUARE ROOT OF TDR, ETC.
C      EQUATION 35
      TCH2 = 1*THF*TF0**2.2/P
C      EQUATION 36

```

```

      TDIF2 = B*TFR**(5./5.)/(P**(1./3.)*TSR**(7./8.))
C      EQUATION 37
      TCH2 = TCH2 + TDIF2
      TCH2 = TCH2**2
      EXRT = EXP(-TCH2*TCH2)
      DTDTAU = (T45 - T4PREV)/DELTIM
      H = HAL
      IF (TSR .LT. ALVEL) H = 4NDVAL
C      EQUATIONS 25 & 41
      FDRK = (DPR/TCH2**2)*(TCH2*EXRT + (1. - EXRT)*TDIF2/(R*R*TCH2))
      1 + H*R - C*DTDTAU
C      EQUATION 42
      THF = T45 + Q + H - FDRK/R
      IF = THF*(TSO - TINF) + TINF
      TFR2 = TFR1
      TFR1 = TFR
      TFR = IF/TEQ
      TFR22 = TFR21
      TFR21 = TFR
      KTF = KTF + 1
      DELTF = ABS(TFR - TFR1)/TFR1
      IF (DELTF - .001) 309,309,306
306 CONTINUE
      IF (KTF > 307,307,308)
307 TFR = TFR1*(1. + .1*(TFR1*DELTF)/(TFR - TFR1))
      GO TO 297
308 CONTINUE
      IF (KTF - 20) 311,311,312
311 CONTINUE
      TFR = (TFR22*TFR1 - TFR21*TFR2)/(TFR22 - TFR21 - TFR2 + TFR1)
      IF (TFR .LT..01) TFR = .01
      GO TO 297
312 CONTINUE
      WRITE (6,103) TFR,TFR1
309 CONTINUE
      A1 = R/2.
      A2 = (A1*A1 + 1./(DELTF*XI))**.5
C      EQUATION 77
      ZLW2 = -(A1 + A2)
      ZLW1 = -A1 + A2
      APR2 = R
C
C      RUNGE KUTTA 4TH ORDER METHOD
C      EQUATION 82
      TAU1 (J) = 0.
      TAU2(J) = 1.
      TAU3(J) = ZLW2*SI(J)
      DO 61 J=1,NJ
      ZJ = J
      DELB1 = ZLW2*TAU3(J) - SI(J)/DELX1/XI
      X31 = TAU3(J) + .5*DELB1*DELX
      TAU4(J) = (SI(J) + SI(J+1))/2./DELX/XI
      DELB2 = ZLW2*TAU4(J) - TAU3(J)
      X32 = TAU3(J) + .5*DELB2*DELX

```

```

DEL33 = ZLAM2*X32 - TAUAVG
X33 = TAU3(J) + DEL33*DELX
DEL34 = ZLAM2*X33 - SI(J+1) /DEL114/X1
DTAU3 = (DEL31 + 2.*DEL32 + 2.*DEL33 + DEL34)*DELX/6.
TAU3(J+1) = TAU3(J) + DTAU3
XLAM2 = ZJ*DELX*ZLAM2
IF ((1-XLAM2) .GT. 50.) GO TO 60
TAU2(J+1) = EXP(XLAM2)
GO TO 61
60 TAU2(J+1) = 0.
61 CONTINUE
DO 70 L=1,NR
J = NR - L
DEL11 = ZLAM1*TAU1(J) + TAU3(J)
X11 = TAU1(J) - .5*DEL11*DELX
TAUAVG = (TAU3(J) + TAU3(J-1))/2.
DEL12 = ZLAM1*X11 + TAUAVG
X12 = TAU1(J) - .5*DEL12*DELX
DEL13 = ZLAM1*X12 + TAUAVG
X13 = TAU1(J) - DEL13*DELX
DEL14 = ZLAM1*X13 + TAU3(J-1)
DTAU1 = (DEL11 + 2.*DEL12 + 2.*DEL13 + DEL14)*DELX/6.
TAU1(J-1) = TAU1(J) - DTAU1
70 CONTINUE
C
C   END OF RUNGE KUTTA
C
C   EQUATION 83
C   BB = (-FDBK - ZLAM1*TAU1(1) - ZLAM2*SI(1))/ZLAM2
C   EQUATION 81
C   TH(1) = TAU1(1) + BB*TAU2(1)
C   TS = TH(1)*(TS0 - TIME) + TIME
C   TSRED = TS/TS0
C   EQUATION 16, NON-DIMENSIONALIZED
C   R = EXP((ESJFF/(PBAS*TS0))*(1. - 1./TSRED))
C   END OF NEW FEEDBACK LAW
C
C   ZAA = ABS(TSRED - R)
C   KOUNT = KOUNT + 1
C   IF(ZAA .LT. .001) 17,17,23
23 CONTINUE
R2 = R2
R2 = R1
R1 = R
R21 = R2R2
IF (KOUNT - 1) 25,25,25
25 CONTINUE
R = (R + R2R2)/2.
IF (R .GT. (1.2*R2R2)) R = 1.2*R2R2
GO TO 9
25 CONTINUE
IF (KOUNT - 12) 22,22,13
13 CONTINUE

```

```

      WRITE (6,533) R,RPED,ZAA
      LINES = LINES + 3
      IF (LINES - 55) 53,54,54
54  WRITE (6,117)
      WRITE (6,116)
      LINES = 0
53  CONTINUE
      GO TO 17
22  CONTINUE
      R = (RP1*RP2 - R1*RP2)/(RP1 - RP2 - R1 + R2)
      DELR = R - RP1
      ZBR = ABS(DELR)/RP1
      IF (ZBR - .1) 171,171,170
170  S = RP1 + .1*DELR/ZBR
171  CONTINUE
      GO TO 9
17  CONTINUE
      DO 20 L = 1,10
      EQUATION 81
      TH(L) = TAU1(L) + PR*TAU2(L)
20  SI(L) = (TH(L) - SI(L))*(1. - XI)/XI + TH(L)
      THPREV = TH(1)
19  RSTAR1 = RSTAR
      RSTAR = R
      PCM = R*PRFF*2.54
C      FIND STEADY STATE BURNING RATE FOR THIS PRESSURE
      CALL REJUL (P,REQ)
      REQ = R/REQ
      PATH = P*PRFF/14.7
      WRITE (6,115) TT11,P,P,THF,FDBK,REQ,TDIF2,TCH2,TH(1),TH(41),TH(
181 1,TH(121),TH(161),REALT,PATH,PCM,TS
      LINES=LINES+1
      IF (LINES-54) 153,154,154
154  WRITE (6,117)
      WRITE (6,115)
      LINES=0
153  CONTINUE
      IF (P .LT. .02) GO TO 151
      DELTIM = DELTIM + (.025*(P - .02)**.4)/BETA
151  CONTINUE
      IF (TH(1) .GT. .45) GO TO 152
      WRITE (6,119)
      GO TO 154
152  IF (TT11 .LT. TCHFIN) GO TO 8
      ISTOP = ISTOP + 1
      IF (ISTOP .GT. 12) GO TO 194
      GO TO 8
194  CONTINUE
      GO TO 191
44  CONTINUE
      RETURN
      END

```

