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Closed-Chamber Analysis of M5 Propellant Lot RAD-64597

William F. Oberle

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1. INTRODUCTION

The Advanced Propulsion Technology Branch (APTB) of the Propulsion and Flight Division (PFD) is currently engaged in the investigation of both liquid and solid propellant electrothermal-chemical (ETC) propulsion concepts. A major goal of this technology investigation is to demonstrate that ETC propulsion offers performance advantages (increased muzzle kinetic energy) in comparison to conventional solid propellant performance. To experimentally quantify differences in performance between ETC and conventional solid propellant technologies requires optimization of the propelling charges. For solid propellant ETC (SPETC) such an optimization requires an accurate knowledge of the burning characteristics (linear burn rate) of the propellant. For the APTB experimental program, one of the baseline solid propellants will be M5, lot RAD-64597.

In this report, results of the closed-chamber linear burn rate analysis of M5 propellant will be presented.

2. PROPELLANT PHYSICAL PROPERTIES

M5 is a double base, nitrocellulose and nitroglycerin, propellant. The specific lot utilized in the experimental program, RAD-64597, was produced in 1966 by the Radford Army Ammunition Plant, Radford, Virginia. Table 1 provides the propellant composition as provided by the manufacturer (see Propellant Description Sheet, Appendix A). Although the sum of the percentages exceeds 100% (102.19%), this is an artifact of the reporting process utilized by the manufacturer.

Thermochemical properties for the propellant are obtained using the thermodynamic code BLAKE[1] based upon the constituent list provided in Table 1. However, the percentages are normalized to 100%. For example, the percent used in BLAKE for nitrocellulose is 79.9% (81.65/102.19). The BLAKE results are given in Table 2.

[1]Freedman, E. "BLAKE - A Thermodynamics Code Based on TIGER: User's Guide and Manual." BRL-TR-02411, U.S. Army Ballistic Research Laboratory, Aberdeen Proving Ground, MD, July 1982.

Table 1. Composition of M5: Lot RAD-64597

Constituent	Percent
Nitrocellulose	81.65
Nitroglycerine	15.27
Ethyl Centralite	0.52
Potassium Nitrate	0.82
Barium Nitrate	1.41
Graphite	0.33
Moisture	0.30
Total Volatiles	1.85
Graphite Glaze	0.04

Table 2. Thermochemical Properties for M5: Lot RAD-64597 as Computed by BLAKE

Flame Temperature	3397 K
Impetus	1093 J/g
Covolume	0.984 cm^3/g
Specific Heat Ratio	1.2258
Molecular Weight	25.70266

Note: Propellant density was measured to be 1.65 g/cm^3.

Table 3. Grain Geometry for M5: Lot RAD-64597 Utilized in the APTB Experimental Program

Length	0.574294 cm
Outer Diameter	0.136906 cm
Perf Diameter	0.040894 cm
Web	0.048006 cm

The grain geometry was cylindrical with a single perforation (i.e., 1-Perf). Specifics of the grain geometry are provided in Table 3 (also see Propellant Description Sheet, Appendix A).

3. EXPERIMENTAL CONFIGURATION

Six firings, which will be referenced as Tracks 1 through 6, of the M5 propellant were performed at the PFD High-Pressure Closed-Chamber Facility by Mr. William Aungst in November 1992. The closed vessel had an internal volume of 209 cm^3. The pressure data was recorded (as voltage) for each individual firing by a single Kistler 607C4 pressure transducer mounted in the chamber wall. Subsequently, the voltage data was converted to pressure units using an option of the closed-chamber data analysis program BRLCB.[2] BRLCB utilizes a second order fit,

$$\text{Pressure (MPa)} = A + B*X + C*X*X$$

where X is the voltage data converted to pico-columbs and A, B, and C are calibration constants associated with each pressure transducer. Table 4 gives relevant information concerning the pressure transducers utilized in the closed-chamber experiments.

Table 4. Information for the Pressure Transducers Utilized in the Closed-Chamber Firings

Transducer ID	Firing	A	B	C	Date Calibrated
C13788	Track 1	5.3714E-1	5.2948E-2	−8.8281E-8	10 May 91
C14430	Tracks 2–6	2.0157E0	5.2474E-2	−1.2544E-7	21 Apr 92

As mentioned previously, six closed-chamber firings were performed in the experimental series. The first three firings (Tracks 1–3) had a nominal loading density (mass of propellant/closed-chamber volume, ld) of 0.25 g/cm^3 while the final three firings had a nominal loading density of 0.35 g/cm^3. In all firings, the igniter mass was 1.5 g. Specific details of the propellant and igniter masses are presented in Table 5 (see also Appendix B, Closed-Chamber Data Sheets).

[2]Oberle, W. F., and Kooker, D. E. "BRLCB: A Closed-Chamber Data Analysis Program, Part I—Theory and User's Manual." ARL-TR-36, U.S. Army Research Laboratory, Aberdeen Proving Ground, MD, January 1993.

Table 5. Propellant and Igniter Masses Utilized in the Firing Series

	Igniter Mass (g)	Propellant Mass (g)	Propellant ld (g/cm^3)
Track 1	1.5	52.4416	0.250917
Track 2	1.5	52.4396	0.250907
Track 3	1.5	52.3564	0.250509
Track 4	1.5	73.1632	0.350063
Track 5	1.5	73.1950	0.350215
Track 6	1.5	73.4889	0.351622

4. RESULTS

Figures 1–6 show the pressure histories (pressure vs. time) recorded for the six firings. As can be observed from the figures, the pressure histories appear to smooth with little or no evidence of longitudinal or radial pressure waves.

The pressure histories, physical properties of the propellant and closed vessel were utilized as input to the closed-chamber data reduction code BRLCB in order to determine the propellant's apparent linear regression or burn rate. Preprocessing (prior to the burn rate calculation) of the pressure-time data included wildpointing and smoothing. Due to the "smoothness" of the pressure histories, Figures 1–6, no data points were modified by the wildpointing process. Smoothing was performed utilizing a "fixed bridge" of length 15. Details of the wildpointing and smoothing algorithms can be found in the report by Oberle and Kooker.

For the burn rate calculation in BRLCB, the difference between the observed maximum pressure and the theoretical maximum pressure is used as a measure of the heat loss which occurred during the closed-chamber firing. For a typical double base propellant, such as M5, heat loss is generally 5%–10%. However, in this series of firings, the heat loss was substantially below these levels (see Table 6). In fact, for the first two firings, Tracks 1 and 2, the observed maximum pressure was actually greater than the theoretical maximum pressure (a physical impossibility). Generally, this indicates either an error with the

Table 6. Observed and Theoretical Maximum Pressures

	Observed Max Press (MPa)	Theoretical Max Press (MPa)	Heat Loss (%)
Track 1	373.445	370.573	–0.77
Track 2	370.832	370.555	–0.75
Track 3	368.139	369.779	+0.44
Track 4	592.380	593.182	+0.14
Track 5	590.098	593.575	+0.59
Track 6	591.675	597.216	+0.93

pressure transducer (calibration or physical) or a discrepancy between the actual propellant thermochemistry (impetus, flame temperature, etc.) and that utilized in the data reduction code. If the discrepancy is in the thermochemistry, this normally results from the propellant not having the physical composition as stated on the Propellant Description Sheet (used as input to the thermochemical code). Without a new chemical analysis of the propellant, there is no way to rectify this discrepancy. If the discrepancy lies with the pressure transducer, attempting to correct the pressure-time data is extremely "risky" since it is often difficult to determine when the transducer went "bad". Fortunately, if the thermochemistry used in the closed-chamber reduction code is utilized in interior ballistic performance codes together with the derived propellant burn rates, little effect is observed[3] regardless of the source of the discrepancy. However, in a direct comparison of propellant burn rates from other experimental firings, the low heat loss values should be recognized. In the BRLCB burn rate reductions, the heat loss for Tracks 1 and 2 was set to zero; Tracks 3–6 used the value of heat loss shown in Table 6.

The one-page summary of the BRLCB reduction for each firing is provided in Appendix C. The complete BRLCB output is given in Appendices D through I. Log-log plots of BRLCB deduced burn rate vs. pressure for each firing are shown in Figures 7–12. No filtering (FFT) of the burn rates was performed. From a comparison of the six graphs, it is evident that there is more wave structure on the first three firings (Tracks 1–3, Figures 7–9) than on the last three (Tracks 4–6, Figure 10–12). The lower propellant loading density for Tracks 1–3 (0.25 g/cm^3 vs. 0.35 g/cm^3 for Tracks 4–6) and the resulting increased initial ullage in the chamber is the most likely cause of the increased wave structure.

[3]Robbins, F. Private communication. U.S. Army Research Laboratory, Aberdeen Proving Ground, MD, 1987.

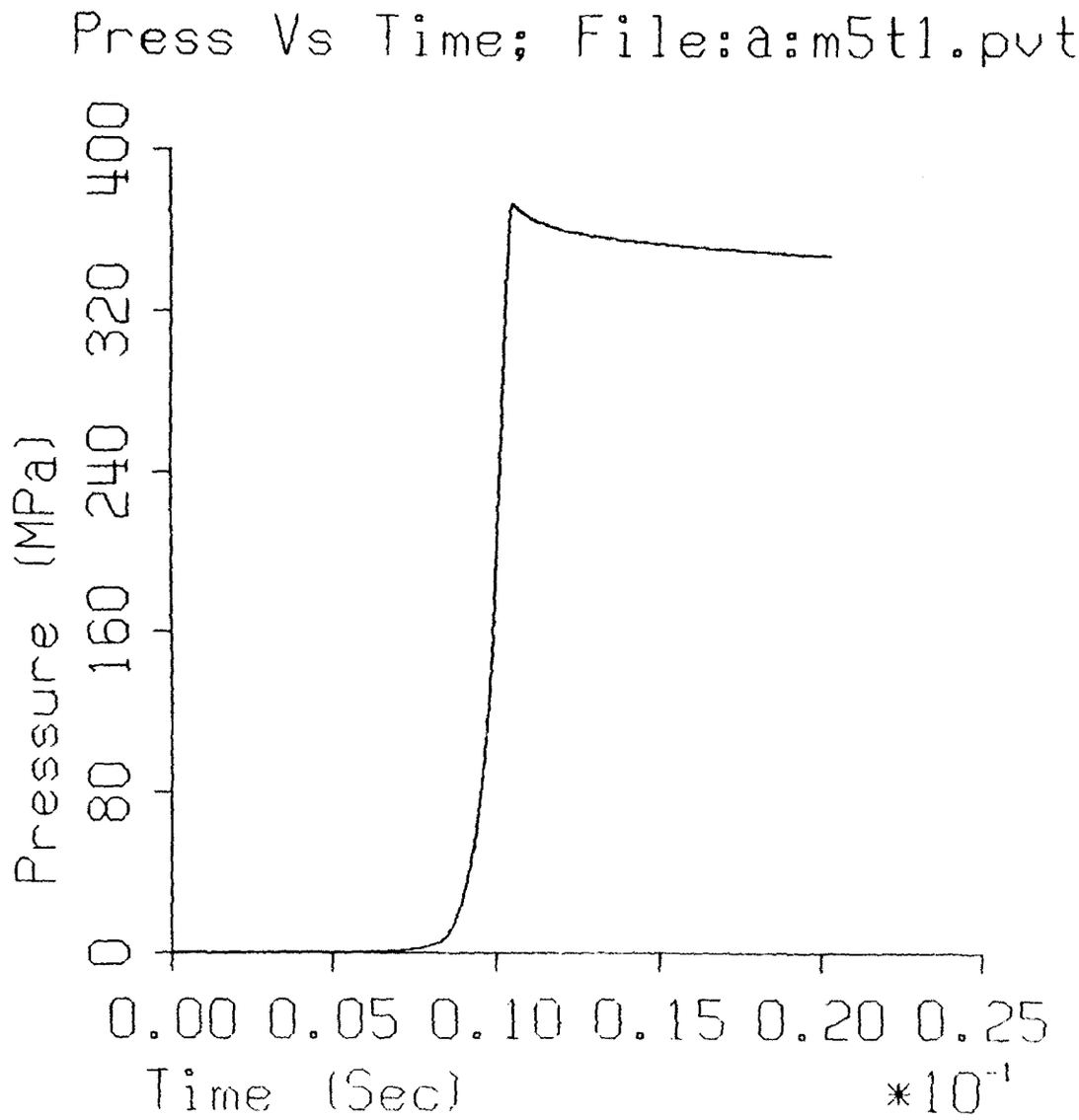

Figure 1. Pressure history for Track 1 firing.

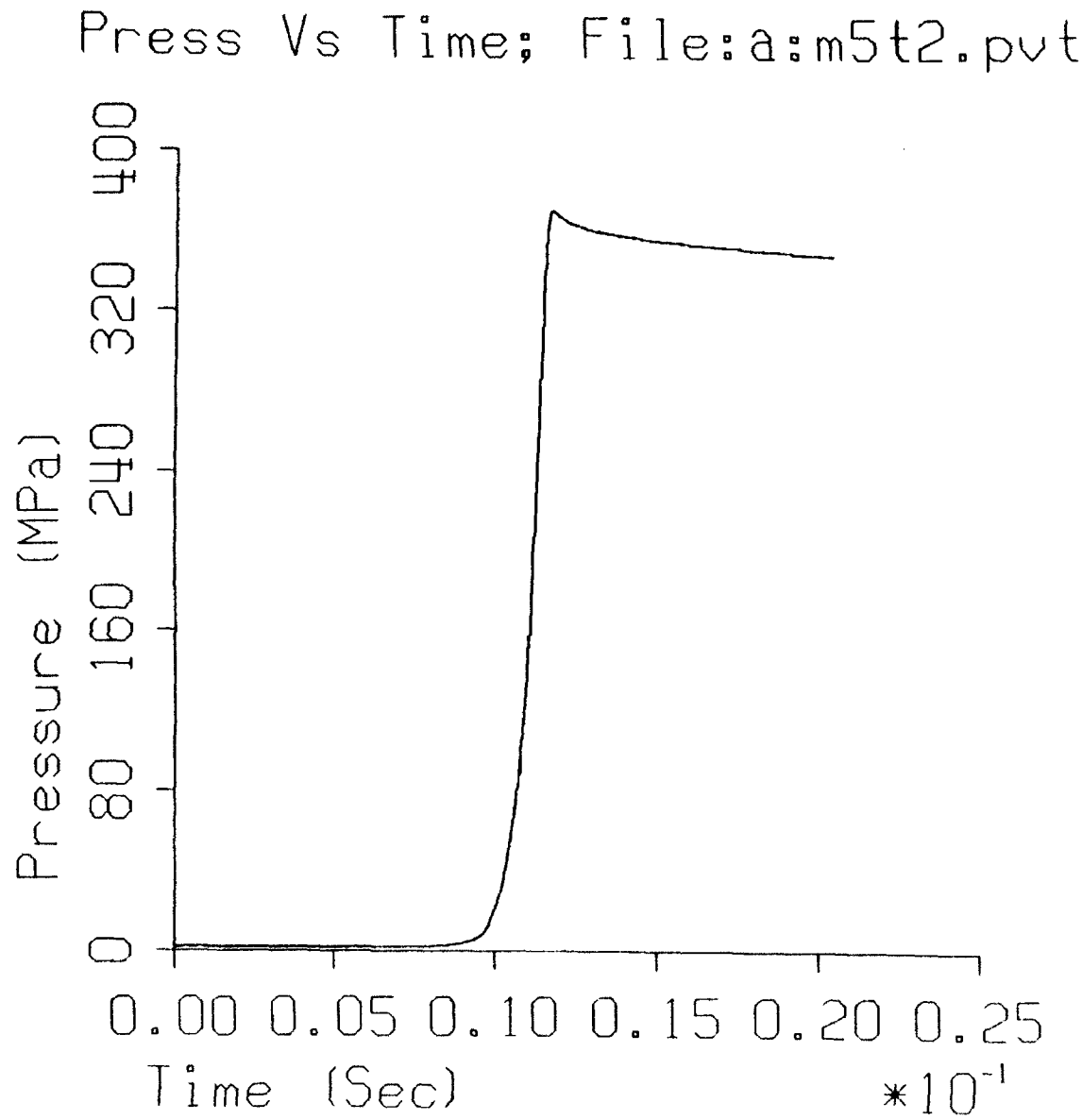

Figure 2. Pressure history for Track 2 firing.

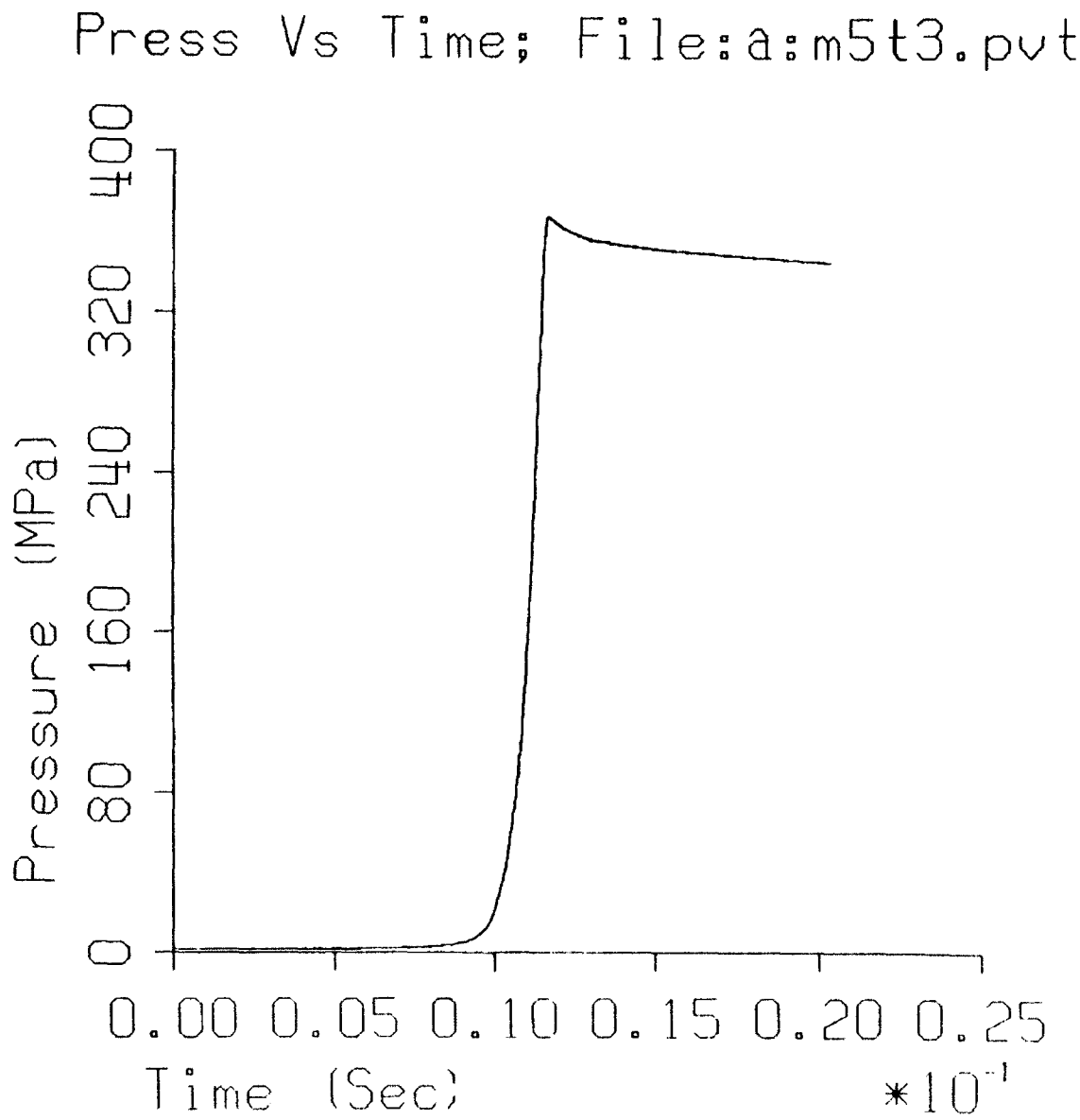

Figure 3. Pressure history for Track 3 firing.

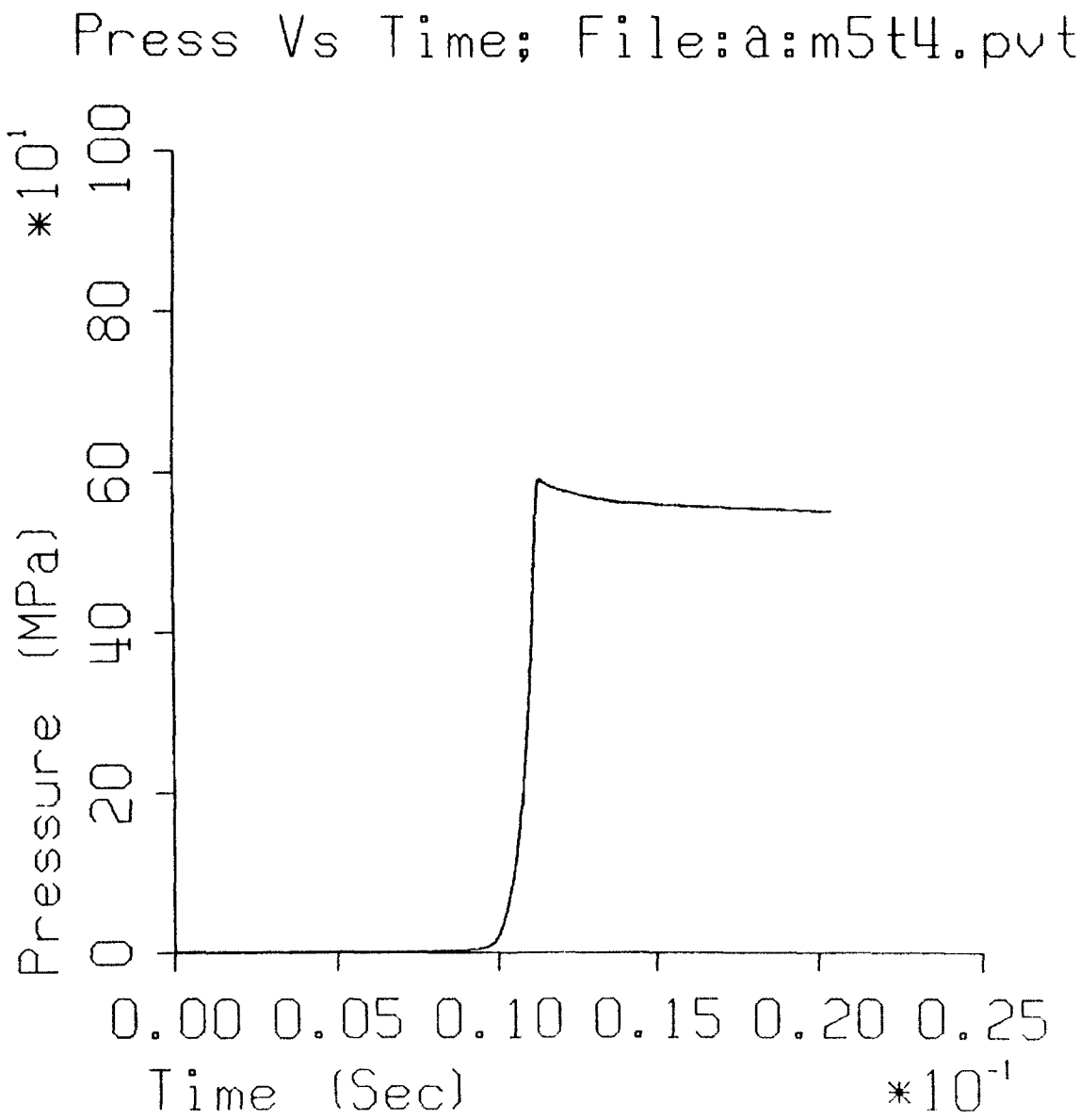

Figure 4. Pressure history for Track 4 firing.

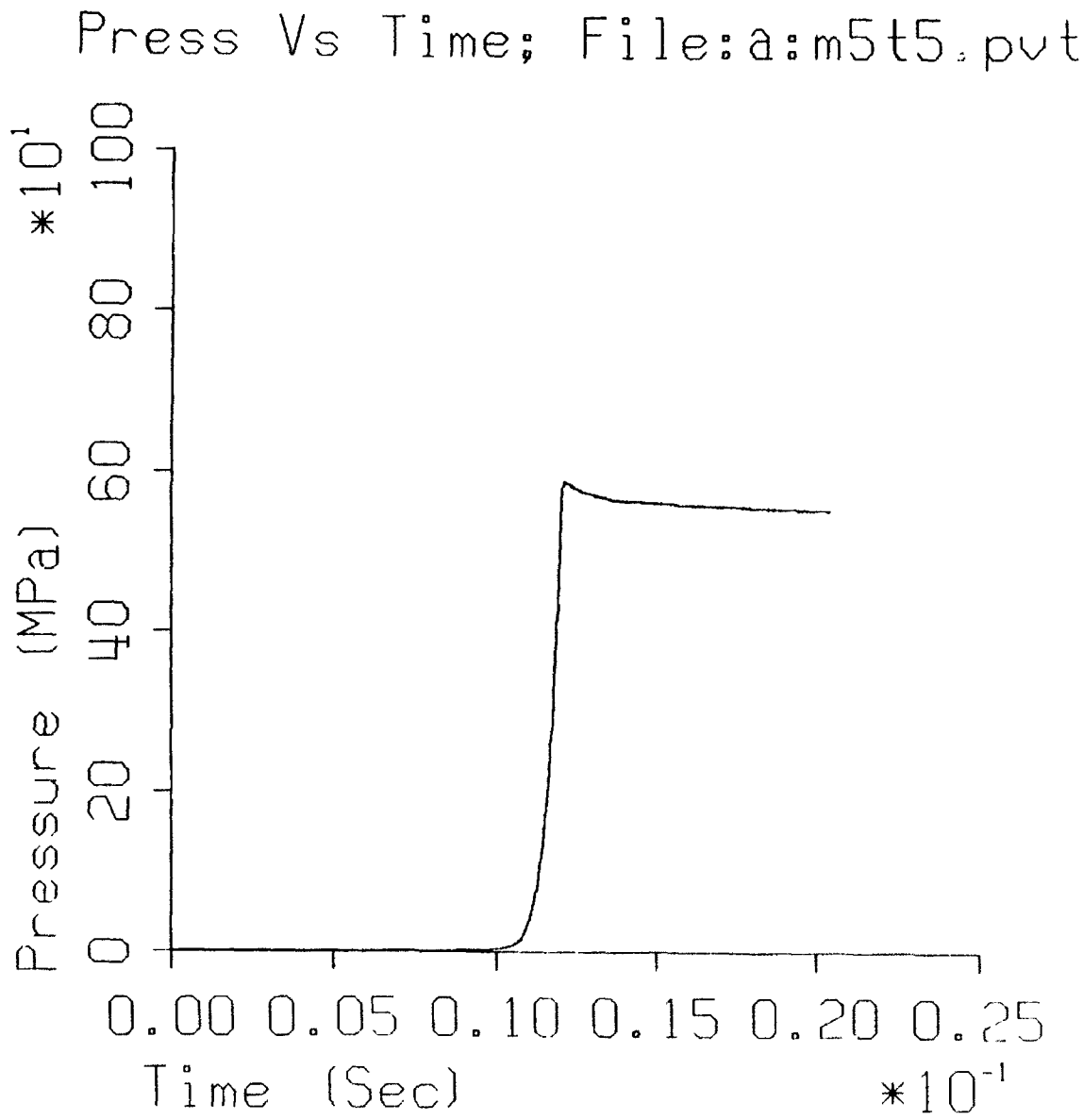

Figure 5. Pressure history for Track 5 firing.

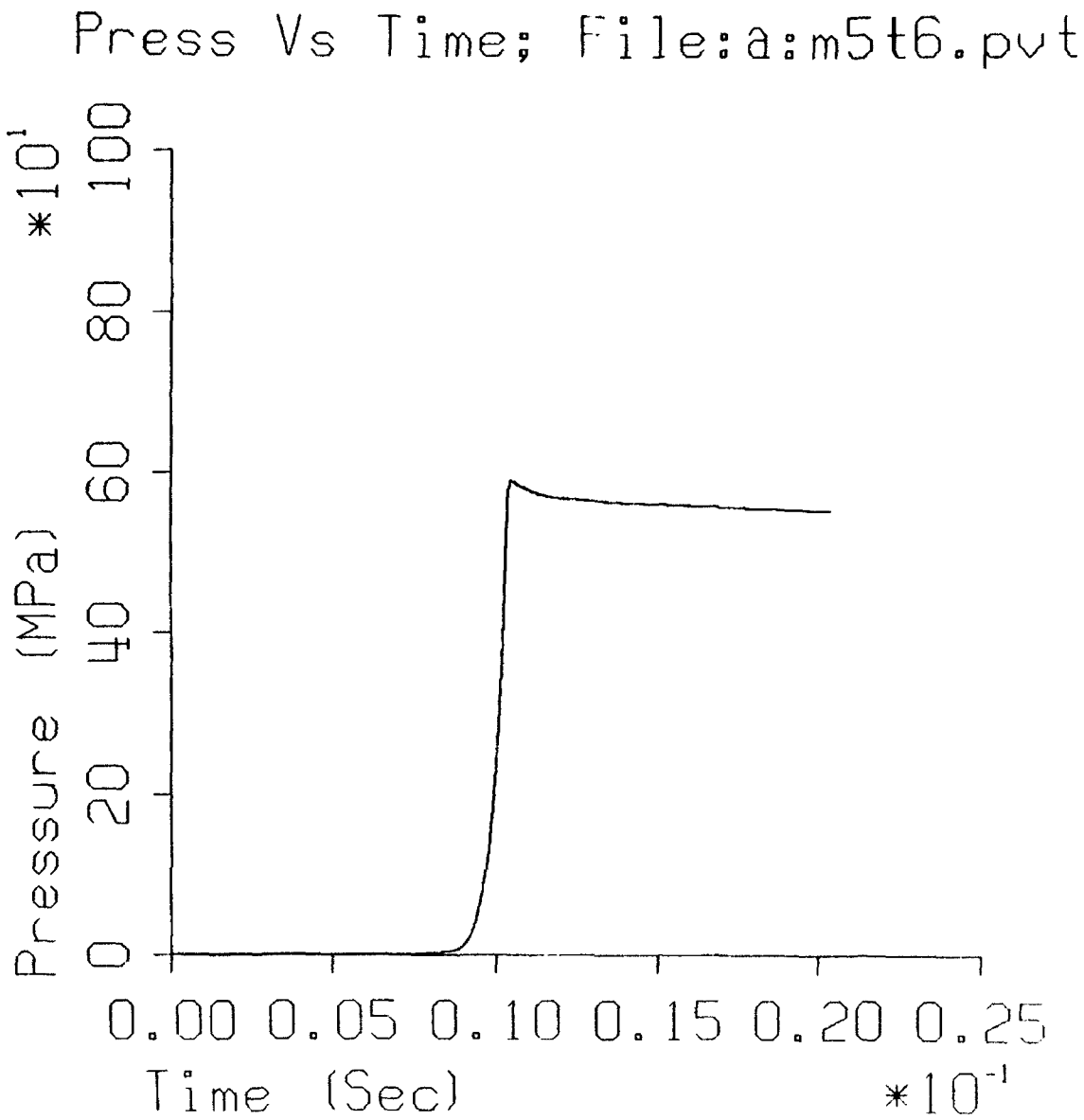

Figure 6. Pressure history for Track 6 firing.

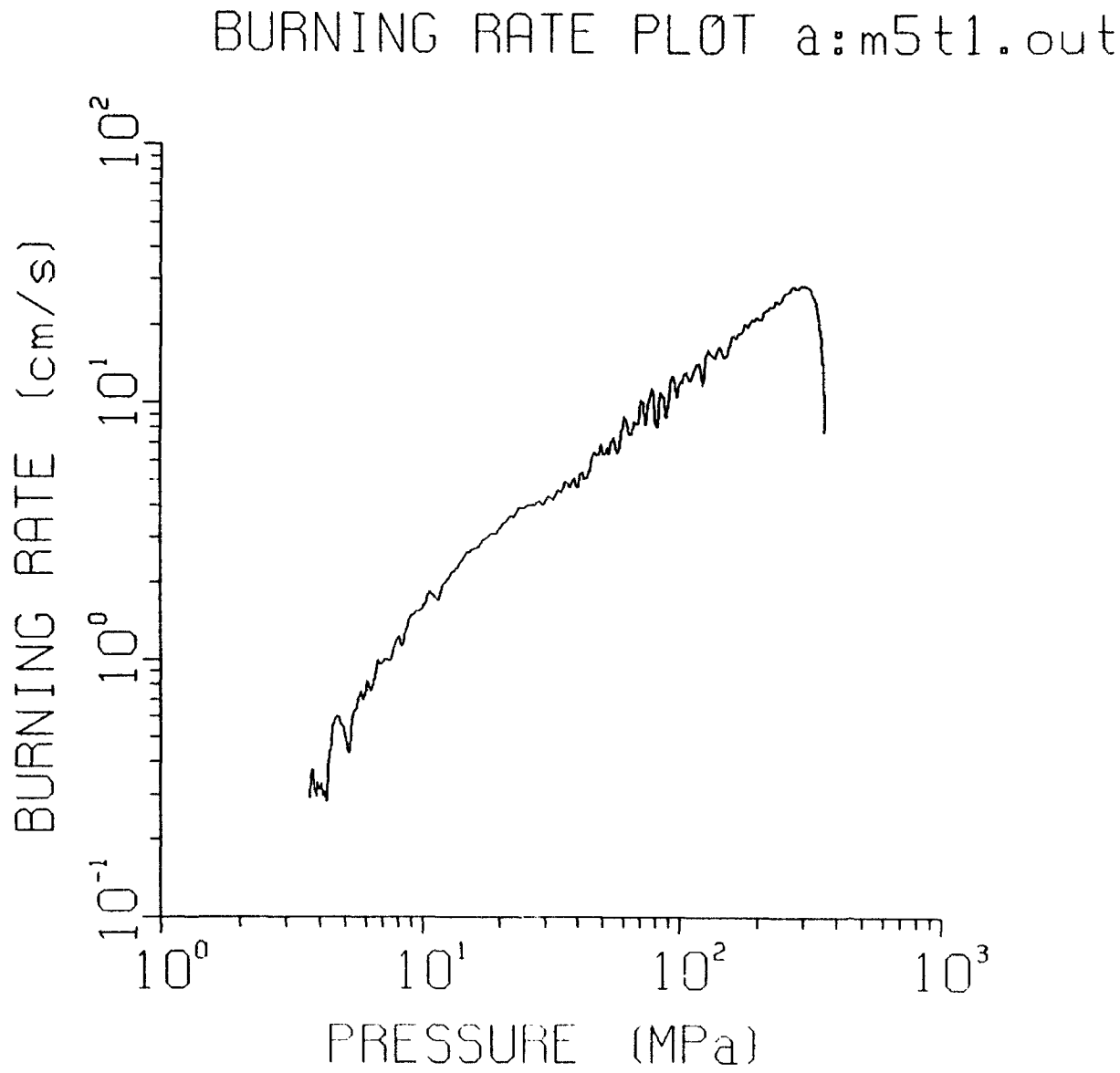

Figure 7. Log-log plot of burn rate vs. pressure, Track 1.

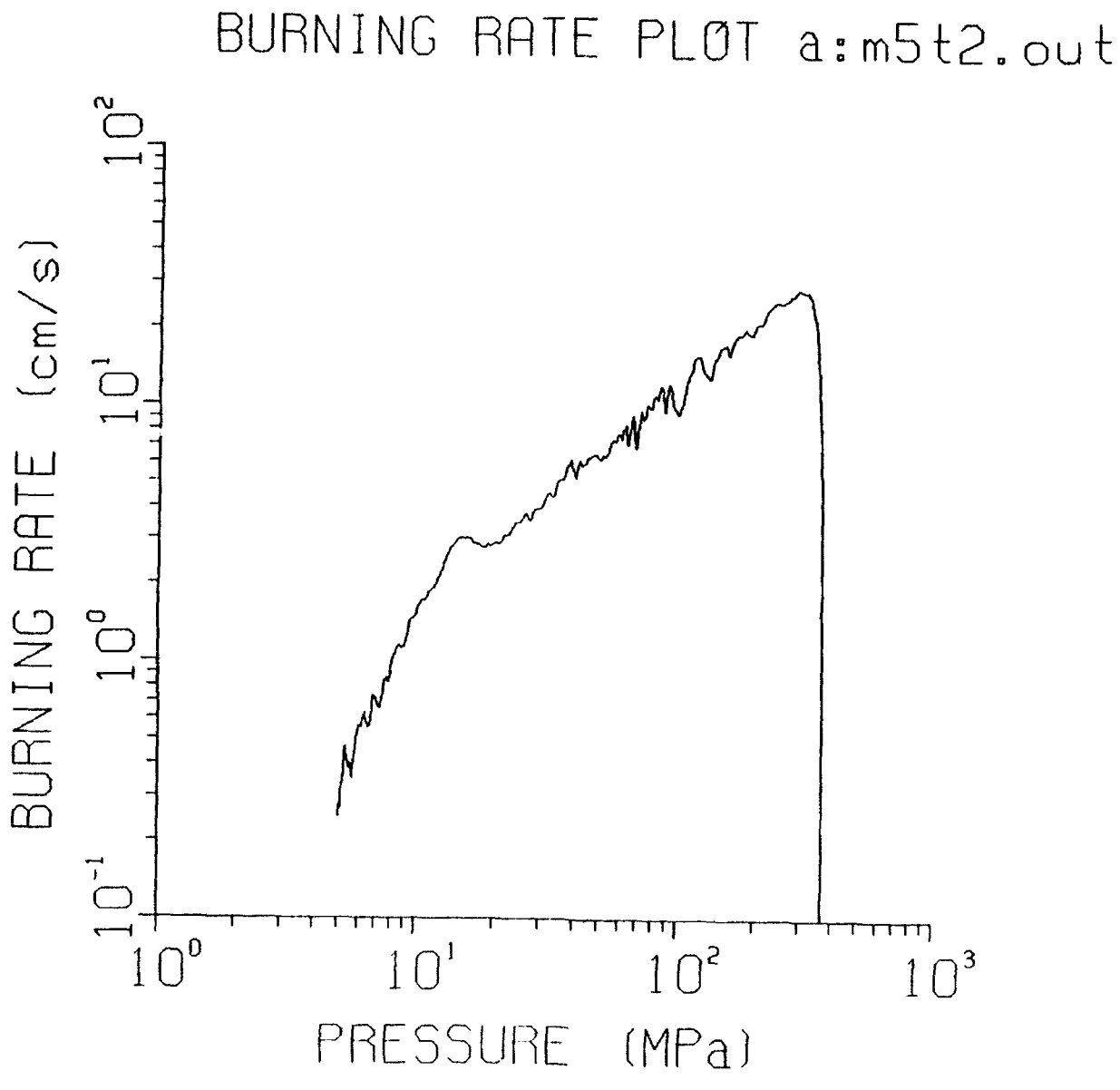

Figure 8. Log-log plot of burn rate vs. pressure, Track 2.

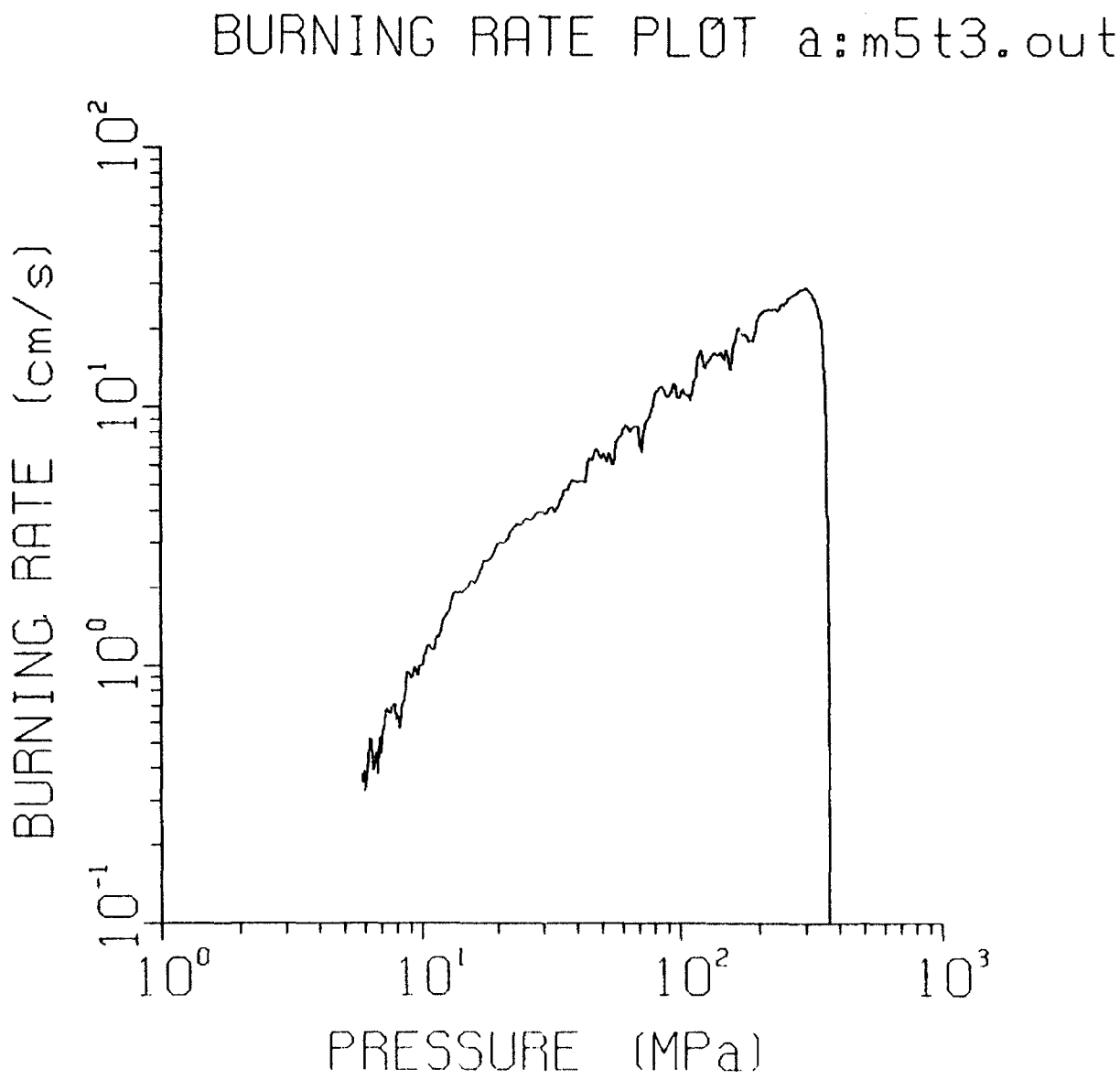

Figure 9. Log-log plot of burn rate vs. pressure, Track 3.