```

SUBROUTINE REJUL(PRESS,PGUESS)
COMMON A, BAVG, TFR, THS, Q, ESURF, ALVELT,
D FLAME, PGAS, TFO, ISO, TIME, HAL, HNOVAL
C THIS ROUTINE EVALUATES THE STEADY STATE BURNING RATE AT A PRESS.
RG1 = 0.
RSS1 = 0.
KTSR = 0
H = HAL
CC FROM EQUATION 61
RGUESS = (Q/(1. - H))**.5/(A/PRESS + BAVG/PRESS**(1./3.))
C
C ITERATIVE CALCULATION OF STEADY STATE BURNING RATE
800 CONTINUE
C EQUATION 53
IF (RGUESS .LT. .02) RGUESS = .02
TSR = 1./(1. - (PGAS*TSO/ESURF)*ALOG(PGUESS))
TS = TSR*TSO
THS = (TS - TIME)/(ISO - TIME)
EE = EXP((FLAME/(PGAS*2.*TFO))*(1./TFR - 1.))
C TCH2 IMPLIES THE SQUARE ROOT OF TCH, ETC.
C EQUATION 54
TCH2 = A*EE*TFR**.25/PRESS
C EQUATION 55
TDIF2 = BAVG*TFR**((5./6.)/(PRESS**(1./3.)*TSR**(7./8.))
C EQUATION 56
TCHAR2 = TCH2 + TDIF2
TCHAR = TCHAR2**2
EXRPT = EXP(-RGUESS**2*TCHAR)
C EQUATION 51
GRAB = (Q*RGUESS/TCHAR2)*(TCH2*EXRPT + (1. - EXRPT)*TDIF2/
1 (RGUESS**2*TCHAR))
H = HAL
IF (TSR .LT. ALVELT) H = HNOVAL
C EQUATION 50
RSS = GRAB/(THS - H)
IF (RSS .LT. .001) RSS = .001
DR = ABS(RSS - RGUESS)/RGUESS
IF (DR - .001) 813,813,812
812 CONTINUE
KTSR = KTSR + 1
RSS2 = RSS1
RSS1 = RSS
RG2 = RG1
RG1 = RGUESS
IF (KTSR - 1) 814,814,815
814 CONTINUE
DRS = RSS - RGUESS
RGUESS = RGUESS*(1. + .05*(ABS(DRS)/DRS))
GO TO 800
813 CONTINUE
IF (KTSR - 20) 817,817,820
817 CONTINUE
RGUESS = (.RSS2*.51 - RSS1*.21)/(1 - RSS2 - RSS1 - RG2 + RG1 + .000001)
GO TO 812
820 WRITE (6,810) RSS, RGUESS
819 PRINT*, 'RSS ITERATION FAILED, RSS, RGUESS', P, 15, 6)
818 CONTINUE
C END OF STEADY STATE BURNING RATE CALCULATION.
RETURN
END

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NOT REPRODUCIBLE

C. Sample Problem Input

<u>Equation Symbol</u>	<u>Fortran Symbol</u>	<u>Description</u>	<u>Units</u>	<u>Location</u>	
				<u>Card</u>	<u>Col's.</u>
A	A	Constant in Equation 35 to be determined by ABDETRM deck from the pressure dependence of the steady state burning rate.	-	1	1-10
B	B	Constant in Equation 36 to be determined by ABDETRM deck from the pressure dependence of the steady state burning rate.	-	1	11-20
	AP	Decimal fraction AP content	%/100	1	21-30
	FUEL	Decimal fraction fuel content	%/100	1	31-40
E_s	ESURF	Surface activation energy	cal/mole	1	41-50
	AL	Decimal fraction aluminum content	%/100	1	51-60
α_p	ALPHA	Thermal diffusivity of propellant	in ² /sec	1	61-70
E_f	EFLAME	Flame activation energy	cal/mole	2	1-10
r_o	RREF	Burning rate @ PREF	in/sec	2	11-20
$T_{f,o}$	TFO	Adiabatic flame temperature @ PREF	°K	2	21-30
T_∞	TINF	Ambient temperature of propellant	°K	2	31-40
$T_{s,o}$	TSO	Surface temperature of 80/20 PBAA @ PREF (taken to be 1000°K)	°K	2	41-50
P_o	PREF	Reference pressure	psia	2	51-60
	TF1000	Adiabatic flame temperature @ P1000	°K	3	1-10
	TF600	Adiabatic flame temperature @ P600	°K	3	11-20
	TF300	Adiabatic flame temperature @ P300	°K	3	21-30

<u>Equation Symbol</u>	<u>Fortran Symbol</u>	<u>Description</u>	<u>Units</u>	<u>Location</u>	
				<u>Card</u>	<u>Col's.</u>
	TF100	Adiabatic flame temperature @ P100	$^{\circ}\text{K}$	3	31-40
	TF000	Adiabatic flame temperature @ P000	$^{\circ}\text{K}$	3	41-50
	P1000	Pressure for TF1000 (p/p_o)	-	4	1-10
	P600	Pressure for TF600 (p/p_o)	-	4	11-20
	P300	Pressure for TF300 (p/p_o)	-	4	21-30
	P100	Pressure for TF200 (p/p_o)	-	4	31-40
	P000	Pressure for TF000 (p/p_o)	-	4	41-50
	RUN	Identifies experimental run for particular p vs. t data. If RUN < 0., signifies end of data	-	5	1-10
	CIJK1	The number of points in p vs. t data set. CIJK1 <u>must</u> be equal to 10., 12., or 14. If CIJK1 < 0., signifies read data for new batch of propellant	-	5	11-20
	T(I)	Time corresponding to some pressure (DEF(I)) for Run	tens of msec.s	6 → (CIJK1+6)	1-10
	DEF(I)	Pressure at time T(I) divided by 100. If any data is included from the tape, it must be preceded by a card having a negative number in the first ten columns and the magnitude of the tape de- flection at zero time in columns eleven through twenty	psia/100.	6 → (CIJK1+5)	11-20

//DATA.SYSIN DD *

A	B	AP	FUEL	ESURF	AL	ALPHA
.077	1.92	.75	.25	16000.	0.	.00029
EFLAME	RREF	TF0	TINF	TS0	PREF	
20000.	.2162	1840.	300.	1000.	1000.	
TF1000	TF600	TF300	TF100	TF000		
1840.	1840.	1840.	1840.	1840.		
P1000	P600	P300	P100	P000		
1.	.6	.3	.1	0.0		

AP	FUEL	ESURF	AL	ALPHA
183.	14.			
T(1)	DEF(1)			
0.	7.7			
T(2)	DEF(2)			
.08	7.07			

AP	FUEL	ESURF	AL	ALPHA
.58	4.8			
1.08	3.6			
1.58	2.75			
2.08	2.2			
2.58	1.8			
3.08	1.55			
4.08	1.2			
5.08	.95			
6.08	.73			
7.08	.65			

AP	FUEL	ESURF	AL	ALPHA
8.08	.58			
T(IJK1)	DEF(14)			
10.08	.5			
RUN	CIJK1			
	-1.			

CIJK1 < 0. signifies new batch of propellant data follows.

A	B	AP	FUEL	ESURF	AL	ALPHA
.030	1.709	.75	.25	16000.	0.	.00030
EFLAME	RREF	TF0	TINF	TS0	PREF	
30000.	.3435	1840.	300.	1000.	1000.	
TF1000	TF600	TF300	TF100	TF000		
1840.	1840.	1840.	1840.	1840.		
P1000	P600	P300	P100	P000		
1.0	.6	.3	.1	0.0		
RUN	CIJK1					
220.	14.					
T(1)	DEF(1)					
0.	9.02					
T(2)	DEF(2)					
.2	6.25					
.7	3.1					
1.2	1.95					
T(5)	DEF(5)					
1.7	1.25					

(cont.)

T(6)	DEF(6)
2.2	.85
:	:
2.7	.65
:	:
3.2	.5
:	:
4.2	.35
:	:
5.2	.28
T(11)	DEF(11)
6.2	.23
T(12)	DEF(12)
-1.	6.1
T(12)	DEF(12)
1.8	4.95
:	:
2.8	4.45
T(IJK1)	DEF(14)
4.8	3.65
RUN	CIJK1
221.	14.
T(1)	DEF(1)
0.	9.03
:	:
.24	5.2
:	:
.74	2.35
:	:
1.24	1.25
:	:
1.74	.65
:	:
2.24	.32
T(7)	DEF(7)
2.74	.2
T(8)	DEF(8)
-1.	6.15
T(8)	DEF(8)
.85	5.4
:	:
1.85	4.55
:	:
2.85	3.95
:	:
3.85	3.5
:	:
5.85	2.8
:	:
7.85	2.25
T(14)	DEF(IJK1)
9.85	1.9
RUN	CIJK1
-1.	

$T(I) < 0$. signifies data from tape follows — $DEF(I) = DTAPE$ where $DTAPE$ is the magnitude of the tape deflection at $t = 0$.

$T(8) < 0$. means $DTAPE = DEF(8)$, proceed to read $T(8)$ and $DEF(8)$.

$RUN < 0$. signifies end of data set.

D. Sample Problem Output

<u>Equation Symbol</u>	<u>Fortran Symbol</u>	<u>Description</u>	<u>Units</u>
	T (I)	Time corresponding to some pressure (DEF(I)) for current RUN	tens of msec.s
	DEF (I)	Pressure at time T(I), divided by 100	psia/100.
	DAA (N) $\{N=2+\frac{IJK1}{2} + 2\}$	Coefficients in polynomial curve fit expression: $\ln(P) = DAA(2) + DAA(3)\tau + DAA(4)\tau^2 + DAA(5)\tau^3 + \dots$	-
E _s	ESURF	Surface activation energy	cal/mole
P _i	PO	Initial pressure	psig
	NUM	Number of points used in the space coordinate (i.e., number of DELX (ΔX) increments)	-
A	A	Constant in Equation 35 (see input listing)	-
B	B	Constant in Equation 36 (see input listing)	-
	HI	Non-dimensional exothermic surface heat release	-
	HS	Non-dimensional endothermic surface heat release	-
H	H	(HI-HS) Total surface heat release	-
	NRUN	Identifies experimental p vs. t data set	-
	IJK1	The number of points in p vs. t data set	-
τ	TTTT	Non-dimensional time ($t/(\nu_p/r_o^2)$)	-
P	P	Non-dimensional pressure (p/p_o)	-
R	R	Non-dimensional burning rate (r/r_o)	-
θ_f	THF	Non-dimensional flame temperature $[(T_f - T_\infty)/(T_{s,o} - T_\infty)]$	-
$(\partial\theta/\partial x)_{s,p}$	FDBK	Heat feedback to solid phase	-

<u>Equation Symbol</u>	<u>Fortran Symbol</u>	<u>Description</u>	<u>Units</u>
$R/\bar{R}$	RRQ	Ratio of instantaneous burning rate to steady-state value at that pressure	-
$\sqrt{\tau'_{dif}}$	TDIF2	Characteristic time for diffusion process	-
$\sqrt{\tau'_{CH}}$	TCH2	Characteristic time for chemical process	-
θ_s	TH(1)	Non-dimensional temperature at surface	-
	TH(41)- TH(161)	Non-dimensional temperatures at selected points in the subsurface region of the solid	-
t	REALT	Real time in seconds	sec.
p	PATM	Pressure in atmospheres	atm.
r	RCM	Burning rate in centimeters	cm.
T_s	TS	Surface temperature in degrees K	$^{\circ}K$

TIME =	0.0	DEF =	7.6999998
TIME =	0.0008	DEF =	7.0599997
TIME =	0.0058	DEF =	4.7999992
TIME =	0.0108	DEF =	3.5999994
TIME =	0.0158	DEF =	2.7500000
TIME =	0.0208	DEF =	2.1999998
TIME =	0.0258	DEF =	1.7999992
TIME =	0.0308	DEF =	1.5499992
TIME =	0.0408	DEF =	1.1999998
TIME =	0.0508	DEF =	0.9500000
TIME =	0.0608	DEF =	0.7300000
TIME =	0.0708	DEF =	0.5500000
TIME =	0.0808	DEF =	0.5300000
TIME =	0.1008	DEF =	0.5000000

-0.74853004570-02

-0.56612567740 00

0.10093530530 00

-0.21373541910-01

0.35661328430-02

-0.35439273700-03

0.17969387350-04

-0.35572511680-06

⇒ (-.007485300457)

⇒ (-.5661266774)

Coefficients in polynomial
curve fit expression.

(double precision)