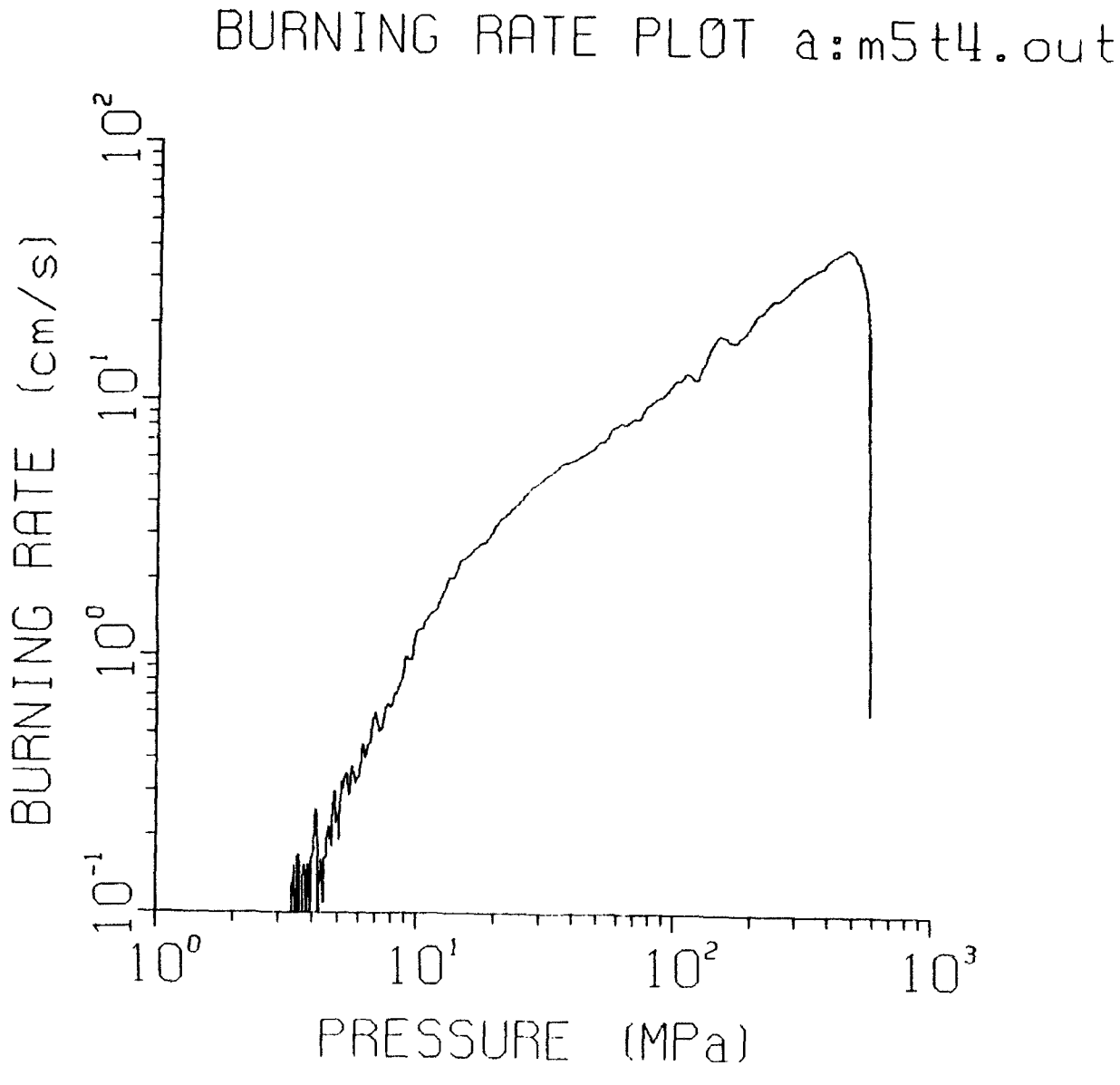

Figure 10. Log-log plot of burn rate vs. pressure, Track 4.

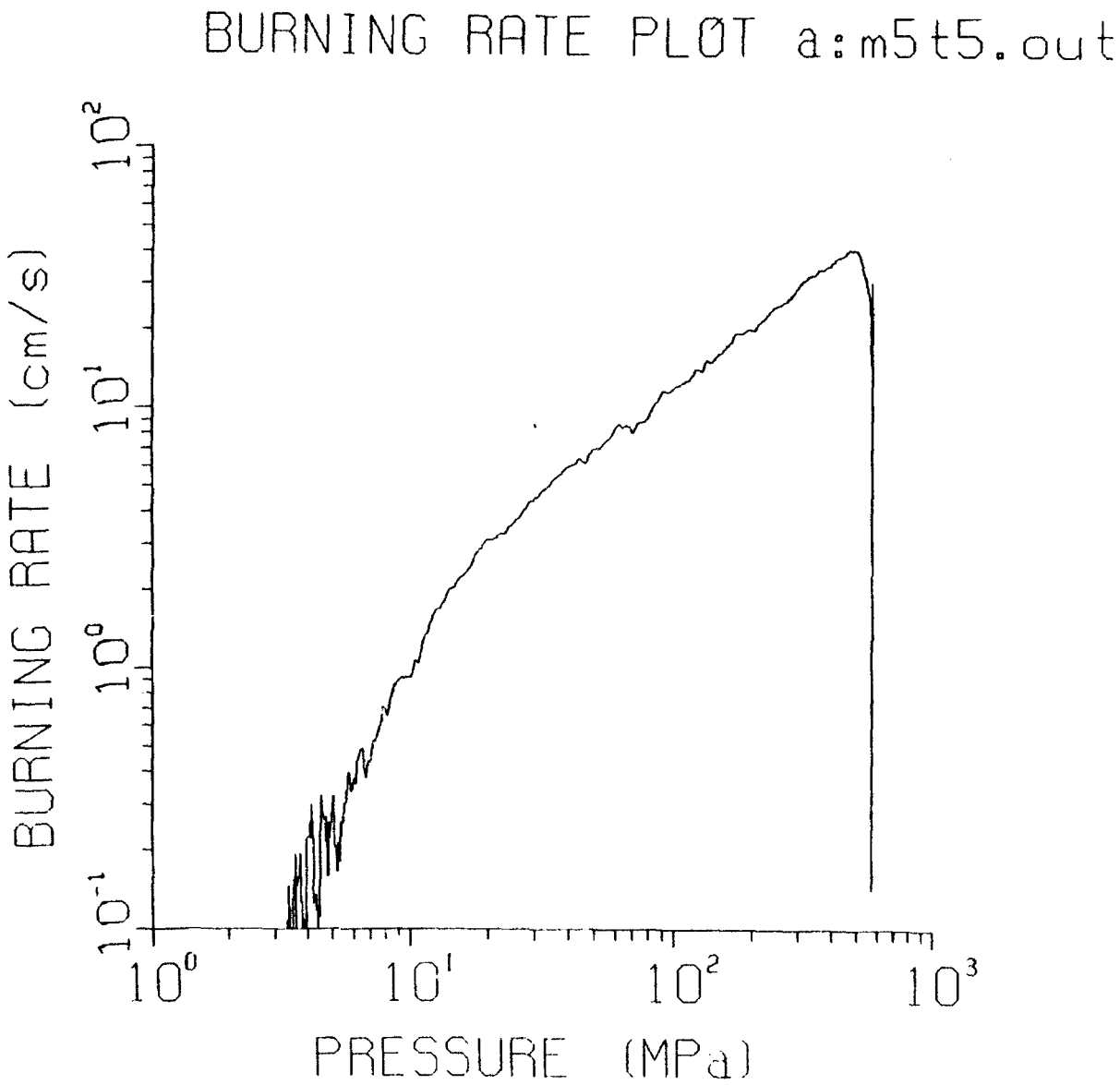

Figure 11. Log-log plot of burn rate vs. pressure, Track 5.

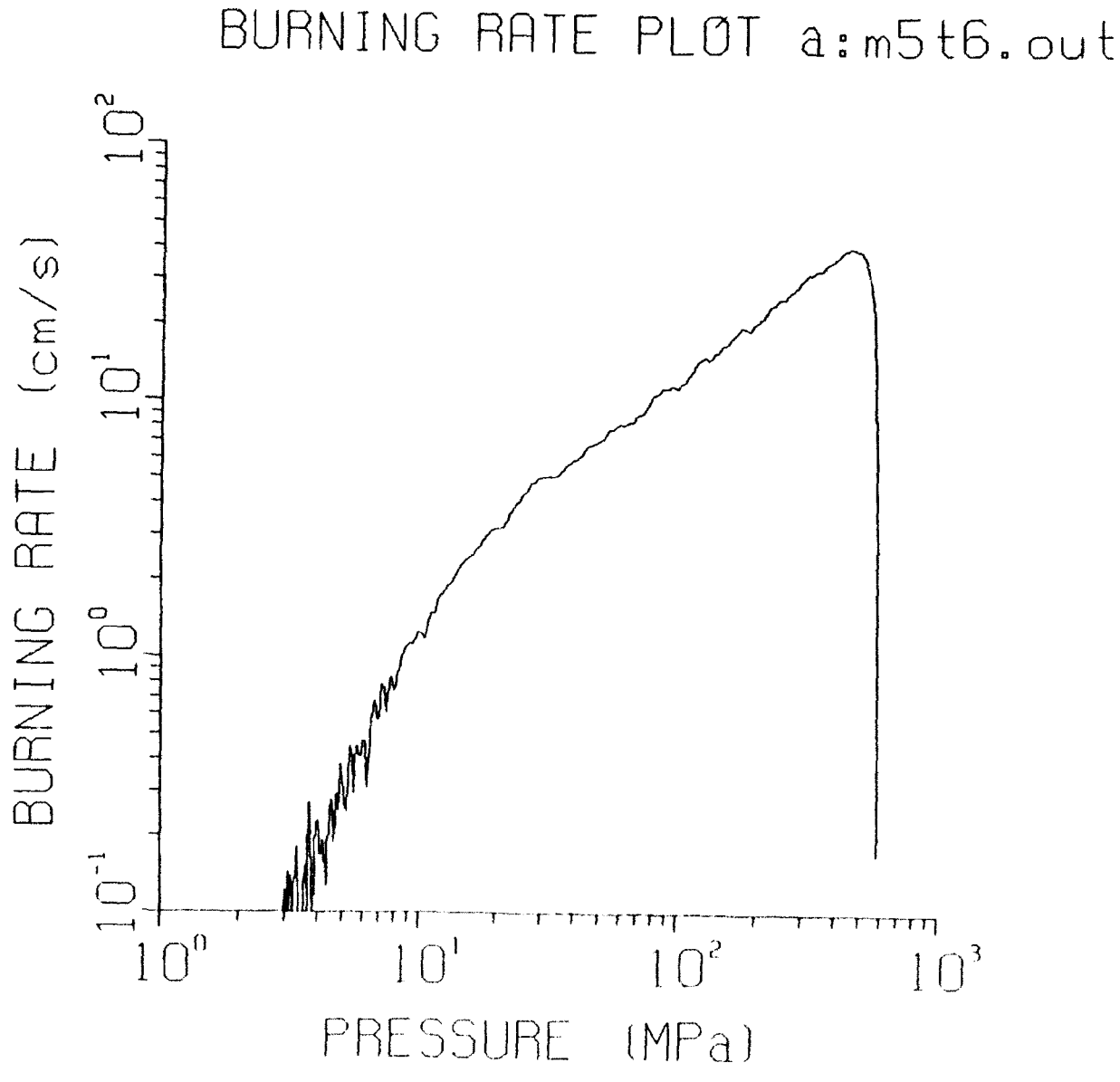

Figure 12. Log-log plot of burn rate vs. pressure, Track 6.

Also, it appears that for all six burn rate graphs, the burn rate is fairly linear from approximately 20 MPa to peak pressure. This region for each firing will be utilized to compute the coefficient (b) and exponent (n) for the traditional bP^n burn rate law. This information is presented in Table 7.

Table 7. Parameters for $r = bP^n$ Burn Rate Laws, r (cm/s)

	Pressure Range (MPa)	Coefficient (b) cm/s-$(MPa)^n$	Exponent (n) (–)
Track 1	30–280	0.207218	0.8724
Track 2	30–300	0.251033	0.8332
Track 3	30–300	0.206544	0.8738
Track 4	20–420	0.315470	0.7902
Track 5	30–440	0.295513	0.8046
Track 6	40–420	0.300348	0.8011

5. REPEATABILITY AND COMPARISON OF BURN RATES

An overlay of the log-log of burn rate vs. pressure for the first three firings (Tracks 1–3) is given in Figure 13. A similar overlay for the last three firings (Tracks 4–6) is presented in Figure 14. In both figures, repeatability in the burn rate is very good above approximately 20–30 MPa. For Tracks 4–6, the agreement in burn rate is excellent across the entire pressure range. The better repeatability of the last three firings may again be due to the higher loading density used for these firings.

Given the repeatability demonstrated for the burn rates in Figures 13 and 14, an average burn rate (burn rate law) for Tracks 1–3 and Tracks 4–6 will be used for the burn rate of this lot of M5 propellant at the appropriate loading density. Values resulting from averaging both the coefficients and exponents are given in Table 8. In general, averaging the coefficients and exponents to obtain an average burn rate is not recommended. A better procedure is to average the tabulated burn rates at the same pressure and then determine the appropriate bP^n burn rate law using the average values. However, considering the repoducibility between the firings (Tracks 1–3 and 4–6) using the average of the coefficients and exponents is felt adaquate as shown below.

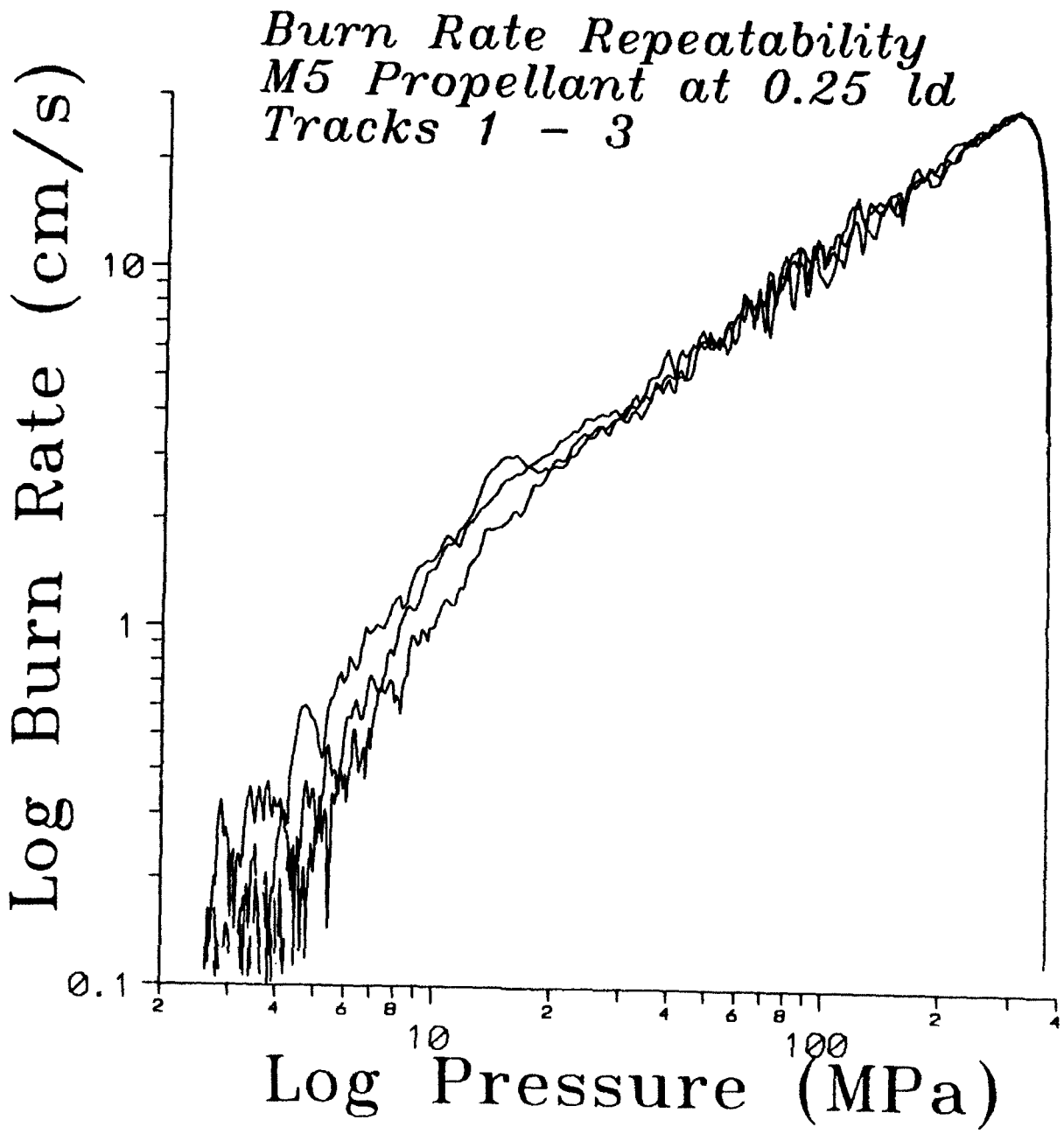

Figure 13. Overlay of log-log of burn rate vs. pressure, Tracks 1–3.

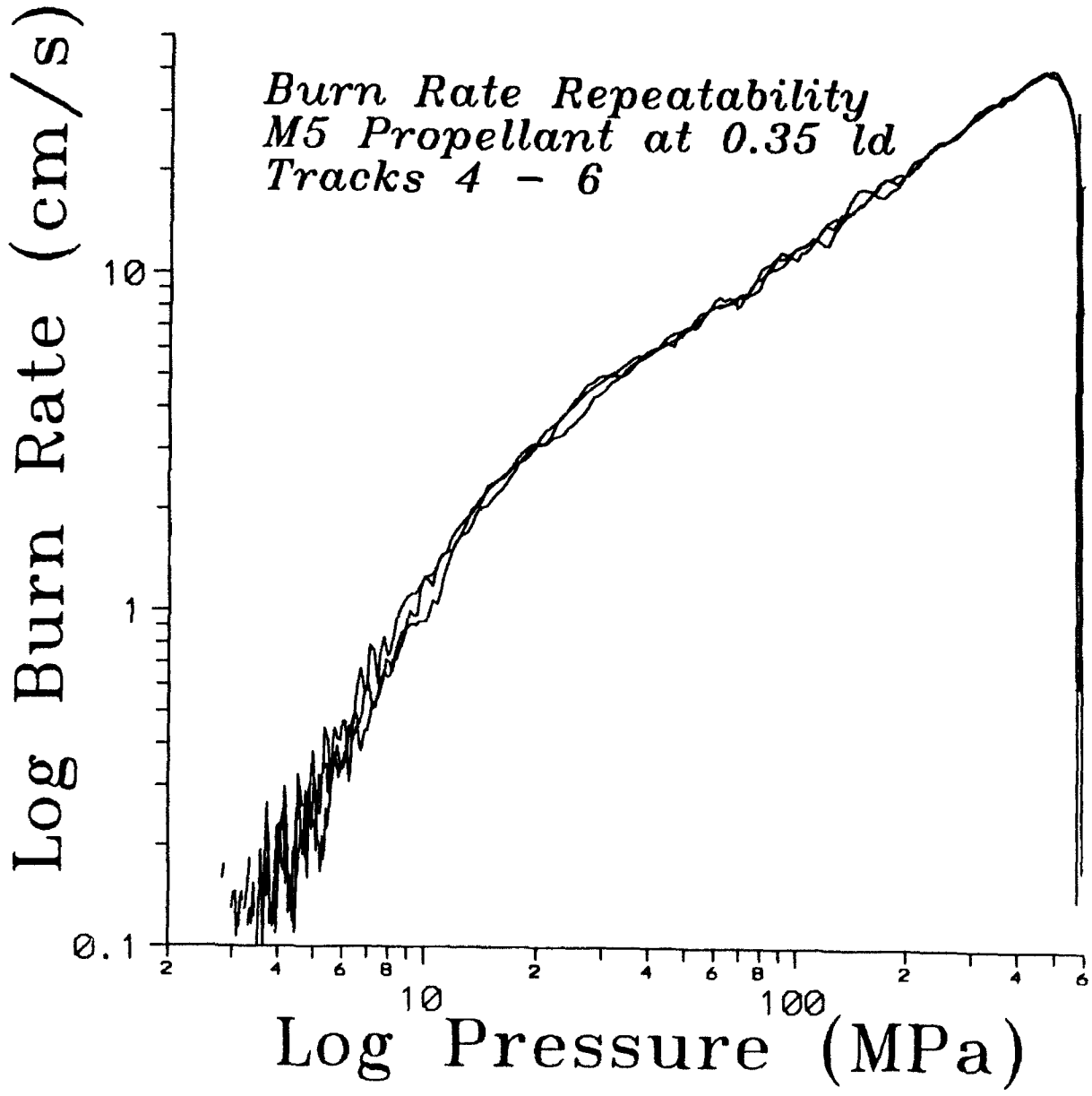

Figure 14. Overlay of log-log of burn rate vs. pressure, Tracks 4–6.

Table 8. Average Coefficient and Exponent for Tracks 1–3 and Tracks 4–6

	Coefficient cm/s-MPa^n	Exponent (–)
Tracks 1–3	0.221598	0.8598
Tracks 4–6	0.303777	0.7986

Tables 9 and 10 compare results from using the average values for the coefficient and exponent with the coefficient and exponent values deduced in BRLCB for each firing. The percentage difference between the burn rates for each track and the average should not be taken as measure of the "goodness" of using the average since the true value of the burn rate is not known. The data is provided for reference purposes only.

Figure 15 compares the burn rates for the first three firings with those from the last three firings (one curve from each set of firings). Below 20 MPa, a significant difference in the burn rate values is observed. However, above 20 MPa to the maximum pressure of the firing with a loading density of 0.25 g/cm^3, the agreement in burn rates appears to be better. A comparison of burn rates computed for each group (Tracks 1–3 vs. Tracks 4–6), using the average values from Table 8, is given in Table 11.

As can be observed in Table 11, the difference in the burn rate between Tracks 1–3 and Tracks 4–6 is approximately 5%. This difference in burn rates is not unexpected when comparing burn rates of the same propellant at different loading densities.

6. CONCLUSIONS AND OBSERVATIONS

Samples of M5 were fired in a closed chamber at loading densities of 0.25 g/cm^3 and 0.35 g/cm^3. The recorded pressure histories, in combination with the propellant and closed-chamber physical properties were utilized as input to the closed-chamber data reduction code BRLCB. Observations and conclusions from the burn rate analysis are listed below.

1. Pressure histories for the six firings exhibited minimal or no pressure waves.

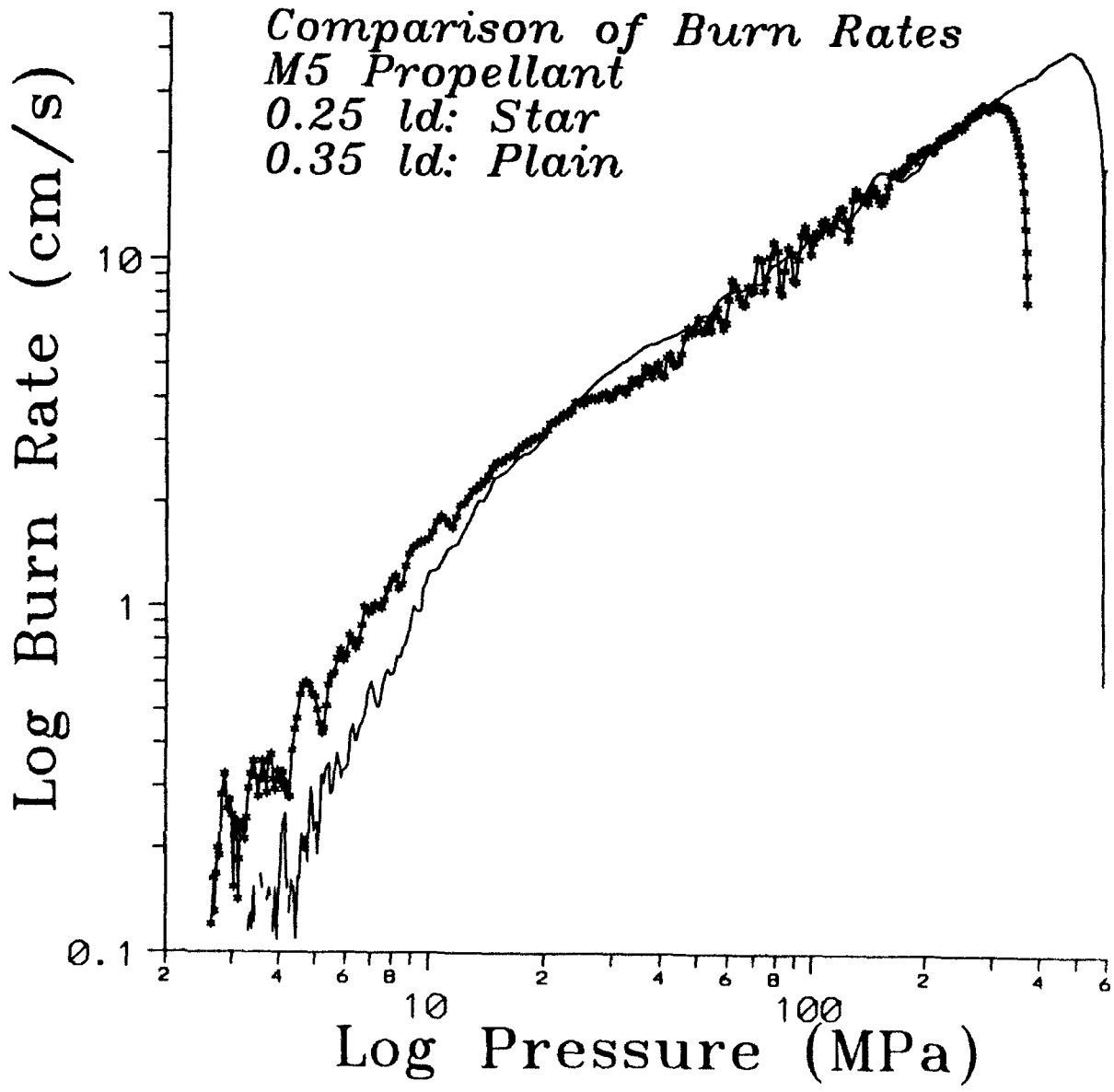

Figure 15. Comparison of burn rates.

2. Unusually low heat loss values were obtained for all firings. This indicates an error in the pressure transducer or a discrepancy in the thermochemical values used in the data reduction with the actual thermochemical properties of the propellant.

3. The deduced burn rates for the firings at a loading density of 0.25 g/cm^3 exhibited greater wave structure than the burn rates for the firings at a loading density of 0.35 g/cm^3. This is most likely a result of the additional initial ullage associated with the 0.25 g/cm^3 loading density firings.

4. The log-log graph of burn rate vs. pressure is nearly linear between approximately 20 MPa and maximum pressure for all firings.

5. Repeatability among the firings of the same loading density is good.

6. A comparison of the burn rates between the 0.25 g/cm^3 and 0.35 g/cm^3 loading density firings indicates a difference of about 5% in the computed rates.

Table 9. Comparison of Burn Rates Using Average Values for the Coefficient and Exponent, Tracks 1–3

Press (MPa)	BR Tk 1 (cm/s)	BR Tk 2 (cm/s)	BR Tk 3 (cm/s)	BR Avg (cm/s)	%Diff Tk1-Avg (%)	%Diff Tk2-Avg (%)	%Diff Tk3-Avg (%)
30	4.0278	4.2704	4.0339	4.1266	−2.39	3.48	−2.25
40	5.1768	5.4271	5.1867	5.2847	−2.04	2.70	−1.85
50	6.2894	6.5360	6.3034	6.4024	−1.76	2.09	−1.55
60	7.3737	7.6083	7.3920	7.4889	−1.54	1.59	−1.29
70	8.4351	8.6510	8.4578	8.5503	−1.35	1.18	−1.08
80	9.4773	9.6691	9.5046	9.5905	−1.18	0.82	−0.90
90	10.5029	10.6661	10.5349	10.6127	−1.03	0.50	−0.73
100	11.5140	11.6448	11.5508	11.6189	−0.90	0.22	−0.59
110	12.5123	12.6072	12.5540	12.6112	−0.78	−0.03	−0.45
120	13.4991	13.5552	13.5457	13.5908	−0.67	−0.26	−0.33
130	14.4754	14.4900	14.5270	14.5591	−0.57	−0.47	−0.22
140	15.4422	15.4129	15.4988	15.5170	−0.48	−0.67	−0.12
150	16.4002	16.3249	16.4619	16.4653	−0.40	−0.85	−0.02
160	17.3501	17.2268	17.4170	17.4048	−0.31	−1.02	0.07
170	18.2924	18.1193	18.3645	18.3361	−0.24	−1.18	0.15
180	19.2277	19.0031	19.3050	19.2597	−0.17	−1.33	0.24
190	20.1564	19.8787	20.2389	20.1762	−0.10	−1.47	0.31
200	21.0788	20.7467	21.1667	21.0859	−0.03	−1.61	0.38
210	21.9954	21.6075	22.0886	21.9893	0.03	−1.74	0.45
220	22.9064	22.4614	23.0050	22.8866	0.09	−1.86	0.52
230	23.8122	23.3089	23.9161	23.7783	0.14	−1.97	0.58
240	24.7129	24.1503	24.8222	24.6645	0.20	−2.08	0.64
250	25.6089	24.9859	25.7236	25.5456	0.25	−2.19	0.70
260	26.5003	25.8159	26.6205	26.4217	0.30	−2.29	0.75
270	27.3873	26.6405	27.5130	27.2931	0.35	−2.39	0.81
280	28.2702	27.4601	28.4014	28.1600	0.39	−2.49	0.86
290	29.1490	28.2749	29.2857	29.0226	0.44	−2.58	0.91
300	30.0240	29.0849	30.1662	29.8810	0.48	−2.66	0.95

Table 10. Comparison of Burn Rates Using Average Values for the Coefficient and Exponent, Tracks 4–6

Press (MPa)	BR Tk 1 (cm/s)	BR Tk 2 (cm/s)	BR Tk 3 (cm/s)	BR Avg (cm/s)	%Diff Tk1-Avg (%)	%Diff Tk2-Avg (%)	%Diff Tk3-Avg (%)
30	4.6364	4.5611	4.5809	4.5944	0.91	–0.73	–0.30
40	5.8198	5.7490	5.7681	5.7811	0.67	–0.56	–0.23
50	6.9420	6.8797	6.8972	6.9089	0.48	–0.42	–0.17
60	8.0178	7.9667	7.9818	7.9918	0.32	–0.31	–0.13
70	9.0564	9.0187	9.0309	9.0388	0.19	–0.22	–0.09
80	10.0642	10.0416	10.0506	10.0560	0.08	–0.14	–0.05
90	11.0459	11.0398	11.0451	11.0479	–0.02	–0.07	–0.03
100	12.0049	12.0165	12.0178	12.0177	–0.11	–0.01	0.00
110	12.9439	12.9742	12.9713	12.9682	–0.19	0.05	0.02
120	13.8652	13.9151	13.9078	13.9014	–0.26	0.10	0.05
130	14.7705	14.8407	14.8288	14.8191	–0.33	0.15	0.07
140	15.6613	15.7526	15.7358	15.7226	–0.39	0.19	0.08
150	16.5389	16.6517	16.6300	16.6132	–0.45	0.23	0.10
160	17.4042	17.5393	17.5124	17.4920	–0.50	0.27	0.12
170	18.2582	18.4160	18.3839	18.3597	–0.55	0.31	0.13
180	19.1018	19.2827	19.2453	19.2172	–0.60	0.34	0.15
190	19.9356	20.1401	20.0971	20.0652	–0.65	0.37	0.16
200	20.7602	20.9887	20.9402	20.9042	–0.69	0.40	0.17
210	21.5762	21.8290	21.7748	21.7348	–0.73	0.43	0.18
220	22.3841	22.6616	22.6016	22.5575	–0.77	0.46	0.20
230	23.1844	23.4867	23.4210	23.3727	–0.81	0.49	0.21
240	23.9773	24.3049	24.2333	24.1808	–0.84	0.51	0.22
250	24.7634	25.1165	25.0389	24.9821	–0.88	0.54	0.23
260	25.5429	25.9217	25.8381	25.7770	–0.91	0.56	0.24
270	26.3161	26.7209	26.6312	26.5658	–0.94	0.58	0.25
280	27.0833	27.5144	27.4185	27.3487	–0.97	0.61	0.26
290	27.8449	28.3023	28.2002	28.1260	–1.00	0.63	0.26
300	28.6009	29.0850	28.9765	28.8979	–1.03	0.65	0.27
310	29.3516	29.8625	29.7478	29.6647	–1.06	0.67	0.28
320	30.0973	30.6352	30.5141	30.4264	–1.08	0.69	0.29

Table 10. Comparison of Burn Rates Using Average Values for the Coefficient and Exponent, Tracks 4–6 (continued)

Press (MPa)	BR Tk 1 (cm/s)	BR Tk 2 (cm/s)	BR Tk 3 (cm/s)	BR Avg (cm/s)	%Diff Tk1-Avg (%)	%Diff Tk2-Avg (%)	%Diff Tk3-Avg (%)
330	30.8381	31.4031	31.2756	31.1834	-1.11	0.70	0.30
340	31.5742	32.1666	32.0326	31.9358	-1.13	0.72	0.30
350	32.3058	32.9256	32.7852	32.6838	-1.16	0.74	0.31
360	33.0330	33.6804	33.5335	33.4275	-1.18	0.76	0.32
370	33.7560	34.4312	34.2777	34.1670	-1.20	0.77	0.32
380	34.4749	35.1779	35.0178	34.9025	-1.23	0.79	0.33
390	35.1898	35.9209	35.7542	35.6341	-1.25	0.80	0.34
400	35.9009	36.6601	36.4867	36.3619	-1.27	0.82	0.34
410	36.6083	37.3958	37.2157	37.0861	-1.29	0.84	0.35
420	37.3121	38.1279	37.9411	37.8067	-1.31	0.85	0.36
430	38.0124	38.8566	38.6631	38.5239	-1.33	0.86	0.36
440	38.7092	39.5821	39.3817	39.2378	-1.35	0.88	0.37

Table 11. Comparison of Average Burn Rates, M5 Lot RAD-64597 at Loading Densities of 0.25 g/cm^3 and 0.35 g/cm^3

Pressure	Burn Rate 0.25 ld	Burn Rate 0.35 ld	% Difference
30	4.1266	4.5939	-10.17
40	5.2847	5.7804	-8.58
50	6.4024	6.9080	-7.32
60	7.4889	7.9907	-6.28
70	8.5503	9.0375	-5.39
80	9.5905	10.0545	-4.62
90	10.6126	11.0462	-3.92
100	11.6189	12.0159	-3.30
110	12.6112	12.9662	-2.74
120	13.5908	13.8992	-2.22

Table 11. Comparison of Average Burn Rates, M5 Lot RAD-64597 at Loading Densities of 0.25 g/cm^3 and 0.35 g/cm^3 (continued)

Press (MPa)	BR Tk 1 (cm/s)	BR Tk 2 (cm/s)	BR Tk 3 (cm/s)
130	14.5591	14.8167	-1.74
140	15.5170	15.7200	-1.29
150	16.4653	16.6105	-0.87
160	17.4048	17.4890	-0.48
170	18.3361	18.3566	-0.11
180	19.2597	19.2139	0.24
190	20.1761	20.0617	0.57
200	21.0859	20.9005	0.89
210	21.9892	21.7310	1.19
220	22.8866	22.5535	1.48
230	23.7782	23.3685	1.75
240	24.6644	24.1764	2.02
250	25.5455	24.9776	2.27
260	26.4216	25.7723	2.52
270	27.2931	26.5609	2.76
280	28.1600	27.3436	2.99
290	29.0226	28.1207	3.21
300	29.8810	28.8924	3.42
310	30.7354	29.6590	3.63
320	31.5859	30.4206	3.83
330	32.4328	31.1774	4.03
340	33.2760	31.9296	4.22
350	34.1158	32.6774	4.40
360	34.9522	33.4209	4.58
370	35.7854	34.1602	4.76
380	36.6154	34.8956	4.93
390	37.4424	35.6270	5.10
400	38.2663	36.3547	5.26
410	39.0875	37.0787	5.42
420	39.9058	37.7991	5.57

Table 11. Comparison of Average Burn Rates, M5 Lot RAD-64597 at Loading Densities of 0.25 g/cm^3 and 0.35 g/cm^3 (continued)

Press (MPa)	BR Tk 1 (cm/s)	BR Tk 2 (cm/s)	BR Tk 3 (cm/s)
430	40.7213	38.5161	5.73
440	41.5343	39.2298	5.87

APPENDIX A:

PROPELLANT DESCRIPTION SHEET

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C PROPELLANT DESCRIPTION SHE

(AMCR 715-509)

U. S. ARMY LOT NO. RAD-64597 of 1966 COMPOSITION NO. M-5 SP FOR 90MM M67 F/CTG. HEAT M371A1 F/CHG. M82 Item V3-22380

MANUFACTURED AT RADFORD ARMY AMMUNITION PLANT, RADFORD, VA. PACKED WEIGHT 165,985

CONTRACT NO. W-11-173 AMC-37(A) DATE 4-28-49 SPECIFICATION NO. MIL-P-46426A (MU) w/EO 38573-S and EO 41451-S

NITROCELLULOSE

ACCEPTED BLENDS (Nos.) B20, 187-186-185-188-189-190

NITROGEN CONTENT		R.L. STARCH TEST (65.5° C)		STABILITY TEST (135° C)	
MAXIMUM	13.27 %	MAXIMUM	45+ MINS.	MAXIMUM	30 MINS
MINIMUM	13.20 %	MINIMUM	45+ MINS	MINIMUM	30 MINS
AVERAGE	13.24 %	AVERAGE	45+ MINS	AVERAGE	30 MINS
				EXPLOSION	MINS

MANUFACTURER OF PROPELLANT

TOTAL WEIGHT OF SOLVENT PER POUND ~~NO~~ dry ingredient 0.439 CONSISTING OF 44 POUNDS ACOHOL AND 56 POUNDS ~~OTHER~~ acetone PER 100 POUND SOLVENT. PERCENTAGE OF REMIX TO WHOLE

TEMPS °C. FROM	TO	PROCESS-SOLVENT RECOVERY AND DRYING	TIME DAYS	HOURS
		Raise temperature 2°F per hour until 140°F is reached.		
		Hold at 140°F for 60 hours.		

TESTS OF FINISHED PROPELLANT

COMPOSITION, percent CONSTITUENT	FORMULA	MFR.	INSPR.	STABILITY AND PHYSICAL TESTS 120°F	MFR.	INSPR
Nitrocellulose	81.95	±2.00	81.65	~~135°~~ C HEAT TEST, S. P.		60'+NF
Nitroglycerin	15.00	±1.00	15.27	EXPLOSION		
Ethyl Centralite	0.60	±0.15	0.52	FORM OF GRAIN		cyld
Potassium Nitrate	0.75	±0.25	0.82	NO. OF PERFORATIONS		
Barium Nitrate	1.40	±0.25	1.41	NO. OF GRAINS PER POUND		
Graphite	0.30	±0.10	0.33	BURNING SURFACE PER POUND (sq. inches)		
Total			100.00	GRAV. DENSITY, OR POUNDS PER CU. FT.		
Moisture	0.70	max.	0.30	SPECIFIC GRAVITY		
Total Volatiles	2.89	max.	1.85	HYGROSCOPICITY 1.50 max.		0.74
Graphite Glaze	0.10	max.	0.04	COMPRESSION TEST		

GRAIN DIMENSIONS	DIE (Inches)	FINISHED GRAIN (Inches) MANUFACTURER	INSPECTOR	MEAN VARIATION IN PER CENT OF MEAN DIMENSIONS MANUFACTURER	INSPECTOR
LENGTH (L)	0.268		0.2661		2.59
DIAMETER (D)	0.070		0.0539		4.39
DIAMETER OF PERFORATIONS (d)	0.028		0.0161		
WEB INNER					
WEB OUTER					
WEB AVERAGE	0.025		0.0189		15.73
WEB CALCULATED					
DIFFERENCE BETWEEN INNER AND OUTER WEB IN PER CENT OF WEB AVERAGE					
L:D (Y)			4.94		
D:d (X)			3.35		

DATE PACKED 12-14-66 DATE OFFERED 1-5-67 DATE SAMPLED 12-14-66

DATE TEST FINISHED 12-22-66 DATE DESCRIPTION SHEETS FORWARDED 11 January 1967

TYPE OF PACKING BOX M24

REMARKS PRON: A1-6-F0108-03-FO-FK. This lot meets all the requirements of the applicable specification.

Technical Dept.