TIME	PRESSURE	BURNING RATE	FLAME TEMP	TEMP SPAC	W/SPAC	TOIF2 TEMP	TEMPERATURE DIFFERENTIALS				ATM	BURNING RATE	TEMP DIFF	TEMP DIFF
							TH(1)	TH(61)	TH(62)	TH(63)				
5.907	0.1462	0.4140	1.1201	0.4283	0.809	3.77	0.8604	0.2245	0.3443	0.3059	0.94	0.223	0.03666	877.9
5.167	0.1409	0.4098	2.1204	0.4208	0.808	3.82	0.8592	0.2290	0.3455	0.3010	0.959	0.224	0.038259	876.4
5.431	0.1361	0.4028	2.1209	0.4137	0.807	3.84	0.8561	0.2334	0.3487	0.3001	0.926	0.221	0.039898	875.0
5.699	0.1314	0.3971	2.1214	0.4064	0.806	3.83	0.8541	0.2378	0.3510	0.3002	0.94	0.218	0.041561	873.7
5.771	0.1271	0.3918	2.1223	0.4002	0.805	3.81	0.8521	0.2420	0.3533	0.3004	0.965	0.215	0.043259	872.3
7.247	0.1229	0.3862	2.1231	0.3937	0.804	3.80	0.8502	0.2462	0.3555	0.3100	0.936	0.212	0.044900	871.0
7.526	0.1190	0.3810	2.1234	0.3874	0.803	3.79	0.8482	0.2503	0.3580	0.3109	0.909	0.209	0.046596	869.7
7.810	0.1152	0.3758	2.1244	0.3813	0.802	3.78	0.8463	0.2543	0.3603	0.3115	0.884	0.206	0.048344	868.4
8.097	0.1115	0.3706	2.1248	0.3752	0.802	3.77	0.8443	0.2583	0.3627	0.3123	0.859	0.203	0.050136	867.1
8.388	0.1080	0.3653	2.1249	0.3691	0.801	3.76	0.8423	0.2622	0.3651	0.3131	0.834	0.201	0.051939	865.8
8.582	0.1045	0.3600	2.1247	0.3631	0.800	3.75	0.8403	0.2660	0.3675	0.3139	0.809	0.198	0.053735	864.4
8.940	0.1012	0.3545	2.1242	0.3570	0.798	3.74	0.8382	0.2698	0.3700	0.3148	0.784	0.195	0.055531	863.0
9.281	0.0979	0.3490	2.1233	0.3510	0.796	3.73	0.8362	0.2736	0.3724	0.3157	0.759	0.192	0.057328	861.5
9.585	0.0948	0.3434	2.1220	0.3450	0.793	3.72	0.8343	0.2774	0.3747	0.3166	0.734	0.189	0.059125	860.0
9.894	0.0918	0.3377	2.1204	0.3391	0.790	3.71	0.8323	0.2811	0.3769	0.3175	0.709	0.186	0.060922	858.5
10.205	0.0889	0.3321	2.1185	0.3332	0.787	3.70	0.8303	0.2849	0.3790	0.3184	0.684	0.183	0.062719	857.0
10.520	0.0862	0.3266	2.1164	0.3275	0.784	3.69	0.8282	0.2884	0.3811	0.3193	0.659	0.180	0.064516	855.4
10.838	0.0836	0.3214	2.1143	0.3221	0.781	3.68	0.8261	0.2921	0.3832	0.3202	0.634	0.177	0.066313	853.9
11.158	0.0812	0.3165	2.1124	0.3170	0.778	3.67	0.8240	0.2956	0.3853	0.3211	0.609	0.174	0.068110	852.5
11.482	0.0791	0.3121	2.1109	0.3123	0.776	3.66	0.8219	0.2991	0.3874	0.3220	0.584	0.171	0.069907	851.0
11.810	0.0772	0.3083	2.1100	0.3082	0.774	3.65	0.8198	0.3026	0.3895	0.3229	0.559	0.168	0.071704	849.3
12.140	0.0756	0.3054	2.1100	0.3047	0.774	3.64	0.8177	0.3059	0.3916	0.3238	0.534	0.165	0.073501	847.8
12.473	0.0743	0.3035	2.1114	0.3019	0.774	3.63	0.8156	0.3091	0.3937	0.3247	0.509	0.162	0.075298	846.3
12.809	0.0732	0.3029	2.1154	0.3002	0.774	3.62	0.8135	0.3121	0.3958	0.3256	0.484	0.159	0.077095	844.8
13.147	0.0725	0.3035	2.1212	0.2993	0.782	3.61	0.8114	0.3150	0.3979	0.3265	0.459	0.156	0.078892	843.3
13.489	0.0721	0.3054	2.1282	0.2993	0.789	3.60	0.8093	0.3176	0.3999	0.3274	0.434	0.153	0.080689	841.8
13.834	0.0719	0.3087	2.1372	0.3001	0.798	3.59	0.8072	0.3200	0.4019	0.3283	0.409	0.150	0.082486	840.3
14.181	0.0719	0.3131	2.1482	0.3016	0.810	3.58	0.8051	0.3224	0.4039	0.3292	0.384	0.147	0.084283	838.8
14.532	0.0719	0.3182	2.1599	0.3035	0.823	3.57	0.8030	0.3248	0.4059	0.3301	0.359	0.144	0.086080	837.3
14.885	0.0719	0.3235	2.1738	0.3054	0.837	3.56	0.8009	0.3272	0.4079	0.3310	0.334	0.141	0.087877	835.8
15.241	0.0714	0.3280	2.1884	0.3066	0.851	3.55	0.7988	0.3296	0.4099	0.3319	0.309	0.138	0.089674	834.3
15.601	0.0701	0.3291	2.1948	0.3048	0.860	3.54	0.7967	0.3320	0.4119	0.3328	0.284	0.135	0.091471	832.8
15.963	0.0677	0.3257	2.1986	0.2999	0.864	3.53	0.7946	0.3344	0.4139	0.3337	0.259	0.132	0.093268	831.3
16.327	0.0650	0.3188	2.1967	0.2932	0.840	3.52	0.7925	0.3368	0.4159	0.3346	0.234	0.129	0.095065	829.8
16.695	0.0650	0.3170	2.1907	0.2922	0.855	3.51	0.7904	0.3392	0.4179	0.3355	0.209	0.126	0.096862	828.3
17.065	0.0650	0.3185	2.1942	0.2928	0.859	3.50	0.7883	0.3416	0.4199	0.3364	0.184	0.123	0.098659	826.8
17.438	0.0650	0.3210	2.1994	0.2937	0.866	3.49	0.7862	0.3440	0.4219	0.3373	0.159	0.120	0.100456	825.3
17.814	0.0650	0.3241	2.2066	0.2949	0.874	3.48	0.7841	0.3464	0.4239	0.3382	0.134	0.117	0.102253	823.8
18.192	0.0650	0.3275	2.2144	0.2963	0.894	3.47	0.7820	0.3488	0.4259	0.3391	0.109	0.114	0.104050	822.3
18.573	0.0650	0.3311	2.2222	0.2977	0.893	3.46	0.7799	0.3512	0.4279	0.3400	0.084	0.111	0.105847	820.8
18.957	0.0650	0.3347	2.2306	0.2991	0.903	3.45	0.7778	0.3536	0.4299	0.3409	0.059	0.108	0.107644	819.3
19.344	0.0650	0.3381	2.2365	0.3004	0.912	3.44	0.7757	0.3560	0.4319	0.3418	0.034	0.105	0.109441	817.8
19.733	0.0650	0.3414	2.2428	0.3016	0.921	3.43	0.7736	0.3584	0.4339	0.3427	0.009	0.102	0.111238	816.3
20.125	0.0650	0.3444	2.2484	0.3028	0.929	3.42	0.7715	0.3608	0.4359	0.3436	0.000	0.100	0.113035	814.8
20.517	0.0650	0.3471	2.2535	0.3038	0.936	3.41	0.7694	0.3632	0.4379	0.3445	0.000	0.098	0.114832	813.3
20.917	0.0650	0.3497	2.2585	0.3050	0.943	3.40	0.7673	0.3656	0.4399	0.3454	0.000	0.096	0.116629	811.8

TIME =	0.0	DEF =	9.0199995
TIME =	0.0020	DEF =	6.2500000
TIME =	0.0070	DEF =	3.0999994
TIME =	0.0120	DEF =	1.9499998
TIME =	0.0170	DEF =	1.2500000
TIME =	0.0220	DEF =	0.8500000
TIME =	0.0270	DEF =	0.6500000
TIME =	0.0320	DEF =	0.5000000
TIME =	0.0420	DEF =	0.3500000
TIME =	0.0520	DEF =	0.2800000
TIME =	0.0620	DEF =	0.2300000
TIME =	0.0711	DEF =	7.3195066
TIME =	0.0717	DEF =	6.5301630
TIME =	0.0730	DEF =	5.3972111

0.69759462740-02

-0.51154346140 00

0.73136890030-01

-0.10729709010-01

0.99595309660-03

-0.52126055160-04

0.14200620060-05

-0.15668198220-07

Coefficients in polynomial
curve fit expression.

 GRANULAR DIFFUSION MODEL USING WEIGHTED STEP-IMPULSE INTEGRATION JF THE GAS PHASE.

DEPRESSURIZATION MODEL:

E-ACT (SURF) = 14000. A = 0.080 HI = 2.3093

PO = 902. B = .709 HS = 1.7550

204 POINTS WERE USED IN THE SPACE COORDINATE.

Y = 0.554

PRESSURE VS. TIME DATA FROM RUN # 220

NO. OF DATA POINTS USED = 14

TIME	PRESSURE	BURNING RATE	FLAME TEMP	TEMP GRAD	R/REQ	TOIF2	TCH2	TEMPERATURE PROFILE IN EVENLY SPACED INCREMENTS	REAL TIME	P ATM	BURNING RATE CM/SEC	TEMP SURF D'GK
								TH(1) TH(41) TH(81) TH(121) TH(161)				
0.0	0.9230	0.9785	2.1103	0.9708	1.004	1.76	0.09	0.9961 0.0964 0.0093 0.0009 0.0001 0.0	0.0	62.79	0.866	1328.6
0.227	0.9106	0.9783	2.1139	0.9660	1.008	1.77	0.09	0.9950 0.0955 0.0092 0.0009 0.0001 0.0000067	0.000067	61.94	0.866	1328.6
0.367	0.8926	0.9773	2.1144	0.9585	1.009	1.79	0.09	0.9949 0.0965 0.0094 0.0009 0.0001 0.000166	0.000166	60.72	0.861	1327.8
0.511	0.8696	0.9508	2.1106	0.9483	1.006	1.80	0.09	0.9928 0.0967 0.0094 0.0009 0.0001 0.000298	0.000298	59.16	0.851	1326.2
0.657	0.8423	0.9436	2.1047	0.9349	0.998	1.82	0.09	0.9895 0.0969 0.0094 0.0009 0.0001 0.000461	0.000461	57.30	0.835	1323.8
0.806	0.8115	0.9232	2.0944	0.9197	0.989	1.84	0.10	0.9856 0.0973 0.0094 0.0009 0.0001 0.000656	0.000656	55.21	0.817	1321.0
0.957	0.7781	0.9007	2.0838	0.9030	0.979	1.87	0.11	0.9812 0.0983 0.0095 0.0009 0.0001 0.000882	0.000882	52.93	0.797	1317.8
1.109	0.7427	0.8767	2.0734	0.8848	0.968	1.90	0.11	0.9765 0.0990 0.0096 0.0009 0.0001 0.001139	0.001139	50.52	0.776	1314.3
1.262	0.7062	0.8520	2.0620	0.8654	0.957	1.93	0.12	0.9715 0.1003 0.0097 0.0009 0.0001 0.001425	0.001425	48.04	0.754	1310.6
1.415	0.6692	0.8273	2.0504	0.8449	0.947	1.96	0.13	0.9663 0.1020 0.0099 0.0010 0.0001 0.001741	0.001741	45.52	0.732	1306.9
1.568	0.6323	0.8028	2.0398	0.8239	0.937	2.00	0.14	0.9612 0.1041 0.0102 0.0010 0.0001 0.002085	0.002085	43.01	0.711	1303.1
1.721	0.5961	0.7788	2.0302	0.8024	0.928	2.04	0.15	0.9560 0.1067 0.0105 0.0010 0.0001 0.002458	0.002458	40.55	0.689	999.3
1.874	0.5608	0.7554	2.0215	0.7808	0.919	2.08	0.16	0.9508 0.1096 0.0108 0.0010 0.0001 0.002858	0.002858	38.15	0.669	995.5
2.027	0.5268	0.7325	2.0135	0.7592	0.911	2.12	0.18	0.9456 0.1130 0.0113 0.0011 0.0001 0.003284	0.003284	35.83	0.648	991.7
2.180	0.4942	0.7102	2.0063	0.7376	0.904	2.17	0.19	0.9404 0.1167 0.0118 0.0011 0.0001 0.003736	0.003736	33.62	0.629	987.9
2.333	0.4633	0.6888	1.9996	0.7163	0.897	2.22	0.20	0.9353 0.1209 0.0124 0.0012 0.0001 0.004214	0.004214	31.52	0.610	984.2
2.486	0.4341	0.6679	1.9934	0.6952	0.890	2.27	0.22	0.9302 0.1253 0.0132 0.0013 0.0001 0.004716	0.004716	29.53	0.591	980.4
2.639	0.4065	0.6476	1.9877	0.6745	0.883	2.33	0.24	0.9252 0.1301 0.0140 0.0014 0.0001 0.005242	0.005242	27.66	0.573	976.8
2.792	0.3807	0.6278	1.9824	0.6542	0.877	2.38	0.25	0.9202 0.1351 0.0150 0.0015 0.0001 0.005792	0.005792	25.90	0.556	973.1
2.945	0.3564	0.6087	1.9773	0.6343	0.871	2.44	0.28	0.9152 0.1404 0.0161 0.0015 0.0002 0.006364	0.006364	24.25	0.539	969.4
3.098	0.3337	0.5900	1.9724	0.6148	0.864	2.50	0.30	0.9102 0.1459 0.0173 0.0018 0.0002 0.006958	0.006958	22.70	0.522	965.8
3.251	0.3125	0.5718	1.9676	0.5958	0.858	2.55	0.32	0.9052 0.1517 0.0186 0.0019 0.0002 0.007574	0.007574	21.26	0.505	962.1
3.404	0.2927	0.5541	1.9630	0.5771	0.852	2.62	0.34	0.9002 0.1576 0.0201 0.0022 0.0002 0.008210	0.008210	19.91	0.490	958.5
3.557	0.2742	0.5367	1.9583	0.5589	0.846	2.68	0.37	0.8953 0.1636 0.0219 0.0024 0.0002 0.008867	0.008867	18.65	0.475	954.9
3.710	0.2569	0.5197	1.9535	0.5411	0.839	2.74	0.40	0.8903 0.1698 0.0235 0.0027 0.0003 0.009544	0.009544	17.47	0.460	951.2
3.863	0.2407	0.5030	1.9485	0.5237	0.832	2.81	0.43	0.8852 0.1767 0.0255 0.0030 0.0003 0.010239	0.010239	16.38	0.445	947.5
4.016	0.2257	0.4866	1.9434	0.5067	0.825	2.87	0.46	0.8802 0.1826 0.0274 0.0033 0.0004 0.010953	0.010953	15.35	0.431	943.8
4.169	0.2115	0.4704	1.9383	0.4900	0.818	2.94	0.50	0.8750 0.1891 0.0294 0.0037 0.0004 0.011686	0.011686	14.40	0.415	940.1
4.322	0.1985	0.4545	1.9324	0.4737	0.810	3.01	0.53	0.8699 0.1958 0.0322 0.0042 0.0005 0.012436	0.012436	13.50	0.402	936.3
4.475	0.1863	0.4389	1.9264	0.4577	0.802	3.07	0.58	0.8646 0.2024 0.0347 0.0047 0.0005 0.013203	0.013203	12.67	0.388	932.5
4.628	0.1749	0.4235	1.9200	0.4421	0.793	3.14	0.62	0.8594 0.2092 0.0374 0.0053 0.0006 0.013986	0.013986	11.90	0.375	928.6
4.781	0.1643	0.4083	1.9137	0.4268	0.784	3.21	0.67	0.8540 0.2160 0.0403 0.0059 0.0007 0.014786	0.014786	11.18	0.361	924.7
4.934	0.1544	0.3934	1.9061	0.4119	0.774	3.29	0.72	0.8486 0.2224 0.0433 0.0066 0.0008 0.015601	0.015601	10.51	0.348	920.7
5.087	0.1453	0.3788	1.8985	0.3974	0.763	3.36	0.79	0.8431 0.2298 0.0465 0.0074 0.0010 0.016432	0.016432	9.84	0.335	916.7
5.240	0.1368	0.3644	1.8905	0.3832	0.753	3.43	0.84	0.8376 0.2365 0.0499 0.0083 0.0011 0.017278	0.017278	9.30	0.323	912.7
5.393	0.1289	0.3504	1.8820	0.3694	0.741	3.50	0.90	0.8321 0.2436 0.0534 0.0093 0.0013 0.018138	0.018138	8.77	0.310	908.6
5.546	0.1216	0.3367	1.8732	0.3561	0.730	3.57	0.97	0.8269 0.2507 0.0570 0.0104 0.0015 0.019012	0.019012	8.27	0.298	904.5
5.699	0.1143	0.3234	1.8659	0.3431	0.717	3.64	1.04	0.8208 0.2579 0.0607 0.0114 0.0018 0.020000	0.020000	7.77	0.286	900.4
5.852	0.1077	0.3104	1.8583	0.3305	0.705	3.71	1.12	0.8152 0.2657 0.0643 0.0124 0.0020 0.021001	0.021001	7.30	0.275	896.3