J. W. Pierce

QU REP J. W. Patteson

U. S. CHEMIST J. W. Patteson

AMC FORM 1047 10 JUN 66

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APPENDIX B:

CLOSED-CHAMBER INFORMATION SHEETS

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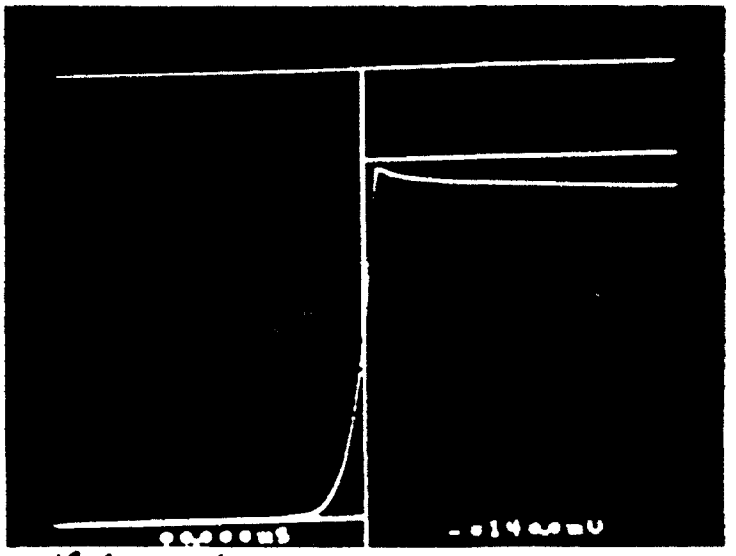
INFORMATION SHEET FOR IN



NIC 1 10 ms

Date: 20 Nov 92

Firing Record Number:

Project:

POC: STOBIE

Series Run Number: 1

Propellant or Sample Type: M5 Lot Number: 64597-5

Impetus: ~361X10³ Sample or Grain Dimensions:

Sample Weight: 52.4416 Sample Treatment: BAGGED

Igniter: 1.5 gm (3 Eq) Igniter Weight: 1.50 gm

Closed Bomb Used: 209

Relevant Information: .25 lb (~ 52 gm)

P_{max} (Calc): 52X10³ psi Sampling Rate: NIC 1 = 10 μs, NIC 2 = 20 μs

Gauge #1: 13788 (.133) Sensitivity:

Gauge #2: Sensitivity:

Disc Identification: OBERLE D1 {NIC 1, NIC 2}

Tracks used: TR 1 {NIC 1, NIC 2}

	#1	#2
Gauge		
Trigger	1.5 V	V
V in	7.315	
V out	6.00	
Range	5X10³	
Full Scale		

T = 3379 K MW = 25.496

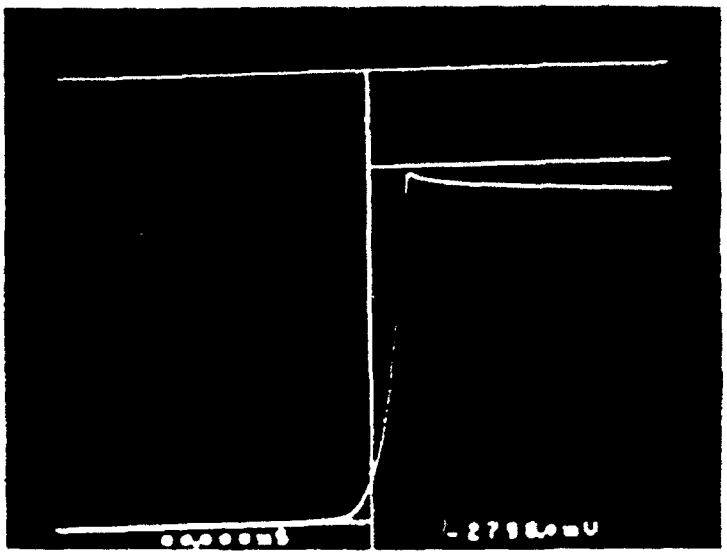
I = 1093 J/g ρ = 1.65

n = .984

γ = 1.2258

ΔU = 55X10³ psi

INFORMATION SHEET FOR INDI



MIC 1 10 μs

Date: 23 Jul 92

Firing Record Number:

Project:

POC: STOBIE

Series Run Number: 2

Propellant or Sample Type: M-5

Lot Number: 64597-S

Impetus: ≈ 361 x 10^3

Sample or Grain Dimensions:

Sample Weight: 52.4396

Sample Treatment: Bagged

Igniter: 1.5 gm (3 g)

Igniter Weight: 1.50 gm

Closed Bomb Used: 209

* Relevant Information: CHANGE PRESSURE TRANSDUCERS

P_{max} (Calc): 52 x 10^3 PSI

Sampling Rate: MIC 1 = 10 μs, MIC 2 = 10 μs

* Gauge #1: 14430

Sensitivity:

Gauge #2:

Sensitivity:

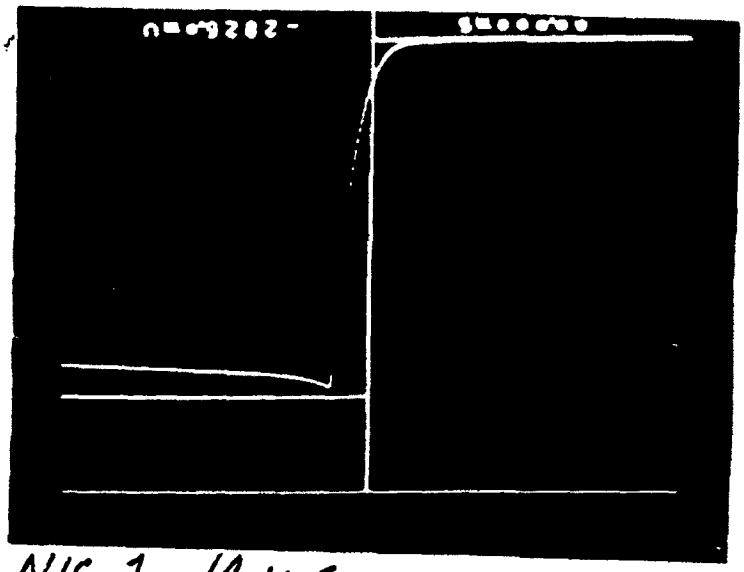
Disc Identification: OBERLE D1 {MIC 1, MIC 2}

Tracks used: 2 {MIC 1, MIC 2}

	#1	#2
Gauge		
Trigger	1.5 V	V
V in	7.3 V	
V out	6.00	
Range	5 x 10^3	
Full Scale		

6V = 55 x 10^3 PSI

INFORMATION SHEET FOR INDI



NIC 1 10 μs

Date: 23 Nov 92

Firing Record Number: _____

Project: _____

POC: STOBIE

Series Run Number: 3

Propellant or Sample Type: M-5 Lot Number: 64597-S

Impetus: e 361 x 10^3 Sample or Grain Dimensions: _____

Sample Weight: 52-3564 Sample Treatment: Bagged

Igniter: 1.5 gm (3 Cg) Igniter Weight: 1.50 gm

Closed Bomb Used: 209

Relevant Information: _____

P max (Calc): 52 x 10^3 PSI Sampling Rate: NIC 1 = 10 μs, NIC 2 = 10 μs

Gauge #1: 14430 (.385) Sensitivity: _____

Gauge #2: _____ Sensitivity: _____

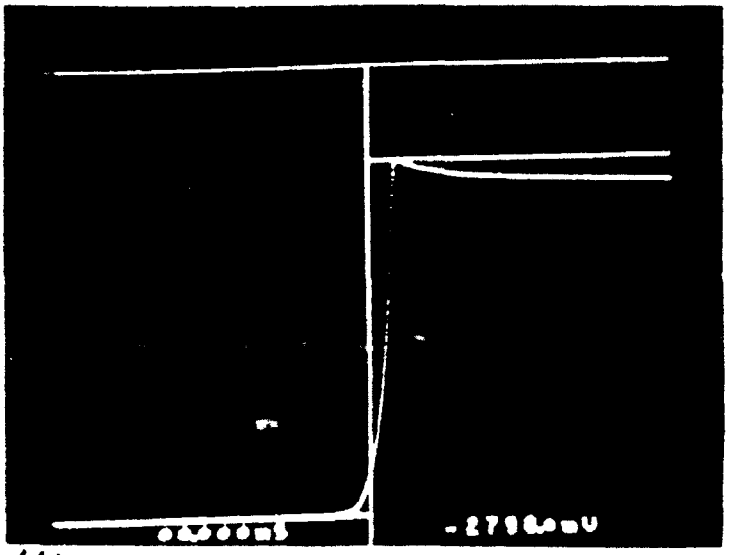
Disc Identification: OBERLE D1 {NIC 1, NIC 2}

Tracks used: 3 {NIC 1, NIC 2}

	#1	#2
Gauge		
Trigger	1.5 V	V
V in	7.315	
V out	6.00	
Range	5	
Full Scale		

6 V = 55 x 10^3 PSI

INFORMATION SHEET FOR INDI



NIC I 10 μs

Date: 23 Nov 93

Firing Record Number: _____

Project: _____

POC: STOBIE

Series Run Number: 4

Propellant or Sample Type: AA-5 Lot Number: 64597-S

Impetus: ≈ 36 x 10^3 Sample or Grain Dimensions: _____

Sample Weight: 73.1632 gm Sample Treatment: Bagged

Igniter: 1.5 gm (3 g) Igniter Weight: 1.50 gm

Closed Bomb Used: 209 cc

Relevant Information: _____

P_{max} (Calc): 82.[illegible] psi Sampling Rate: NIC 1 = 10 μs, NIC 2 = 10 μs

Gauge #1: 14430 Sensitivity: S = -385

Gauge #2: _____ Sensitivity: _____

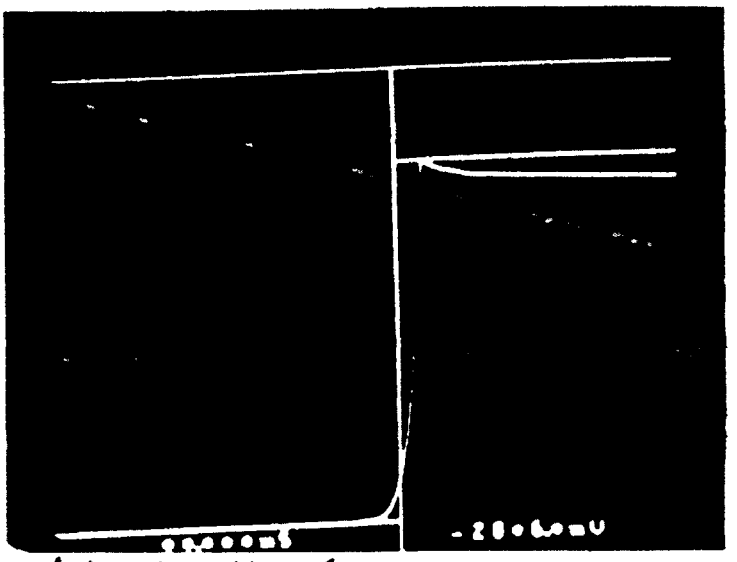
Disc Identification: OBERLE D1 {NIC 1, NIC 2}

Tracks used: NIC 1: 4, NIC 2

	#1	#2
Gauge		
Trigger	1.5 V	V
V in	11.560	
V out	6.00	
Range	5 x 10^3	
Full Scale		

6 V = 85 x 10^3

INFORMATION SHEET FOR INDI



MIC 1 10 MS

Date: 23 Nov 92

Firing Record Number: _____

Project: _____

POC: STABLE

Series Run Number: 5

Propellant or Sample Type: M-5

Lot Number: 64597-S

Impetus: 361 X 10^3

Sample or Grain Dimensions: _____

Sample Weight: 73.1950

Sample Treatment: Bagged

Igniter: 1.5gm (3 ps)

Igniter Weight: 1.50gm

Closed Bomb Used: 209cc

Relevant Information: _____

P_{max} (Calc): 82,000 PSI

Sampling Rate: MIC 1: 10 MS; MIC 2: 5 MS

Gauge #1: 14430

Sensitivity: S-385

Gauge #2: _____

Sensitivity: _____

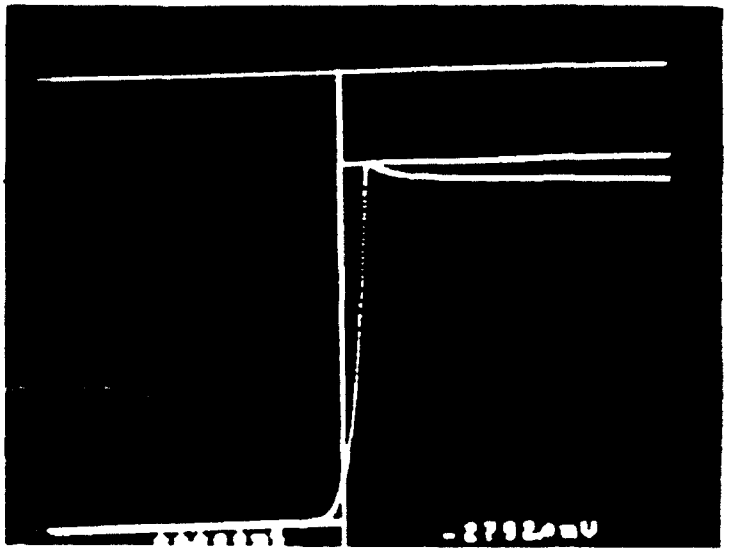
Disc Identification: OBERLE D1 {NIC 1, NIC 2}

Tracks used: 5 NIC 1, NIC 2

	#1	#2
Gauge		
Trigger	1.5 V	V
V in	11.560	
V out	1.00	
Range	5 X 10^3	
Full Scale		

6 V = 85 X 10^3

INFORMATION SHEET FOR IND



NIC 1 10 μs

Date: 24 Nov 92

Firing Record Number: _____

Project: _____

POC: STOBIE

Series Run Number: 6

Propellant or Sample Type: M-5 Lot Number: 64597-S

Impetus: ~ 361 X 10^3 Sample or Grain Dimensions: _____

Sample Weight: 73.4889 Sample Treatment: Bagged

Igniter: 1.5 gm (3 g) Igniter Weight: 1.50 gm

Closed Bomb Used: 209 cc

Relevant Information: _____

P_{max} (Calc): 82,000 PSI Sampling Rate: NIC 1 = 10 μs, NIC 2 = 5 μs

Gauge #1: 14430 Sensitivity: _____

Gauge #2: _____ Sensitivity: _____

Disc Identification: OBERLE D-1 {NIC 1, NIC 2

Tracks used: 6 NIC 1, NIC 2

	#1	#2
Gauge		
Trigger	1.5 V	V
V in	11.560	
V out	6.00	
Range	5X10^3	
Full Scale		

6 V = 85 X 10^3

APPENDIX C:

QUICK SUMMARY SHEETS

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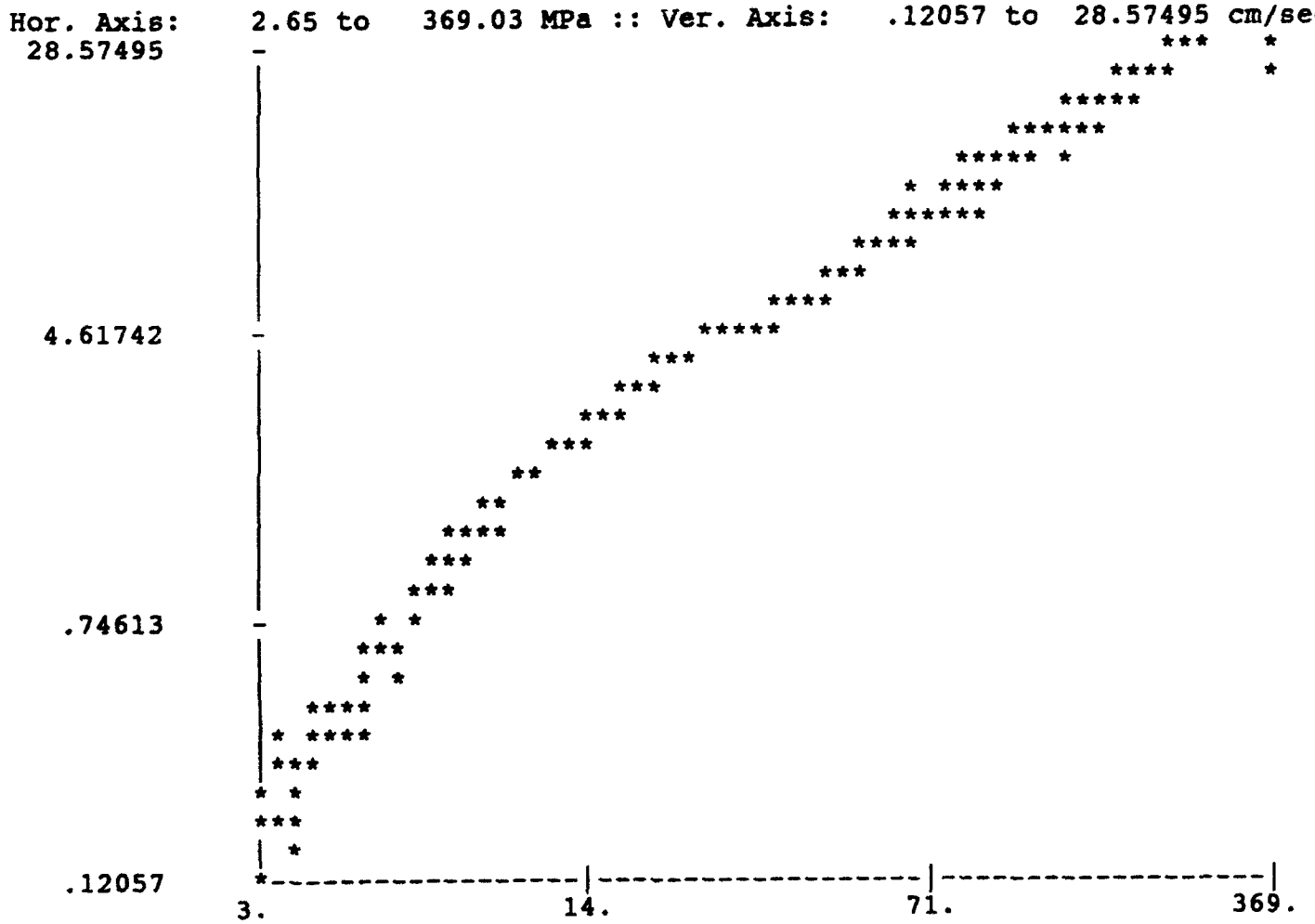
OUTPUT FILE: a:m5t1.ot
Information File:a:m5t1.inf
Project Name : BC M5 BURN RATES
Propellant Type :M5
Grain Geometry :1-Perf. Cyl.
Grain Length(cm): .57429
Outer Diameter : .13691
Perf Diameter : .04089
Inner Web : .04801
Middle Web : .00000
Outer Web : .00000
Prop Thermochems:
Impetus (J/g) : 1093.00000
Flame Temp (K) : 3379.00000
Density (g/cc) : 1.65000
Molecular Weight: 25.70266
Covolume (cc/g) : .98400
Gamma : 1.22580

Pressure (MPa)	Burn Rate (cm/sec)
20.0	3.198
72.0	10.199
100.0	11.270
140.0	15.161
200.0	21.386
240.0	24.843
300.0	28.494
340.0	24.533

Burn Rate Laws (MPa & cm/sec)

Pressure --	Pressure	Coeff	Exp	Corr Coef f
18.67	37.34	.547756	.6008	.9740830
37.34	93.36	.170881	.9187	.9397104
93.36	280.08	.239805	.8440	.9832941
30.00	280.00	.207218	.8724	.9928279
10.00	30.00	.210789	.9045	.9876295

Hor. Axis: 2.65 to 369.03 MPa :: Ver. Axis: .12057 to 28.57495 cm/sec



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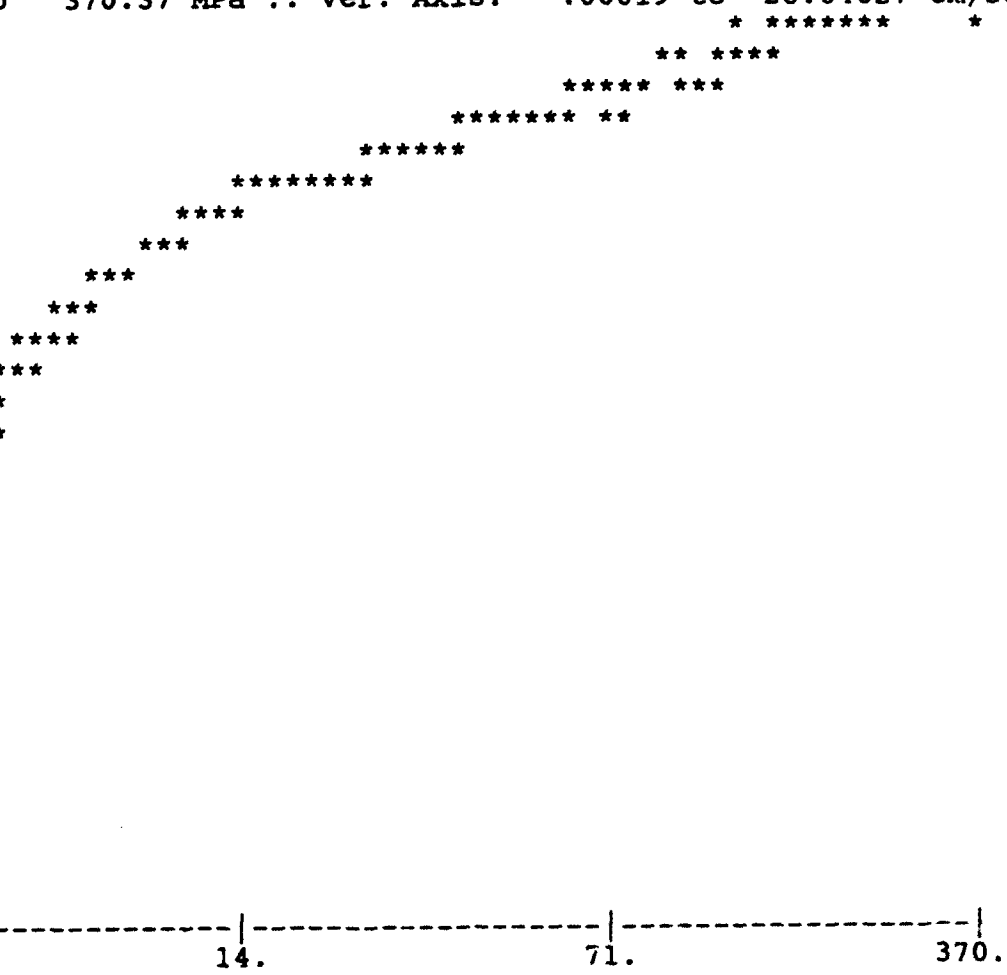
 OUTPUT FILE: a:m5t2.ot
Information File:a:m5t2.inf
Project Name     : BC M5 BURN RATES
Propellant Type :M5
Grain Geometry  :1-Perf. Cyl.
Grain Length(cm):                .57429
Outer Diameter  :                .13691
Perf  Diameter  :                .04089
Inner Web       :                .04801
Middle Web      :                .00000
Outer  Web      :                .00000
Prop Thermochems:
Impetus (J/g)   :           1093.00000
Flame Temp (K)  :           3379.00000
Density (g/cc)  :              1.65000
Molecular Weight:             25.70266
Covolume (cc/g) :               .98400
Gamma           :              1.22580
```

Pressure (MPa)	Burn Rate (cm/sec)
20.0	2.867
72.0	9.405
100.0	9.498
140.0	15.447
200.0	20.219
240.0	25.408
300.0	28.626
340.0	23.343

Burn Rate Laws (MPa & cm/sec)

Pressure --	Pressure	Coeff	Exp	Corr Coef f
18.54	37.08	.174479	.9298	.9852290
37.08	92.71	.247634	.8399	.9494147
92.71	278.12	.177142	.9003	.9667697
30.00	300.00	.251033	.8332	.9911913
30.00	280.00	.249648	.8346	.9902594

Hor. Axis: 2.65 to 370.37 MPa :: Ver. Axis: .00019 to 28.64627 cm/sec



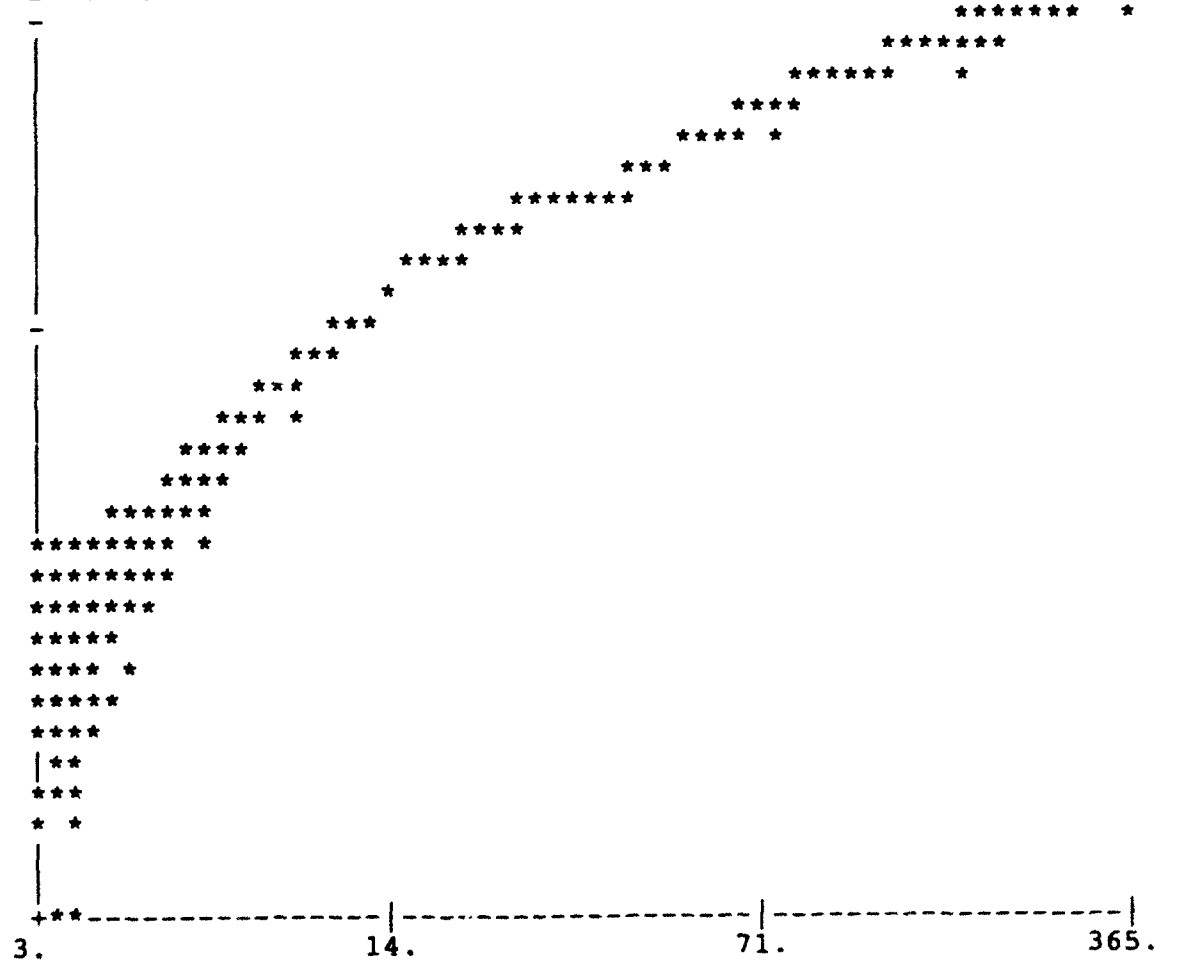
OUTPUT FILE: a:m5t3.ot
Information File:a:m5t3.inf
Project Name : BC M5 BURN RATES
Propellant Type :M5
Grain Geometry :1-Perf. Cyl.
Grain Length(cm): .57429
Outer Diameter : .13691
Perf Diameter : .04089
Inner Web : .04801
Middle Web : .00000
Outer Web : .00000
Prop Thermochems:
Impetus (J/g) : 1093.00000
Flame Temp (K) : 3379.00000
Density (g/cc) : 1.65000
Molecular Weight: 25.70266
Covolume (cc/g) : .98400
Gamma : 1.22580

Pressure (MPa)	Burn Rate (cm/sec)
20.0	2.967
72.0	6.756
100.0	10.918
140.0	16.040
200.0	21.948
240.0	23.731
300.0	28.954
340.0	23.525

Burn Rate Laws (MPa & cm/sec)

Pressure --	Pressure	Coeff	Exp	Corr Coef f
18.41	36.81	.308054	.7519	.9694617
36.81	92.03	.157450	.9450	.9448234
92.03	276.10	.221427	.8594	.9675660
30.00	280.00	.204503	.8762	.9906946
30.00	300.00	.206544	.8738	.9913580

Hor. Axis: 2.65 to 364.95 MPa :: Ver. Axis: .00501 to 29.12210 cm/sec



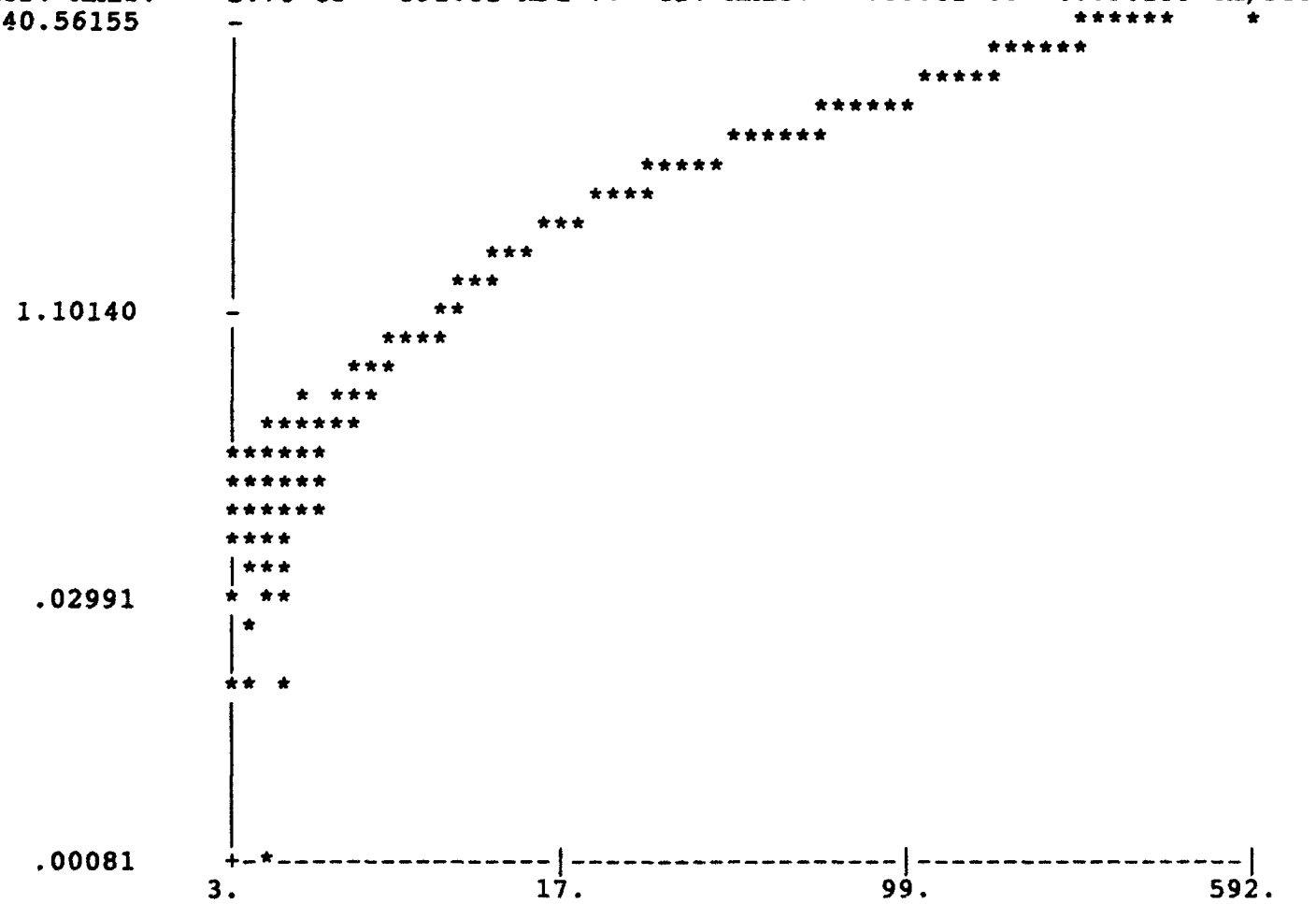
OUTPUT FILE: a:m5t4.ot

			Pressure (MPa)	Burn Rate (cm/sec)
Information File	:a:m5t4.inf			
Project Name	:HCC M5 BURN RATES			
Propellant Type	:M5		20.0	3.176
Grain Geometry	:1-Perf. Cyl.		72.0	8.664
Grain Length(cm)	:	.57429	100.0	12.131
Outer Diameter	:	.13691	140.0	16.522
Perf Diameter	:	.04089	200.0	20.487
Inner Web	:	.04801	240.0	24.935
Middle Web	:	.00000	300.0	29.528
Outer Web	:	.00000	340.0	32.568
Prop Thermochems	:		400.0	36.083
Impetus (J/g)	:	1093.00000	440.0	38.710
Flame Temp (K)	:	3379.00000	500.0	39.079
Density (g/cc)	:	1.65000	540.0	33.270
Molecular Weight	:	25.70266		
Covolume (cc/g)	:	.98400		
Gamma	:	1.22580		

Burn Rate Laws (MPa & cm/sec)

Pressure --	Pressure	Coeff	Exp	Corr Coef f
29.62	59.24	.510368	.6653	.9892604
59.24	148.10	.274854	.8155	.9786542
148.10	444.29	.283246	.8109	.9916131
20.00	420.00	.315470	.7902	.9982091

Hor. Axis: 2.78 to 591.81 MPa :: Ver. Axis: .00081 to 40.56155 cm/sec



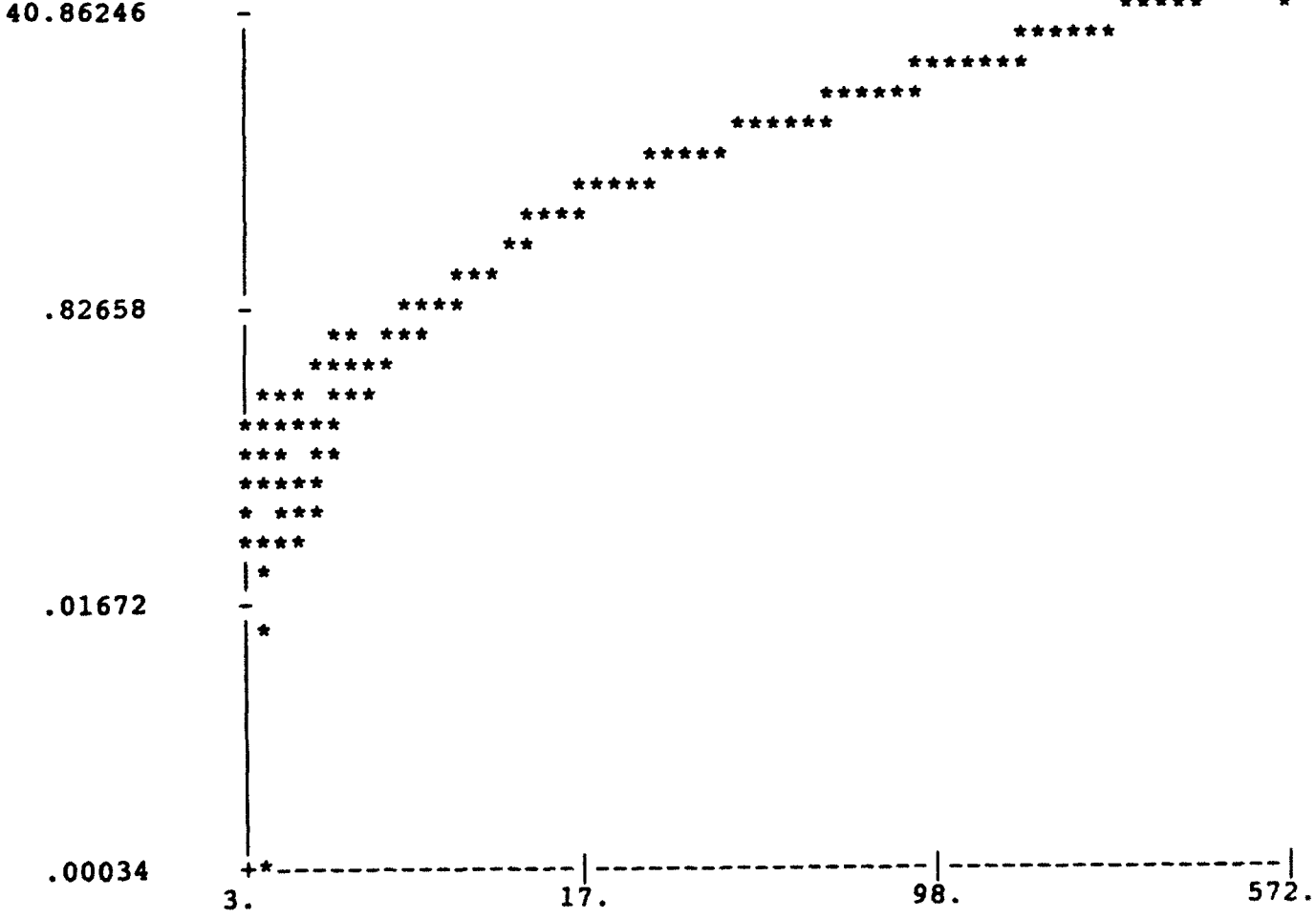
```
 OUTPUT FILE: a:m5t5.ot
Information File:a:m5t5.inf
Project Name     :HCC M5 BURN RATES
Propellant Type  :M5
Grain Geometry   :1-Perf. Cyl.
Grain Length(cm):                .57429
Outer Diameter   :               .13691
Perf  Diameter   :               .04089
Inner Web        :               .04801
Middle Web       :               .00000
Outer  Web       :               .00000
Prop Thermochems:
Impetus (J/g)    :           1093.00000
Flame Temp (K)   :           3379.00000
Density (g/cc)   :              1.65000
Molecular Weight:              25.70266
Covolume (cc/g)  :               .98400
Gamma            :              1.22580
```

Pressure (MPa)	Burn Rate (cm/sec)
20.0	3.140
72.0	8.548
100.0	12.080
140.0	15.338
200.0	20.222
240.0	24.735
300.0	30.072
340.0	32.874
400.0	36.211
440.0	39.151
500.0	40.342
540.0	32.591

Burn Rate Laws (MPa & cm/sec)

Pressure --	Pressure	Coeff	Exp	Corr Coef f
29.50	59.01	.323998	.7833	.9912014
59.01	147.52	.282177	.8120	.9814939
147.52	442.57	.284842	.8120	.9964502
30.00	440.00	.295513	.8046	.9987165

Hor. Axis: 2.84 to 571.53 MPa :: Ver. Axis: .00034 to 40.86246 cm/sec



OUTPUT FILE: a:m5t6.ot

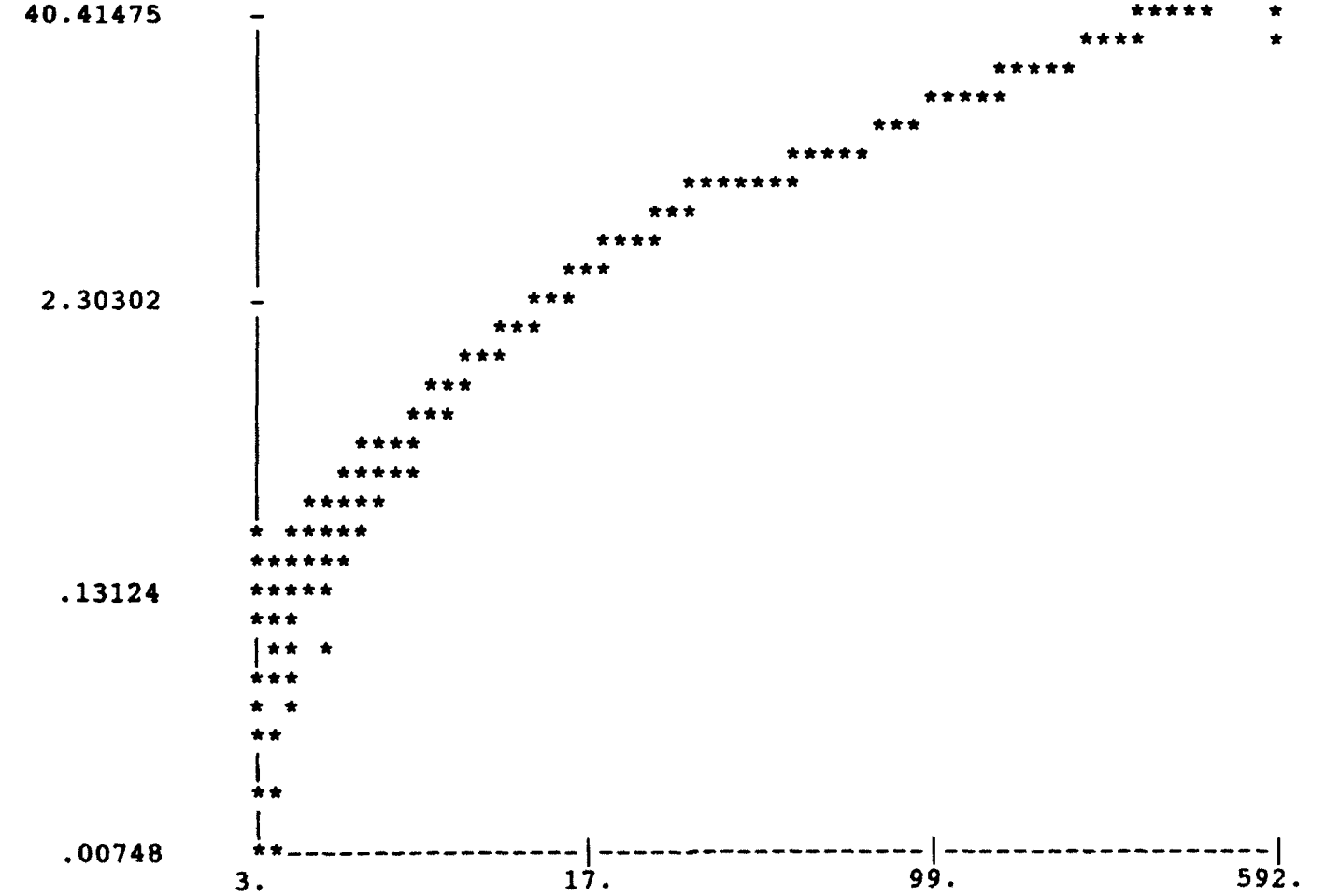
Information File:	a:m5t6.inf
Project Name	:HCC M5 BURN RATES
Propellant Type	:M5
Grain Geometry	:1-Perf. Cyl.
Grain Length(cm):	.57429
Outer Diameter :	.13691
Perf Diameter :	.04089
Inner Web :	.04801
Middle Web :	.00000
Outer Web :	.00000
Prop Thermochems:	
Impetus (J/g) :	1093.00000
Flame Temp (K) :	3379.00000
Density (g/cc) :	1.65000
Molecular Weight:	25.70266
Covolume (cc/g) :	.98400
Gamma :	1.22580

Pressure (MPa)	Burn Rate (cm/sec)
20.0	3.158
72.0	8.870
100.0	11.290
140.0	15.523
200.0	20.279
240.0	24.572
300.0	29.642
340.0	32.535
400.0	36.483
440.0	39.456
500.0	39.501
540.0	33.740

Burn Rate Laws (MPa & cm/sec)

Pressure --	Pressure	Coeff	Exp	Corr Coef f
29.58	59.17	.326743	.7850	.9917435
59.17	147.92	.288910	.8068	.9892018
147.92	443.76	.281014	.8136	.9970241
40.00	420.00	.300348	.8011	.9987572

Hor. Axis: 2.81 to 591.61 MPa :: Ver. Axis: .00748 to 40.41475 cm/sec



APPENDIX D:

BRLCB RESULTS FOR TRACK 1

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BURNING RATE ANALYSIS
BRLCB V3.0
ADVANCED BALLISTIC CONCEPTS BRANCH - BRL

Project :	M5 BURN RATES	Requested by :	W. Oberle
Inf File:	a:m5t1.inf	Created From .MAS File :	a:m5.mas
P/T File:	a:m5t1.pvt	Calculation Output File:	a:m5t1.out
Smoothed:	a:m5t1.pdt	Graphics File :	a:m5t1.dat
Fired on:	20 Nov 92		

FIRING REMARKS:
Bill Aungst: Operator

REDUCTION REMARKS:
Reduced on 12 Dec 92 by Bill Oberle

IGNITER INFORMATION

The Igniter Used Is : Black Powder Lot: FFFG
The Source For The Igniter Is: Pellets, Milan Ord.

IGNITER THERMOCHEMICAL PROPERTIES

Impetus (J/g) :	290.0	Molecular Weight:	66.37000
Flame Temperature (K):	2188.0	Covolume (cm^3/g) :	.78500
Density (g/cm^3) :	1.75000	Gamma :	1.21840

PROPELLANT INFORMATION

The Propellant Used Is : M5 Lot: RAD-64597 Of 1966
The Source For The Propellant Is : Radfort Army Ammo Pl
Propellant Thermochemical Properties: Following Sheets of Output

PROPELLANT GRAIN GEOMETRY

Grain Type: 1-Perf. Cyl.

Length --- (cm.):	.574294
Outer Diam.(cm.):	.136906
Perf Diam. (cm.):	.040894
Inner Web (cm.):	.048006

Bomb Information		Gage Information	
Bomb Type :	Closed Chamber	Gage I.D. :	C13788
Bomb Vol (cm^3) :	209.0	Input Voltage :	7.3150
		Constants For Fit:	A+Bx+C^2
		A:	.53714E+00
		B:	.52948E-01
		C:	-.88281E-07

Temperature and Charge Mass Information

Propellant Mass (g) :	52.4416	Igniter Mass (g) :	1.5000
Initial Temp. Prop.(K) :	294.	Igniter Temp.(K) :	294.
Initial Bomb Temp. (K) :	294.		
Number of Propellant Grains:	4127.72		
Number of Wildpoint Passes :	1	Wildpoint Tolerance:	5.000
Number of Smoothing Passes :	1	Smoothing Option :	1
Bridge Length :	15		

****