TIME	PRESSURE	BURNING RATE	FLAME TEMP	TEMP GRAD	R/RFO	TDIF2	TCH2	TEMPERATURE PROFILE IN EV'NLY SPACED INCREMENTS				REAL TIME	P ATM	BURNING RATE CM/SFC	TFMP SURF DEGR
								TH(1)	TH(2)	TH(3)	TH(4)	TH(5)			
8.791	0.1030	0.2979	1.8443	0.3184	0.692	3.78	1.21	3.8095	0.2704	0.0687	0.0140	0.0023	0.021714	0.264	892.2
9.155	0.0977	0.2957	1.8339	0.3067	0.678	3.85	1.30	3.8039	0.2770	0.0731	0.0154	0.0027	0.022644	0.253	888.0
9.546	0.0929	0.2739	1.8232	0.2955	0.665	3.91	1.39	0.7983	0.2835	0.0775	0.0169	0.0031	0.023580	0.242	879.8
9.931	0.0885	0.2576	1.8122	0.2846	0.651	3.98	1.50	0.7926	0.2899	0.0820	0.0186	0.0035	0.024531	0.232	875.7
10.321	0.0844	0.2517	1.8009	0.2742	0.637	4.04	1.63	0.7871	0.2962	0.0865	0.0203	0.0040	0.025493	0.223	871.7
10.715	0.0806	0.2412	1.7893	0.2642	0.622	4.10	1.72	0.7815	0.3023	0.0912	0.0222	0.0045	0.026467	0.214	867.6
11.114	0.0772	0.2311	1.7775	0.2546	0.608	4.15	1.84	0.7760	0.3083	0.0960	0.0242	0.0051	0.027452	0.205	863.6
11.524	0.0740	0.2214	1.7653	0.2454	0.593	4.22	1.96	0.7705	0.3142	0.1008	0.0263	0.0057	0.028447	0.196	859.5
11.924	0.0711	0.2119	1.7537	0.2364	0.578	4.27	2.10	0.7649	0.3199	0.1057	0.0284	0.0064	0.029454	0.187	855.4
12.336	0.0685	0.2027	1.7400	0.2276	0.562	4.32	2.24	0.7593	0.3254	0.1107	0.0307	0.0071	0.030470	0.178	851.3
12.759	0.0660	0.1937	1.7259	0.2191	0.546	4.37	2.40	0.7537	0.3308	0.1157	0.0331	0.0079	0.031497	0.169	847.1
13.171	0.0638	0.1849	1.7114	0.2109	0.530	4.41	2.55	0.7480	0.3360	0.1207	0.0356	0.0088	0.032534	0.160	842.9
13.595	0.0617	0.1764	1.6962	0.2028	0.513	4.45	2.74	0.7422	0.3411	0.1258	0.0382	0.0098	0.033580	0.151	838.6
14.022	0.0597	0.1679	1.6802	0.1949	0.495	4.49	2.93	0.7363	0.3460	0.1309	0.0410	0.0108	0.034637	0.142	834.1
14.454	0.0579	0.1595	1.6630	0.1869	0.477	4.53	3.14	0.7301	0.3507	0.1361	0.0438	0.0119	0.035702	0.133	829.3
14.889	0.0562	0.1510	1.6445	0.1789	0.458	4.56	3.37	0.7237	0.3552	0.1412	0.0467	0.0131	0.036777	0.124	824.3
15.327	0.0547	0.1424	1.6241	0.1708	0.438	4.59	3.63	0.7168	0.3596	0.1464	0.0497	0.0143	0.037860	0.115	818.9
15.770	0.0532	0.1336	1.6015	0.1624	0.416	4.62	3.94	0.7094	0.3638	0.1515	0.0528	0.0157	0.038953	0.106	813.0
16.216	0.0519	0.1244	1.5762	0.1535	0.392	4.64	4.30	0.7013	0.3678	0.1569	0.0561	0.0171	0.040054	0.100	808.6
16.665	0.0506	0.1148	1.5473	0.1441	0.366	4.65	4.73	0.6923	0.3716	0.1622	0.0594	0.0186	0.041164	0.093	804.5
17.118	0.0494	0.1046	1.5143	0.1339	0.337	4.66	5.27	0.6821	0.3752	0.1676	0.0629	0.0202	0.042282	0.083	799.0
17.574	0.0483	0.0940	1.4764	0.1229	0.306	4.66	5.97	0.6705	0.3785	0.1730	0.0665	0.0219	0.043409	0.073	790.5
18.033	0.0473	0.0828	1.4343	0.1107	0.272	4.65	6.89	0.6572	0.3815	0.1784	0.0702	0.0238	0.044544	0.063	780.7
18.496	0.0464	0.0713	1.3848	0.0976	0.237	4.64	8.14	0.6419	0.3840	0.1839	0.0741	0.0257	0.045687	0.053	769.5
18.962	0.0455	0.0590	1.3296	0.0838	0.201	4.62	9.85	0.6246	0.3861	0.1894	0.0782	0.0278	0.046838	0.044	756.9
19.431	0.0446	0.0492	1.2702	0.0700	0.166	4.59	12.25	0.6056	0.3874	0.1949	0.0824	0.0300	0.047996	0.035	728.7
19.903	0.0441	0.0398	1.2139	0.0576	0.135	4.55	15.32	0.5860	0.3880	0.2003	0.0867	0.0325	0.049163	0.028	714.3
20.378	0.0435	0.0319	1.1579	0.0470	0.109	4.53	19.20	0.5664	0.3878	0.2055	0.0910	0.0348	0.050337	0.023	700.4
20.857	0.0429	0.0256	1.1074	0.0381	0.094	4.51	23.99	0.5474	0.3867	0.2104	0.0955	0.0373	0.051519	0.018	687.2
21.338	0.0424	0.0205	1.0616	0.0311	0.071	4.49	29.70	0.5293	0.3848	0.2150	0.0999	0.0400	0.052708	0.015	674.4
21.823	0.0420	0.0165	1.0149	0.0247	0.057	4.46	37.43	0.5119	0.3823	0.2191	0.1042	0.0427	0.053905	0.012	662.6
22.310	0.0415	0.0133	0.9755	0.0201	0.047	4.44	46.16	0.4957	0.3792	0.2229	0.1085	0.0455	0.055109	0.010	651.7
22.801	0.0411	0.0109	0.9424	0.0167	0.038	4.43	55.54	0.4809	0.3756	0.2262	0.1127	0.0483	0.056320	0.008	641.7
23.294	0.0407	0.0090	0.9134	0.0140	0.032	4.43	65.97	0.4672	0.3716	0.2290	0.1167	0.0512	0.057539	0.007	632.4
23.791	0.0401	0.0075	0.8874	0.0118	0.027	4.43	77.79	0.4545	0.3675	0.2315	0.1206	0.0540	0.058755	0.006	623.5
24.293	0.0394	0.0063	0.8639	0.0101	0.023	4.44	91.21	0.4427	0.3631	0.2335	0.1243	0.0569	0.059998		

CASE -XTINGJISHED.

**

TIME =	0.0	DEF =	9.0299997
TIME =	0.0024	DEF =	5.1999993
TIME =	0.0074	DEF =	2.1499994
TIME =	0.0124	DEF =	1.2500000
TIME =	0.0174	DEF =	0.6500000
TIME =	0.0224	DEF =	0.3200000
TIME =	0.0274	DEF =	0.2000000
TIME =	0.0005	DEF =	7.9287796
TIME =	0.0012	DEF =	6.6907299
TIME =	0.0018	DEF =	5.7997541
TIME =	0.0024	DEF =	5.1390238
TIME =	0.0037	DEF =	4.1112165
TIME =	0.0049	DEF =	3.3036566
TIME =	0.0052	DEF =	2.7897530

0.29107715460-02

-0.69296413440 00

0.13821431990 00

-0.26669359400-01

0.30930622430-02

-0.20984303540-03

0.55625746010-05

0.63759869120-07

Coefficients in polynomial
curve fit expression.

 GRANULAR DIFFUSION MODEL USING WEIGHTED STEP-IMPULSE INTEGRATION OF THE GAS PHASE.

DEPRESSURIZATION MODEL:

E-act (SURF) = 16000. A = 0.080 HI = 2.3093
 PO = 903. B = 1.709 HS = 1.7550

H = 0.554

PRESSURE VS. TIME DATA FROM RUN # 221

NO. OF DATA POINTS USED = 14

204 POINTS WERE USED IN THE SPACE COORDINATE.

TIME	PRESSURE	BURNING RATE	FLAME TEMP	TEMP GRAD	R/RFO	TDIF2 TCH2	TEMPERATURE PROFILE IN EVENLY SPACED INCREMENTS	REAL TIME	P ATM	BURNING RATE CM/SEC	TEMP SJRF DEGR
							TH(2) TH(41) TH(81) TH(121) TH(161)				
3.0	0.9201	0.9780	2.1105	0.9697	1.004	1.76	0.9960 0.9993 0.9999 0.9999 0.9999	0.0	62.61	0.825	1028.5
3.022	0.9070	0.9775	2.1137	0.9645	1.009	1.78	0.9959 0.9964 0.9993 0.9999 0.9999	0.000053	61.70	0.865	1028.5
3.054	0.8877	0.9714	2.1145	0.9564	1.010	1.79	0.9947 0.9965 0.9993 0.9999 0.9999	0.000132	60.38	0.860	1027.6
3.096	0.8631	0.9595	2.1125	0.9455	1.007	1.81	0.9925 0.9966 0.9994 0.9999 0.9999	0.000237	58.71	0.849	1026.0
3.149	0.8341	0.9419	2.1063	0.9314	1.000	1.83	0.9892 0.9968 0.9994 0.9999 0.9999	0.000367	56.74	0.834	1023.6
3.212	0.8015	0.9204	2.0957	0.9152	0.990	1.85	0.9851 0.9977 0.9994 0.9999 0.9999	0.000523	54.52	0.815	1020.6
3.284	0.7652	0.8962	2.0842	0.8974	0.979	1.88	0.9804 0.9977 0.9994 0.9999 0.9999	0.000703	52.13	0.793	1017.1
3.367	0.7293	0.8702	2.0726	0.8781	0.967	1.91	0.9757 0.9964 0.9994 0.9999 0.9999	0.000907	49.61	0.770	1013.3
3.459	0.6913	0.8431	2.0587	0.8574	0.954	1.94	0.9706 0.9966 0.9994 0.9999 0.9999	0.001134	47.03	0.746	1009.3
3.561	0.6532	0.8158	2.0454	0.8358	0.942	1.97	0.9639 0.9998 0.9999 0.9999 0.9999	0.001385	44.43	0.722	1005.1
3.672	0.6154	0.7886	2.0316	0.8135	0.929	2.01	0.9581 0.9998 0.9999 0.9999 0.9999	0.001659	41.87	0.698	1000.8
3.791	0.5780	0.7521	2.0189	0.7909	0.917	2.05	0.9523 0.9998 0.9999 0.9999 0.9999	0.001954	39.36	0.675	996.6
3.920	0.5430	0.7362	2.0071	0.7682	0.906	2.10	0.9464 0.9998 0.9999 0.9999 0.9999	0.002272	36.94	0.652	992.3
4.057	0.5089	0.7111	1.9967	0.7455	0.895	2.14	0.9406 0.9998 0.9999 0.9999 0.9999	0.002610	34.62	0.629	988.1
4.202	0.4765	0.6869	1.9860	0.7231	0.885	2.19	0.9349 0.9998 0.9999 0.9999 0.9999	0.002968	32.42	0.608	983.8
4.355	0.4459	0.6635	1.9765	0.7009	0.875	2.24	0.9292 0.9998 0.9999 0.9999 0.9999	0.003347	30.34	0.587	979.7
4.516	0.4172	0.6410	1.9677	0.6792	0.866	2.29	0.9235 0.9998 0.9999 0.9999 0.9999	0.003744	28.38	0.567	975.5
4.681	0.3902	0.6193	1.9594	0.6578	0.857	2.35	0.9179 0.9998 0.9999 0.9999 0.9999	0.004161	26.54	0.548	971.5
4.844	0.3650	0.5983	1.9516	0.6369	0.848	2.40	0.9124 0.9998 0.9999 0.9999 0.9999	0.004596	24.83	0.530	967.4
5.004	0.3414	0.5780	1.9441	0.6165	0.840	2.46	0.9069 0.9998 0.9999 0.9999 0.9999	0.005048	23.22	0.512	963.4
5.164	0.3193	0.5582	1.9369	0.5965	0.831	2.52	0.9014 0.9998 0.9999 0.9999 0.9999	0.005518	21.72	0.494	959.4
5.324	0.2987	0.5390	1.9298	0.5769	0.823	2.57	0.8954 0.9998 0.9999 0.9999 0.9999	0.006005	20.32	0.477	955.4
5.484	0.2795	0.5202	1.9226	0.5577	0.814	2.64	0.8904 0.9998 0.9999 0.9999 0.9999	0.006507	19.01	0.460	951.3
5.644	0.2615	0.5017	1.9154	0.5388	0.805	2.70	0.8848 0.9998 0.9999 0.9999 0.9999	0.007026	17.79	0.444	947.2
5.804	0.2446	0.4834	1.9078	0.5202	0.795	2.76	0.8782 0.9998 0.9999 0.9999 0.9999	0.007560	16.64	0.428	943.1
5.964	0.2287	0.4653	1.8998	0.5018	0.785	2.83	0.8724 0.9998 0.9999 0.9999 0.9999	0.008109	15.54	0.412	938.9