```
*****************************************************************************
  Total # Layers =  1
  Chamber Volume (cm3) =  209.000
  Heat-Loss-Fraction (n-d) =  .000
  Time Step (mil-sec) =  .10000000E-01     Max Time Steps =  1200
  Convergence Criterion =  .10000000E-04
  Computation Type (1=BURN-RATE, 2=PTGEN, 3=SURF AREA, 4=INTERR BOMB, 5=ETC) 1
*****************************************************************************
                      Beginning (1) of Layer          End (2) of Layer
*****************************************************************************
           Propellant Mass in grams
*****************************************************************************
          1                 52.44161
       Ignitor               1.50000
         Air                  .21234
*****************************************************************************
           Propellant Density in g/cm3
*****************************************************************************
          1                 1.65000                  1.65000
       Ignitor              1.75000
*****************************************************************************
           Propellant Impetus in J/g
*****************************************************************************
          1               1093.00000               1093.00000
       Ignitor             290.00000
*****************************************************************************
           Propellant Flame Temperature in deg K
*****************************************************************************
          1               3379.00000               3379.00000
       Ignitor            2188.00000
*****************************************************************************
           Propellant Molecular Weight in g/g-mole
*****************************************************************************
       Ignitor              66.37000
         Air                28.90000
*****************************************************************************
           Propellant Gas Constant in cal/g-deg K
*****************************************************************************
          1                  .07731                   .07731
       Ignitor               .02994
         Air                 .06876
*****************************************************************************
           Gamma (Ratio of Specific Heats)
*****************************************************************************
          1                 1.22580                  1.22580
       Ignitor              1.21840
         Air                1.40000
*****************************************************************************
           Specific Heat (Cv) in cal/g-deg K
*****************************************************************************
          1                  .34240                   .34240
       Ignitor               .13709
         Air                 .17190
*****************************************************************************
           Covolume in cm3/g
*****************************************************************************
          1                  .98400                   .98400
       Ignitor               .78500
         Air                 .98000
*****************************************************************************
```

```
*****************************************************************************************************************

      ******** Maximum Chamber Properties are  *******
      Theoretical Maximum Chamber Pressure (MPa) =  .37057390E+03
      Theoretical Maximum Chamber Temperature (deg K) =  .33587640E+04
      **** Assuming a Heat-Loss-Fraction =  .000
      Maximum Total Heat Loss from Chamber (cal) =  -.72657580E-02
      Maximum Chamber Pressure (MPa) w/Heat Loss =   .37057390E+03
      Maximum Chamber Temperature (deg K) w/Heat Loss =  .33587640E+04



   ** Results: Deduced Burning Rates Based on a given Chamber Pressure vs. Time **
   *** N *** LAYER *** TIME(ms) *** PCH(MPa) *** TPMR(gm) *** RBR(cm/s) *** ASUR(cm2) *** TCH(degK) ***
DEPTHB(cm) ***

   N=    1 LAYER= 1   .00000000E+00   .26313630E+01   .52441610E+02   .00000000E+00   .14348020E+04
.18581670E+04   .00000000E+00

   *** PROPELLANT LAYER J = 1 has Burned out on Step N = 288 Before TIME (millisec) of .31700000E+01
                Chamber Pressure (MPa) at Burnout =  .37057390E+03
                Chamber Temperature (deg K) at Burnout =  .33587640E+04
                Depth of Layer (cm) at Burnout =  .48006000E-01
```

*** DECUDED BURNING RATES ***

N= 3	LAYER= 1	.32000000E+00	.26546130E+01	.52437890E+02	.12056640E+00	.14348020E+04	.18661320E+04	.00000000E+00
N= 4	LAYER= 1	.33000000E+00	.26818660E+01	.52437890E+02	.16267490E+00	.14348020E+04	.18750650E+04	.00000000E+00
N= 5	LAYER= 1	.34000000E+00	.27058590E+01	.52430180E+02	.13123530E+00	.14348020E+04	.18823530E+04	.00000000E+00
N= 6	LAYER= 1	.35000000E+00	.27230980E+01	.52427450E+02	.16796210E+00	.14348020E+04	.18880210E+04	.00000000E+00
N= 7	LAYER= 1	.36000000E+00	.27558260E+01	.52422230E+02	.19949630E+00	.14348020E+04	.18987330E+04	.00000000E+00
N= 8	LAYER= 1	.37000000E+00	.27823800E+01	.52418000E+02	.18948850E+00	.14348020E+04	.19072870E+04	.00000000E+00
N= 9	LAYER= 1	.38000000E+00	.28159210E+01	.52413260E+02	.28399660E+00	.14348020E+04	.19167870E+04	.00000000E+00
N= 10	LAYER= 1	.39000000E+00	.28159210E+01	.52404560E+02	.32582240E+00	.14348020E+04	.19338780E+04	.00000000E+00
N= 11	LAYER= 1	.40000000E+00	.29130510E+01	.52397830E+02	.25841050E+00	.14348020E+04	.19468230E+04	.00000000E+00
N= 12	LAYER= 1	.41000000E+00	.29506680E+01	.52392320E+02	.27361110E+00	.14348020E+04	.19572500E+04	.00000000E+00
N= 13	LAYER= 1	.42000000E+00	.29956220E+01	.52384870E+02	.24778060E+00	.14345810E+04	.19712180E+04	.24003480E-04
N= 14	LAYER= 1	.43000000E+00	.30262530E+01	.52380590E+02	.15401440E+00	.14345640E+04	.19790650E+04	.25803770E-04
N= 15	LAYER= 1	.44000000E+00	.30466330E+01	.52377580E+02	.22701030E+00	.14345500E+04	.19845290E+04	.27303620E-04
N= 16	LAYER= 1	.45000000E+00	.30956640E+01	.52369850E+02	.23665000E+00	.14345060E+04	.19983790E+04	.32102450E-04
N= 17	LAYER= 1	.46000000E+00	.31160440E+01	.52366380E+02	.14202780E+00	.14345060E+04	.20044960E+04	.32103890E-04
N= 18	LAYER= 1	.47000000E+00	.31375890E+01	.52363120E+02	.18490200E+00	.14344950E+04	.20102000E+04	.33304200E-04
N= 19	LAYER= 1	.48000000E+00	.31722950E+01	.52357630E+02	.23184230E+00	.14344510E+04	.20197010E+04	.38102430E-04
N= 20	LAYER= 1	.49000000E+00	.32064170E+01	.52352150E+02	.22825370E+00	.14344510E+04	.20290510E+04	.38103860E-04
N= 21	LAYER= 1	.50000000E+00	.32440330E+01	.52346820E+02	.21173430E+00	.14344060E+04	.20380160E+04	.42901610E-04
N= 22	LAYER= 1	.51000000E+00	.32714010E+01	.52342120E+02	.24365510E+00	.14344060E+04	.20458270E+04	.42903050E-04
N= 23	LAYER= 1	.52000000E+00	.33183350E+01	.52335290E+02	.29654980E+00	.14343620E+04	.20570240E+04	.47700320E-04
N= 24	LAYER= 1	.53000000E+00	.33620080E+01	.52328090E+02	.32667850E+00	.14343590E+04	.20686300E+04	.48001020E-04
N= 25	LAYER= 1	.54000000E+00	.34144150E+01	.52319830E+02	.35502230E+00	.14343150E+04	.20816840E+04	.52797780E-04
N= 26	LAYER= 1	.55000000E+00	.34697330E+01	.52311280E+02	.31914190E+00	.14342710E+04	.20949170E+04	.57594050E-04
N= 27	LAYER= 1	.56000000E+00	.35130570E+01	.52304720E+02	.28126920E+00	.14342680E+04	.21049030E+04	.57894700E-04
N= 28	LAYER= 1	.57000000E+00	.35552160E+01	.52297970E+02	.31254150E+00	.14342240E+04	.21150090E+04	.62690470E-04
N= 20	LAYER= 1	.58000000E+00	.36070390E+01	.52289930E+02	.35523640E+00	.14342100E+04	.21268500E+04	.64189170E-04
N= 30	LAYER= 1	.59000000E+00	.36623560E+01	.52281160E+02	.32473810E+00	.14341660E+04	.21395080E+04	.68984310E-04
N= 31	LAYER= 1	.60000000E+00	.37062590E+01	.52274560E+02	.28724330E+00	.14341490E+04	.21488630E+04	.70782900E-04
N= 32	LAYER= 1	.61000000E+00	.37495790E+01	.52267560E+02	.35063470E+00	.14341050E+04	.21586240E+04	.75577390E-04
N= 33	LAYER= 1	.62000000E+00	.38118830E+01	.52257970E+02	.37095400E+00	.14340610E+04	.21717740E+04	.80371390E-04
N= 34	LAYER= 1	.63000000E+00	.38604450E+01	.52250010E+02	.31342850E+00	.14340550E+04	.21824640E+04	.80971430E-04
N= 35	LAYER= 1	.64000000E+00	.39060960E+01	.52243130E+02	.29397810E+00	.14340110E+04	.21915490E+04	.85764890E-04
N= 36	LAYER= 1	.65000000E+00	.39505840E+01	.52236100E+02	.33346660E+00	.14340000E+04	.22007030E+04	.86963860E-04
N= 37	LAYER= 1	.66000000E+00	.40047350E+01	.52227350E+02	.31363990E+00	.14339560E+04	.22118830E+04	.91756720E-04
N= 38	LAYER= 1	.67000000E+00	.40445630E+01	.52221260E+02	.31354760E+00	.14339420E+04	.22195530E+04	.93254520E-04
N= 39	LAYER= 1	.68000000E+00	.40987140R+01	.52212520E+02	.32952260E+00	.14338980E+04	.22303790E+04	.98046750E-04
N= 40	LAYER= 1	.69000000E+00	.41432020E+01	.52205660E+02	.29466600E+00	.14338810E+04	.22387240E+04	.99844260E-04
N= 41	LAYER= 1	.70000000E+00	.41888520E+01	.52198570E+02	.30620140E+00	.14338370E+04	.22472310E+04	.10463580E-03
N= 42	LAYER= 1	.71000000E+00	.42374130E+01	.52191170E+02	.28126080E+00	.14338260E+04	.22559750E+04	.10583430E-03
N= 43	LAYER= 1	.72000000E+00	.42724650E+01	.52185260E+02	.28079710E+00	.14337820E+04	.22628650E+04	.11062530E-03
N= 44	LAYER= 1	.73000000E+00	.43203250E+01	.52177890E+02	.38170570E+00	.14337740E+04	.22713450E+04	.11152380E-03
N= 45	LAYER= 1	.74000000E+00	.43894960E+01	.52167210E+02	.43935300E+00	.14337290E+04	.22834010E+04	.11631420E-03
N= 46	LAYER= 1	.75000000E+00	.44536600E+01	.52157100E+02	.47309740E+00	.14336850E+04	.22945620E+04	.12110420E-03
N= 47	LAYER= 1	.76000000E+00	.45300500E+01	.52144820E+02	.55314650E+00	.14336410E+04	.23078240E+04	.12589360E-03
N= 48	LAYER= 1	.77000000E+00	.46180870E+01	.52130930E+02	.58982920E+00	.14335910E+04	.23224430E+04	.13128050E-03

N= 49	LAYER= 1	.78000000E+00	.47084530E+01	.52116920E+02	.60185160E+00	.14335360E+04	.23367910E+04	.13726480E-03
N= 50	LAYER= 1	.79000000E+00	.48005670E+01	.52102460E+02	.59176470E+00	.14334810E+04	.23511900E+04	.14324870E-03
N= 51	LAYER= 1	.80000000E+00	.48847600E+01	.52088920E+02	.55767020E+00	.14334290E+04	.23643190E+04	.14893230E-03
N= 52	LAYER= 1	.81000000E+00	.49683700E+01	.52076080E+02	.54748240E+00	.14333760E+04	.23764680E+04	.15461520E-03
N= 53	LAYER= 1	.82000000E+00	.50496540E+01	.52063030E+02	.50185390E+00	.14333260E+04	.23885200E+04	.15999890E-03
N= 54	LAYER= 1	.83000000E+00	.51177770E+01	.52052340E+02	.45735330E+00	.14332820E+04	.23981710E+04	.16478450E-03
N= 55	LAYER= 1	.84000000E+00	.51876460E+01	.52041390E+02	.43005090E+00	.14332380E+04	.24078700E+04	.16956960E-03
N= 56	LAYER= 1	.85000000E+00	.52472670E+01	.52032000E+02	.44329910E+00	.14331940E+04	.24160380E+04	.17435410E-03
N= 57	LAYER= 1	.86000000E+00	.53194630E+01	.52020430E+02	.51439270E+00	.14331500E+04	.24259130E+04	.17913830E-03
N= 58	LAYER= 1	.87000000E+00	.54009750E+01	.52007680E+02	.59210570E+00	.14331060E+04	.24365670E+04	.18392190E-03
N= 59	LAYER= 1	.88000000E+00	.54976220E+01	.51992430E+02	.62786030E+00	.14330510E+04	.24489940E+04	.18990000E-03
N= 60	LAYER= 1	.89000000E+00	.55886790E+01	.51977980E+02	.64102770E+00	.14329960E+04	.24604670E+04	.19587740E-03
N= 61	LAYER= 1	.90000000E+00	.56878860E+01	.51962110E+02	.70798830E+00	.14329320E+04	.24727510E+04	.20274990E-03
N= 62	LAYER= 1	.91000000E+00	.57999030E+01	.51944500E+02	.74745630E+00	.14328440E+04	.24860010E+04	.21231050E-03
N= 63	LAYER= 1	.92000000E+00	.59115710E+01	.51926770E+02	.69860170E+00	.14327940E+04	.24989610E+04	.21768780E-03
N= 64	LAYER= 1	.93000000E+00	.60085670E+01	.51911470E+02	.72236350E+00	.14327340E+04	.25098390E+04	.22425900E-03
N= 65	LAYER= 1	.94000000E+00	.61280330E+01	.5189262OE+02	.82320460E+00	.14326460E+04	.25228870E+04	.23381620E-03
N= 66	LAYER= 1	.95000000E+00	.62544860E+01	.51872550E+02	.78694340E+00	.14325570E+04	.25363460E+04	.24337070E-03
N= 67	LAYER= 1	.96000000E+00	.63633570E+01	.51855420E+02	.75992210E+00	.14325130E+04	.25475120E+04	.24814790E-03
N= 68	LAYER= 1	.97000000E+00	.64815400E+01	.51836630E+02	.79514510E+00	.14324250E+04	.25594150E+04	.25769950E-03
N= 69	LAYER= 1	.98000000E+00	.65999570E+01	.51817830E+02	.88228250E+00	.14323700E+04	.25709920E+04	.26366840E-03
N= 70	LAYER= 1	.98999990E+00	.67443370E+01	.51794930E+02	.99631260E+00	.14322790E+04	.25846610E+04	.27351560E-03
N= 71	LAYER= 1	.99999990E+00	.68968660E+01	.51770740E+02	.95995680E+00	.14321860E+04	.25986050E+04	.28365920E-03
N= 72	LAYER= 1	.10100000E+01	.70306480E+01	.51749560E+02	.97665910E+00	.14320980E+04	.26104170E+04	.29320460E-03
N= 73	LAYER= 1	.10200000E+01	.71880660E+01	.51724580E+02	.10127650E+01	.14320040E+04	.26238950E+04	.30334390E-03
N= 74	LAYER= 1	.10300000E+01	.73319740E+01	.51701700E+02	.10014800E+01	.14319160E+04	.26358360E+04	.31288540E-03
N= 75	LAYER= 1	.10400000E+01	.74857780E+01	.51677260E+02	.99331890E+00	.14318230E+04	.26481790E+04	.32302060E-03
N= 76	LAYER= 1	.10500000E+01	.76278220E+01	.51654760E+02	.10438020E+01	.14317320E+04	.26591820E+04	.33285560E-03
N= 77	LAYER= 1	.10600000E+01	.77969900E+01	.51627940E+02	.11225100E+01	.14316280E+04	.26718770E+04	.34417810E-03
N= 78	LAYER= 1	.10700000E+01	.79617340E+01	.51601730E+02	.11931000E+01	.14315260E+04	.26838570E+04	.35520000E-03
N= 79	LAYER= 1	.10800000E+01	.81518550E+01	.51571580E+02	.12243400E+01	.14313940E+04	.26971470E+04	.36949620E-03
N= 80	LAYER= 1	.10900000E+01	.83267230E+01	.51543900E+02	.11277820E+01	.14313010E+04	.27089080E+04	.37961930E-03
N= 81	LAYER= 1	.11000000E+01	.84880890E+01	.51518310E+02	.11574940E+01	.14311990E+04	.27194240E+04	.39063260E-03
N= 82	LAYER= 1	.11100000E+01	.86709850E+01	.51489230E+02	.13042290E+01	.14310680E+04	.27309810E+04	.40491670E-03
N= 83	LAYER= 1	.11200000E+01	.88748370E+01	.51456720E+02	.14150170E+01	.14309360E+04	.27434320E+04	.41919660E-03
N= 84	LAYER= 1	.11300000E+01	.90899820E+01	.51422410E+02	.14787710E+01	.14308040E+04	.27560610E+04	.43347210E-03
N= 85	LAYER= 1	.11400000E+01	.93146650E+01	.51386890E+02	.15048430E+01	.14306730E+04	.27686200E+04	.44774480E-03
N= 86	LAYER= 1	.11500000E+01	.95372490E+01	.51351360E+02	.15418260E+01	.14305410E+04	.27806850E+04	.46201320E-03
N= 87	LAYER= 1	.11600000E+01	.97714740E+01	.51314110E+02	.15420760E+01	.14304040E+04	.27928340E+04	.47687100E-03
N= 88	LAYER= 1	.11700000E+01	.99951020E+01	.51278580E+02	.15692990E+01	.14302640E+04	.28039710E+04	.49202060E-03
N= 89	LAYER= 1	.11800000E+01	.10237350E+02	.51240040E+02	.16418320E+01	.14301140E+04	.28155810E+04	.50835300E-03
N= 90	LAYER= 1	.11900000E+01	.10482740E+02	.51201090E+02	.17571490E+01	.14299360E+04	.28268490E+04	.52764740E-03
N= 91	LAYER= 1	.12000000E+01	.10759320E+02	.51157120E+02	.18277260E+01	.14297880E+04	.28390370E+04	.54367130E-03
N= 92	LAYER= 1	.12100000E+01	.11024720E+02	.51114850E+02	.17837930E+01	.14296130E+04	.28502590E+04	.56265720E-03
N= 93	LAYER= 1	.12200000E+01	.11288020E+02	.51072970E+02	.17316910E+01	.14294380E+04	.28609270E+04	.58163360E-03
N= 94	LAYER= 1	.12300000E+01	.11538980E+02	.51033160E+02	.16976470E+01	.14293040E+04	.28706740E+04	.59615760E-03
N= 95	LAYER= 1	.12400000E+01	.11791920E+02	.50992900E+02	.18212790E+01	.14291290E+04	.28801690E+04	.61512060E-03
N= 96	LAYER= 1	.12500000E+01	.12077790E+02	.50947270E+02	.19663370E+01	.14289540E+04	.28905070E+04	.63407790E-03

N= 97	LAYER= 1	.12600000E+01	.12374950E+02	.50900170E+02	.19935990E+01	.14287790E+04	.29007380E+04	.65302750E-03
N= 98	LAYER= 1	.12700000E+01	.12669650E+02	.50853280E+02	.20759880E+01	.14285990E+04	.29105100E+04	.67256090E-03
N= 99	LAYER= 1	.12800000E+01	.12990540E+02	.50802300E+02	.21681930E+01	.14283810E+04	.29206860E+04	.69622610E-03
N=100	LAYER= 1	.12900000E+01	.13312470E+02	.50751070E+02	.22060160E+01	.14282010E+04	.29304790E+04	.71574180E-03
N=101	LAYER= 1	.13000000E+01	.13643930E+02	.50698330E+02	.22619550E+01	.14279830E+04	.29401330E+04	.73938790E-03
N=102	LAYER= 1	.13100000E+01	.13983190E+02	.50644480E+02	.23352630E+01	.14277650E+04	.29495690E+04	.76301970E-03
N=103	LAYER= 1	.13200000E+01	.14336050E+02	.50588300E+02	.24135270E+01	.14275470E+04	.29589910E+04	.78664220E-03
N=104	LAYER= 1	.13300000E+01	.14698110E+02	.50530780E+02	.25429830E+01	.14273290E+04	.29682190E+04	.81025270E-03
N=105	LAYER= 1	.13400000E+01	.15089820E+02	.50468520E+02	.26319380E+01	.14270950E+04	.29777610E+04	.83562020E-03
N=106	LAYER= 1	.13500000E+01	.15477930E+02	.50406830E+02	.26381200E+01	.14268320E+04	.29867890E+04	.86421470E-03
N=107	LAYER= 1	.13600000E+01	.15871490E+02	.50344310E+02	.27007560E+01	.14266090E+04	.29955330E+04	.88837510E-03
N=108	LAYER= 1	.13700000E+01	.16278420E+02	.50279690E+02	.27276440E+01	.14263450E+04	.30041690E+04	.91694050E-03
N=109	LAYER= 1	.13800000E+01	.16679410E+02	.50215920E+02	.27628950E+01	.14260850E+04	.30123190E+04	.94519190E-03
N=110	LAYER= 1	.13900000E+01	.17097500E+02	.50149670E+02	.28619370E+01	.14258240E+04	.30204190E+04	.97342640E-03
N=111	LAYER= 1	.14000000E+01	.17528020E+02	.50081260E+02	.29287870E+01	.14255640E+04	.30284160E+04	.10016470E-02
N=112	LAYER= 1	.14100000E+01	.17965160E+02	.50011880E+02	.29789340E+01	.14253040E+04	.30361700E+04	.10298500E-02
N=113	LAYER= 1	.14200000E+01	.18410660E+02	.49941140E+02	.30376890E+01	.14250280E+04	.30437300E+04	.10597970E-02
N=114	LAYER= 1	.14300000E+01	.18865120E+02	.49869030E+02	.30938530E+01	.14247220E+04	.30511010E+04	.10929500E-02
N=115	LAYER= 1	.14400000E+01	.19327930E+02	.49795680E+02	.31161270E+01	.14244570E+04	.30582740E+04	.11216840E-02
N=116	LAYER= 1	.14500000E+01	.19788300E+02	.49722550E+02	.31464670E+01	.14241540E+04	.30651200E+04	.11545040E-02
N=117	LAYER= 1	.14600000E+01	.20259930E+02	.49647810E+02	.32615720E+01	.14238520E+04	.30718210E+04	.11872970E-02
N=118	LAYER= 1	.14700000E+01	.20755390E+02	.49569300E+02	.34053070E+01	.14235500E+04	.30785580E+04	.12200680E-02
N=119	LAYER= 1	.14800000E+01	.21269110E+02	.49487840E+02	.34440070E+01	.14232480E+04	.30852430E+04	.12528190E-02
N=120	LAYER= 1	.14900000E+01	.21776530E+02	.49407550E+02	.35167350E+01	.14229350E+04	.30915480E+04	.12867150E-02
N=121	LAYER= 1	.15000000E+01	.22312420E+02	.49322700E+02	.36162470E+01	.14225880E+04	.30979220E+04	.13243830E-02
N=122	LAYER= 1	.15100000E+01	.22848770E+02	.49237780E+02	.36087220E+01	.14222430E+04	.31040250E+04	.13617250E-02
N=123	LAYER= 1	.15200000E+01	.23382070E+02	.49153330E+02	.37191790E+01	.14219340E+04	.31098370E+04	.13952500E-02
N=124	LAYER= 1	.15300000E+01	.23951170E+02	49063260E+02	.39123300E+01	.14215800E+04	.31157710E+04	.14337030E-02
N=125	LAYER= 1	.15400000E+01	.24542360E+02	.48969800E+02	.39238400E+01	.14211930E+04	.31216580E+04	.14756150E-02
N=126	LAYER= 1	.15500000E+01	.25115030E+02	.48879230E+02	.38911330E+01	.14208500E+04	.31271170E+04	.15128400E-02
N=127	LAYER= 1	.15600000E+01	.25696640E+02	.48787350E+02	.39802580E+01	.14204960E+04	.31324230E+04	.15511960E-02
N=128	LAYER= 1	.15700000E+01	.26295670E+02	.48692660E+02	.40367490E+01	.14201080E+04	.31376630E+04	.15932960E-02
N=129	LAYER= 1	.15800000E+01	.26893740E+02	.48598170E+02	.40224810E+01	.14197490E+04	.31426740E+04	.16321650E-02
N=130	LAYER= 1	.15900000E+01	.27489120E+02	.48504200E+02	.40225430E+01	.14193640E+04	.31474560E+04	.16738990E-02
N=131	LAYER= 1	.16000000E+01	.28087620E+02	.48409760E+02	.41205420E+01	.14190090E+04	.31520690E+04	.17124120E-02
N=132	LAYER= 1	.16100000E+01	.28712020E+02	.48311240E+02	.41662670E+01	.14186200E+04	.31566910E+04	.17546540E-02
N=133	LAYER= 1	.16200000E+01	.29323830E+02	.48214720E+02	.40356030E+01	.14182360E+04	.31610400E+04	.17962820E-02
N=134	LAYER= 1	.16300000E+01	.29909590E+02	.48122370E+02	.40728640E+01	.14178520E+04	.31650440E+04	.18378670E-02
N=135	LAYER= 1	.16400000E+01	.30532870E+02	.48024150E+02	.42427380E+01	.14174690E+04	.31691450E+04	.18794150E-02
N=136	LAYER= 1	.16500000E+01	.31169500E+02	.47923910E+02	.43114170E+01	.14170860E+04	.31731710E+04	.19209300E-02
N=137	LAYER= 1	.16600000E+01	.31813070E+02	.47822540E+02	.42743220E+01	.14166930E+04	.31770890E+04	.19635580E-02
N=138	LAYER= 1	.16700000E+01	.32438730E+02	.47724080E+02	.42073910E+01	.14163060E+04	.31807530E+04	.20055710E-02
N=139	LAYER= 1	.16800000E+01	.33062740E+02	.47625890E+02	.43622350E+01	.14159180E+04	.31842780E+04	.20475470E-02
N=140	LAYER= 1	.16900000E+01	.33734470E+02	.47520260E+02	.45848860E+01	.14154920E+04	.31879320E+04	.20937930E-02
N=141	LAYER= 1	.17000000E+01	.34425120E+02	.47411720E+02	.45560800E+01	.14150680E+04	.31915470E+04	.21397060E-02
N=142	LAYER= 1	.17100000E+01	.35088220E+02	.47307500E+02	.44696760E+01	.14146450E+04	.31948920E+04	.21855720E-02
N=143	LAYER= 1	.17200000E+01	.35753150E+02	.47203060E+02	.46600980E+01	.14142230E+04	.31981250E+04	.22313890E-02
N=144	LAYER= 1	.17300000E+01	.36473350E+02	.47090020E+02	.49788890E+01	.14137980E+04	.32015000E+04	.22774500E-02

N=145	LAYER= 1	.17400000E+01	.37233490E+02	.46970770E+02	.48727140E+01	.14133290E+04	.32049260E+04	.23283220E-02
N=146	LAYER= 1	.17500000E+01	.37922050E+02	.46862750E+02	.46808010E+01	.14129020E+04	.32079180E+04	.23745700E-02
N=147	LAYER= 1	.17600000E+01	.38624960E+02	.46752530E+02	.49415330E+01	.14124660E+04	.32108660E+04	.24219100E-02
N=148	LAYER= 1	.17700000E+01	.39391720E+02	.46632420E+02	.51006790E+01	.14119900E+04	.32139640E+04	.24734750E-02
N=149	LAYER= 1	.17800000E+01	.40142450E+02	.46514850E+02	.47446760E+01	.14115260E+04	.32168890E+04	.25238460E-02
N=150	LAYER= 1	.17900000E+01	.40803360E+02	.46411410E+02	.46951680E+01	.14111040E+04	.32193780E+04	.25696110E-02
N=151	LAYER= 1	.18000000E+01	.41539490E+02	.46296220E+02	.53155700E+01	.14106430E+04	.32220620E+04	.26195880E-02
N=152	LAYER= 1	.18100000E+01	.42384970E+02	.46163960E+02	.54119150E+01	.14101350E+04	.32250330E+04	.26746180E-02
N=153	LAYER= 1	.18200000E+01	.43150290E+02	.46044380E+02	.50796520E+01	.14096620E+04	.32276250E+04	.27258990E-02
N=154	LAYER= 1	.18300000E+01	.43897270E+02	.45927670E+02	.50844030E+01	.14091980E+04	.32300710E+04	.27762730E-02
N=155	LAYER= 1	.18400000E+01	.44664280E+02	.45807940E+02	.51533750E+01	.14086970E+04	.32325000E+04	.28305440E-02
N=156	LAYER= 1	.18500000E+01	.45432160E+02	.45688100E+02	.54362290E+01	.14082390E+04	.32348540E+04	.28802390E-02
N=157	LAYER= 1	.18600000E+01	.46283400E+02	.45555310E+02	.60646870E+01	.14076980E+04	.32373740E+04	.29388960E-02
N=158	LAYER= 1	.18700000E+01	.47238940E+02	.45406370E+02	.64586990E+01	.14071160E+04	.32400980E+04	.30019910E-02
N=159	LAYER= 1	.18800000E+01	.48207840E+02	.45255400E+02	.62278340E+01	.14065300E+04	.32427550E+04	.30655580E-02
N=160	LAYER= 1	.18900000E+01	.49094860E+02	.45117300E+02	.63355130E+01	.14059810E+04	.32450980E+04	.31251040E-02
N=161	LAYER= 1	.19000000E+01	.50096680E+02	.44961440E+02	.68979730E+01	.14053570E+04	.32476470E+04	.31927060E-02
N=162	LAYER= 1	.19100000E+01	.51151650E+02	.44797400E+02	.63281580E+01	.14046960E+04	.32502270E+04	.32644070E-02
N=163	LAYER= 1	.19200000E+01	.51983700E+02	.44668110E+02	.63475980E+01	.14041930E+04	.32521900E+04	.33189350E-02
N=164	LAYER= 1	.19300000E+01	.53045390E+02	.44503260E+02	.67085930E+01	.14035340E+04	.32546080E+04	.33904350E-02
N=165	LAYER= 1	.19400000E+01	.53985430E+02	.44357380E+02	.63640460E+01	.14029550E+04	.32566720E+04	.34531750E-02
N=166	LAYER= 1	.19500000E+01	.54944490E+02	.44208620E+02	.70279670E+01	.14023390E+04	.32587070E+04	.35199980E-02
N=167	LAYER= 1	.19600000E+01	.56083310E+02	.44032150E+02	.73779430E+01	.14016410E+04	.32610360E+04	.35956190E-02
N=168	LAYER= 1	.19700000E+01	.57147400E+02	.43867360E+02	.68180380E+01	.14009860E+04	.32631300E+04	.36666690E-02
N=169	LAYER= 1	.19800000E+01	.58119420E+02	.43716930E+02	.64393560E+01	.14004030E+04	.32649780E+04	.37298530E-02
N=170	LAYER= 1	.19900000E+01	.59071130E+02	.43569770E+02	.66878320E+01	.13997880E+04	.32667300E+04	.37965360E-02
N=171	LAYER= 1	.20000000E+01	.60117710E+02	.43408000E+02	.78167800E+01	.13991670E+04	.32685950E+04	.38639550E-02
N=172	LAYER= 1	.20100000E+01	.61407260E+02	.43208860E+02	.88774670E+01	.13983520E+04	.32708060E+04	.39522290E-02
N=173	LAYER= 1	.20200000E+01	.62771550E+02	.42998350E+02	.85511080E+01	.13975300E+04	.32730500E+04	.40414320E-02
N=174	LAYER= 1	.20300000E+01	.63964350E+02	.42814490E+02	.79581860E+01	.13967950E+04	.32749350E+04	.41211150E-02
N=175	LAYER= 1	.20400000E+01	.65152120E+02	.42631520E+02	.76087570E+01	.13960610E+04	.32767460E+04	.42006540E-02
N=176	LAYER= 1	.20500000E+01	.66240670E+02	.42463950E+02	.75829110E+01	.13953750E+04	.32783490E+04	.42751160E-02
N=177	LAYER= 1	.20600000E+01	.67421550E+02	.42282350E+02	.85151350E+01	.13946490E+04	.32800310E+04	.43538230E-02
N=178	LAYER= 1	.20700000E+01	.68789960E+02	.42072060E+02	.82577850E+01	.13938030E+04	.32819100E+04	.44454820E-02
N=179	LAYER= 1	.20800000E+01	.69894150E+02	.41902530E+02	.83292320E+01	.13931200E+04	.32833740E+04	.45195320E-02
N=180	LAYER= 1	.20900000E+01	.71285000E+02	.41689140E+02	.10261640E+02	.13922780E+04	.32851540E+04	.46108570E-02
N=181	LAYER= 1	.21000000E+01	.72969020E+02	.41431060E+02	.10114680E+02	.13912370E+04	.32872210E+04	.47236850E-02
N=182	LAYER= 1	.21100000E+01	.74316440E+02	.41224770E+02	.82677020E+01	.13903990E+04	.32888090E+04	.48145720E-02
N=183	LAYER= 1	.21200000E+01	.75447620E+02	.41051700E+02	.89354240E+01	.13897220E+04	.32900990E+04	.48879950E-02
N=184	LAYER= 1	.21300000E+01	.76996610E+02	.40814980E+02	.10351370E+02	.13887680E+04	.32918050E+04	.49914840E-02
N=185	LAYER= 1	.21400000E+01	.78553180E+02	.40577310E+02	.11373230E+02	.13878130E+04	.32934540E+04	.50949850E-02
N=186	LAYER= 1	.21500000E+01	.80410260E+02	.40294110E+02	.10804920E+02	.13866650E+04	.32953390E+04	.52194260E-02
N=187	LAYER= 1	.21600000E+01	.81796820E+02	.40082880E+02	.83961070E+01	.13857970E+04	.32966910E+04	.53135450E-02
N=188	LAYER= 1	.21700000E+01	.82931640E+02	.39910150E+02	.81263680E+01	.13851230E+04	.32977650E+04	.53866540E-02
N=189	LAYER= 1	.21800000E+01	.84238370E+02	.39711430E+02	.94969160E+01	.13842980E+04	.32989660E+04	.54761430E-02
N=190	LAYER= 1	.21900000E+01	.85785800E+02	.39476310E+02	.11010830E+02	.13833570E+04	.33003430E+04	.55782030E-02
N=191	LAYER= 1	.22000000E+01	.87548530E+02	.39208780E+02	.10618200E+02	.13822900E+04	.33018520E+04	.56938120E-02
N=192	LAYER= 1	.22100000E+01	.88978700E+02	.38991950E+02	.89132000E+01	.13813930E+04	.33030330E+04	.57911160E-02

N=193	LAYER= 1	.22200000E+01	.90229700E+02	.38802460E+02	.88196940E+01	.13806480E+04	.33040370E+04	.58718550E-02
N=194	LAYER= 1	.22300000E+01	.91632710E+02	.38590120E+02	.10210210E+02	.13797860E+04	.33051300E+04	.59653360E-02
N=195	LAYER= 1	.22400000E+01	.93303280E+02	.38337560E+02	.11968250E+02	.13787400E+04	.33063900E+04	.60788340E-02
N=196	LAYER= 1	.22500000E+01	.95236890E+02	.38045580E+02	.12686350E+02	.13775800E+04	.33077930E+04	.62046190E-02
N=197	LAYER= 1	.22600000E+01	.97125010E+02	.37760840E+02	.11848210E+02	.13764230E+04	.33091110E+04	.63300270E-02
N=198	LAYER= 1	.22700000E+01	.98807550E+02	.37507410E+02	.10567810E+02	.13753850E+04	.33102440E+04	.64425550E-02
N=199	LAYER= 1	.22800000E+01	.10031090E+03	.37281190E+02	.11452460E+02	.13744650E+04	.33112240E+04	.65423120E-02
N=200	LAYER= 1	.22900000E+01	.10226190E+03	.36987960E+02	.12184690E+02	.13732800E+04	.33124530E+04	.66708470E-02
N=201	LAYER= 1	.23000000E+01	.10398700E+03	.36729000E+02	.12016590E+02	.13722120E+04	.33135030E+04	.67865780E-02
N=202	LAYER= 1	.23100000E+01	.10588910E+03	.36443810E+02	.13011920E+02	.13710650E+04	.33146210E+04	.69110100E-02
N=203	LAYER= 1	.23200000E+01	.10791620E+03	.36140280E+02	.13233020E+02	.13698140E+04	.33157700E+04	.70466100E-02
N=204	LAYER= 1	.23300000E+01	.10988670E+03	.35845630E+02	.12506790E+02	.13686050E+04	.33168470E+04	.71776680E-02
N=205	LAYER= 1	.23400000E+01	.11169590E+03	.35575420E+02	.12259720E+02	.13675130E+04	.33178020E+04	.72960740E-02
N=206	LAYER= 1	.23500000E+01	.11359340E+03	.35292370E+02	.12803940E+02	.13663500E+04	.33187720E+04	.74222580E-02
N=207	LAYER= 1	.23600000E+01	.11556890E+03	.34998090E+02	.13527380E+02	.13651520E+04	.33197490E+04	.75521230E-02
N=208	LAYER= 1	.23700000E+01	.11768710E+03	.34682960E+02	.14254430E+02	.13638460E+04	.33207600E+04	.76936910E-02
N=209	LAYER= 1	.23800000E+01	.11988440E+03	.34356550E+02	.14343200E+02	.13625080E+04	.33217720E+04	.78388040E-02
N=210	LAYER= 1	.23900000E+01	.12203140E+03	.34038050E+02	.13279190E+02	.13612120E+04	.33227260E+04	.79793780E-02
N=211	LAYER= 1	.24000000E+01	.12390790E+03	.33760040E+02	.11662340E+02	.13600670E+04	.33235320E+04	.81034540E-02
N=212	LAYER= 1	.24100000E+01	.12556650E+03	.33514620E+02	.12477080E+02	.13590690E+04	.33242250E+04	.82117000E-02
N=213	LAYER= 1	.24200000E+01	.12769230E+03	.33200460E+02	.15277650E+02	.13577800E+04	.33250880E+04	.83514810E-02
N=214	LAYER= 1	.24300000E+01	.13020230E+03	.32830070E+02	.16164080E+02	.13562390E+04	.33260710E+04	.85185130E-02
N=215	LAYER= 1	.24400000E+01	.13259880E+03	.32477020E+02	.15709020E+02	.13547830E+04	.33269750E+04	.86764500E-02
N=216	LAYER= 1	.24500000E+01	.13497330E+03	.32127760E+02	.15394480E+02	.13533320E+04	.33278390E+04	.88337540E-02
N=217	LAYER= 1	.24600000E+01	.13727650E+03	.31789500E+02	.15182560E+02	.13519550E+04	.33286490E+04	.89830940E-02
N=218	LAYER= 1	.24700000E+01	.13958900E+03	.31450400E+02	.15018690E+02	.13505510E+04	.33294360E+04	.91352820E-02
N=219	LAYER= 1	.24800000E+01	.14184450E+03	.31120150E+02	.15802410E+02	.13491840E+04	.33301790E+04	.92834850E-02
N=220	LAYER= 1	.24900000E+01	.14439820E+03	.30746830E+02	.16647790E+02	.13476130E+04	.33309930E+04	.94538550E-02
N=221	LAYER= 1	.25000000E+01	.14691300E+03	.30379800E+02	.16131850E+02	.13461150E+04	.33317670E+04	.96162730E-02
N=222	LAYER= 1	.25100000E+01	.14931220E+03	.30030220E+02	.15304270E+02	.13446640E+04	.33324810E+04	.97736700E-02
N=223	LAYER= 1	.25200000E+01	.15157730E+03	.29700680E+02	.14967230E+02	.13432890E+04	.33331350E+04	.99227720E-02
N=224	LAYER= 1	.25300000E+01	.15387610E+03	.29366750E+02	.15246180E+02	.13418840E+04	.33337790E+04	.10075080E-01
N=225	LAYER= 1	.25400000E+01	.15622840E+03	.29025550E+02	.15699270E+02	.13404800E+04	.33344180E+04	.10227290E-01
N=226	LAYER= 1	.25500000E+01	.15866790E+03	.28672270E+02	.16767350E+02	.13389820E+04	.33350620E+04	.10389700E-01
N=227	LAYER= 1	.25600000E+01	.16134890E+03	.28284670E+02	.18051370E+02	.13373860E+04	.33357470E+04	.10562740E-01
N=228	LAYER= 1	.25700000E+01	.16418340E+03	.27875600E+02	.18342730E+02	.13356600E+04	.33364470E+04	.10749920E-01
N=229	LAYER= 1	.25800000E+01	.16695620E+03	.27476180E+02	.17958740E+02	.13340070E+04	.33371090E+04	.10929200E-01
N=230	LAYER= 1	.25900000E+01	.16967650E+03	.27085030E+02	.18111540E+02	.13323610E+04	.33377380E+04	.11107620E-01
N=231	LAYER= 1	.26000000E+01	.17249940E+03	.26679850E+02	.18677120E+02	.13306600E+04	.33383690E+04	.11292120E-01
N=232	LAYER= 1	.26100000E+01	.17539600E+03	.26264870E+02	.18664580E+02	.13288990E+04	.33389960E+04	.11483010E-01
N=233	LAYER= 1	.26200000E+01	.17821790E+03	.25861340E+02	.19177880E+02	.13272150E+04	.33395880E+04	.11665620E-01
N=234	LAYER= 1	.26300000E+01	.18127570E+03	.25424920E+02	.20311790E+02	.13253720E+04	.33402080E+04	.11865470E-01
N=235	LAYER= 1	.26400000E+01	.18444880E+03	.24972960E+02	.20216840E+02	.13234720E+04	.33408310E+04	.12071500E-01
N=236	LAYER= 1	.26500000E+01	.18748080E+03	.24541960E+02	.19772710E+02	.13216490E+04	.33414060E+04	.12269100E-01
N=237	LAYER= 1	.26600000E+01	.19052150E+03	.24110590E+02	.20582230E+02	.13198040E+04	.33419640E+04	.12469190E-01
N=238	LAYER= 1	.26700000E+01	.19380630E+03	.23645530E+02	.21042930E+02	.13178380E+04	.33425480E+04	.12682410E-01
N=239	LAYER= 1	.26800000E+01	.19699190E+03	.23195470E+02	.20980140E+02	.13159440E+04	.33430950E+04	.12887730E-01
N=240	LAYER= 1	.26900000E+01	.20026190E+03	.22734440E+02	.21421740E+02	.13139680E+04	.33436400E+04	.13101940E-01

N=241	LAYER= 1	.27000000E+01	.20358740E+03	.22266580E+02	.21450220E+02	.13119730E+04	.33441750E+04	.13318340E-01
N=242	LAYER= 1	.27100000E+01	.20687000E+03	.21805760E+02	.21106180E+02	.13100210E+04	.33446870E+04	.13529940E-01
N=243	LAYER= 1	.27200000E+01	.21009360E+03	.21354150E+02	.21132760E+02	.13080820E+04	.33451750E+04	.13740230E-01
N=244	LAYER= 1	.27300000E+01	.21338860E+03	.20893520E+02	.21976920E+02	.13061230E+04	.33456570E+04	.13952640E-01
N=245	LAYER= 1	.27400000E+01	.21687700E+03	.20406910E+02	.22709220E+02	.13040460E+04	.33461530E+04	.14177790E-01
N=246	LAYER= 1	.27500000E+01	.22040230E+03	.19916270E+02	.23015940E+02	.13019250E+04	.33466380E+04	.14407780E-01
N=247	LAYER= 1	.27600000E+01	.22399010E+03	.19418060E+02	.23257290E+02	.12997870E+04	.33471160E+04	.14639620E-01
N=248	LAYER= 1	.27700000E+01	.22759460E+03	.18918690E+02	.23630400E+02	.12976330E+04	.33475810E+04	.14873180E-01
N=249	LAYER= 1	.27800000E+01	.23130280E+03	.18406160E+02	.23663110E+02	.12954330E+04	.33480440E+04	.15111740E-01
N=250	LAYER= 1	.27900000E+01	.23492190E+03	.17907110E+02	.23793520E+02	.12932790E+04	.33484830E+04	.15345260E-01
N=251	LAYER= 1	.28000000E+01	.23867570E+03	.17390700E+02	.24820200E+02	.12910500E+04	.33489240E+04	.15586930E-01
N=252	LAYER= 1	.28100000E+01	.24261830E+03	.16849660E+02	.24889100E+02	.12886890E+04	.33493720E+04	.15842970E-01
N=253	LAYER= 1	.28200000E+01	.24639800E+03	.16332240E+02	.24472760E+02	.12864640E+04	.33497880E+04	.16084190E-01
N=254	LAYER= 1	.28300000E+01	.25021700E+03	.15810710E+02	.24933820E+02	.12841970E+04	.33501960E+04	.16330000E-01
N=255	LAYER= 1	.28400000E+01	.25414520E+03	.15275590E+02	.25554460E+02	.12818600E+04	.33506030E+04	.16583440E-01
N=256	LAYER= 1	.28500000E+01	.25816250E+03	.14729710E+02	.26280530E+02	.12794840E+04	.33510070E+04	.16841080E-01
N=257	LAYER= 1	.28600000E+01	.26232220E+03	.14165940E+02	.26951410E+02	.12770130E+04	.33514120E+04	.17109050E-01
N=258	LAYER= 1	.28700000E+01	.26655390E+03	.13593940E+02	.26868810E+02	.12745050E+04	.33518100E+04	.17380950E-01
N=259	LAYER= 1	.28800000E+01	.27069350E+03	.13035870E+02	.26972810E+02	.12720480E+04	.33521890E+04	.17647340E-01
N=260	LAYER= 1	.28900000E+01	.27496390E+03	.12461700E+02	.27804010E+02	.12695280E+04	.33525670E+04	.17920560E-01
N=261	LAYER= 1	.29000000E+01	.27936890E+03	.11871050E+02	.28292850E+02	.12669210E+04	.33529460E+04	.18203300E-01
N=262	LAYER= 1	.29100000E+01	.28379800E+03	.11278820E+02	.28327250E+02	.12643100E+04	.33533140E+04	.18486390E-01
N=263	LAYER= 1	.29200000E+01	.28822010E+03	.10689170E+02	.27854990E+02	.12616960E+04	.33536700E+04	.18769790E-01
N=264	LAYER= 1	.29300000E+01	.29250740E+03	.10119050E+02	.27719580E+02	.12591610E+04	.33540060E+04	.19044650E-01
N=265	LAYER= 1	.29400000E+01	.29689380E+03	.95373490E+01	.28311120E+02	.12565970E+04	.33543400E+04	.19322670E-01
N=266	LAYER= 1	.29500000E+01	.30137260E+03	.89450390E+01	.28574950E+02	.12539520E+04	.33546700E+04	.19609490E-01
N=267	LAYER= 1	.29600000E+01	.30584740E+03	.83549130E+01	.28479460E+02	.12513060E+04	.33549900E+04	.19896360E-01
N=268	LAYER= 1	.29700000E+01	.31030240E+03	.77690400E+01	.28510320E+02	.12486880E+04	.33553010E+04	.20180210E-01
N=269	LAYER= 1	.29800000E+01	.31479330E+03	.71800910E+01	.28311540E+02	.12460710E+04	.33556040E+04	.20464030E-01
N=270	LAYER= 1	.29900000E+01	.31919170E+03	.66048670E+01	.28132750E+02	.12434800E+04	.33558930E+04	.20745000E-01
N=271	LAYER= 1	.30000000E+01	.32363270E+03	.60256750E+01	.27943120E+02	.12408640E+04	.33561770E+04	.21028570E-01
N=272	LAYER= 1	.30100000E+01	.32797710E+03	.54606220E+01	.27010890E+02	.12383280E+04	.33564470E+04	.21303650E-01
N=273	LAYER= 1	.30200000E+01	.33213020E+03	.49218760E+01	.26193440E+02	.12358890E+04	.33566990E+04	.21568050E-01
N=274	LAYER= 1	.30300000E+01	.33622270E+03	.43923460E+01	.25608730E+02	.12335000E+04	.33569420E+04	.21827050E-01
N=275	LAYER= 1	.30400000E+01	.34019650E+03	.38794550E+01	.24476940E+02	.12311600E+04	.33571710E+04	.22080880E-01
N=276	LAYER= 1	.30500000E+01	.34393650E+03	.33978970E+01	.23194580E+02	.12289840E+04	.33573820E+04	.22316800E-01
N=277	LAYER= 1	.30600000E+01	.34751030E+03	.29387710E+01	.21955000E+02	.12268990E+04	.33575800E+04	.22542810E-01
N=278	LAYER= 1	.30700000E+01	.35086290E+03	.25089860E+01	.20643920E+02	.12249270E+04	.33577620E+04	.22756680E-01
N=279	LAYER= 1	.30800000E+01	.35402610E+03	.21042950E+01	.19404210E+02	.12230870E+04	.33579300E+04	.22956190E-01
N=280	LAYER= 1	.30900000E+01	.35699010E+03	.17258010E+01	.18011130E+02	.12213540E+04	.33580850E+04	.23144070E-01
N=281	LAYER= 1	.31000000E+01	.35971580E+03	.13783520E+01	.16221770E+02	.12197720E+04	.33582260E+04	.23315630E-01
N=282	LAYER= 1	.31100000E+01	.36211630E+03	.10728320E+01	.14385750E+02	.12183610E+04	.33583480E+04	.23468630E-01
N=283	LAYER= 1	.31200000E+01	.36426330E+03	.79996320E+00	.12614300E+02	.12171170E+04	.33584550E+04	.23603540E-01
N=284	LAYER= 1	.31300000E+01	.36610500E+03	.56617840E+00	.10886790E+02	.12160360E+04	.33585470E+04	.23720650E-01
N=285	LAYER= 1	.31400000E+01	.36770660E+03	.36308780E+00	.92562240E+01	.12150960E+04	.33586250E+04	.23822650E-01
N=286	LAYER= 1	.31500000E+01	.36903320E+03	.19502310E+00	.77420100E+01	.12143380E+04	.33586900E+04	.23904850E-01
N=286	LAYER= 1	.31500000E+01	.36903320E+03	.19502310E+00	.77420100E+01	.12143380E+04	.33586900E+04	.23904850E-01

Pressure	Rate	Pressure	Rate	Pressure	Rate
4.000	.315	128.000	15.386	252.000	25.216
8.000	1.199	132.000	15.823	256.000	25.890
12.000	1.927	136.000	15.300	260.000	26.577
16.000	2.709	140.000	15.161	264.000	26.919
20.000	3.198	144.000	16.516	268.000	26.905
24.000	3.913	148.000	15.757	272.000	27.227
28.000	4.106	152.000	15.019	276.000	27.919
32.000	4.254	156.000	15.655	280.000	28.298
36.000	4.769	160.000	17.405	284.000	28.306
40.000	4.812	164.000	18.324	288.000	27.878
44.000	5.094	168.000	18.017	292.000	27.736
48.000	6.277	172.000	18.577	296.000	28.191
52.000	6.353	176.000	18.774	300.000	28.494
56.000	7.352	180.000	19.839	304.000	28.519
60.000	7.690	184.000	20.230	308.000	28.494
64.000	7.948	188.000	19.911	312.000	28.435
68.000	8.406	192.000	20.790	316.000	28.262
72.000	10.199	196.000	21.000	320.000	28.098
76.000	9.440	200.000	21.386	324.000	27.864
80.000	10.930	204.000	21.407	328.000	27.006
84.000	9.247	208.000	21.115	332.000	26.219
88.000	10.080	212.000	21.621	336.000	25.641
92.000	10.597	216.000	22.525	340.000	24.533
96.000	12.348	220.000	22.981	344.000	23.173
100.000	11.270	224.000	23.258	348.000	21.764
104.000	12.023	228.000	23.634	352.000	20.198
108.000	13.202	232.000	23.688	356.000	18.476
112.000	12.347	236.000	24.088	360.000	16.004
116.000	13.675	240.000	24.843	364.000	12.832
120.000	14.286	244.000	24.737	368.000	8.921
124.000	11.708	248.000	24.666		

Table of Burn Rate Laws

RANGE PLOW MPa	RANGE PHIGH MPa	COEF CM/S-MPa^EXP	EXP	CORR COEF
19.	37.	.54775E6+00	.600753	.974083
37.	93.	.170881E+00	.918731	.939710
93.	280.	.239805E+00	.843965	.983294
30.	280.	.207218E+00	.872360	.992828
10.	30.	.21078E+00	.904514	.987630

INTENTIONALLY LEFT BLANK.

APPENDIX E:

BRLCB RESULTS FOR TRACK 2

INTENTIONALLY LEFT BLANK.

BURNING RATE ANALYSIS
BRLCB V3.0
ADVANCED BALLISTIC CONCEPTS BRANCH - BRL

Project :	M5 BURN RATES	Requested by :	W. Oberle
Inf File:	a:m5t2.inf	Created From .MAS File :	a:m5.mas
P/T File:	a:m5t2.pvt	Calculation Output File:	a:m5t2.out
Smoothed:	a:m5t2.pdt	Graphics File :	a:m5t2.dat
Fired on:	23 Nov 92		

FIRING REMARKS:
Bill Aungst: Operator 1

REDUCTION REMARKS:
Reduced on 12 Dec 92 by W. Oberle

IGNITER INFORMATION

The Igntier Used Is : Black Powder Lot: FFFG
The Source For The Igniter Is: Pellets, Milan Ord.

IGNITER THERMOCHEMICAL PROPERTIES:

Impetus (J/g)	: 290.0	Molecular Weight:	66.37000
Flame Temperature (K):	2188.0	Covolume (cm^3/g) :	.78500
Density (g/cm^3)	: 1.75000	Gamma :	1.21840

PROPELLANT INFORMATION

The Propellant Used Is : M5 Lot: RAD-64597 Of 1966
The Source For The Propellant Is : Radfort Army Ammo Pl
Propellant Thermochemical Properties: Following Sheets of Output

PROPELLANT GRAIN GEOMETRY

Grain Type: 1-Perf. Cyl.

Length --- (cm.):	.574294
Outer Diam.(cm.):	.136906
Perf Diam. (cm.):	.040894
Inner Web (cm.):	.048006

Bomb Information		Gage Information	
Bomb Type :	Closed Chamber	Gage I.D. :	C14430
Bomb Vol (cm^3) :	209.0	Input Voltage :	7.3150
		Constants For Fit:	A+Bx+C^2
		A:	.20157E+01
		B:	.52474E-01
		C:	-.12544E-06

Temperature and Charge Mass Information

Propellant Mass (g) :	52.4396	Igniter Mass (g):	1.5000
Initial Temp. Prop.(K) :	294.	Igniter Temp.(K):	294.
Initial Bomb Temp. (K) :	294.		
Number of Propellant Grains:	4127.56		

Number of Wildpoint Passes :	1	Wildpoint Tolerance:	2.000
Number of Smoothing Passes :	1	Smoothing Option :	1
Bridge Length :	15		

****

```
*****************************************************************************
  Total # Layers =  1
  Chamber Volume (cm3) =  209.000
  Heat-Loss-Fraction (n-d) =  .000
  Time Step (mil-sec) =  .10000000E-01     Max Time Steps =  1200
  Convergence Criterion =  .10000000E-04
  Computation Type (1=BURN-RATE, 2=PTGEN, 3=SURF AREA, 4=INTERR BOMB, 5=ETC) 1
*****************************************************************************
                    Beginning (1) of Layer          End (2) of Layer
*****************************************************************************
          Propellant Mass in grams
*****************************************************************************
          1                 52.43960
       Ignitor               1.50000
         Air                  .21234
*****************************************************************************
          Propellant Density in g/cm3
*****************************************************************************
          1                 1.65000                   1.65000
       Ignitor              1.75000
*****************************************************************************
          Propellant Impetus in J/g
*****************************************************************************
          1               1093.00000               1093.00000
       Ignitor             290.00000
*****************************************************************************
          Propellant Flame Temperature in deg K
*****************************************************************************
          1               3379.00000               3379.00000
       Ignitor            2188.00000
*****************************************************************************
          Propellant Molecular Weight in g/g-mol
*****************************************************************************
          1                 25.70266                  25.70266
       Ignitor              66.37000
         Air                28.90000
*****************************************************************************
          Propellant Gas Constant in cal/g-deg K
*****************************************************************************
          1                  .07731                    .07731
       Ignitor               .02994
         Air                 .06876
*****************************************************************************
          Gamma (Ratio of Specific Heats)
*****************************************************************************
          1                 1.22580                   1.22580
       Ignitor              1.21840
         Air                1.40000
*****************************************************************************
          Specific Heat (Cv) in cal/g-deg K
*****************************************************************************
          1                  .34240                    .34240
       Ignitor               .13709
         Air                 .17190
*****************************************************************************
          Covolume in cm3/g
*****************************************************************************
          1                  .98400                    .98400
       Ignitor               .78500
         Air                 .98000
*****************************************************************************
```

```
*****************************************************************************************************************

       ******* Maximum Chamber Properties are  *******
      Theoretical Maximum Chamber Pressure (MPa) =  .37055510E+03
      Theoretical Maximum Chamber Temperature (deg K) =  .33587630E+04
      **** Assuming a Heat-Loss-Fraction =  .000
      Maximum Total Heat Loss from Chamber (cal) =  .20525670E-02
      Maximum Chamber Pressure (MPa) w/Heat Loss =  .37055510E+03
      Maximum Chamber Temperature (deg K) w/Heat Loss =  .33587630E+04


    ** Results:  Deduced Burning Rates Based on a given Chamber Pressure vs. Time
  *** N *** LAYER *** TIME(ms) *** PCH(MPa) *** TPMR(gm) *** RBR(cm/s) *** ASUR(cm2) *** TCH(deg K) ***
DEPTHB(cm) ***