6.124	0.2138	0.4472	1.8912	0.4836	0.774	2.89	0.8674 0.9998 0.9999 0.9999 0.9999	0.008671	14.55	0.396	934.5
6.284	0.1998	0.4290	1.8818	0.4654	0.762	2.96	0.8613 0.9998 0.9999 0.9999 0.9999	0.009251	13.59	0.380	930.0
6.444	0.1866	0.4106	1.8714	0.4473	0.750	3.03	0.8558 0.9998 0.9999 0.9999 0.9999	0.009842	12.69	0.363	925.3
6.604	0.1741	0.3920	1.8597	0.4291	0.735	3.11	0.8481 0.9998 0.9999 0.9999 0.9999	0.010447	11.85	0.347	920.4
6.764	0.1624	0.3710	1.8465	0.4107	0.719	3.18	0.8409 0.9998 0.9999 0.9999 0.9999	0.011064	11.05	0.331	915.1
6.924	0.1512	0.3516	1.8315	0.3921	0.701	3.26	0.8333 0.9998 0.9999 0.9999 0.9999	0.011694	10.29	0.313	909.5
7.084	0.1407	0.3331	1.8147	0.3729	0.680	3.33	0.8250 0.9998 0.9999 0.9999 0.9999	0.012336	9.57	0.295	903.5
7.244	0.1309	0.3172	1.7938	0.3531	0.657	3.41	0.8166 0.9998 0.9999 0.9999 0.9999	0.012990	8.90	0.276	896.9
7.404	0.1214	0.2992	1.7675	0.3326	0.629	3.49	0.8080 0.9998 0.9999 0.9999 0.9999	0.013655	8.26	0.257	889.6
7.564	0.1126	0.2843	1.7390	0.3108	0.597	3.54	0.7988 0.9998 0.9999 0.9999 0.9999	0.014331	7.56	0.235	881.4
7.724	0.1045	0.2721	1.7075	0.2877	0.559	3.64	0.7881 0.9998 0.9999 0.9999 0.9999	0.015017	7.09	0.214	872.0
7.884	0.0964	0.2611	1.6753	0.2605	0.512	3.71	0.7762 0.9998 0.9999 0.9999 0.9999	0.015714	6.54	0.190	867.5
8.044	0.0897	0.2505	1.6422	0.2331	0.459	3.79	0.7643 0.9998 0.9999 0.9999 0.9999	0.016420	6.05	0.164	862.4

TIME	PRESSURE	BURNING RATE	FLAME TEMP	TEMP GRAD	R/REQ	TDIF2	TCH2	TEMPERATURE PROFILE IN EVENLY SPACED INCREMENTS				REAL TIME	P ATM	BURNING RATE CM/SEC	TEMP SURF DEGR
								TH(1)	TH(2)	TH(41)	TH(42)	TH(161)			
5.937	0.0821	0.1540	1.5326	0.2002	0.394	3.83	3.04	0.7259	0.2771	0.0701	0.0133	0.0020	5.59	0.136	831.0
7.230	0.0757	0.1222	1.4541	0.1654	0.324	3.88	4.07	0.5993	0.2855	0.0758	0.0150	0.0024	5.14	0.108	811.6
7.527	0.0697	0.0919	1.3615	0.1285	0.253	3.93	5.79	0.5681	0.2935	0.0820	0.0170	0.0028	4.74	0.081	788.7
7.827	0.0642	0.0675	1.2837	0.0984	0.193	3.99	8.15	0.6363	0.3008	0.0895	0.0193	0.0033	4.37	0.060	755.4
8.130	0.0592	0.0487	1.2083	0.0732	0.144	4.05	11.59	0.6047	0.3058	0.0952	0.0217	0.0039	4.02	0.043	742.3
9.437	0.0546	0.0351	1.1410	0.0539	0.108	4.12	16.37	0.5748	0.3115	0.1020	0.0244	0.0046	3.71	0.031	720.4
8.746	0.0505	0.0256	1.0830	0.0399	0.082	4.20	22.65	0.5474	0.3148	0.1038	0.0273	0.0054	3.43	0.023	700.4
9.058	0.0468	0.0190	1.0352	0.0302	0.063	4.29	30.39	0.5229	0.3167	0.1153	0.0303	0.0063	3.19	0.017	682.5
9.372	0.0436	0.0141	0.9777	0.0213	0.048	4.36	43.32	0.5000	0.3175	0.1217	0.0335	0.0072	2.97	0.012	655.7
9.682	0.0409	0.0103	0.9390	0.0163	0.038	4.44	56.71	0.4799	0.3173	0.1276	0.0368	0.0083	2.78	0.010	651.0
10.008	0.0386	0.0083	0.8993	0.0123	0.030	4.50	75.40	0.4617	0.3162	0.1332	0.0402	0.0094	2.63	0.007	637.7
10.329	0.0369	0.0066	0.8704	0.0099	0.024	4.55	93.76	0.4455	0.3144	0.1384	0.0436	0.0107	2.51	0.006	625.9

CASE EXTINGUISHED.

Unclassified

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

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		2b. GROUP	
3. REPORT TITLE Extinguishment of Solid Propellants by Rapid Depressurization (A Supplement to AMS Report No.880)			
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13. ABSTRACT This document is a supplement to Report No. AMS 880 (July 1969) and contains the detailed data from the extinguishment tests and complete descriptions of the computer programs referred to in AMS 880. The data from 330 extinguishment tests include the measured pressure versus time histories (in tabular and graphical form), propellant designations and extinguishment parameters. Listings, descriptions and sample cases are included for two computer programs: 1) Program to Calculate Constants in the Characteristic Time Equations for Chemical and Diffusional Processes and 2) Program to Predict Extinguishment and to Calculate Dynamic Burning Properties from Pressure versus Time Data Input.			

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