   N = 1 LAYER = 1 .00000000E+00  .26313620E+01  .52439600E+02  .00000000E+00  .14347470E+04  .18581770E+04
.00000000E+00

  *** PROPELLANT LAYER J = 1 has Burned out on Step N = 395  Before TIME (millisec) of .99000000E+01
                Chamber Pressure (MPa) at Burnout =  .37055510E+03
                Chamber Temperature (deg K) at Burnout =  .33587630E+04
                Depth of Layer (cm) at Burnout =  .48006000E-01
```

***DEDUCED BURNING RATES ***

N= 3	LAYER= 1	.59800000E+01	.26457450E+01	.52437370E+02	.83842330E-01	.14347470E+04	.18629670E+04	.00000000E+00
N= 4	LAYER= 1	.59900000E+01	.26584830E+01	.52435130E+02	.31440870E-01	.14347470E+04	.18677220E+04	.00000000E+00
N= 5	LAYER= 1	.60000000E+01	.26558190E+01	.52435870E+02	.15767650E-01	.14347470E+04	.18661470E+04	.00000000E+00
N= 6	LAYER= 1	.60100000E+01	.26633460E+01	.52434390E+02	.52494810E-01	.14347470E+04	.18693060E+04	.00000000E+00
N= 7	LAYER= 1	.60200000E+01	.26720320E+01	.52433390E+02	.52591350E-01	.14347470E+04	.18714100E+04	.00000000E+00
N= 8	LAYER= 1	.60300000E+01	.26818770E+01	.52431900E+02	.10480500E-01	.14347470E+04	.18745600E+04	.00000000E+00
N= 9	LAYER= 1	.60400000E+01	.26751600E+01	.52432900E+02	-.10574710E-01	.14347470E+04	.18724590E+04	.00000000E+00
N= 10	LAYER= 1	.60500000E+01	.26774770E+01	.52432400E+02	-.15767650E-01	.14347470E+04	.18735070E+04	.00000000E+00
N= 11	LAYER= 1	.60600000E+01	.26711080E+01	.52433640E+02	-.68169100E-01	.14347470E+04	.18708880E+04	.00000000E+00
N= 12	LAYER= 1	.60700000E+01	.26560540E+01	.52435630E+02	-.89129680E-01	.14347470E+04	.18666720E+04	.00000000E+00
N= 13	LAYER= 1	.60800000E+01	.26409990E+01	.52437860E+02	-.15767960E-01	.14347470E+04	.18619050E+04	.00000000E+00
N= 14	LAYER= 1	.60900000E+01	.26526960E+01	.52436370E+02	-.10480500E-01	.14347470E+04	.18650880E+04	.00000000E+00
N= 15	LAYER= 1	.61000000E+01	.26399570E+01	.52438360E+02	-.20960160E-01	.14347470E+04	.18608400E+04	.00000000E+00
N= 16	LAYER= 1	.61100000E+01	.26472530E+01	.52437370E+02	-.57688810E-01	.14347470E+04	.18629670E+04	.00000000E+00
N= 17	LAYER= 1	.61200000E+01	.26222380E+01	.52441090E+02	-.99609980E-01	.14347470E+04	.18549700E+04	.00000000E+00
N= 18	LAYER= 1	.61300000E+01	.26161000E+01	.52442080E+02	-.52873540E-02	.14347470E+04	.18528200E+04	.00000000E+00
N= 19	LAYER= 1	.61400000E+01	.26186470E+01	.52441340E+02	.47115050E-01	.14347470E+04	.18544300E+04	.00000000E+00
N= 20	LAYER= 1	.61500000E+01	.26287220E+01	.52439850E+02	.11018690E+00	.14347470E+04	.18576390E+04	.00000000E+00
N= 21	LAYER= 1	.61600000E+01	.26541980E+01	.52436120E+02	.15739320E+00	.14347470E+04	.18656140E+04	.00000000E+00
N= 22	LAYER= 1	.61700000E+01	.26773590E+01	.52432400E+02	.11537760E+00	.14347470E+04	.18735070E+04	.00000000E+00
N= 23	LAYER= 1	.61800000E+01	.26891710E+01	.52430660E+02	.94417040E-01	.14347470E+04	.18771670E+04	.00000000E+00
N= 24	LAYER= 1	.61900000E+01	.27061950E+01	.52427930E+02	.12594980E+00	.14347470E+04	.18828750E+04	.00000000E+00
N= 25	LAYER= 1	.62000000E+01	.27272720E+01	.52424700E+02	.79028660E-01	.14347470E+04	.18895710E+04	.00000000E+00
N= 26	LAYER= 1	.62100000E+01	.27335250E+01	.52424190E+02	.36917800E-01	.14347470E+04	.18906150E+04	.00000000E+00
N= 27	LAYER= 1	.62200000E+01	.27403570E+01	.52422950E+02	.99704390E-01	.14347470E+04	.18931660E+04	.00000000E+00
N= 28	LAYER= 1	.62300000E+01	.27631710E+01	.52419460E+02	.52495870E-01	.14347470E+04	.19002790E+04	.00000000E+00
N= 29	LAYER= 1	.62400000E+01	.27563370E+01	.52420460E+02	-.18883410E-03	.14347470E+04	.18982500E+04	.00000000E+00
N= 30	LAYER= 1	.62500000E+01	.27608540E+01	.52419480E+02	.68074690E-01	.14347470E+04	.19002600E+04	.00000000E+00
N= 31	LAYER= 1	.62600000E+01	.27744050E+01	.52417240E+02	.11556880E+00	.14347470E+04	.19047900E+04	.00000000E+00
N= 32	LAYER= 1	.62700000E+01	.27958290E+01	.52414000E+02	.10518270E+00	.14347470E+04	.19113050E+04	.00000000E+00
N= 33	LAYER= 1	.62800000E+01	.28070620E+01	.52412260E+02	.89599960E-01	.14347470E+04	.19147840E+04	.00000000E+00
N= 34	LAYER= 1	.62900000E+01	.28246640E+01	.52409760E+02	.13152290E+00	.14347470E+04	.19197450E+04	.00000000E+00
N= 35	LAYER= 1	.63000000E+01	.28474770E+01	.52406030E+02	.11009030E+00	.14347470E+04	.19270910E+04	.00000000E+00
N= 36	LAYER= 1	.63100000E+01	.28566270E+01	.52404550E+02	.63164990E-01	.14347470E+04	.19300010E+04	.00000000E+00
N= 37	LAYER= 1	.63200000E+01	.28678620E+01	.52403040E+02	.42394110E-01	.14347470E+04	.19329370E+04	.00000000E+00
N= 38	LAYER= 1	.63300000E+01	.28709880E+01	.52402540E+02	.20961010E-01	.14347470E+04	.19339080E+04	.00000000E+00
N= 39	LAYER= 1	.63400000E+01	.28735360E+01	.52402050E+02	.10574710E-01	.14347470E+04	.19348600E+04	.00000000E+00
N= 40	LAYER= 1	.63500000E+01	.28743470E+01	.52402040E+02	-.18883030E-03	.14347470E+04	.19348730E+04	.00000000E+00
N= 41	LAYER= 1	.63600000E+01	.28722620E+01	.52402060E+02	.31535290E-01	.14347470E+04	.19348420E+04	.00000000E+00
N= 42	LAYER= 1	.63700000E+01	.28838440E+01	.52400550E+02	.18883410E-03	.14347470E+04	.19377640E+04	.00000000E+00
N= 43	LAYER= 1	.63800000E+01	.28733060E+01	.52402050E+02	-.51929370E-02	.14347470E+04	.19348600E+04	.00000000E+00
N= 44	LAYER= 1	.63900000E+01	.28828020E+01	.52400790E+02	.89698000E-01	.14347470E+04	.19372930E+04	.00000000E+00
N= 45	LAYER= 1	.64000000E+01	.29021430E+01	.52397800E+02	.94985460E-01	.14347470E+04	.19430510E+04	.00000000E+00
N= 46	LAYER= 1	.64100000E+01	.29124480E+01	.52396300E+02	.68074690E-01	.14347470E+04	.19459270E+04	.00000000E+00
N= 47	LAYER= 1	.64200000E+01	.29204380E+01	.52394580E+02	.12633000E+00	.14347470E+04	.19491970E+04	.00000000E+00
N= 48	LAYER= 1	.64300000E+01	.29505460E+01	.52390320E+02	.14285300E+00	.14347470E+04	.19572610E+04	.00000000E+00

N= 49	LAYER= 1	.64400000E+01	.29669890E+01	.52387820E+02	.14747640E+00	.14347470E+04	.19619390E+04	.00000000E+00
N= 50	LAYER= 1	.64500000E+01	.29953600E+01	.52383330E+02	.13702300E+00	.14345260E+04	.19703430E+04	.24003480E-04
N= 51	LAYER= 1	.64600000E+01	.30089090E+01	.52381330E+02	.41739850E-01	.14345170E+04	.19740300E+04	.24903620E-04
N= 52	LAYER= 1	.64700000E+01	.30064770E+01	.52381360E+02	.15486870E-01	.14345170E+04	.19739780E+04	.24904580E-04
N= 53	LAYER= 1	.64800000E+01	.30124980E+01	.52380600E+02	.31823700E-01	.14345150E+04	.19753770E+04	.25205420E-04
N= 54	LAYER= 1	.64900000E+01	.30167830E+01	.52379850E+02	.20964020E-01	.14345120E+04	.19767380E+04	.25506260E-04
N= 55	LAYER= 1	.65000000E+01	.30181720E+01	.52379600E+02	-.31823760E-01	.14345120E+04	.19771890E+04	.25507220E-04
N= 56	LAYER= 1	.65100000E+01	.30064760E+01	.52381360E+02	-.37112730E-01	.14345120E+04	.19739780E+04	.25508660E-04
N= 57	LAYER= 1	.65200000E+01	.30061290E+01	.52381360E+02	-.48161560E-02	.14345120E+04	.19739720E+04	.25509620E-04
N= 58	LAYER= 1	.65300000E+01	.30069390E+01	.52381580E+02	.26912720E-01	.14345120E+04	.19735650E+04	.25510580E-04
N= 59	LAYER= 1	.65400000E+01	.30164350E+01	.52380080E+02	.89522020E-01	.14345120E+04	.19763090E+04	.25512020E-04
N= 60	LAYER= 1	.65500000E+01	.30334580E+01	.52377350E+02	.16827970E+00	.14345030E+04	.19813010E+04	.26412130E-04
N= 61	LAYER= 1	.65600000E+01	.30658840E+01	.52372120E+02	.17423440E+00	.14344590E+04	.19907300E+04	.31211050E-04
N= 62	LAYER= 1	.65700000E+01	.30869600E+01	.52369100E+02	.99915280E-01	.14344590E+04	.19961260E+04	.31212490E-04
N= 63	LAYER= 1	.65800000E+01	.30955300E+01	.52367390E+02	.99820840E-01	.14344590E+04	.19991590E+04	.31213930E-04
N= 64	LAYER= 1	.65900000E+01	.31160270E+01	.52364370E+02	.74793600E-01	.14344530E+04	.20044790E+04	.31814580E-04
N= 65	LAYER= 1	.66000000E+01	.31205450E+01	.52363850E+02	.58077300E-01	.14344510E+04	.20053950E+04	.32114890E-04
N= 66	LAYER= 1	.66100000E+01	.31335160E+01	.52361630E+02	.47785160E-01	.14344430E+04	.20092890E+04	.33014880E-04
N= 67	LAYER= 1	.66200000E+01	.31357160E+01	.52361590E+02	.26725690E-01	.14344430E+04	.20093490E+04	.33015840E-04
N= 68	LAYER= 1	.66300000E+01	.31425490E+01	.52360360E+02	.84239890E-01	.14344370E+04	.20114930E+04	.33616470E-04
N= 69	LAYER= 1	.66400000E+01	.31607310E+01	.52357600E+02	.68280180E-01	.14344260E+04	.20162760E+04	.34816740E-04
N= 70	LAYER= 1	.66500000E+01	.31623530E+01	.52357130E+02	.73095280E-01	.14344230E+04	.20170900E+04	.35117040E-04
N= 71	LAYER= 1	.66600000E+01	.31805350E+01	.52354140E+02	.84334100E-01	.14344120E+04	.20222190E+04	.36317270E-04
N= 72	LAYER= 1	.66700000E+01	.31873670E+01	.52353130E+02	.80177310E-01	.14344090E+04	.20239390E+04	.36618040E-04
N= 73	LAYER= 1	.66800000E+01	.32072860E+01	.52350350E+02	.13769350E+00	.14343980E+04	.20286890E+04	.37818240E-04
N= 74	LAYER= 1	.66900000E+01	.32301010E+01	.52346620E+02	.16291380E+00	.14343850E+04	.20349810E+04	.39318210E-04
N= 75	LAYER= 1	.67000000E+01	.32546520E+01	.52342630E+02	.11040490E+00	.14343680E+04	.20416360E+04	.41117910E-04
N= 76	LAYER= 1	.67100000E+01	.32620640E+01	.52341390E+02	.33149260E-01	.14343620E+04	.20436970E+04	.41717950E-04
N= 77	LAYER= 1	.67200000E+01	.32677400E+01	.52341060E+02	.21343970E-01	.14343620E+04	.20442410E+04	.41718910E-04
N= 78	LAYER= 1	.67300000E+01	.32690140E+01	.52340380E+02	.78292880E-01	.14343590E+04	.20453690E+04	.42019650E-04
N= 79	LAYER= 1	.67400000E+01	.32891640E+01	.52337360E+02	.91043320E-01	.14343490E+04	.20503490E+04	.43219710E-04
N= 80	LAYER= 1	.67500000E+01	.32991220E+01	.52336070E+02	.10615680E+00	.14343430E+04	.20524650E+04	.43820210E-04
N= 81	LAYER= 1	.67600000E+01	.33221650E+01	.52332330E+02	.16320350E+00	.14343290E+04	.20585480E+04	.45319980E-04
N= 82	LAYER= 1	.67700000E+01	.33469460E+01	.52328350E+02	.19049300E+00	.14343130E+04	.20649830E+04	.47119470E-04
N= 83	LAYER= 1	.67800000E+01	.33798330E+01	.52323320E+02	.17510410E+00	.14342680E+04	.20730080E+04	.51916310E-04
N= 84	LAYER= 1	.67900000E+01	.34007920E+01	.52320060E+02	.14347020E+00	.14342680E+04	.20781580E+04	.51917760E-04
N= 85	LAYER= 1	.68000000E+01	.34240680E+01	.52316530E+02	.18446210E+00	.14342650E+04	.20836870E+04	.52218420E-04
N= 86	LAYER= 1	.68100000E+01	.34548700E+01	.52311330E+02	.22168250E+00	.14342210E+04	.20917460E+04	.57014760E-04
N= 87	LAYER= 1	.68200000E+01	.34897250E+01	.52306030E+02	.22413830E+00	.14342210E+04	.20998530E+04	.57016200E-04
N= 88	LAYER= 1	.68299990E+01	.35251590E+01	.52300720E+02	.24566660E+00	.14342050E+04	.21078860E+04	.58815250E-04
N= 89	LAYER= 1	.68400000E+01	.35667300E+01	.52294410E+02	.20109200E+00	.14341600E+04	.21173020E+04	.63610930E-04
N= 90	LAYER= 1	.68500000E+01	.35853740E+01	.52291200E+02	.99747190E-01	.14341600E+04	.21220260E+04	.63612370E-04
N= 91	LAYER= 1	.68600000E+01	.35953320E+01	.52289690E+02	.53271920E-01	.14341600E+04	.21242500E+04	.63613810E-04
N= 92	LAYER= 1	.68700000E+01	.36018150E+01	.52288680E+02	.13781390E+00	.14341580E+04	.21257210E+04	.63914410E-04
N= 93	LAYER= 1	.68800000E+01	.36367870E+01	.52283160E+02	.14358020E+00	.14341130E+04	.21337270E+04	.68709580E-04
N= 94	LAYER= 1	.68900000E+01	.36455860E+01	.52281890E+02	.11070340E+00	.14341130E+04	.21355680E+04	.68711020E-04
N= 95	LAYER= 1	.69000000E+01	.36692090E+01	.52277930E+02	.10683500E+00	.14341130E+04	.21412350E+04	.68712460E-04
N= 96	LAYER= 1	.69100000E+01	.36785870E+01	.52276830E+02	.90587940E-01	.14341110E+04	.21427920E+04	.69013030E-04

N= 97	LAYER= 1	.69200000E+01	.36969990E+01	.52273640E+02	.11627750E+00	.14340990E+04	.21473140E+04	.70212410E-04
N= 98	LAYER= 1	.69300000E+01	.37130960E+01	.52271330E+02	.59036440E-01	.14340910E+04	.21505640E+04	.71112170E-04
N= 99	LAYER= 1	.69400000E+01	.37155280E+01	.52270840E+02	.74814150E-01	.14340880E+04	.21512390E+04	.71412240E-04
N=100	LAYER= 1	.69500000E+01	.37362570E+01	.52267790E+02	.19100430E+00	.14340770E+04	.21555130E+04	.72611560E-04
N=101	LAYER= 1	.69600000E+01	.37729660E+01	.52261810E+02	.20650250E+00	.14340330E+04	.21637800E+04	.77405860E-04
N=102	LAYER= 1	.69700000E+01	.37977470E+01	.52258010E+02	.17957250E+00	.14340330E+04	.21689680E+04	.77407290E-04
N=103	LAYER= 1	.69800000E+01	.38260020E+01	.52253310E+02	.10135890E+00	.14340190E+04	.21753430E+04	.78905530E-04
N=104	LAYER= 1	.69900000E+01	.38286680E+01	.52253220E+02	.55735450E-01	.14340190E+04	.21754610E+04	.78906490E-04
N=105	LAYER= 1	.70000000E+01	.38455740E+01	.52250670E+02	.12129640E+00	.14340080E+04	.21788820E+04	.80105150E-04
N=106	LAYER= 1	.70100000E+01	.38642180E+01	.52247480E+02	.15256630E+00	.14339970E+04	.21831450E+04	.81304260E-04
N=107	LAYER= 1	.70200000E+01	.38898090E+01	.52243450E+02	.17683960E+00	.14339810E+04	.21884750E+04	.83101900E-04
N=108	LAYER= 1	.70300000E+01	.39188730E+01	.52239110E+02	.18761080E+00	.14339640E+04	.21941690E+04	.84899960E-04
N=109	LAYER= 1	.70400000E+01	.39479370E+01	.52234570E+02	.18081860E+00	.14339480E+04	.22000640E+04	.86697970E-04
N=110	LAYER= 1	.70500000E+01	.39731810E+01	.52230550E+02	.20141570E+00	.14339310E+04	.22052320E+04	.88495900E-04
N=111	LAYER= 1	.70600000E+01	.40076870E+01	.52225040E+02	.24884870E+00	.14338870E+04	.22122490E+04	.93288610E-04
N=112	LAYER= 1	.70700000E+01	.40468240E+01	.52218780E+02	.25669070E+00	.14338840E+04	.22201250E+04	.93589030E-04
N=113	LAYER= 1	.70799990E+01	.40859610E+01	.52212890E+02	.27605560E+00	.14338400E+04	.22274240E+04	.98381230E-04
N=114	LAYER= 1	.70900000E+01	.41291510E+01	.52205720E+02	.31819250E+00	.14338340E+04	.22362100E+04	.98981040E-04
N=115	LAYER= 1	.71000000E+01	.41804470E+01	.52197840E+02	.28920930E+00	.14337900E+04	.22456950E+04	.10377270E-03
N=116	LAYER= 1	.71100000E+01	.42174990E+01	.52192030E+02	.26699680E+00	.14337820E+04	.22525890E+04	.10467180E-03
N=117	LAYER= 1	.71200000E+01	.42612690E+01	.52185210E+02	.26692130E+00	.14337380E+04	.22605890E+04	.10946290E-03
N=118	LAYER= 1	.71300000E+01	.42980900E+01	.52179410E+02	.23498610E+00	.14337320E+04	.22672960E+04	.11006260E-03
N=119	LAYER= 1	.71400000E+01	.43320180E+01	.52174090E+02	.22562990E+00	.14336880E+04	.22733690E+04	.11485310E-03
N=120	LAYER= 1	.71500000E+01	.43671030E+01	.52168730E+02	.19200100E+00	.14336880E+04	.22794290E+04	.11485460E-03
N=121	LAYER= 1	.71600000E+01	.43896830E+01	.52165000E+02	.23943620E+00	.14336770E+04	.22835980E+04	.11605280E-03
N=122	LAYER= 1	.71700000E+01	.44384320E+01	.52157400E+02	.22355990E+00	.14336330E+04	.22920180E+04	.12084280E-03
N=123	LAYER= 1	.71800000E+01	.44563800E+01	.52154430E+02	.11320180E+00	.14336330E+04	.22952740E+04	.12084420E-03
N=124	LAYER= 1	.71900000E+01	.44731710E+01	.52152050E+02	.20401010E+00	.14336240E+04	.22978680E+04	.12174250E-03
N=125	LAYER= 1	.72000000E+01	.45184450E+01	.52144780E+02	.24265540E+00	.14335800E+04	.23057130E+04	.12653190E-03
N=126	LAYER= 1	.72100000E+01	.45439200E+01	.52140560E+02	.23056980E+00	.14335800E+04	.23102040E+04	.12653330E-03
N=127	LAYER= 1	.72200000E+01	.45882660E+01	.52133870E+02	.25192340E+00	.14335360E+04	.23172710E+04	.13132220E-03
N=128	LAYER= 1	.72300000E+01	.46201070E+01	.52128650E+02	.24011200E+00	.14335330E+04	.23227150E+04	.13162240E-03
N=129	LAYER= 1	.72400000E+01	.46600530E+01	.52122510E+02	.30042120E+00	.14334890E+04	.23290450E+04	.13641080E-03
N=130	LAYER= 1	.72500000E+01	.47109980E+01	.52114440E+02	.35788110E+00	.14334780E+04	.23372570E+04	.13760850E-03
N=131	LAYER= 1	.72600000E+01	.47671540E+01	.52105580E+02	.37017780E+00	.14334340E+04	.23461160E+04	.14239630E-03
N=132	LAYER= 1	.72700000E+01	.48227310E+01	.52096920E+02	.31677920E+00	.14333900E+04	.23546310E+04	.14718360E-03
N=133	LAYER= 1	.72800000E+01	.48629070E+01	.52090600E+02	.31082660E+00	.14333840E+04	.23607730E+04	.14778230E-03
N=134	LAYER= 1	.72900000E+01	.49161680E+01	.52082220E+02	.35205580E+00	.14333400E+04	.23687790E+04	.15256910E-03
N=135	LAYER= 1	.73000000E+01	.49676930E+01	.52073940E+02	.35140510E+00	.14332960E+04	.23765760E+04	.15735540E-03
N=136	LAYER= 1	.73100000E+01	.50203760E+01	.52065600E+02	.29866770E+00	.14332880E+04	.23843100E+04	.15825300E-03
N=137	LAYER= 1	.73200000E+01	.50593960E+01	.52059820E+02	.24801520E+00	.14332430E+04	.23896020E+04	.16303880E-03
N=138	LAYER= 1	.73299990E+01	.50955210E+01	.52053870E+02	.27418570E+00	.14332430E+04	.23949870E+04	.16304020E-03
N=139	LAYER= 1	.73400000E+01	.51391720E+01	.52046850E+02	.26625460E+00	.14331990E+04	.24012700E+04	.16782550E-03
N=140	LAYER= 1	.73500000E+01	.51743710E+01	.52041280E+02	.29944340E+00	.14331940E+04	.24061960E+04	.16842440E-03
N=141	LAYER= 1	.73600000E+01	.52284420E+01	.52032690E+02	.33546630E+00	.14331500E+04	.24136960E+04	.17320910E-03
N=142	LAYER= 1	.73700000E+01	.52763760E+01	.52025410E+02	.36023650E+00	.14331300E+04	.24199600E+04	.17530230E-03
N=143	LAYER= 1	.73800000E+01	.53368130E+01	.52015650E+02	.45428500E+00	.14330860E+04	.24282360E+04	.18008630E-03
N=144	LAYER= 1	.73900000E+01	.54114910E+01	.52003930E+02	.46677660E+00	.14330420E+04	.24379870E+04	.18486980E-03

N=145	LAYER= 1	.74000000E+01	.54765580E+01	.51993580E+02	.40810410E+00	.14329980E+04	.24464370E+04	.18965290E-03
N=146	LAYER= 1	.74100000E+01	.55337530E+01	.51984630E+02	.38408870E+00	.14329540E+04	.24536150E+04	.19443550E-03

N=147	LAYER= 1	.74200010E+01	.55926840E+01	.51975410E+02	.39931320E+00	.14329370E+04	.24608950E+04	.19622940E-03
N=148	LAYER= 1	.74300000E+01	.56539310E+01	.51965750E+02	.39404730E+00	.14328930E+04	.24684080E+04	.20101130E-03
N=149	LAYER= 1	.74400000E+01	.57090400E+01	.51956780E+02	.34792190E+00	.14328490E+04	.24752700E+04	.20579270E-03
N=150	LAYER= 1	.74500000E+01	.57574350E+01	.51949300E+02	.38290690E+00	.14328350E+04	.24809190E+04	.20728740E-03
N=151	LAYER= 1	.74600000E+01	.58241210E+01	.51938670E+02	.41790140E+00	.14327910E+04	.24888140E+04	.21206830E-03
N=152	LAYER= 1	.74700000E+01	.58817750E+01	.51929540E+02	.44011590E+00	.14327470E+04	.24954960E+04	.21684860E-03
N=153	LAYER= 1	.74800000E+01	.59554070E+01	.51917870E+02	.51529660E+00	.14327030E+04	.25038890E+04	.22162850E-03
N=154	LAYER= 1	.74900000E+01	.60354070E+01	.51905170E+02	.55750540E+00	.14326590E+04	.25128330E+04	.22640790E-03
N=155	LAYER= 1	.75000000E+01	.61211950E+01	.51891510E+02	.56055060E+00	.14326100E+04	.25222620E+04	.23178350E-03
N=156	LAYER= 1	.75100000E+01	.62031630E+01	.51878670E+02	.55366690E+00	.14325600E+04	.25309330E+04	.23715850E-03
N=157	LAYER= 1	.75200000E+01	.62882550E+01	.51865330E+02	.59621800E+00	.14325080E+04	.25397610E+04	.24283150E-03
N=158	LAYER= 1	.75300000E+01	.63826070E+01	.51850490E+02	.62744900E+00	.14324500E+04	.25493740E+04	.24910070E-03
N=159	LAYER= 1	.75400000E+01	.64746430E+01	.51835670E+02	.57869950E+00	.14323920E+04	.25587480E+04	.25536920E-03
N=160	LAYER= 1	.75500000E+01	.65524400E+01	.51823140E+02	.55195400E+00	.14323420E+04	.25665170E+04	.26074150E-03
N=161	LAYER= 1	.75600000E+01	.66383390E+01	.51809590E+02	.55698690E+00	.14322900E+04	.25747500E+04	.26641170E-03
N=162	LAYER= 1	.75700000E+01	.67192580E+01	.51796810E+02	.59540740E+00	.14322410E+04	.25823630E+04	.27178280E-03
N=163	LAYER= 1	.75799990E+01	.68167300E+01	.51781440E+02	.66691420E+00	.14321800E+04	.25913260E+04	.27834650E-03
N=164	LAYER= 1	.75900000E+01	.69176780E+01	.51765290E+02	.73127660E+00	.14320920E+04	.26005380E+04	.28789210E-03
N=165	LAYER= 1	.76000000E+01	.70357580E+01	.51746880E+02	.71600530E+00	.14320450E+04	.26107740E+04	.29296260E-03
N=166	LAYER= 1	.76100000E+01	.71323050E+01	.51731450E+02	.67857340E+00	.14319850E+04	.26191480E+04	.29952340E-03
N=167	LAYER= 1	.76200000E+01	.72375310E+01	.51714820E+02	.66045060E+00	.14318970E+04	.26279750E+04	.30906470E-03
N=168	LAYER= 1	.76300000E+01	.73281740E+01	.51700240E+02	.65826840E+00	.14318530E+04	.26355420E+04	.31383540E-03
N=169	LAYER= 1	.76400000E+01	.74321250E+01	.51683710E+02	.71505940E+00	.14317980E+04	.26439420E+04	.31979720E-03
N=170	LAYER= 1	.76500000E+01	.75418600E+01	.51666460E+02	.75827860E+00	.14317100E+04	.26525110E+04	.32933450E-03
N=171	LAYER= 1	.76600000E+01	.76585440E+01	.51647890E+02	.84125480E+00	.14316600E+04	.26615100E+04	.33469850E-03
N=172	LAYER= 1	.76700010E+01	.77920090E+01	.51626710E+02	.86585090E+00	.14315700E+04	.26715070E+04	.34453110E-03
N=173	LAYER= 1	.76800000E+01	.79166770E+01	.51606980E+02	.83353910E+00	.14314820E+04	.26805700E+04	.35406340E-03
N=174	LAYER= 1	.76900000E+01	.80404150E+01	.51587340E+02	.91416910E+00	.14314210E+04	.26893700E+04	.36061580E-03
N=175	LAYER= 1	.77000000E+01	.81876500E+01	.51563800E+02	.10071100E+01	.14313310E+04	.26996240E+04	.37044300E-03
N=176	LAYER= 1	.77100000E+01	.83391680E+01	.51539770E+02	.10544060E+01	.14312370E+04	.27097840E+04	.38056600E-03
N=177	LAYER= 1	.77200000E+01	.85013300E+01	.51514000E+02	.11166240E+01	.14311390E+04	.27203450E+04	.39128190E-03
N=178	LAYER= 1	.77300000E+01	.86706710E+01	.51487030E+02	.11472340E+01	.14310310E+04	.27310470E+04	.40288760E-03
N=179	LAYER= 1	.77399990E+01	.88425540E+01	.51459820E+02	.11147530E+01	.14309240E+04	.27414960E+04	.41449040E-03
N=180	LAYER= 1	.77500000E+01	.90021610E+01	.51434390E+02	.11249150E+01	.14308260E+04	.27509650E+04	.42519880E-03
N=181	LAYER= 1	.77600000E+01	.91768130E+01	.51406710E+02	.11991090E+01	.14306940E+04	.27609570E+04	.43947250E-03
N=182	LAYER= 1	.77700000E+01	.93580600E+01	.51377780E+02	.13016840E+01	.14306040E+04	.27710630E+04	.44928350E-03
N=183	LAYER= 1	.77800000E+01	.95630300E+01	.51345250E+02	.14280350E+01	.14304720E+04	.27820390E+04	.46355150E-03
N=184	LAYER= 1	.77900000E+01	.97821170E+01	.51310370E+02	.14569210E+01	.14303410E+04	.27933800E+04	.47781520E-03
N=185	LAYER= 1	.78000000E+01	.99958710E+01	.51276490E+02	.14675720E+01	.14302060E+04	.28039890E+04	.49237120E-03
N=186	LAYER= 1	.78100000E+01	.10217960E+02	.51241100E+02	.15386630E+01	.14300690E+04	.28146660E+04	.50721950E-03
N=187	LAYER= 1	.78200000E+01	.10451840E+02	.51203880E+02	.16532590E+01	.14299270E+04	.28254780E+04	.52265660E-03
N=188	LAYER= 1	.78299990E+01	.10708870E+02	.51163090E+02	.17258780E+01	.14297490E+04	.28368580E+04	.54194700E-03
N=189	LAYER= 1	.78400000E+01	.10964620E+02	.51122440E+02	.17204340E+01	.14296070E+04	.28477450E+04	.55737290E-03
N=190	LAYER= 1	.78499990E+01	.11219080E+02	.51081930E+02	.17658530E+01	.14294290E+04	.28581690E+04	.57664750E-03
N=191	LAYER= 1	.78600000E+01	.11487670E+02	.51039150E+02	.18773260E+01	.14292810E+04	.28687410E+04	.59265480E-03
N=192	LAYER= 1	.78700000E+01	.11775570E+02	.50993380E+02	.19279570E+01	.14291010E+04	.28795850E+04	.61221260E-03
N=193	LAYER= 1	.78799990E+01	.12060100E+02	.50948230E+02	.19994250E+01	.14289230E+04	.28898420E+04	.63146670E-03
N=194	LAYER= 1	.78900000E+01	.12368580E+02	.50899100E+02	.20998150E+01	.14287320E+04	.29005340E+04	.65219290E-03

N=195	LAYER= 1	.78999990E+01	.12682370E+02	.50849220E+02	.22414240E+01	.14285140E+04	.29109200E+04	.67586830E-03
N=196	LAYER= 1	.79100000E+01	.13032830E+02	.50793430E+02	.24706230E+01	.14282960E+04	.29220160E+04	.69953200E-03
N=197	LAYER= 1	.79200000E+01	.13414740E+02	.50732770E+02	.26612940E+01	.14280780E+04	.29335000E+04	.72318620E-03
N=198	LAYER= 1	.79300000E+01	.13821750E+02	.50668020E+02	.27765660E+01	.14278160E+04	.29451380E+04	.75155680E-03
N=199	LAYER= 1	.79400000E+01	.14237300E+02	.50601940E+02	.28585860E+01	.14275550E+04	.29564030E+04	.77991050E-03
N=200	LAYER= 1	.79500000E+01	.14669260E+02	.50533350E+02	.29940950E+01	.14272930E+04	.29674940E+04	.80824720E-03
N=201	LAYER= 1	.79600000E+01	.15124340E+02	.50460920E+02	.30514400E+01	.14270180E+04	.29785920E+04	.83804030E-03
N=202	LAYER= 1	.79700000E+01	.15573510E+02	.50389660E+02	.30243810E+01	.14267380E+04	.29889410E+04	.86840330E-03
N=203	LAYER= 1	.79800000E+01	.16021160E+02	.50318520E+02	.30587680E+01	.14264340E+04	.29987510E+04	.90139730E-03
N=204	LAYER= 1	.79899990E+01	.16479540E+02	.50245670E+02	.29936220E+01	.14261740E+04	.30083000E+04	.92966100E-03
N=205	LAYER= 1	.80000000E+01	.16908290E+02	.50177640E+02	.28907680E+01	.14259080E+04	.30167930E+04	.95849550E-03
N=206	LAYER= 1	.80100000E+01	.17335880E+02	.50109650E+02	.28590960E+01	.14256420E+04	.30249030E+04	.98731230E-03
N=207	LAYER= 1	.80200000E+01	.17755340E+02	.50043130E+02	.28387150E+01	.14253790E+04	.30324920E+04	.10158170E-02
N=208	LAYER= 1	.80300010E+01	.18177460E+02	.49976120E+02	.27769960E+01	.14251160E+04	.30398150E+04	.10443050E-02
N=209	LAYER= 1	.80400000E+01	.18578390E+02	.49912530E+02	.27893090E+01	.14248560E+04	.30464830E+04	.10724830E-02
N=210	LAYER= 1	.80499990E+01	.19004290E+02	.49844970E+02	.28524450E+01	.14245970E+04	.30532870E+04	.11006450E-02
N=211	LAYER= 1	.80600000E+01	.19423460E+02	.49778430E+02	.28150940E+01	.14243370E+04	.30597210E+04	.11287880E-02
N=212	LAYER= 1	.80700010E+01	.19838810E+02	.49712640E+02	.28565490E+01	.14240780E+04	.30658380E+04	.11569160E-02
N=213	LAYER= 1	.80800000E+01	.20270080E+02	.49644190E+02	.28847830E+01	.14238160E+04	.30719580E+04	.11853180E-02
N=214	LAYER= 1	.80899990E+01	.20693490E+02	.49577110E+02	.28655780E+01	.14235510E+04	.30777280E+04	.12139950E-02
N=215	LAYER= 1	.81000000E+01	.21119420E+02	.49509570E+02	.28840030E+01	.14232870E+04	.30833220E+04	.12426550E-02
N=216	LAYER= 1	.81100000E+01	.21548450E+02	.49441650E+02	.29322590E+01	.14230200E+04	.30887420E+04	.12715900E-02
N=217	LAYER= 1	.81200000E+01	.21988680E+02	.49371870E+02	.30923110E+01	.14227450E+04	.30941080E+04	.13013830E-02
N=218	LAYER= 1	.81300000E+01	.22465070E+02	.49296460E+02	.30931570E+01	.14224440E+04	.30996870E+04	.13340770E-02
N=219	LAYER= 1	.81399990E+01	.22905960E+02	.49226680E+02	.31362890E+01	.14221750E+04	.31046590E+04	.13632470E-02
N=220	LAYER= 1	.81500010E+01	.23394920E+02	.49149270E+02	.32695750E+01	.14218710E+04	.31099720E+04	.13961890E-02
N=221	LAYER= 1	.81600000E+01	.23875300E+02	.49073260E+02	.33396380E+01	.14215700E+04	.31149910E+04	.14288170E-02
N=222	LAYER= 1	.81700010E+01	.24385130E+02	.48992600E+02	.34565100E+01	.14212560E+04	.31201180E+04	.14628750E-02
N=223	LAYER= 1	.81799990E+01	.24900360E+02	.48911150E+02	.34675470E+01	.14209100E+04	.31250960E+04	.15003970E-02
N=224	LAYER= 1	.81899990E+01	.25413160E+02	.48830020E+02	.35048570E+01	.14206100E+04	.31298680E+04	.15329520E-02
N=225	LAYER= 1	.82000000E+01	.25940030E+02	.48746840E+02	.36511980E+01	.14202670E+04	.31345780E+04	.15701280E-02
N=226	LAYER= 1	.82100000E+01	.26496680E+02	.48658880E+02	.37608490E+01	.14199240E+04	.31393680E+04	.16072730E-02
N=227	LAYER= 1	.82200000E+01	.27055270E+02	.48570620E+02	.35834010E+01	.14195820E+04	.31439900E+04	.16443930E-02
N=228	LAYER= 1	.82300000E+01	.27559760E+02	.48491010E+02	.35456980E+01	.14192800E+04	.31480080E+04	.16771360E-02
N=229	LAYER= 1	.82400000E+01	.28107320E+02	.48404550E+02	.37779170E+01	.14189380E+04	.31522190E+04	.17142000E-02
N=230	LAYER= 1	.82500000E+01	.28680840E+02	.48314110E+02	.38935050E+01	.14185860E+04	.31564640E+04	.17523900E-02
N=231	LAYER= 1	.82599990E+01	.29263230E+02	.48222290E+02	.39517830E+01	.14182000E+04	.31606130E+04	.17943030E-02
N=232	LAYER= 1	.82700000E+01	.29853570E+02	.48129170E+02	.39643330E+01	.14178560E+04	.31646660E+04	.18315620E-02
N=233	LAYER= 1	.82800000E+01	.30439930E+02	.48036790E+02	.40340290E+01	.14174700E+04	.31685410E+04	.18734030E-02
N=234	LAYER= 1	.82900000E+01	.31051340E+02	.47940460E+02	.41762120E+01	.14170870E+04	.31724350E+04	.19149200E-02
N=235	LAYER= 1	.83000000E+01	.31679910E+02	.47841500E+02	.44692270E+01	.14167050E+04	.31762880E+04	.19563990E-02
N=236	LAYER= 1	.83099990E+01	.32378210E+02	.47731540E+02	.45864210E+01	.14162800E+04	.31804040E+04	.20024490E-02
N=237	LAYER= 1	.83200000E+01	.33041820E+02	.47627140E+02	.43971360E+01	.14158560E+04	.31841600E+04	.20484480E-02
N=238	LAYER= 1	.83300000E+01	.33684620E+02	.47526080E+02	.44321850E+01	.14154740E+04	.31876630E+04	.20898110E-02
N=239	LAYER= 1	.83400000E+01	.34358690E+02	.47420100E+02	.47479810E+01	.14150510E+04	.31912040E+04	.21357290E-02
N=240	LAYER= 1	.83500000E+01	.35095270E+02	.47304360E+02	.50931610E+01	.14145860E+04	.31949240E+04	.21861870E-02
N=241	LAYER= 1	.83600000E+01	.35872180E+02	.47182360E+02	.51380350E+01	.14141180E+04	.31986890E+04	.22368740E-02
N=242	LAYER= 1	.83700000E+01	.36622260E+02	.47064590E+02	.51593600E+01	.14136510E+04	.32021810E+04	.22875070E-02

N=243	LAYER= 1	.83800000E+01	.37405700E+02	.46941670E+02	.53974990E+01	.14131450E+04	.32056840E+04	.23423650E-02
N=244	LAYER= 1	.83900000E+01	.38227270E+02	.46812880E+02	.58126740E+01	.14126400E+04	.32092080E+04	.23971550E-02
N=245	LAYER= 1	.84000000E+01	.39134380E+02	.46670700E+02	.61468550E+01	.14120930E+04	.32129350E+04	.24564480E-02
N=246	LAYER= 1	.84100000E+01	.40055150E+02	.46526450E+02	.56099130E+01	.14115050E+04	.32165540E+04	.25202110E-02
N=247	LAYER= 1	.84200000E+01	.40802850E+02	.46409390E+02	.52183530E+01	.14110440E+04	.32193760E+04	.25702410E-02
N=248	LAYER= 1	.84299990E+01	.41608040E+02	.46283460E+02	.57970790E+01	.14105410E+04	.32223050E+04	.26247610E-02
N=249	LAYER= 1	.84400010E+01	.42528060E+02	.46139540E+02	.61506360E+01	.14099920E+04	.32255230E+04	.26843230E-02
N=250	LAYER= 1	.84500000E+01	.43438710E+02	.45997280E+02	.58776340E+01	.14094040E+04	.32285770E+04	.27480490E-02
N=251	LAYER= 1	.84600000E+01	.44277860E+02	.45866180E+02	.59939970E+01	.14089030E+04	.32312860E+04	.28023590E-02
N=252	LAYER= 1	.84700000E+01	.45223480E+02	.45718590E+02	.63210790E+01	.14083190E+04	.32342200E+04	.28656460E-02
N=253	LAYER= 1	.84800000E+01	.46160410E+02	.45572410E+02	.62986760E+01	.14077370E+04	.32370150E+04	.29288440E-02
N=254	LAYER= 1	.84900000E+01	.47099800E+02	.45425990E+02	.64396500E+01	.14071550E+04	.32397070E+04	.29919520E-02
N=255	LAYER= 1	.85000000E+01	.48079320E+02	.45273370E+02	.65016350E+01	.14065320E+04	.32424070E+04	.30594660E-02
N=256	LAYER= 1	.85100000E+01	.49037490E+02	.45124200E+02	.64777950E+01	.14059520E+04	.32449470E+04	.31223900E-02
N=257	LAYER= 1	.85200000E+01	.50010120E+02	.44972830E+02	.62315780E+01	.14053590E+04	.32474290E+04	.31866280E-02
N=258	LAYER= 1	.85300010E+01	.50895390E+02	.44835190E+02	.62149730E+01	.14048120E+04	.32496080E+04	.32460130E-02
N=259	LAYER= 1	.85400000E+01	.51863680E+02	.44684720E+02	.64816490E+01	.14041900E+04	.32519090E+04	.33134250E-02
N=260	LAYER= 1	.85499990E+01	.52828540E+02	.44534860E+02	.63615140E+01	.14036130E+04	.32541210E+04	.33759950E-02
N=261	LAYER= 1	.85600000E+01	.53761440E+02	.44390050E+02	.64886730E+01	.14030370E+04	.32561860E+04	.34384760E-02
N=262	LAYER= 1	.85700000E+01	.54764760E+02	.44234430E+02	.67501140E+01	.14024170E+04	.32583300E+04	.35056080E-02
N=263	LAYER= 1	.85800010E+01	.55776430E+02	.44077650E+02	.72646060E+01	.14017940E+04	.32604170E+04	.35731920E-02
N=264	LAYER= 1	.85899990E+01	.56933780E+02	.43898380E+02	.74326320E+01	.14010540E+04	.32627150E+04	.36534430E-02
N=265	LAYER= 1	.85999990E+01	.57995610E+02	.43734020E+02	.73301640E+01	.14004000E+04	.32647450E+04	.37244000E-02
N=266	LAYER= 1	.86100000E+01	.59123410E+02	.43559620E+02	.77889260E+01	.13997060E+04	.32668240E+04	.37996720E-02
N=267	LAYER= 1	.86200010E+01	.60322920E+02	.43374230E+02	.78186240E+01	.13989720E+04	.32689510E+04	.38792350E-02
N=268	LAYER= 1	.86300000E+01	.61459810E+02	.43198670E+02	.74252890E+01	.13982800E+04	.32708940E+04	.39542500E-02
N=269	LAYER= 1	.86399990E+01	.62542510E+02	.43031620E+02	.81910630E+01	.13975890E+04	.32726790E+04	.40291310E-02
N=270	LAYER= 1	.86500010E+01	.63909260E+02	.42820880E+02	.85119140E+01	.13967730E+04	.32748490E+04	.41176350E-02
N=271	LAYER= 1	.86600000E+01	.65088200E+02	.42639260E+02	.71151980E+01	.13960450E+04	.32766490E+04	.41966350E-02
N=272	LAYER= 1	.86699990E+01	.66037860E+02	.42493110E+02	.79207430E+01	.13954390E+04	.32780530E+04	.42623440E-02
N=273	LAYER= 1	.86799990E+01	.67458890E+02	.42274520E+02	.91862570E+01	.13945870E+04	.32800830E+04	.43547530E-02
N=274	LAYER= 1	.86900000E+01	.68787630E+02	.42070340E+02	.78313750E+01	.13937660E+04	.32819060E+04	.44436890E-02
N=275	LAYER= 1	.87000000E+01	.69803700E+02	.41914320E+02	.69524750E+01	.13931240E+04	.32832540E+04	.45133830E-02
N=276	LAYER= 1	.87100000E+01	.70870000E+02	.41750700E+02	.83589490E+01	.13924820E+04	.32846290E+04	.45829730E-02
N=277	LAYER= 1	.87199990E+01	.72308070E+02	.41530230E+02	.96900690E+01	.13915980E+04	.32864210E+04	.46787750E-02
N=278	LAYER= 1	.87300000E+01	.73773820E+02	.41305710E+02	.88553300E+01	.13906790E+04	.32881760E+04	.47784140E-02
N=279	LAYER= 1	.87399990E+01	.74962380E+02	.41123840E+02	.90200560E+01	.13899620E+04	.32895500E+04	.48562240E-02
N=280	LAYER= 1	.87500000E+01	.76479050E+02	.40891970E+02	.10160850E+02	.13890070E+04	.32912420E+04	.49597700E-02
N=281	LAYER= 1	.87599990E+01	.78010350E+02	.40658080E+02	.99213500E+01	.13880920E+04	.32928850E+04	.50590440E-02
N=282	LAYER= 1	.87700000E+01	.79456000E+02	.40437510E+02	.97822550E+01	.13871810E+04	.32943800E+04	.51578150E-02
N=283	LAYER= 1	.87800000E+01	.80946770E+02	.40210270E+02	.10829010E+02	.13862720E+04	.32958660E+04	.52563600E-02
N=284	LAYER= 1	.87900000E+01	.82707760E+02	.39942120E+02	.11069260E+02	.13852050E+04	.32975550E+04	.53720460E-02
N=285	LAYER= 1	.88000000E+01	.84271580E+02	.39704270E+02	.10684450E+02	.13842220E+04	.32989960E+04	.54786260E-02
N=286	LAYER= 1	.88099990E+01	.85918430E+02	.39454070E+02	.12032880E+02	.13832370E+04	.33004580E+04	.55854790E-02
N=287	LAYER= 1	.88200000E+01	.87889180E+02	.39155010E+02	.11559660E+02	.13820210E+04	.33021360E+04	.57172520E-02
N=288	LAYER= 1	.88300000E+01	.89394360E+02	.38926860E+02	.95640330E+01	.13810850E+04	.33033700E+04	.58187310E-02
N=289	LAYER= 1	.88400000E+01	.90766400E+02	.38719110E+02	.10672650E+02	.13802640E+04	.33044580E+04	.59078550E-02
N=290	LAYER= 1	.88500000E+01	.92606810E+02	.38440720E+02	.12222320E+02	.13791330E+04	.33058690E+04	.60304580E-02

N=291	LAYER= 1	.88599990E+01	.94445570E+02	.38162910E+02	.11447310E+02	.13780080E+04	.33072250E+04	.61524460E-02
N=292	LAYER= 1	.88700000E+01	.96054220E+02	.37920170E+02	.10235530E+02	.13770040E+04	.33083690E+04	.62612560E-02
N=293	LAYER= 1	.88800000E+01	.97529560E+02	.37697770E+02	.99442640E+01	.13761190E+04	.33093860E+04	.63572740E-02
N=294	LAYER= 1	.88900000E+01	.99051330E+02	.37468570E+02	.97372770E+01	.13751900E+04	.33104040E+04	.64580110E-02
N=295	LAYER= 1	.89000000E+01	.10046510E+03	.37255890E+02	.93800900E+01	.13743060E+04	.33113220E+04	.65538180E-02
N=296	LAYER= 1	.89099990E+01	.10188010E+03	.37043190E+02	.96507120E+01	.13734600E+04	.33122160E+04	.66455320E-02
N=297	LAYER= 1	.89200000E+01	.10337670E+03	.36818460E+02	.99902570E+01	.13725430E+04	.33131350E+04	.67450550E-02
N=298	LAYER= 1	.89299990E+01	.10489510E+03	.36590680E+02	.10391990E+02	.13715910E+04	.33140410E+04	.68482010E-02
N=299	LAYER= 1	.89400010E+01	.10651390E+03	.36348080E+02	.11261760E+02	.13706040E+04	.33149790E+04	.69552060E-02
N=300	LAYER= 1	.89500000E+01	.10829610E+03	.36081320E+02	.12636370E+02	.13695400E+04	.33159800E+04	.70706650E-02
N=301	LAYER= 1	.89600000E+01	.11033180E+03	.35777000E+02	.13414000E+02	.13682920E+04	.33170840E+04	.72060120E-02
N=302	LAYER= 1	.89700000E+01	.11235050E+03	.35475620E+02	.13800020E+02	.13670500E+04	.33181400E+04	.73406430E-02
N=303	LAYER= 1	.89800000E+01	.11450470E+03	.35154450E+02	.15241560E+02	.13657380E+04	.33192270E+04	.74829620E-02
N=304	LAYER= 1	.89900000E+01	.11696170E+03	.34788700E+02	.15762050E+02	.13642430E+04	.33204170E+04	.76450330E-02
N=305	LAYER= 1	.89999990E+01	.11927520E+03	.34444850E+02	.15656660E+02	.13628290E+04	.33214940E+04	.77983820E-02
N=306	LAYER= 1	.90100000E+01	.12170330E+03	.34084550E+02	.15789190E+02	.13613460E+04	.33225810E+04	.79591890E-02
N=307	LAYER= 1	.90200000E+01	.12405910E+03	.33735520E+02	.14629490E+02	.13599050E+04	.33235960E+04	.81153570E-02
N=308	LAYER= 1	.90300000E+01	.12613760E+03	.33428040E+02	.13737620E+02	.13586550E+04	.33244600E+04	.82509660E-02
N=309	LAYER= 1	.90400000E+01	.12822540E+03	.33119590E+02	.13517420E+02	.13573720E+04	.33252990E+04	.83901050E-02
N=310	LAYER= 1	.90500000E+01	.13023890E+03	.32822530E+02	.13319280E+02	.13561660E+04	.33260840E+04	.85208330E-02
N=311	LAYER= 1	.90600000E+01	.13226850E+03	.32523490E+02	.12922120E+02	.13549280E+04	.33268520E+04	.86550800E-02
N=312	LAYER= 1	.90700000E+01	.13416280E+03	.32244760E+02	.12985260E+02	.13537670E+04	.33275470E+04	.87809830E-02
N=313	LAYER= 1	.90800010E+01	.13621370E+03	.31943370E+02	.14367960E+02	.13525370E+04	.33282780E+04	.89143430E-02
N=314	LAYER= 1	.90899990E+01	.13852990E+03	.31603470E+02	.15396170E+02	.13511310E+04	.33290780E+04	.90667710E-02
N=315	LAYER= 1	.90999990E+01	.14089510E+03	.31256940E+02	.15477400E+02	.13496950E+04	.33298690E+04	.92225100E-02
N=316	LAYER= 1	.91100000E+01	.14323870E+03	.30914090E+02	.15981860E+02	.13482650E+04	.33306270E+04	.93776170E-02
N=317	LAYER= 1	.91200000E+01	.14576000E+03	.30545840E+02	.16968150E+02	.13467330E+04	.33314150E+04	.95437150E-02
N=318	LAYER= 1	.91300000E+01	.14840620E+03	.30160010E+02	.17033460E+02	.13451370E+04	.33322130E+04	.97167850E-02
N=319	LAYER= 1	.91399990E+01	.15094990E+03	.29789750E+02	.17230810E+02	.13436140E+04	.33329550E+04	.98818950E-02
N=320	LAYER= 1	.91500000E+01	.15365950E+03	.29396020E+02	.17450240E+02	.13419620E+04	.33337180E+04	.10061080E-01
N=321	LAYER= 1	.91600000E+01	.15627280E+03	.29016950E+02	.16200650E+02	.13403870E+04	.33344300E+04	.10231800E-01
N=322	LAYER= 1	.91700010E+01	.15860380E+03	.28679370E+02	.15967260E+02	.13389890E+04	.33350440E+04	.10383370E-01
N=323	LAYER= 1	.91799990E+01	.16114860E+03	.28311420E+02	.17295150E+02	.13374280E+04	.33356960E+04	.10552670E-01
N=324	LAYER= 1	.91900000E+01	.16388750E+03	.27916090E+02	.18078950E+02	.13358000E+04	.33363750E+04	.10729190E-01
N=325	LAYER= 1	.92000000E+01	.16667510E+03	.27514460E+02	.18445990E+02	.13341150E+04	.33370420E+04	.10911860E-01
N=326	LAYER= 1	.92100000E+01	.16952940E+03	.27103970E+02	.18817700E+02	.13323710E+04	.33377030E+04	.11101030E-01
N=327	LAYER= 1	.92199990E+01	.17243340E+03	.26687120E+02	.19069730E+02	.13306350E+04	.33383540E+04	.11289240E-01
N=328	LAYER= 1	.92300000E+01	.17536850E+03	.26266610E+02	.19093710E+02	.13288750E+04	.33389900E+04	.11480130E-01
N=329	LAYER= 1	.92400000E+01	.17828340E+03	.25849790E+02	.19197920E+02	.13271230E+04	.33396010E+04	.11670070E-01
N=330	LAYER= 1	.92500000E+01	.18125400E+03	.25425820E+02	.19873890E+02	.13253140E+04	.33402030E+04	.11866290E-01
N=331	LAYER= 1	.92600000E+01	.18437980E+03	.24980580E+02	.20179640E+02	.13234480E+04	.33408160E+04	.12068620E-01
N=332	LAYER= 1	.92700000E+01	.18744710E+03	.24544550E+02	.19629970E+02	.13215920E+04	.33413980E+04	.12269870E-01
N=333	LAYER= 1	.92800000E+01	.19040790E+03	.24124480E+02	.19437760E+02	.13198120E+04	.33419430E+04	.12462820E-01
N=334	LAYER= 1	.92899990E+01	.19341990E+03	.23697970E+02	.19287240E+02	.13180100E+04	.33424790E+04	.12658270E-01
N=335	LAYER= 1	.93000000E+01	.19633790E+03	.23285570E+02	.19195640E+02	.13162820E+04	.33429840E+04	.12845590E-01
N=336	LAYER= 1	.93099990E+01	.19932550E+03	.22864150E+02	.20050850E+02	.13144670E+04	.33434850E+04	.13042450E-01
N=337	LAYER= 1	.93200000E+01	.20251000E+03	.22415830E+02	.20844670E+02	.13125640E+04	.33440030E+04	.13248710E-01
N=338	LAYER= 1	.93300000E+01	.20574580E+03	.21961250E+02	.21113560E+02	.13106410E+04	.33445130E+04	.13457230E-01

N=339	LAYER= 1	.93399990E+01	.20901690E+03	.21502660E+02	.21152960E+02	.13086660E+04	.33450130E+04	.13671430E-01
N=340	LAYER= 1	.93500000E+01	.21226890E+03	.21047710E+02	.21155900E+02	.13067340E+04	.33454950E+04	.13880870E-01
N=341	LAYER= 1	.93600000E+01	.21554480E+03	.20590390E+02	.21566280E+02	.13047840E+04	.33459650E+04	.14092420E-01
N=342	LAYER= 1	.93700000E+01	.21892770E+03	.20119130E+02	.22616520E+02	.13027510E+04	.33464370E+04	.14312810E-01
N=343	LAYER= 1	.93800000E+01	.22253270E+03	.19618060E+02	.23522220E+02	.13006070E+04	.33469230E+04	.14545280E-01
N=344	LAYER= 1	.93900000E+01	.22619990E+03	.19109530E+02	.24068950E+02	.12984160E+04	.33474020E+04	.14782850E-01
N=345	LAYER= 1	.94000000E+01	.22997870E+03	.18586780E+02	.24486150E+02	.12961490E+04	.33478800E+04	.15028650E-01
N=346	LAYER= 1	.94099990E+01	.23377930E+03	.18062290E+02	.24641760E+02	.12938990E+04	.33483460E+04	.15272660E-01
N=347	LAYER= 1	.94200000E+01	.23761250E+03	.17534580E+02	.25146850E+02	.12916050E+04	.33488000E+04	.15521430E-01
N=348	LAYER= 1	.94299990E+01	.24157540E+03	.16990390E+02	.25580090E+02	.12892680E+04	.33492540E+04	.15774790E-01
N=349	LAYER= 1	.94400010E+01	.24554800E+03	.16446230E+02	.25642880E+02	.12868910E+04	.33496950E+04	.16032560E-01
N=350	LAYER= 1	.94500000E+01	.24953550E+03	.15901420E+02	.25600610E+02	.12845320E+04	.33501240E+04	.16288380E-01
N=351	LAYER= 1	.94599990E+01	.25350020E+03	.15361090E+02	.25372660E+02	.12821920E+04	.33505370E+04	.16542120E-01
N=352	LAYER= 1	.94700000E+01	.25742300E+03	.14827810E+02	.25429450E+02	.12798420E+04	.33509330E+04	.16796930E-01
N=353	LAYER= 1	.94800000E+01	.26141080E+03	.14287060E+02	.25748560E+02	.12774820E+04	.33513230E+04	.17052890E-01
N=354	LAYER= 1	.94900010E+01	.26543830E+03	.13742310E+02	.25892780E+02	.12751120E+04	.33517060E+04	.17309810E-01
N=355	LAYER= 1	.94999990E+01	.26947620E+03	.13197540E+02	.26154290E+02	.12727060E+04	.33520780E+04	.17570700E-01
N=356	LAYER= 1	.95100000E+01	.27359080E+03	.12643860E+02	.26749440E+02	.12702920E+04	.33524460E+04	.17832420E-01
N=357	LAYER= 1	.95200000E+01	.27782050E+03	.12076190E+02	.26980950E+02	.12677880E+04	.33528130E+04	.18103970E-01
N=358	LAYER= 1	.95300000E+01	.28201240E+03	.11515080E+02	.27021220E+02	.12653070E+04	.33531660E+04	.18373000E-01
N=359	LAYER= 1	.95400000E+01	.28626070E+03	.10947930E+02	.27513270E+02	.12627930E+04	.33535130E+04	.18645610E-01
N=360	LAYER= 1	.95499990E+01	.29061230E+03	.10368560E+02	.28161920E+02	.12602210E+04	.33538580E+04	.18924460E-01
N=361	LAYER= 1	.95600000E+01	.29506990E+03	.97767240E+01	.28607280E+02	.12575940E+04	.33542010E+04	.19209380E-01
N=362	LAYER= 1	.95700000E+01	.29956700E+03	.91813130E+01	.28646270E+02	.12549650E+04	.33545370E+04	.19494430E-01
N=363	LAYER= 1	.95799990E+01	.30404240E+03	.85904380E+01	.28440360E+02	.12523350E+04	.33548620E+04	.19779580E-01
N=364	LAYER= 1	.95900000E+01	.30848160E+03	.80059750E+01	.28330590E+02	.12497070E+04	.33551740E+04	.20064560E-01
N=365	LAYER= 1	.96000000E+01	.31292940E+03	.74220000E+01	.28170790E+02	.12471050E+04	.33554790E+04	.20346720E-01
N=366	LAYER= 1	.96100010E+01	.31732410E+03	.68465930E+01	.28098350E+02	.12445290E+04	.33557710E+04	.20626060E-01
N=367	LAYER= 1	.96200000E+01	.32175500E+03	.62680340E+01	.28012070E+02	.12419280E+04	.33560580E+04	.20908060E-01
N=368	LAYER= 1	.96300000E+01	.32612820E+03	.56985750E+01	.27371470E+02	.12393540E+04	.33563330E+04	.21187180E-01
N=369	LAYER= 1	.96399990E+01	.33036310E+03	.51485960E+01	.26730060E+02	.12368810E+04	.33565930E+04	.21455370E-01
N=370	LAYER= 1	.96500000E+01	.33454010E+03	.46075500E+01	.25669270E+02	.12344330E+04	.33568430E+04	.21720770E-01
N=371	LAYER= 1	.96600000E+01	.33844590E+03	.41029000E+01	.23958210E+02	.12321310E+04	.33570700E+04	.21970430E-01
N=372	LAYER= 1	.96699990E+01	.34208800E+03	.36334170E+01	.22517000E+02	.12299940E+04	.33572780E+04	.22202160E-01
N=373	LAYER= 1	.96800000E+01	.34554360E+03	.31889540E+01	.21104080E+02	.12279720E+04	.33574710E+04	.22421420E-01
N=374	LAYER= 1	.96900000E+01	.34874370E+03	.27781940E+01	.19712890E+02	.12261070E+04	.33576470E+04	.22623580E-01
N=375	LAYER= 1	.97000000E+01	.35176330E+03	.23913520E+01	.18299020E+02	.12243520E+04	.33578100E+04	.22813970E-01
N=376	LAYER= 1	.97100000E+01	.35451990E+03	.20388300E+01	.16670100E+02	.12227490E+04	.33579560E+04	.22987720E-01
N=377	LAYER= 1	.97200010E+01	.35702760E+03	.17186580E+01	.15124130E+02	.12212730E+04	.33580870E+04	.23147800E-01
N=378	LAYER= 1	.97300000E+01	.35929720E+03	.14293070E+01	.13556750E+02	.12199430E+04	.33582040E+04	.23292010E-01
N=379	LAYER= 1	.97400000E+01	.36131090E+03	.11729200E+01	.11995950E+02	.12187810E+04	.33583060E+04	.23418050E-01
N=380	LAYER= 1	.97500000E+01	.36308880E+03	.94682110E+00	.10768700E+02	.12177380E+04	.33583960E+04	.23531140E-01
N=381	LAYER= 1	.97600000E+01	.36471550E+03	.74016570E+00	.96134270E+01	.12167900E+04	.33584780E+04	.23633930E-01
N=382	LAYER= 1	.97700000E+01	.36612850E+03	.56082480E+00	.82582740E+01	.12159580E+04	.33585470E+04	.23724070E-01
N=383	LAYER= 1	.97800000E+01	.36732730E+03	.40879440E+00	.69247030E+01	.12152640E+04	.33586060E+04	.23799360E-01
N=384	LAYER= 1	.97900000E+01	.36831900E+03	.28311180E+00	.54186220E+01	.12146830E+04	.33586550E+04	.23862310E-01
N=385	LAYER= 1	.98000000E+01	.36904160E+03	.19158610E+00	.40165060E+01	.12142610E+04	.33586900E+04	.23908170E-01
N=386	LAYER= 1	.98099990E+01	.36958980E+03	.12217060E+00	.29632960E+01	.12139490E+04	.33587170E+04	.23941910E-01

N=387	LAYER= 1	.98200000E+01	.36997920E+03	.72882140E-01	.18587700E+01	.1213 280E+04	.33587350E+04	.23965970E-01
N=388	LAYER= 1	.98300000E+01	.37017800E+03	.47719440E-01	.97831030E+00	.12135940E+04	.33587450E+04	.23980400E-01
N=389	LAYER= 1	.98399990E+01	.37028880E+03	.33702800E-01	.41012010E+00	.12135500E+04	.33587500E+04	.23985200E-01
N=390	LAYER= 1	.98500000E+01	.37030780E+03	.31294900E-01	.12017290E+00	.12135280E+04	.33587510E+04	.23987610E-01
N=391	LAYER= 1	.98600000E+01	.37032680E+03	.28890190E-01	.20695110E+00	.12135060E+04	.33587520E+04	.23990010E-01
N=392	LAYER= 1	.98700000E+01	.37037330E+03	.23007530E-01	.35404810E-01	.12134840E+04	.33587540E+04	.23992410E-01
N=393	LAYER= 1	.98800000E+01	.37033800E+03	.27472370E-01	-.89274220E+00	.12135060E+04	.33587530E+04	.23990010E-01
N=393	LAYER= 1	.98800000E+01	.37033800E+03	.27472370E-01	-.89274220E+00	.12135060E+04	.33587530E+04	.23990010E-01

Pressure	Rate	Pressure	Rate	Pressure	Rate
4.000	.238	128.000	13.541	252.000	25.459
8.000	.888	132.000	12.975	256.000	25.409
12.000	1.984	136.000	14.224	260.000	25.636
16.000	3.057	140.000	15.447	264.000	25.841
20.000	2.867	144.000	16.280	268.000	26.059
24.000	3.368	148.000	17.023	272.000	26.519
28.000	3.732	152.000	17.316	276.000	26.881
32.000	4.523	156.000	16.331	280.000	27.002
36.000	5.142	160.000	16.696	284.000	27.251
40.000	5.642	164.000	18.094	288.000	27.773
44.000	5.955	168.000	18.619	292.000	28.301
48.000	6.497	172.000	19.032	296.000	28.615
52.000	6.465	176.000	19.116	300.000	28.626
56.000	7.297	180.000	19.589	304.000	28.442
60.000	7.811	184.000	20.142	308.000	28.342
64.000	8.404	188.000	19.594	312.000	28.204
68.000	8.635	192.000	19.358	316.000	28.120
72.000	9.405	196.000	19.206	320.000	28.046
76.000	9.801	200.000	20.219	324.000	27.864
80.000	10.164	204.000	20.968	328.000	27.683
84.000	10.751	208.000	21.141	332.000	27.088
88.000	11.413	212.000	21.156	336.000	26.314
92.000	11.711	216.000	21.708	340.000	25.030
96.000	10.276	220.000	22.886	344.000	23.343
100.000	9.498	224.000	23.741	348.000	21.735
104.000	10.155	228.000	24.268	352.000	20.036
108.000	12.408	232.000	24.569	356.000	18.159
112.000	13.733	236.000	24.934	360.000	15.758
116.000	15.558	240.000	25.408	364.000	13.012
120.000	15.696	244.000	25.618	368.000	5.903
124.000	14.659	248.000	25.617		

Table of Burn Rate Laws

RANGE PLOW MPa	RANGE PHIGH MPa	COEF CM/S-MPa^EXP	EXP	CORR COEFF
19.	37.	.174479E+00	.929768	.985229
37.	93.	.247634E+00	.839917	.949415
93.	278.	.177142E+00	.900312	.966770
30.	300.	.251033E+00	.833238	.991191
30.	280.	.249648E+00	.834555	.990259

INTENTIONALLY LEFT BLANK.

APPENDIX F:

BRLCB RESULTS FOR TRACK 3

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BURNING RATE ANALYSIS
BRLCB V3.0
ADVANCED BALLISTIC CONCEPTS BRANCH - BRL

Project :	BC M5 BURN RATES	Requested by :	W. Oberle
Inf File:	a:m5t3.inf	Created From .MAS File :	a:m5.mas
P/T File:	a:m5t3.pvt	Calculation Output File:	a:m5t3.out
Smoothed:	a:m5t3.pdt	Graphics File :	a:m5t3.dat
Fired on:	23 Nov 92		

FIRING REMARKS:
Bill Aungst: Operator

REDUCTION REMARKS:
Reduced on 12 Dec 92 by W. Oberle

IGNITER INFORMATION

The Igntier Used Is : Black Powder Lot: FFFG
The Source For The Igniter Is: Pellets, Milan Ord.

IGNITER THERMOCHEMICAL PROPERTIES:

Impetus (J/g) : 290.0 Molecular Weight: 66.37000
Flame Temperature (K): 2188:0 .7850Covolume (g/cm^3)
Density (g/cm^3) : 1.75000 Gamma : 1.21840

PROPELLANT INFORMATION

The Propellant Used Is : M5 Lot: RAD-64597 Of 1966
The Source For The Propellant Is : Radfort Army Ammo Pl
Propellant Thermochemical Properties: Following Sheets of Output

PROPELLANT GRAIN GEOMETRY

Grain Type: 1-Perf. Cyl.
Length --- (cm.): .574294
Outer Diam.(cm.): .136906
Perf Diam. (cm.): .040894
Inner Web (cm.): .048006

Bomb Information		Gage Information	
Bomb Type :	Closed Chamber	Gage I.D. :	C14430
Bomb Vol (cm^3) :	209.0	Input Voltage :	7.3150
		Constants For Fit:	A+Bx+C^2
		A:	.20157E+01
		B:	.52474E-01
		C:	-.12544E-06

Temperature and Charge Mass Information

Propellant Mass (g) :	52.3564	Igniter Mass (g) :	1.5000
Initial Temp. Prop.(K) :	294.	Igniter Temp.(K) :	294.
Initial Bomb Temp. (K) :	294.		
Number of Propellant Grains:	4121.02		
Number of Wildpoint Passes :	1	Wildpoint Tolerance:	2.000
Number of Smoothing Passes :	1	Smoothing Option :	1
Bridge Length :	15		

****

```
*****************************************************************************
  Total # Layers =  1
  Chamber Volume (cm3) = 209.000
  Heat-Loss-Fraction (n-d) = .000
  Time Step (mil-sec) = .10000000E-01     Max Time Steps = 1200
  Convergence Criterion = .10000000E-04
  Computation Type (1=BURN-RATE, 2=PTGEN, 3=SURF AREA, 4=INTERR BOMB, 5=ETC) 1
*****************************************************************************
                     Beginning (1) of Layer          End (2) of Layer
*****************************************************************************
           Propellant Mass in grams
*****************************************************************************
          1                 52.35640
       Ignitor               1.50000
         Air                  .21240
*****************************************************************************
           Propellant Density in g/cm3
*****************************************************************************
          1                  1.65000                  1.65000
       Ignitor               1.75000
*****************************************************************************
           Propellant Impetus in J/g
*****************************************************************************
          1                1093.00000               1093.00000
       Ignitor              290.00000
*****************************************************************************
           Propellant Flame Temperature in deg K
*****************************************************************************
          1                3379.00000               3379.00000
       Ignitor             2188.00000
*****************************************************************************
           Propellant Molecular Weight in g/g-mol
*****************************************************************************
          1                 25.70266                 25.70266
       Ignitor              66.37000
         Air                28.90000
*****************************************************************************
           Propellant Gas Constant in cal/g-deg K
*****************************************************************************
          1                   .07731                   .07731
       Ignitor                .02994
         Air                  .06876
*****************************************************************************
           Gamma (Ratio of Specific Heats)
*****************************************************************************
          1                  1.22580                  1.22580
       Ignitor               1.21840
         Air                 1.40000
*****************************************************************************
           Specific Heat (Cv) in cal/g-deg K
*****************************************************************************
          1                   .34240                   .34240
       Ignitor                .13709
         Air                  .17190
*****************************************************************************
           Covolume in cm3/g
*****************************************************************************
          1                   .98400                   .98400
       Ignitor                .78500
         Air                  .98000
*****************************************************************************
```

```
*****************************************************************************

  ******* Maximum Chamber Properties are *******
  Theoretical Maximum Chamber Pressure (MPa) =  .36977850E+03
  Theoretical Maximum Chamber Temperature (deg K) = .33587300E+04
  **** Assuming a Heat-Loss-Fraction =  .004
  Maximum Total Heat Loss from Chamber (cal) =  .27060930E+03
  Maximum Chamber Pressure (MPa) w/Heat Loss =  .36813870E+03
  Maximum Chamber Temperature (deg K) w/Heat Loss =  .33438360E+04



   ** Results:  Deduced Burning Rates Based on a Given Chamber Pressure vs. Time **
   *** N *** LAYER *** TIME(ms) *** PCH(MPa) *** TPMR(gm) *** RBR(cm/s) *** ASUR(cm2) *** TCH(degK) ***
DEPTHB(cm) ***

    N = 1 LAYER = 1  .00000000E+00   .26194020E+01  .52356400E+02  .00000000E+00  .14324710E+04
.18501310E+04  .00000000E+00

   *** PROPELLANT LAYER J = 1 has Burned out on Step N = 465 Before TIME (millisec) of .70100000E+01
                Chamber Pressure (MPa) at Burnout =  .36813870E+03
                Chamber Temperature (deg K) at Burnout =  .33438360E+04
                Depth of Layer (cm) at Burnout =  .48006000E-01
```

*** DEDUCED BURNING RATES ***

N= 3	LAYER= 1	.23900000E+01	.26519780E+01	.52351430E+02	.16274990E+00	.14324710E+04	.18606910E+04	.00000000E+00
N= 4	LAYER= 1	.24000000E+01	.26689710E+01	.52348710E+02	.14714780E+00	.14324710E+04	.18664390E+04	.00000000E+00
N= 5	LAYER= 1	.24100000E+01	.26967160E+01	.52344470E+02	.131[illegible]960E+00	.14324710E+04	.18752440E+04	.00000000E+00
N= 6	LAYER= 1	.24200000E+01	.27085060E+01	.52342490E+02	.524[illegible]190E-01	.14324710E+04	.18793470E+04	.00000000E+00
N= 7	LAYER= 1	.24300000E+01	.27122060E+01	.52342000E+02	-.52011890E-02	.14324710E+04	.18803740E+04	.00000000E+00
N= 8	LAYER= 1	.24400000E+01	.27066570E+01	.52342740E+02	-.41988200E-01	.14324710E+04	.18788400E+04	.00000000E+00
N= 9	LAYER= 1	.24500000E+01	.26993740E+01	.52343980E+02	-.57875050E-01	.14324710E+04	.18762720E+04	.00000000E+00
N= 10	LAYER= 1	.24600000E+01	.26892010E+01	.52345470E+02	-.78869730E-01	.14324710E+04	.18731820E+04	.00000000E+00
N= 11	LAYER= 1	.24700000E+01	.26749820E+01	.52347710E+02	-.31396590E-01	.14324710E+04	.18685240E+04	.00000000E+00
N= 12	LAYER= 1	.24800000E+01	.26822650E+01	.52346960E+02	.00000000E+00	.14324710E+04	.18700810E+04	.00000000E+00
N= 13	LAYER= 1	.24900000E+01	.26764850E+01	.52347710E+02	.10497050E-01	.14324710E+04	.18685200E+04	.00000000E+00
N= 14	LAYER= 1	.25000000E+01	.26843460E+01	.52346460E+02	.10591620E-01	.14324710E+04	.18711190E+04	.00000000E+00
N= 15	LAYER= 1	.25100000E+01	.26803000E+01	.52347210E+02	-.10496840E-01	.14324710E+04	.18695610E+04	.00000000E+00
N= 16	LAYER= 1	.25200000E+01	.26820340E+01	.52346960E+02	.26289650E-01	.14324710E+04	.18700820E+04	.00000000E+00
N= 17	LAYER= 1	.25300000E+01	.26895480E+01	.52345960E+02	.15698290E-01	.14324710E+04	.18721520E+04	.00000000E+00
N= 18	LAYER= 1	.25400000E+01	.26851550E+01	.52346210E+02	.26195080E-01	.14324710E+04	.18716350E+04	.00000000E+00
N= 19	LAYER= 1	.25500000E+01	.26944030E+01	.52344730E+02	-.53903780E-02	.14324710E+04	.18747280E+04	.00000000E+00
N= 20	LAYER= 1	.25600000E+01	.26815720E+01	.52346470E+02	.10497050E-01	.14324710E+04	.18711140E+04	.00000000E+00
N= 21	LAYER= 1	.25700000E+01	.26977560E+01	.52344230E+02	.52579290E-01	.14324710E+04	.18757560E+04	.00000000E+00
N= 22	LAYER= 1	.25800000E+01	.26985650E+01	.52343980E+02	.36786960E-01	.14324710E+04	.18762680E+04	.00000000E+00
N= 23	LAYER= 1	.25900000E+01	.27095480E+01	.52342490E+02	.73667740E-01	.14324710E+04	.18793510E+04	.00000000E+00
N= 24	LAYER= 1	.26000000E+01	.27216860E+01	.52340500E+02	.84163840E-01	.14324710E+04	.18834370E+04	.00000000E+00
N= 25	LAYER= 1	.26100000E+01	.27349800E+01	.52338510E+02	.94568030E-01	.14324710E+04	.18875050E+04	.00000000E+00
N= 26	LAYER= 1	.26200000E+01	.27494300E+01	.52336030E+02	.47189440E-01	.14324710E+04	.18925480E+04	.00000000E+00
N= 27	LAYER= 1	.26300000E+01	.27473500E+01	.52336280E+02	-.15698130E-01	.14324710E+04	.18920370E+04	.00000000E+00
N= 28	LAYER= 1	.26400000E+01	.27452690E+01	.52336770E+02	-.26006210E-01	.14324710E+04	.18910410E+04	.00000000E+00
N= 29	LAYER= 1	.26500000E+01	.27420320E+01	.52337510E+02	-.31491150E-01	.14324710E+04	.18895350E+04	.00000000E+00
N= 30	LAYER= 1	.26600000E+01	.27364830E+01	.52338260E+02	-.21088460E-01	.14324710E+04	.18880070E+04	.00000000E+00
N= 31	LAYER= 1	.26700000E+01	.27361360E+01	.52338510E+02	.41988200E-01	.14324710E+04	.18875070E+04	.00000000E+00
N= 32	LAYER= 1	.26800000E+01	.27488520E+01	.52336280E+02	.42082350E-01	.14324710E+04	.18920450E+04	.00000000E+00
N= 33	LAYER= 1	.26900000E+01	.27479280E+01	.52336520E+02	-.26289380E-01	.14324710E+04	.18915500E+04	.00000000E+00
N= 34	LAYER= 1	.27000000E+01	.27408770E+01	.52337520E+02	.68467240E-01	.14324710E+04	.18895260E+04	.00000000E+00
N= 35	LAYER= 1	.27100000E+01	.27697760E+01	.52333280E+02	.16312980E+00	.14324710E+04	.18980840E+04	.00000000E+00
N= 36	LAYER= 1	.27200000E+01	.27902370E+01	.52329810E+02	.13674400E+00	.14324710E+04	.19050330E+04	.00000000E+00
N= 37	LAYER= 1	.27300000E+01	.28101200E+01	.52326820E+02	.12634290E+00	.14324710E+04	.19109560E+04	.00000000E+00
N= 38	LAYER= 1	.27400000E+01	.28282690E+01	.52323840E+02	.11055000E+00	.14324710E+04	.19168180E+04	.00000000E+00
N= 39	LAYER= 1	.27500000E+01	.28435280E+01	.52321590E+02	.84448400E-01	.14324710E+04	.19212010E+04	.00000000E+00
N= 40	LAYER= 1	.27600000E+01	.28547410E+01	.52319840E+02	.52957560E-01	.14324710E+04	.19245880E+04	.00000000E+00
N= 41	LAYER= 1	.27700000E+01	.28607520E+01	.52319090E+02	.20899320E-01	.14324710E+04	.19260460E+04	.00000000E+00
N= 42	LAYER= 1	.27800000E+01	.28604050E+01	.52318860E+02	.50120550E-02	.14324710E+04	.19265040E+04	.00000000E+00
N= 43	LAYER= 1	.27900000E+01	.28612160E+01	.52318850E+02	-.26195340E-01	.14324710E+04	.19265130E+04	.00000000E+00
N= 44	LAYER= 1	.28000000E+01	.28530090E+01	.52320100E+02	-.94568030E-04	.14324710E+04	.19241050E+04	.00000000E+00
N= 45	LAYER= 1	.28100000E+01	.28601760E+01	.52318860E+02	.94756210E-01	.14324710E+04	.19265040E+04	.00000000E+00
N= 46	LAYER= 1	.28200000E+01	.28815610E+01	.52315620E+02	.73573920E-01	.14324710E+04	.19327390E+04	.00000000E+00
N= 47	LAYER= 1	.28300000E+01	.28817900E+01	.52315380E+02	-.10686190E-01	.14324710E+04	.19331970E+04	.00000000E+00
N= 48	LAYER= 1	.28400000E+01	.28773980E+01	.52316120E+02	.32057910E-01	.14324710E+04	.19317730E+04	.00000000E+00

N= 49	LAYER= 1	.28500000E+01	.28935800E+01	.52313860E+02	.79530910E-01	.14324710E+04	.19360820E+04	.00000000E+00
N= 50	LAYER= 1	.28600000E+01	.29036370E+01	.52312360E+02	.73763060E-01	.14324710E+04	.19389360E+04	.00000000E+00
N= 51	LAYER= 1	.28700000E+01	.29154260E+01	.52310380E+02	.84070120E-01	.14324710E+04	.19426970E+04	.00000000E+00
N= 52	LAYER= 1	.28800000E+01	.29277940E+01	.52308390E+02	.79153440E-01	.14324710E+04	.19464480E+04	.00000000E+00
N= 53	LAYER= 1	.28900000E+01	.29395840E+01	.52306630E+02	.73668500E-01	.14324710E+04	.19497280E+04	.00000000E+00
N= 54	LAYER= 1	.29000000E+01	.29496400E+01	.52304900E+02	.62792540E-01	.14324710E+04	.19529620E+04	.00000000E+00
N= 55	LAYER= 1	.29100000E+01	.29568060E+01	.52303670E+02	.31874020E-01	.14322500E+04	.19553660E+04	.24003480E-04
N= 56	LAYER= 1	.29200000E+01	.29599270E+01	.52303400E+02	-.46345480E-02	.14322500E+04	.19558600E+04	.24004440E-04
N= 57	LAYER= 1	.29300000E+01	.29578470E+01	.52303890E+02	.16362630E-01	.14322500E+04	.19549540E+04	.24005400E-04
N= 58	LAYER= 1	.29400000E+01	.29670930E+01	.52302620E+02	.68571020E-01	.14322500E+04	.19572870E+04	.24006840E-04
N= 59	LAYER= 1	.29500000E+01	.29786520E+01	.52300640E+02	.89286000E-01	.14322500E+04	.19609470E+04	.24008280E-04
N= 60	LAYER= 1	.29600000E+01	.29925220E+01	.52298400E+02	.42089430E-01	.14322440E+04	.19650600E+04	.24609020E-04
N= 61	LAYER= 1	.29700000E+01	.29910200E+01	.52298660E+02	-.31874150E-01	.14322440E+04	.19646030E+04	.24609980E-04
N= 62	LAYER= 1	.29800000E+01	.29820040E+01	.52299910E+02	-.26577820E-01	.14322440E+04	.19622990E+04	.24611420E-04
N= 63	LAYER= 1	.29900000E+01	.29820040E+01	.52299910E+02	-.36414450E-01	.14322440E+04	.19622990E+04	.24612380E-04
N= 64	LAYER= 1	.30000000E+01	.29729870E+01	.52301630E+02	-.36792050E-01	.14322440E+04	.19591220E+04	.24613820E-04
N= 65	LAYER= 1	.30100000E+01	.29714850E+01	.52301650E+02	.20335140E-01	.14322440E+04	.19590970E+04	.24614780E-04
N= 66	LAYER= 1	.30200000E+01	.29763400E+01	.52300670E+02	.42751520E-01	.14322440E+04	.19609070E+04	.24616220E-04
N= 67	LAYER= 1	.30300000E+01	.29863970E+01	.52299630E+02	.74341490E-01	.14322440E+04	.19628080E+04	.24617660E-04
N= 68	LAYER= 1	.30400000E+01	.30004990E+01	.52297160E+02	.14178050E+00	.14322380E+04	.19673410E+04	.25218390E-04
N= 69	LAYER= 1	.30500000E+01	.30265090E+01	.52292930E+02	.12163560E+00	.14322220E+04	.19750140E+04	.27018630E-04
N= 70	LAYER= 1	.30600000E+01	.30377220E+01	.52291410E+02	.74437510E-01	.14322160E+04	.19777400E+04	.27619320E-04
N= 71	LAYER= 1	.30700000E+01	.30506690E+01	.52289410E+02	.84843080E-01	.14322080E+04	.19813250E+04	.28519390E-04
N= 72	LAYER= 1	.30800000E+01	.30641940E+01	.52287400E+02	.94396750E-01	.14322000E+04	.19849060E+04	.29419450E-04
N= 73	LAYER= 1	.30900000E+01	.30771410E+01	.52284950E+02	.84085660E-01	.14321920E+04	.19892620E+04	.30319480E-04
N= 74	LAYER= 1	.31000000E+01	.30883540E+01	.52283420E+02	.63561720E-01	.14321860E+04	.19919440E+04	.30920140E-04
N= 75	LAYER= 1	.31100000E+01	.30966770E+01	.52281940E+02	.10688350E-01	.14321800E+04	.19945460E+04	.31520790E-04
N= 76	LAYER= 1	.31200000E+01	.30919390E+01	.52282920E+02	.32159320E-01	.14321800E+04	.19928320E+04	.31522230E-04
N= 77	LAYER= 1	.31300000E+01	.31075440E+01	.52280430E+02	.26200800E-01	.14321720E+04	.19972030E+04	.32422230E-04
N= 78	LAYER= 1	.31400000E+01	.30991040E+01	.52281680E+02	-.16552850E-01	.14321720E+04	.19950030E+04	.32423670E-04
N= 79	LAYER= 1	.31500000E+01	.31008380E+01	.52281210E+02	.15795990E-01	.14321720E+04	.19958430E+04	.32424630E-04
N= 80	LAYER= 1	.31600000E+01	.31037270E+01	.52280930E+02	.21376830E-01	.14321720E+04	.19963150E+04	.32425590E-04
N= 81	LAYER= 1	.31700000E+01	.31077730E+01	.52280200E+02	.26862650E-01	.14321720E+04	.19976040E+04	.32427030E-04
N= 82	LAYER= 1	.31800000E+01	.31129740E+01	.52279660E+02	.55805750E-02	.14321690E+04	.19985240E+04	.32727820E-04
N= 83	LAYER= 1	.31900000E+01	.31103170E+01	.52279930E+02	-.42848330E-01	.14321690E+04	.19980640E+04	.32728790E-04
N= 84	LAYER= 1	.32000000E+01	.30986410E+01	.52281690E+02	-.26390030E-01	.14321690E+04	.19949930E+04	.32730230E-04
N= 85	LAYER= 1	.32100000E+01	.31023400E+01	.52281180E+02	.73777840E-01	.14321690E+04	.19958830E+04	.32731190E-04
N= 86	LAYER= 1	.32200000E+01	.31202560E+01	.52278200E+02	.10584430E+00	.14321640E+04	.20010770E+04	.33331330E-04
N= 87	LAYER= 1	.32300000E+01	.31347050E+01	.52276180E+02	.52969750E-01	.14321560E+04	.20045820E+04	.34231300E-04
N= 88	LAYER= 1	.32400000E+01	.31366700E+01	.52275700E+02	.31119420E-01	.14321550E+04	.20054150E+04	.34232260E-04
N= 89	LAYER= 1	.32500000E+01	.31426810E+01	.52274710E+02	.38308630E-01	.14321500E+04	.20071260E+04	.34832390E-04
N= 90	LAYER= 1	.32600000E+01	.31515820E+01	.52273890E+02	.12182990E+00	.14321470E+04	.20085220E+04	.35133170E-04
N= 91	LAYER= 1	.32700000E+01	.31799010E+01	.52268950E+02	.83711050E-01	.14321280E+04	.20169650E+04	.37232360E-04
N= 92	LAYER= 1	.32800000E+01	.31742350E+01	.52269930E+02	.42660390E-01	.14321280E+04	.20152880E+04	.37233800E-04
N= 93	LAYER= 1	.32900000E+01	.31935390E+01	.52266930E+02	.12599550E+00	.14321200E+04	.20203750E+04	.38133690E-04
N= 94	LAYER= 1	.33000000E+01	.32099520E+01	.52263980E+02	.63754330E-01	.14321090E+04	.20253470E+04	.39333360E-04
N= 95	LAYER= 1	.33100000E+01	.32133040E+01	.52263920E+02	.22134510E-01	.14321090E+04	.20254380E+04	.39334320E-04
N= 96	LAYER= 1	.33200000E+01	.32189680E+01	.52262930E+02	.37080120E-01	.14321060E+04	.20270960E+04	.39635070E-04

N= 97	LAYER= 1	.33300000E+01	.32246320E+01	.52262170E+02	.85225950E-01	.14321030E+04	.20283700E+04	.39935820E-04
N= 98	LAYER= 1	.33400000E+01	.32456690E+01	.52258900E+02	.15863120E+00	.14320890E+04	.20337870E+04	.41435230E-04
N= 99	LAYER= 1	.33500000E+01	.32719090E+01	.52254670E+02	.16326980E+00	.14320730E+04	.20407600E+04	.43234860E-04
N=100	LAYER= 1	.33600000E+01	.32931770E+01	.52251190E+02	.17518860E+00	.14320590E+04	.20464400E+04	.44734170E-04
N=101	LAYER= 1	.33700000E+01	.33251970E+01	.52246390E+02	.95542470E-01	.14320390E+04	.20541720E+04	.46832950E-04
N=102	LAYER= 1	.33800000E+01	.33224240E+01	.52246670E+02	.63189830E-01	.14320390E+04	.20537290E+04	.46833900E-04
N=103	LAYER= 1	.33900000E+01	.33434620E+01	.52243400E+02	.12250220E+00	.14320280E+04	.20589480E+04	.48033350E-04
N=104	LAYER= 1	.34000000E+01	.33604550E+01	.52240880E+02	.63854150E-01	.14320200E+04	.20629550E+04	.48933520E-04
N=105	LAYER= 1	.34100000E+01	.33632290E+01	.52240390E+02	.26014180E-01	.14320170E+04	.20637360E+04	.49233730E-04
N=106	LAYER= 1	.34200000E+01	.33671590E+01	.52239650E+02	.52690630E-01	.14320150E+04	.20648960E+04	.49534410E-04
N=107	LAYER= 1	.34300000E+01	.33786040E+01	.52237900E+02	.85991080E-01	.14320060E+04	.20676680E+04	.50434070E-04
N=108	LAYER= 1	.34400000E+01	.33952490E+01	.52235590E+02	.94882080E-01	.14319980E+04	.20712770E+04	.51333710E-04
N=109	LAYER= 1	.34500000E+01	.34061140E+01	.52233410E+02	.10585610E+00	.14319900E+04	.20746750E+04	.52233350E-04
N=110	LAYER= 1	.34600000E+01	.34265740E+01	.52230590E+02	.12827700E+00	.14319790E+04	.20790440E+04	.53433150E-04
N=111	LAYER= 1	.34700000E+01	.34464550E+01	.52227350E+02	.13612980E+00	.14319680E+04	.20840290E+04	.54632920E-04
N=112	LAYER= 1	.34800000E+01	.34646040E+01	.52224160E+02	.11144020E+00	.14319540E+04	.20889120E+04	.56131880E-04
N=113	LAYER= 1	.34900000E+01	.34798620E+01	.52222090E+02	.80979100E-01	.14319460E+04	.20920450E+04	.57031410E-04
N=114	LAYER= 1	.35000000E+01	.34910750E+01	.52220330E+02	.80697240E-01	.14319400E+04	.20946980E+04	.57631730E-04
N=115	LAYER= 1	.35100000E+01	.35057570E+01	.52218270E+02	.47585140E-01	.14319320E+04	.20977850E+04	.58531240E-04
N=116	LAYER= 1	.35200000E+01	.35050620E+01	.52218080E+02	.35192190E-01	.14319320E+04	.20980750E+04	.58532190E-04
N=117	LAYER= 1	.35300000E+01	.35133860E+01	.52216610E+02	.25637990E-01	.14319230E+04	.21002810E+04	.59431680E-04
N=118	LAYER= 1	.35400000E+01	.35115370E+01	.52216870E+02	-.57613360E-01	.14319230E+04	.20998950E+04	.59432650E-04
N=119	LAYER= 1	.35500000E+01	.34972020E+01	.52219330E+02	-.45408630E-02	.14319230E+04	.20961970E+04	.59434090E-04
N=120	LAYER= 1	.35600000E+01	.35113040E+01	.52217080E+02	.68492730E-01	.14319230E+04	.20995700E+04	.59435530E-04
N=121	LAYER= 1	.35700000E+01	.35169670E+01	.52216090E+02	.14881380E+00	.14319230E+04	.21010450E+04	.59436970E-04
N=122	LAYER= 1	.35800000E+01	.35562650E+01	.52210050E+02	.19630770E+00	.14318790E+04	.21100010E+04	.64232590E-04
N=123	LAYER= 1	.35900000E+01	.35757990E+01	.52206820E+02	.17965700E+00	.14318790E+04	.21147360E+04	.64234030E-04
N=124	LAYER= 1	.36000000E+01	.36089710E+01	.52201560E+02	.17057990E+00	.14318650E+04	.21223650E+04	.65732690E-04
N=125	LAYER= 1	.36100000E+01	.36279270E+01	.52198760E+02	.12800430E+00	.14318540E+04	.21263890E+04	.66931680E-04
N=126	LAYER= 1	.36200000E+01	.36480380E+01	.52195510E+02	.13235730E+00	.14318430E+04	.21310230E+04	.68131110E-04
N=127	LAYER= 1	.36300000E+01	.36669940E+01	.52192500E+02	.85053860E-01	.14318300E+04	.21352860E+04	.69629630E-04
N=128	LAYER= 1	.36400000E+01	.36734680E+01	.52191500E+02	.79566660E-01	.14318270E+04	.21367080E+04	.69930200E-04
N=129	LAYER= 1	.36500000E+01	.36906910E+01	.52188750E+02	.10757410E+00	.14318160E+04	.21405740E+04	.71129560E-04
N=130	LAYER= 1	.36600000E+01	.37073350E+01	.52186410E+02	.38033580E-01	.14318070E+04	.21438240E+04	.72028820E-04
N=131	LAYER= 1	.36700000E+01	.37030590E+01	.52186950E+02	.63862350E-01	.14318070E+04	.21430780E+04	.72030260E-04
N=132	LAYER= 1	.36800000E+01	.37266390E+01	.52183400E+02	.18137410E+00	.14317960E+04	.21480160E+04	.73229560E-04
N=133	LAYER= 1	.36900000E+01	.37580760E+01	.52178380E+02	.17484760E+00	.14317520E+04	.21549090E+04	.78023800E-04
N=134	LAYER= 1	.37000000E+01	.37781890E+01	.52175130E+02	.14447340E+00	.14317520E+04	.21593360E+04	.78025240E-04
N=135	LAYER= 1	.37100000E+01	.38023460E+01	.52171550E+02	.16122350E+00	.14317500E+04	.21641720E+04	.78325740E-04
N=136	LAYER= 1	.37200000E+01	.38282370E+01	.52167520E+02	.14731980E+00	.14317330E+04	.21695810E+04	.80123990E-04
N=137	LAYER= 1	.37300000E+01	.38445330E+01	.52164590E+02	.16274040E+00	.14317220E+04	.21734750E+04	.81323090E-04
N=138	LAYER= 1	.37400000E+01	.38744700E+01	.52159830E+02	.14476520E+00	.14317030E+04	.21797600E+04	.83420270E-04
N=139	LAYER= 1	.37500000E+01	.38890330E+01	.52157750E+02	.12262790E+00	.14316940E+04	.21824730E+04	.84319290E-04
N=140	LAYER= 1	.37600000E+01	.39114560E+01	.52154030E+02	.13833340E+00	.14316800E+04	.21873140E+04	.85817320E-04
N=141	LAYER= 1	.37700000E+01	.39304120E+01	.52151220E+02	.10256810E+00	.14316690E+04	.21909500E+04	.87016270E-04
N=142	LAYER= 1	.37800000E+01	.39435900E+01	.52149190E+02	.86390300E-01	.14316610E+04	.21935540E+04	.87915240E-04
N=143	LAYER= 1	.37900000E+01	.39573440E+01	.52147140E+02	.53934020E-01	.14316530E+04	.21961740E+04	.88814170E-04
N=144	LAYER= 1	.38000000E+01	.39603500E+01	.52146640E+02	.94999580E-01	.14316530E+04	.21968070E+04	.88815130E-04

N=145	LAYER= 1	.38100000E+01	.39848540E+01	.52142650E+02	.17486180E+00	.14316360E+04	.22018740E+04	.90612990E-04
N=146	LAYER= 1	.38200000E+01	.40116690E+01	.52138380E+02	.12263180E+00	.14316200E+04	.22072420E+04	.92410780E-04
N=147	LAYER= 1	.38300000E+01	.40216110E+01	.52136860E+02	.54598950E-01	.14316140E+04	.22091490E+04	.93010660E-04
N=148	LAYER= 1	.38400000E+01	.40292400E+01	.52135800E+02	.11411650E+00	.14316090E+04	.22104610E+04	.93610060E-04
N=149	LAYER= 1	.38500000E+01	.40577880E+01	.52131460E+02	.11487490E+00	.14315920E+04	.22158330E+04	.95407730E-04
N=150	LAYER= 1	.38600000E+01	.40613730E+01	.52130370E+02	.83366560E-01	.14315890E+04	.22171820E+04	.95708140E-04
N=151	LAYER= 1	.38700000E+01	.40809060E+01	.52127530E+02	.13645070E+00	.14315780E+04	.22206740E+04	.96906840E-04
N=152	LAYER= 1	.38800000E+01	.41050630E+01	.52123930E+02	.19786090E+00	.14315650E+04	.22250540E+04	.98404950E-04
N=153	LAYER= 1	.38900000E+01	.41405460E+01	.52118180E+02	.15793720E+00	.14315200E+04	.22319900E+04	.10319670E-03
N=154	LAYER= 1	.39000000E+01	.41504860E+01	.52116470E+02	.11753270E+00	.14315200E+04	.22340420E+04	.10319810E-03
N=155	LAYER= 1	.39100000E+01	.41757980E+01	.52112630E+02	.12301880E+00	.14315200E+04	.22386060E+04	.10319960E-03
N=156	LAYER= 1	.39200000E+01	.41874710E+01	.52110650E+02	.10768940E+00	.14315120E+04	.22409400E+04	.10409820E-03
N=157	LAYER= 1	.39300000E+01	.42087370E+01	.52107540E+02	.13428180E+00	.14314980E+04	.22445990E+04	.10559560E-03
N=158	LAYER= 1	.39400000E+01	.42282700E+01	.52104310E+02	.11715680E+00	.14314870E+04	.22483750E+04	.10679410E-03
N=159	LAYER= 1	.39500000E+01	.42434120E+01	.52102010E+02	.78735900E-01	.14314790E+04	.22510490E+04	.10769320E-03
N=160	LAYER= 1	.39600000E+01	.42506930E+01	.52100590E+02	.99930380E-01	.14314740E+04	.22526890E+04	.10829290E-03
N=161	LAYER= 1	.39700000E+01	.42721920E+01	.52097280E+02	.20838380E+00	.14314600E+04	.22565000E+04	.10979010E-03
N=162	LAYER= 1	.39800000E+01	.43131060E+01	.52090750E+02	.24075600E+00	.14314160E+04	.22639500E+04	.11458070E-03
N=163	LAYER= 1	.39900000E+01	.43444270E+01	.52085910E+02	.19722310E+00	.14314160E+04	.22693970E+04	.11458210E-03
N=164	LAYER= 1	.40000000E+01	.43717040E+01	.52081430E+02	.18312800E+00	.14313990E+04	.22743970E+04	.11637900E-03
N=165	LAYER= 1	.40100000E+01	.44001350E+01	.52077260E+02	.20556000E+00	.14313830E+04	.22790040E+04	.11817580E-03
N=166	LAYER= 1	.40200000E+01	.44349230E+01	.52071720E+02	.24493320E+00	.14313380E+04	.22850750E+04	.12296560E-03
N=167	LAYER= 1	.40300000E+01	.44726000E+01	.52065690E+02	.16439330E+00	.14313360E+04	.22916040E+04	.12326580E-03
N=168	LAYER= 1	.40400000E+01	.44830020E+01	.52063960E+02	.16988310E+00	.14313300E+04	.22934650E+04	.12386530E-03
N=169	LAYER= 1	.40500000E+01	.45224150E+01	.52057670E+02	.25780870E+00	.14312860E+04	.23001700E+04	.12865450E-03
N=170	LAYER= 1	.40600000E+01	.45606710E+01	.52051780E+02	.23709180E+00	.14312830E+04	.23063640E+04	.12895470E-03
N=171	LAYER= 1	.40700000E+01	.45943060E+01	.52046470E+02	.16279860E+00	.14312390E+04	.23118950E+04	.13374330E-03
N=172	LAYER= 1	.40800000E+01	.46108330E+01	.52044090E+02	.12446270E+00	.14312390E+04	.23143520E+04	.13374480E-03
N=173	LAYER= 1	.40900000E+01	.46323330E+01	.52040590E+02	.15304650E+00	.14312390E+04	.23179480E+04	.13374620E-03
N=174	LAYER= 1	.41000000E+01	.46549880E+01	.52036860E+02	.17926620E+00	.14312230E+04	.23217540E+04	.13554190E-03
N=175	LAYER= 1	.41100000E+01	.46840000E+01	.52032120E+02	.20737950E+00	.14312060E+04	.23265490E+04	.13733800E-03
N=176	LAYER= 1	.41200000E+01	.47158990E+01	.52027070E+02	.21344810E+00	.14311620E+04	.23316160E+04	.14212580E-03
N=177	LAYER= 1	.41300000E+01	.47472210E+01	.52022040E+02	.16242880E+00	.14311620E+04	.23366070E+04	.14212730E-03
N=178	LAYER= 1	.41400000E+01	.47654810E+01	.52019400E+02	.11926150E+00	.14311560E+04	.23392110E+04	.14272650E-03
N=179	LAYER= 1	.41500000E+01	.47837410E+01	.52016410E+02	.16981040E+00	.14311460E+04	.23421390E+04	.14392410E-03
N=180	LAYER= 1	.41600000E+01	.48150600E+01	.52011380E+02	.17852410E+00	.14311010E+04	.23470320E+04	.14871120E-03
N=181	LAYER= 1	.41700000E+01	.48379440E+01	.52007980E+02	.20199920E+00	.14311010E+04	.23503080E+04	.14871270E-03
N=182	LAYER= 1	.41800000E+01	.48744640E+01	.52001840E+02	.24734760E+00	.14310880E+04	.23561870E+04	.15020870E-03
N=183	LAYER= 1	.41900000E+01	.49121410E+01	.51996300E+02	.23514360E+00	.14310440E+04	.23614200E+04	.15499520E-03
N=184	LAYER= 1	.42000000E+01	.49471600E+01	.51990730E+02	.21317740E+00	.14310440E+04	.23666270E+04	.15499660E-03
N=185	LAYER= 1	.42100000E+01	.49748970E+01	.51986230E+02	.20654940E+00	.14310270E+04	.23708030E+04	.15679200E-03
N=186	LAYER= 1	.42200000E+01	.50072570E+01	.51980980E+02	.27329900E+00	.14309830E+04	.23756300E+04	.16157790E-03
N=187	LAYER= 1	.42300000E+01	.50561450E+01	.51973320E+02	.27538270E+00	.14309770E+04	.23825760E+04	.16217690E-03
N=188	LAYER= 1	.42400000E+01	.50902390E+01	.51967980E+02	.27548590E+00	.14309330E+04	.23873760E+04	.16696220E-03
N=189	LAYER= 1	.42500000E+01	.51391250E+01	.51960320E+02	.33598780E+00	.14309250E+04	.23941610E+04	.16785970E-03
N=190	LAYER= 1	.42600000E+01	.51891680E+01	.51952110E+02	.29831790E+00	.14308810E+04	.24013400E+04	.17264450E-03
N=191	LAYER= 1	.42700000E+01	.52267290E+01	.51946230E+02	.25154580E+00	.14308700E+04	.24064090E+04	.17384130E-03
N=192	LAYER= 1	.42800000E+01	.52637120E+01	.51940230E+02	.28525240E+00	.14308260E+04	.24115330E+04	.17862540E-03

N=193	LAYER= 1	.42900000E+01	.53120200E+01	.51932760E+02	.31025430E+00	.14308180E+04	.24178330E+04	.17952270E-03
N=194	LAYER= 1	.43000000E+01	.53580180E+01	.51925580E+02	.29180140E+00	.14307740E+04	.24238090E+04	.18430630E-03
N=195	LAYER= 1	.43100000E+01	.53970810E+01	.51918980E+02	.22780420E+00	.14307650E+04	.24292410E+04	.18520390E-03
N=196	LAYER= 1	.43200000E+01	.54242380E+01	.51914830E+02	.14458060E+00	.14307490E+04	.24326270E+04	.18699810E-03
N=197	LAYER= 1	.43300000E+01	.54423820E+01	.51912160E+02	.16001190E+00	.14307380E+04	.24347880E+04	.18819460E-03
N=198	LAYER= 1	.43400000E+01	.54712730E+01	.51907270E+02	.21294550E+00	.14306940E+04	.24387230E+04	.19297730E-03
N=199	LAYER= 1	.43500000E+01	.55047880E+01	.51902100E+02	.24854690E+00	.14306940E+04	.24428470E+04	.19297870E-03
N=200	LAYER= 1	.43600000E+01	.55458150E+01	.51895540E+02	.34295790E+00	.14306500E+04	.24480310E+04	.19776090E-03
N=201	LAYER= 1	.43700000E+01	.56062560E+01	.51885910E+02	.33776020E+00	.14306360E+04	.24555310E+04	.19925590E-03
N=202	LAYER= 1	.43800000E+01	.56457790E+01	.51879590E+02	.31902130E+00	.14305920E+04	.24603880E+04	.20403750E-03
N=203	LAYER= 1	.43900000E+01	.57018290E+01	.51870850E+02	.34770330E+00	.14305750E+04	.24670190E+04	.20583060E-03
N=204	LAYER= 1	.44000000E+01	.57505990E+01	.51863170E+02	.34251280E+00	.14305310E+04	.24727620E+04	.21061160E-03
N=205	LAYER= 1	.44100000E+01	.58028350E+01	.51854680E+02	.40179750E+00	.14305120E+04	.24790370E+04	.21270310E-03
N=206	LAYER= 1	.44200000E+01	.58692850E+01	.51844210E+02	.38012360E+00	.14304680E+04	.24866520E+04	.21748330E-03
N=207	LAYER= 1	.44300000E+01	.59171280E+01	.51836740E+02	.35362580E+00	.14304240E+04	.24920000E+04	.22226320E-03
N=208	LAYER= 1	.44400000E+01	.59736380E+01	.51827510E+02	.38857610E+00	.14304080E+04	.24985190E+04	.22405600E-03
N=209	LAYER= 1	.44500000E+01	.60307250E+01	.51818400E+02	.32560050E+00	.14303640E+04	.25048680E+04	.22883520E-03
N=210	LAYER= 1	.44600000E+01	.60712860E+01	.51812150E+02	.35969180E+00	.14303470E+04	.25091670E+04	.23062780E-03
N=211	LAYER= 1	.44700000E+01	.61391200E+01	.51801420E+02	.40403450E+00	.14303030E+04	.25164430E+04	.23540630E-03
N=212	LAYER= 1	.44800000E+01	.61912390E+01	.51793080E+02	.41569670E+00	.14302590E+04	.25220200E+04	.24018430E-03
N=213	LAYER= 1	.44900000E+01	.62627700E+01	.51781800E+02	.51877120E+00	.14302150E+04	.25294380E+04	.24496180E-03
N=214	LAYER= 1	.45000000E+01	.63456250E+01	.51768590E+02	.51528250E+00	.14301710E+04	.25379650E+04	.24973900E-03
N=215	LAYER= 1	.45100000E+01	.64148450E+01	.51757480E+02	.42729110E+00	.14301270E+04	.25450070E+04	.25451550E-03
N=216	LAYER= 1	.45200000E+01	.64710060E+01	.51748420E+02	.39301380E+00	.14300830E+04	.25506560E+04	.25929160E-03
N=217	LAYER= 1	.45300000E+01	.65312110E+01	.51738930E+02	.41366830E+00	.14300390E+04	.25564960E+04	.26406730E-03
N=218	LAYER= 1	.45400000E+01	.65948830E+01	.51728900E+02	.44077380E+00	.14300230E+04	.25625710E+04	.26585850E-03
N=219	LAYER= 1	.45500000E+01	.66614440E+01	.51718130E+02	.46059560E+00	.14299790E+04	.25690030E+04	.27063350E-03
N=220	LAYER= 1	.45600000E+01	.67303150E+01	.51707170E+02	.37904150E+00	.14299350E+04	.25754390E+04	.27540800E-03
N=221	LAYER= 1	.45700000E+01	.67742250E+01	.51700240E+02	.43948820E+00	.14298910E+04	.25794530E+04	.28018200E-03
N=222	LAYER= 1	.45800000E+01	.68613510E+01	.51686430E+02	.52173660E+00	.14298470E+04	.25873360E+04	.28495550E-03
N=223	LAYER= 1	.45900000E+01	.69298730E+01	.51675620E+02	.45619000E+00	.14298030E+04	.25933930E+04	.28972860E-03
N=224	LAYER= 1	.46000000E+01	.69957390E+01	.51664910E+02	.51996840E+00	.14297590E+04	.25993120E+04	.29450120E-03
N=225	LAYER= 1	.46100000E+01	.70827500E+01	.51651090E+02	.56225400E+00	.14297150E+04	.26068040E+04	.29927330E-03
N=226	LAYER= 1	.46200000E+01	.71624780E+01	.51638380E+02	.59608760E+00	.14296680E+04	.26135740E+04	.30434250E-03
N=227	LAYER= 1	.46300000E+01	.72583890E+01	.51622970E+02	.66329390E+00	.14296110E+04	.26216180E+04	.31060370E-03
N=228	LAYER= 1	.46400000E+01	.73585670E+01	.51607090E+02	.67962190E+00	.14295480E+04	.26297290E+04	.31745970E-03
N=229	LAYER= 1	.46500000E+01	.74593240E+01	.51590910E+02	.66705970E+00	.14294600E+04	.26378130E+04	.32699740E-03
N=230	LAYER= 1	.46600000E+01	.75566120E+01	.51575620E+02	.65542360E+00	.14294160E+04	.26452880E+04	.33176620E-03
N=231	LAYER= 1	.46700000E+01	.76550560E+01	.51559990E+02	.68806190E+00	.14293660E+04	.26527730E+04	.33713000E-03
N=232	LAYER= 1	.46800000E+01	.77592760E+01	.51543170E+02	.71189520E+00	.14292760E+04	.26606630E+04	.34696120E-03
N=233	LAYER= 1	.46900000E+01	.78652310E+01	.51526420E+02	.70365670E+00	.14292320E+04	.26683430E+04	.35172800E-03
N=234	LAYER= 1	.47000000E+01	.79688710E+01	.51509980E+02	.61753850E+00	.14291440E+04	.26757190E+04	.36125890E-03
N=235	LAYER= 1	.47100000E+01	.80481340E+01	.51497290E+02	.64512830E+00	.14291000E+04	.26813070E+04	.36602430E-03
N=236	LAYER= 1	.47200000E+01	.81587060E+01	.51479550E+02	.63084980E+00	.14290510E+04	.26889690E+04	.37138420E-03
N=237	LAYER= 1	.47300000E+01	.82341520E+01	.51467540E+02	.57495330E+00	.14290020E+04	.26940610E+04	.37674300E-03
N=238	LAYER= 1	.47400000E+01	.83290080E+01	.51452440E+02	.68589520E+00	.14289440E+04	.27003540E+04	.38299470E-03
N=239	LAYER= 1	.47500000E+01	.84365740E+01	.51435200E+02	.72147580E+00	.14288560E+04	.27073970E+04	.39251930E-03
N=240	LAYER= 1	.47600000E+01	.85414810E+01	.51418420E+02	.73562590E+00	.14288100E+04	.27141100E+04	.39757860E-03

N=241	LAYER= 1	.47700000E+01	.86538970E+01	.51400510E+02	.84992340E+00	.14287220E+04	.27211250E+04	.40710030E-03
N=242	LAYER= 1	.47800000E+01	.87926530E+01	.51378350E+02	.94648410E+00	.14286350E+04	.27296000E+04	.41662010E-03
N=243	LAYER= 1	.47900000E+01	.89333720E+01	.51355890E+02	.93508710E+00	.14285470E+04	.27379640E+04	.42613800E-03
N=244	LAYER= 1	.48000000E+01	.90685420E+01	.51334270E+02	.89315180E+00	.14284590E+04	.27458100E+04	.43565400E-03
N=245	LAYER= 1	.48100000E+01	.91981660E+01	.51313790E+02	.91082600E+00	.14284040E+04	.27530630E+04	.44160060E-03
N=246	LAYER= 1	.48200000E+01	.93387650E+01	.51291330E+02	.98569560E+00	.14283140E+04	.27608220E+04	.45141120E-03
N=247	LAYER= 1	.48300000E+01	.94891820E+01	.51267330E+02	.96043550E+00	.14282210E+04	.27689030E+04	.46151690E-03
N=248	LAYER= 1	.48400000E+01	.96215750E+01	.51246070E+02	.91913780E+00	.14281340E+04	.27758840E+04	.47102680E-03
N=249	LAYER= 1	.48500000E+01	.97591630E+01	.51224010E+02	.99752840E+00	.14280460E+04	.27829550E+04	.48053470E-03
N=250	LAYER= 1	.48600010E+01	.99161600E+01	.51199050E+02	.99943630E+00	.14279530E+04	.27907500E+04	.49063420E-03
N=251	LAYER= 1	.48700000E+01	.10054550E+02	.51176910E+02	.10109770E+01	.14278660E+04	.27974960E+04	.50013830E-03
N=252	LAYER= 1	.48800000E+01	.10214080E+02	.51151420E+02	.10795290E+01	.14277670E+04	.28050710E+04	.51082740E-03
N=253	LAYER= 1	.48900000E+01	.10373260E+02	.51126050E+02	.11201190E+01	.14276690E+04	.28124080E+04	.52151400E-03
N=254	LAYER= 1	.49000000E+01	.10545150E+02	.51098650E+02	.11927210E+01	.14275380E+04	.28201230E+04	.53575890E-03
N=255	LAYER= 1	.49100000E+01	.10725120E+02	.51069860E+02	.12040890E+01	.14274480E+04	.28279980E+04	.54555000E-03
N=256	LAYER= 1	.49200000E+01	.10899540E+02	.51041930E+02	.11729040E+01	.14273160E+04	.28354260E+04	.55978770E-03
N=257	LAYER= 1	.49300000E+01	.11071300E+02	.51014620E+02	.11613010E+01	.14272290E+04	.28424910E+04	.56927790E-03
N=258	LAYER= 1	.49400000E+01	.11242140E+02	.50987230E+02	.11584190E+01	.14271250E+04	.28493900E+04	.58054420E-03
N=259	LAYER= 1	.49500000E+01	.11412630E+02	.50960060E+02	.12430130E+01	.14269940E+04	.28560570E+04	.59477130E-03
N=260	LAYER= 1	.49600000E+01	.11608870E+02	.50928700E+02	.13018360E+01	.14268990E+04	.28635420E+04	.60514280E-03
N=261	LAYER= 1	.49700000E+01	.11795750E+02	.50898760E+02	.12885970E+01	.14267650E+04	.28704850E+04	.61965980E-03
N=262	LAYER= 1	.49800000E+01	.11989210E+02	.50868030E+02	.13843620E+01	.14266340E+04	.28774150E+04	.63387520E-03
N=263	LAYER= 1	.49900000E+01	.12204040E+02	.50833590E+02	.14936980E+01	.14265030E+04	.28849540E+04	.64808640E-03
N=264	LAYER= 1	.50000000E+01	.12428330E+02	.50797710E+02	.15387260E+01	.14263720E+04	.28925630E+04	.66229460E-03
N=265	LAYER= 1	.50100000E+01	.12658040E+02	.50761160E+02	.15858830E+01	.14262420E+04	.29000720E+04	.67649870E-03
N=266	LAYER= 1	.50200000E+01	.12896650E+02	.50723070E+02	.16286330E+01	.14260670E+04	.29076470E+04	.69542960E-03
N=267	LAYER= 1	.50300000E+01	.13137450E+02	.50684510E+02	.17348620E+01	.14259370E+04	.29150680E+04	.70962370E-03
N=268	LAYER= 1	.50400000E+01	.13407110E+02	.50641430E+02	.18959080E+01	.14257630E+04	.29230800E+04	.72854330E-03
N=269	LAYER= 1	.50500000E+01	.13696970E+02	.50595310E+02	.19143840E+01	.14255880E+04	.29313470E+04	.74745520E-03
N=270	LAYER= 1	.50600000E+01	.13971690E+02	.50551370E+02	.18969030E+01	.14254140E+04	.29389420E+04	.76635960E-03
N=271	LAYER= 1	.50700000E+01	.14255650E+02	.50506080E+02	.19206110E+01	.14252400E+04	.29464960E+04	.78525640E-03
N=272	LAYER= 1	.50800000E+01	.14537530E+02	.50461040E+02	.19260740E+01	.14250660E+04	.29537490E+04	.80414570E-03
N=273	LAYER= 1	.50900000E+01	.14822500E+02	.50415510E+02	.19589210E+01	.14248900E+04	.29608310E+04	.82332180E-03
N=274	LAYER= 1	.51000000E+01	.15114650E+02	.50368930E+02	.19861200E+01	.14247080E+04	.29678250E+04	.84307920E-03
N=275	LAYER= 1	.51100000E+01	.15408150E+02	.50322130E+02	.20340210E+01	.14245230E+04	.29746150E+04	.86312300E-03
N=276	LAYER= 1	.51200000E+01	.15713780E+02	.50273320E+02	.21218420E+01	.14243060E+04	.29814540E+04	.88669300E-03
N=277	LAYER= 1	.51300000E+01	.16033250E+02	.50222400E+02	.21303240E+01	.14241330E+04	.29883380E+04	.90554160E-03
N=278	LAYER= 1	.51400000E+01	.16341630E+02	.50173190E+02	.20847930E+01	.14239160E+04	.29947580E+04	.92909040E-03
N=279	LAYER= 1	.51500000E+01	.16647000E+02	.50124440E+02	.21437530E+01	.14237430E+04	.30009100E+04	.94792220E-03
N=280	LAYER= 1	.51600000E+01	.16973140E+02	.50072480E+02	.22426160E+01	.14235260E+04	.30072430E+04	.97144980E-03
N=281	LAYER= 1	.51700000E+01	.17308160E+02	.50019080E+02	.23795880E+01	.14233360E+04	.30135260E+04	.99202710E-03
N=282	LAYER= 1	.51800000E+01	.17674340E+02	.49960710E+02	.25493610E+01	.14231060E+04	.30201490E+04	.10170020E-02
N=283	LAYER= 1	.51900000E+01	.18058630E+02	.49899360E+02	.25631980E+01	.14228470E+04	.30268460E+04	.10451940E-02
N=284	LAYER= 1	.52000000E+01	.18429170E+02	.49840350E+02	.25585930E+01	.14226310E+04	.30330450E+04	.10686750E-02
N=285	LAYER= 1	.52100000E+01	.18812630E+02	.49779240E+02	.26131550E+01	.14223710E+04	.30392320E+04	.10968360E-02
N=286	LAYER= 1	.52200000E+01	.19198840E+02	.49717690E+02	.27104830E+01	.14221530E+04	.30452340E+04	.11205840E-02
N=287	LAYER= 1	.52300000E+01	.19611010E+02	.49652040E+02	.28425490E+01	.14218940E+04	.30513980E+04	.11487160E-02
N=288	LAYER= 1	.52400000E+01	.20036660E+02	.49584320E+02	.29782340E+01	.14216300E+04	.30575110E+04	.11774160E-02

N=289	LAYER= 1	.52500000E+01	.20488850E+02	.49512320E+02	.30235660E+01	.14213280E+04	.30637560E+04	.12101930E-02
N=290	LAYER= 1	.52600000E+01	.20927280E+02	.49442500E+02	.29917050E+01	.14210690E+04	.30695750E+04	.12382710E-02
N=291	LAYER= 1	.52700000E+01	.21370200E+02	.49372020E+02	.30155410E+01	.14207970E+04	.30752250E+04	.12677930E-02
N=292	LAYER= 1	.52800000E+01	.21815860E+02	.49301110E+02	.31103740E+01	.14204930E+04	.30806950E+04	.13007990E-02
N=293	LAYER= 1	.52899990E+01	.22286900E+02	.49226220E+02	.32982970E+01	.14202250E+04	.30862530E+04	.13299890E-02
N=294	LAYER= 1	.53000000E+01	.22787910E+02	.49146530E+02	.33678700E+01	.14199100E+04	.30919340E+04	.13641200E-02
N=295	LAYER= 1	.53100000E+01	.23279220E+02	.49068410E+02	.34555950E+01	.14196040E+04	.30972840E+04	.13973520E-02
N=296	LAYER= 1	.53200000E+01	.23806600E+02	.48984650E+02	.35578980E+01	.14192580E+04	.31027910E+04	.14349270E-02
N=297	LAYER= 1	.53300000E+01	.24328090E+02	.48901770E+02	.35181040E+01	.14189480E+04	.31080220E+04	.14686900E-02
N=298	LAYER= 1	.53400000E+01	.24843650E+02	.48819910E+02	.35595380E+01	.14186050E+04	.31129890E+04	.15059170E-02
N=299	LAYER= 1	.53500000E+01	.25377660E+02	.48735130E+02	.36775840E+01	.14182940E+04	.31179340E+04	.15396290E-02
N=300	LAYER= 1	.53600000E+01	.25927790E+02	.48647790E+02	.37473610E+01	.14179490E+04	.31228300E+04	.15770930E-02
N=301	LAYER= 1	.53700000E+01	.26482740E+02	.48559790E+02	.37062750E+01	.14176020E+04	.31275710E+04	.16148160E-02
N=302	LAYER= 1	.53800000E+01	.27021050E+02	.48474400E+02	.36895610E+01	.14172600E+04	.31319970E+04	.16519300E-02
N=303	LAYER= 1	.53900000E+01	.27571100E+02	.48387230E+02	.37723830E+01	.14169190E+04	.31363490E+04	.16890150E-02
N=304	LAYER= 1	.54000000E+01	.28133790E+02	.48298010E+02	.38619540E+01	.14165720E+04	.31406380E+04	.17266470E-02
N=305	LAYER= 1	.54100000E+01	.28710070E+02	.48206700E+02	.39273580E+01	.14161890E+04	.31448650E+04	.17682960E-02
N=306	LAYER= 1	.54200000E+01	.29292660E+02	.48114470E+02	.39449510E+01	.14158480E+04	.31489750E+04	.18052870E-02
N=307	LAYER= 1	.54300000E+01	.29874310E+02	.48022380E+02	.39412490E+01	.14154660E+04	.31529290E+04	.18468640E-02
N=308	LAYER= 1	.54400000E+01	.30455580E+02	.47930370E+02	.38752120E+01	.14151230E+04	.31567380E+04	.18840800E-02
N=309	LAYER= 1	.54500000E+01	.31017910E+02	.47841400E+02	.39122520E+01	.14147720E+04	.31602940E+04	.19221300E-02
N=310	LAYER= 1	.54600000E+01	.31610190E+02	.47747720E+02	.41007420E+01	.14143910E+04	.31639090E+04	.19636060E-02
N=311	LAYER= 1	.54700000E+01	.32228710E+02	.47650000E+02	.41494500E+01	.14140090E+04	.31675460E+04	.20050450E-02
N=312	LAYER= 1	.54800000E+01	.32835320E+02	.47554100E+02	.40830090E+01	.14136280E+04	.31709900E+04	.20464460E-02
N=313	LAYER= 1	.54900000E+01	.33434300E+02	.47459530E+02	.39450390E+01	.14132470E+04	.31742710E+04	.20878060E-02
N=314	LAYER= 1	.55000000E+01	.34000640E+02	.47370110E+02	.41013990E+01	.14129090E+04	.31772720E+04	.21245420E-02
N=315	LAYER= 1	.55100000E+01	.34645170E+02	.47268300E+02	.43264680E+01	.14124860E+04	.31805780E+04	.21704200E-02
N=316	LAYER= 1	.55200000E+01	.35278270E+02	.47168450E+02	.44390080E+01	.14121060E+04	.31837080E+04	.22116720E-02
N=317	LAYER= 1	.55300000E+01	.35956850E+02	.47061440E+02	.47914500E+01	.14116850E+04	.31869470E+04	.22574680E-02
N=318	LAYER= 1	.55400000E+01	.36693940E+02	.46945230E+02	.48142390E+01	.14112210E+04	.31903360E+04	.23077930E-02
N=319	LAYER= 1	.55500000E+01	.37379260E+02	.46837250E+02	.48067430E+01	.14108010E+04	.31933720E+04	.23534910E-02
N=320	LAYER= 1	.55600000E+01	.38114930E+02	.46721450E+02	.51023310E+01	.14103380E+04	.31965120E+04	.24037110E-02
N=321	LAYER= 1	.55700000E+01	.38887620E+02	.46599780E+02	.52693040E+01	.14098660E+04	.31996900E+04	.24550130E-02
N=322	LAYER= 1	.55800000E+01	.39672730E+02	.46476290E+02	.51879480E+01	.14093630E+04	.32027960E+04	.25096690E-02
N=323	LAYER= 1	.55900000E+01	.40421760E+02	.46358490E+02	.51325390E+01	.14089020E+04	.32056520E+04	.25597170E-02
N=324	LAYER= 1	.56000000E+01	.41190390E+02	.46237660E+02	.51948500E+01	.14084310E+04	.32084790E+04	.26108440E-02
N=325	LAYER= 1	.56100000E+01	.41958430E+02	.46117050E+02	.51787000E+01	.14079300E+04	.32112020E+04	.26653130E-02
N=326	LAYER= 1	.56200000E+01	.42722590E+02	.45997050E+02	.51848090E+01	.14074700E+04	.32138190E+04	.27151900E-02
N=327	LAYER= 1	.56300000E+01	.43492730E+02	.45876220E+02	.51391760E+01	.14070010E+04	.32163650E+04	.27661400E-02
N=328	LAYER= 1	.56400000E+01	.44243590E+02	.45758430E+02	.57585320E+01	.14065330E+04	.32187680E+04	.28170330E-02
N=329	LAYER= 1	.56500000E+01	.45197300E+02	.45608940E+02	.63424740E+01	.14059400E+04	.32217060E+04	.28814280E-02
N=330	LAYER= 1	.56600000E+01	.46121410E+02	.45464170E+02	.62411020E+01	.14053550E+04	.32244410E+04	.29448850E-02
N=331	LAYER= 1	.56700000E+01	.47045410E+02	.45319500E+02	.66966870E+01	.14047750E+04	.32270730E+04	.30079660E-02
N=332	LAYER= 1	.56800000E+01	.48104930E+02	.45153730E+02	.69435500E+01	.14041120E+04	.32299690E+04	.30799580E-02
N=333	LAYER= 1	.56900000E+01	.49102250E+02	.44997770E+02	.65509500E+01	.14034910E+04	.32325850E+04	.31473430E-02
N=334	LAYER= 1	.57000000E+01	.50046250E+02	.44850310E+02	.63755340E+01	.14029130E+04	.32349670E+04	.32101470E-02
N=335	LAYER= 1	.57100000E+01	.50992000E+02	.44702600E+02	.66557270E+01	.14023350E+04	.32372690E+04	.32728630E-02
N=336	LAYER= 1	.57200000E+01	.52019260E+02	.44542310E+02	.64147260E+01	.14016770E+04	.32396760E+04	.33444310E-02

N=337	LAYER= 1	.57300000E+01	.52894020E+02	.44405890E+02	.62249370E+01	.14011420E+04	.32416540E+04	.34024860E-02
N=338	LAYER= 1	.57400000E+01	.53865360E+02	.44254480E+02	.66447240E+01	.14005520E+04	.32437780E+04	.34666020E-02
N=339	LAYER= 1	.57500000E+01	.54865060E+02	.44098790E+02	.62963140E+01	.13999310E+04	.32458870E+04	.35339690E-02
N=340	LAYER= 1	.57600000E+01	.55733520E+02	.43963600E+02	.60329860E+01	.13993940E+04	.32476600E+04	.35923400E-02
N=341	LAYER= 1	.57700000E+01	.56655620E+02	.43820180E+02	.65097610E+01	.13988190E+04	.32494840E+04	.36547950E-02
N=342	LAYER= 1	.57800000E+01	.57665950E+02	.43663110E+02	.74079950E+01	.13981960E+04	.32514170E+04	.37224300E-02
N=343	LAYER= 1	.57900000E+01	.58855030E+02	.43478370E+02	.77284540E+01	.13974570E+04	.32536090E+04	.38026950E-02
N=344	LAYER= 1	.58000000E+01	.59961120E+02	.43306710E+02	.77324770E+01	.13967650E+04	.32555720E+04	.38778410E-02
N=345	LAYER= 1	.58100000E+01	.61152240E+02	.43121960E+02	.82126950E+01	.13960310E+04	.32576090E+04	.39575450E-02
N=346	LAYER= 1	.58200000E+01	.62401400E+02	.42928350E+02	.85223010E+01	.13952580E+04	.32596630E+04	.40415100E-02
N=347	LAYER= 1	.58300000E+01	.63685250E+02	.42729560E+02	.83948370E+01	.13944490E+04	.32616920E+04	.41294280E-02
N=348	LAYER= 1	.58400000E+01	.64897040E+02	.42542050E+02	.80658460E+01	.13937140E+04	.32635350E+04	.42092240E-02
N=349	LAYER= 1	.58500000E+01	.66083790E+02	.42358590E+02	.83483410E+01	.13929780E+04	.32652760E+04	.42891490E-02
N=350	LAYER= 1	.58600000E+01	.67380390E+02	.42158290E+02	.84453420E+01	.13921730E+04	.32671090E+04	.43765830E-02
N=351	LAYER= 1	.58700000E+01	.68596690E+02	.41970600E+02	.84928350E+01	.13914100E+04	.32687670E+04	.44594680E-02
N=352	LAYER= 1	.58800000E+01	.69908330E+02	.41768330E+02	.84140300E+01	.13906080E+04	.32704920E+04	.45465660E-02
N=353	LAYER= 1	.58900000E+01	.71101580E+02	.41584480E+02	.71355750E+01	.13898470E+04	.32720060E+04	.46291330E-02
N=354	LAYER= 1	.59000000E+01	.72033190E+02	.41441050E+02	.67417310E+01	.13892880E+04	.32731550E+04	.46898610E-02
N=355	LAYER= 1	.59100000E+01	.73109770E+02	.41275400E+02	.77900420E+01	.13886100E+04	.32744460E+04	.47634910E-02
N=356	LAYER= 1	.59200000E+01	.74354160E+02	.41084080E+02	.86366770E+01	.13878540E+04	.32758930E+04	.48456500E-02
N=357	LAYER= 1	.59300000E+01	.75683750E+02	.40879840E+02	.89597770E+01	.13870190E+04	.32773870E+04	.49362830E-02
N=358	LAYER= 1	.59400000E+01	.77025310E+02	.40673980E+02	.92242360E+01	.13861870E+04	.32788430E+04	.50267200E-02
N=359	LAYER= 1	.59500000E+01	.78434560E+02	.40457880E+02	.97242340E+01	.13853160E+04	.32803200E+04	.51212680E-02
N=360	LAYER= 1	.59600000E+01	.79925920E+02	.40229430E+02	.10917260E+02	.13844080E+04	.32818260E+04	.52198890E-02
N=361	LAYER= 1	.59700000E+01	.81692560E+02	.39959130E+02	.11625060E+02	.13833320E+04	.32835420E+04	.53367430E-02
N=362	LAYER= 1	.59800000E+01	.83396190E+02	.39698750E+02	.11645900E+02	.13822710E+04	.32851280E+04	.54519490E-02
N=363	LAYER= 1	.59900000E+01	.85170360E+02	.39427890E+02	.12083850E+02	.13811740E+04	.32867130E+04	.55710840E-02
N=364	LAYER= 1	.60000000E+01	.87006190E+02	.39147980E+02	.11945950E+02	.13800410E+04	.32882860E+04	.56941360E-02
N=365	LAYER= 1	.60100000E+01	.88740490E+02	.38883860E+02	.11326640E+02	.13789870E+04	.32897130E+04	.58086370E-02
N=366	LAYER= 1	.60200000E+01	.90392690E+02	.38632540E+02	.11011610E+02	.13779720E+04	.32910220E+04	.59188790E-02
N=367	LAYER= 1	.60300000E+01	.92034030E+02	.38383140E+02	.11111010E+02	.13769600E+04	.32922770E+04	.60288290E-02
N=368	LAYER= 1	.60400000E+01	.93717030E+02	.38127660E+02	.11445780E+02	.13759160E+04	.32935180E+04	.61421740E-02
N=369	LAYER= 1	.60500000E+01	.95459850E+02	.37863430E+02	.12412100E+02	.13748370E+04	.32947580E+04	.62593790E-02
N=370	LAYER= 1	.60600000E+01	.97433910E+02	.37564530E+02	.12275180E+02	.13736410E+04	.32961090E+04	.63893140E-02
N=371	LAYER= 1	.60700000E+01	.99136760E+02	.37307000E+02	.10973830E+02	.13725650E+04	.32972320E+04	.65060880E-02
N=372	LAYER= 1	.60800000E+01	.10072220E+03	.37067470E+02	.10871230E+02	.13716100E+04	.32982430E+04	.66098380E-02
N=373	LAYER= 1	.60900000E+01	.10239570E+03	.36814940E+02	.11538500E+02	.13705810E+04	.32992770E+04	.67216120E-02
N=374	LAYER= 1	.61000000E+01	.10418250E+03	.36545600E+02	.11762410E+02	.13694790E+04	.33003450E+04	.68413290E-02
N=375	LAYER= 1	.61100000E+01	.10592450E+03	.36283350E+02	.11250570E+02	.13684170E+04	.33013520E+04	.69565900E-02
N=376	LAYER= 1	.61200000E+01	.10755890E+03	.36037550E+02	.11209630E+02	.13673970E+04	.33022660E+04	.70674100E-02
N=377	LAYER= 1	.61300000E+01	.10928990E+03	.35777520E+02	.11182150E+02	.13663410E+04	.33032060E+04	.71820220E-02
N=378	LAYER= 1	.61400000E+01	.11091710E+03	.35533350E+02	.10680130E+02	.13653620E+04	.33040620E+04	.72884190E-02
N=379	LAYER= 1	.61500000E+01	.11249850E+03	.35296320E+02	.11500930E+02	.13643870E+04	.33048710E+04	.73942850E-02
N=380	LAYER= 1	.61600000E+01	.11437400E+03	.35015530E+02	.12570010E+02	.13632280E+04	.33058010E+04	.75201670E-02
N=381	LAYER= 1	.61700000E+01	.11627790E+03	.34730830E+02	.13358560E+02	.13620730E+04	.33067150E+04	.76456690E-02
N=382	LAYER= 1	.61800000E+01	.11839240E+03	.34415080E+02	.15578050E+02	.13607720E+04	.33076950E+04	.77869120E-02
N=383	LAYER= 1	.61900000E+01	.12096650E+03	.34031290E+02	.16616930E+02	.13592100E+04	.33088430E+04	.79565670E-02
N=384	LAYER= 1	.62000000E+01	.12339540E+03	.33669730E+02	.14757270E+02	.13577240E+04	.33098820E+04	.81180030E-02

N=385	LAYER= 1	.62100000E+01	.12541130E+03	.33370110E+02	.14175150E+02	.13564750E+04	.33107130E+04	.82536110E-02
N=386	LAYER= 1	.62200000E+01	.12766770E+03	.33035210E+02	.15003090E+02	.13551160E+04	.33116130E+04	.84011780E-02
N=387	LAYER= 1	.62300000E+01	.12993510E+03	.32699180E+02	.15184710E+02	.13537260E+04	.33124860E+04	.85521540E-02
N=388	LAYER= 1	.62400000E+01	.13224840E+03	.32356860E+02	.15489870E+02	.13523090E+04	.33133460E+04	.87059980E-02
N=389	LAYER= 1	.62500000E+01	.13461010E+03	.32007920E+02	.16011420E+02	.13508620E+04	.33141930E+04	.88631890E-02
N=390	LAYER= 1	.62600000E+01	.13708330E+03	.31643100E+02	.16334050E+02	.13493480E+04	.33150490E+04	.90275760E-02
N=391	LAYER= 1	.62700000E+01	.13954470E+03	.31280610E+02	.16048690E+02	.13478410E+04	.33158710E+04	.91912600E-02
N=392	LAYER= 1	.62800000E+01	.14193400E+03	.30929280E+02	.16001740E+02	.13464120E+04	.33166410E+04	.93465300E-02
N=393	LAYER= 1	.62900000E+01	.14438410E+03	.30569600E+02	.16501820E+02	.13449170E+04	.33174040E+04	.95088980E-02
N=394	LAYER= 1	.63000000E+01	.14692710E+03	.30196890E+02	.15682440E+02	.13433570E+04	.33181690E+04	.96782860E-02
N=395	LAYER= 1	.63100000E+01	.14913100E+03	.29874390E+02	.15298480E+02	.13420160E+04	.33188110E+04	.98239030E-02
N=396	LAYER= 1	.63200000E+01	.15156070E+03	.29519370E+02	.16812200E+02	.13405400E+04	.33194970E+04	.99842610E-02
N=397	LAYER= 1	.63300000E+01	.15422550E+03	.29130660E+02	.15758850E+02	.13389290E+04	.33202250E+04	.10159160E-01
N=398	LAYER= 1	.63400000E+01	.15633750E+03	.28823090E+02	.14138130E+02	.13376400E+04	.33207830E+04	.10299190E-01
N=399	LAYER= 1	.63500000E+01	.15851380E+03	.28506570E+02	.15641170E+02	.13363210E+04	.33213430E+04	.10442470E-01
N=400	LAYER= 1	.63600000E+01	.16108430E+03	.28133310E+02	.17197800E+02	.13347650E+04	.33219850E+04	.10611480E-01
N=401	LAYER= 1	.63700000E+01	.16373510E+03	.27749060E+02	.18473290E+02	.13331460E+04	.33226260E+04	.10787210E-01
N=402	LAYER= 1	.63800000E+01	.16669620E+03	.27320600E+02	.19875940E+02	.13313650E+04	.33233170E+04	.10980710E-01
N=403	LAYER= 1	.63900000E+01	.16977630E+03	.26875800E+02	.20303390E+02	.13294900E+04	.33240100E+04	.11184350E-01
N=404	LAYER= 1	.64000000E+01	.17287070E+03	.26429840E+02	.19537850E+02	.13276250E+04	.33246820E+04	.11386870E-01
N=405	LAYER= 1	.64100000E+01	.17572120E+03	.26019830E+02	.19010680E+02	.13259060E+04	.33252790E+04	.11573630E-01
N=406	LAYER= 1	.64200000E+01	.17865920E+03	.25598030E+02	.19306950E+02	.13241280E+04	.33258740E+04	.11766700E-01
N=407	LAYER= 1	.64300000E+01	.18160310E+03	.25176190E+02	.18860790E+02	.13223260E+04	.33264510E+04	.11962370E-01
N=408	LAYER= 1	.64400000E+01	.18440810E+03	.24775000E+02	.18105990E+02	.13206340E+04	.33269830E+04	.12146170E-01
N=409	LAYER= 1	.64500000E+01	.18712510E+03	.24387090E+02	.18200050E+02	.13190160E+04	.33274840E+04	.12321850E-01
N=410	LAYER= 1	.64600000E+01	.18996190E+03	.23982810E+02	.18274460E+02	.13173070E+04	.33279900E+04	.12507430E-01
N=411	LAYER= 1	.64700000E+01	.19270430E+03	.23592700E+02	.18301720E+02	.13156410E+04	.33284660E+04	.12688470E-01
N=412	LAYER= 1	.64800000E+01	.19555280E+03	.23188220E+02	.19705920E+02	.13139170E+04	.33289450E+04	.12875620E-01
N=413	LAYER= 1	.64900000E+01	.19872780E+03	.22738260E+02	.21648160E+02	.13120090E+04	.33294630E+04	.13082870E-01
N=414	LAYER= 1	.65000000E+01	.20217380E+03	.22250930E+02	.22460610E+02	.13099510E+04	.33300070E+04	.13306390E-01
N=415	LAYER= 1	.65100000E+01	.20560120E+03	.21767370E+02	.22845580E+02	.13078740E+04	.33305290E+04	.13531920E-01
N=416	LAYER= 1	.65200000E+01	.20916960E+03	.21264930E+02	.23415730E+02	.13057160E+04	.33310530E+04	.13766340E-01
N=417	LAYER= 1	.65300000E+01	.21277600E+03	.20758380E+02	.23718740E+02	.13035730E+04	.33315650E+04	.13999120E-01
N=418	LAYER= 1	.65400000E+01	.21644260E+03	.20244580E+02	.23779350E+02	.13013500E+04	.33320680E+04	.14240520E-01
N=419	LAYER= 1	.65500000E+01	.22007190E+03	.19737180E+02	.23940560E+02	.12991730E+04	.33325490E+04	.14476880E-01
N=420	LAYER= 1	.65600000E+01	.22379310E+03	.19218180E+02	.23996100E+02	.12969510E+04	.33330250E+04	.14718260E-01
N=421	LAYER= 1	.65700000E+01	.22744410E+03	.18710160E+02	.23795010E+02	.12947750E+04	.33334770E+04	.14954570E-01
N=422	LAYER= 1	.65800000E+01	.23110840E+03	.18201490E+02	.24109800E+02	.12925840E+04	.33339150E+04	.15192520E-01
N=423	LAYER= 1	.65900000E+01	.23486120E+03	.17681770E+02	.24074640E+02	.12903190E+04	.33343500E+04	.15438580E-01
N=424	LAYER= 1	.66000000E+01	.23851920E+03	.17176380E+02	.23534310E+02	.12881300E+04	.33347600E+04	.15676290E-01
N=425	LAYER= 1	.66100000E+01	.24211050E+03	.16681340E+02	.24010870E+02	.12859860E+04	.33351500E+04	.15909080E-01
N=426	LAYER= 1	.66200000E+01	.24592050E+03	.16157410E+02	.25045000E+02	.12837110E+04	.33355510E+04	.16156170E-01
N=427	LAYER= 1	.66300000E+01	.24983540E+03	.15620370E+02	.25181470E+02	.12813950E+04	.33359490E+04	.16407770E-01
N=428	LAYER= 1	.66400000E+01	.25369220E+03	.15092600E+02	.24887990E+02	.12790680E+04	.33363300E+04	.16660470E-01
N=429	LAYER= 1	.66500000E+01	.25752150E+03	.14569880E+02	.25446660E+02	.12767880E+04	.33366960E+04	.16908100E-01
N=430	LAYER= 1	.66600000E+01	.26155670E+03	.14020430E+02	.26179040E+02	.12743820E+04	.33370690E+04	.17169370E-01
N=431	LAYER= 1	.66700000E+01	.26561730E+03	.13468930E+02	.26683640E+02	.12719680E+04	.33374330E+04	.17431530E-01
N=432	LAYER= 1	.66800000E+01	.26981460E+03	.12900360E+02	.27111310E+02	.12694920E+04	.33377970E+04	.17700480E-01

N=433	LAYER= 1	.66900000E+01	.27401300E+03	.12333140E+02	.27312280E+02	.12669810E+04	.33381500E+04	.17973210E-01
N 434	LAYER= 1	.67000000E+01	.27827820E+03	.11758440E+02	.27638740E+02	.12644650E+04	.33384960E+04	.18246420E-01
N=435	LAYER= 1	.67100000E+01	.28258370E+03	.11179870E+02	.27800020E+02	.12618890E+04	.33388350E+04	.18526180E-01
N=436	LAYER= 1	.67200000E+01	.28690490E+03	.10600780E+02	.28417670E+02	.12593370E+04	.33391640E+04	.18803320E-01
N=437	LAYER= 1	.67300000E+01	.29140870E+03	.99988820E+01	.28720970E+02	.12566750E+04	.33394960E+04	.19092430E-01
N=438	LAYER= 1	.67400000E+01	.29582970E+03	.94097040E+01	.28611390E+02	.12540410E+04	.33398120E+04	.19378590E-01
N=439	LAYER= 1	.67500000E+01	.30030580E+03	.88148420E+01	.28978760E+02	.12514050E+04	.33401220E+04	.19664850E-01
N=440	LAYER= 1	.67600000E+01	.30484720E+03	.82130070E+01	.29122100E+02	.12487160E+04	.33404260E+04	.19956820E-01
N=441	LAYER= 1	.67700000E+01	.30937400E+03	.76148090E+01	.28759140E+02	.12460310E+04	.33407200E+04	.20248530E-01
N=442	LAYER= 1	.67800000E+01	.31380860E+03	.70304310E+01	.28320330E+02	.12434240E+04	.33409990E+04	.20531590E-01
N=443	LAYER= 1	.67900000E+01	.31820470E+03	.64527130E+01	.27765160E+02	.12408190E+04	.33412680E+04	.20814540E-01
N=444	LAYER= 1	.68000000E+01	.32247120E+03	.58935480E+01	.27059380E+02	.12383150E+04	.33415210E+04	.21086460E-01
N=445	LAYER= 1	.68100000E+01	.32665260E+03	.53469650E+01	.26518610E+02	.12358370E+04	.33417620E+04	.21355580E-01
N=446	LAYER= 1	.68200000E+01	.33075520E+03	.48120680E+01	.25830210E+02	.12334320E+04	.33419920E+04	.21616770E-01
N=447	LAYER= 1	.68299990E+01	.33472630E+03	.42956090E+01	.25143820E+02	.12310750E+04	.33422090E+04	.21872760E-01
N=448	LAYER= 1	.68400000E+01	.33861910E+03	.37905630E+01	.24150230E+02	.12287900E+04	.33424170E+04	.22121000E-01
N=449	LAYER= 1	.68500000E+01	.34228330E+03	.33162890E+01	.22490320E+02	.12266440E+04	.33426070E+04	.22354000E-01
N=450	LAYER= 1	.68600000E+01	.34565990E+03	.28801860E+01	.21041750E+02	.12246610E+04	.33427790E+04	.22569420E-01
N=451	LAYER= 1	.68700000E+01	.34887420E+03	.24658920E+01	.19431090E+02	.12227650E+04	.33429390E+04	.22775350E-01
N=452	LAYER= 1	.68800000E+01	.35174870E+03	.20960940E+01	.17639500E+02	.12210680E+04	.33430800E+04	.22959580E-01
N=453	LAYER= 1	.68900000E+01	.35440370E+03	.17551150E+01	.16035760E+02	.12195230E+04	.33432080E+04	.23127410E-01
N=454	LAYER= 1	.69000000E+01	.35677740E+03	.14507320E+01	.14270280E+02	.12181250E+04	.33433200E+04	.23279190E-01
N=455	LAYER= 1	.69100000E+01	.35888000E+03	.11814860E+01	.12690350E+02	.12168960E+04	.33434180E+04	.23412660E-01
N=456	LAYER= 1	.69200000E+01	.36075930E+03	.94112590E+00	.11138430E+02	.12157870E+04	.33435050E+04	.23533120E-01
N=457	LAYER= 1	.69300000E+01	.36237590E+03	.73459040E+00	.94594900E+01	.12148410E+04	.33435780E+04	.23635910E-01
N=458	LAYER= 1	.69400000E+01	.36372890E+03	.56188810E+00	.81421320E+01	.12140330E+04	.33436400E+04	.23723610E-01
N=459	LAYER= 1	.69500000E+01	.36493230E+03	.40839650E+00	.37948860E+01	.12133400E+04	.33436940E+04	.23798890E-01
N=460	LAYER= 1	.69600000E+01	.36492020E+03	.40994240E+00	-.11306130E-01	.12133400E+04	.33436930E+04	.23798890E-01
N=461	LAYER= 1	.69700000E+01	.36492880E+03	.40884920E+00	.86211630E-01	.12133400E+04	.33436930E+04	.23798890E-01
N=462	LAYER= 1	.69800000E+01	.36494730E+03	.40649040E+00	.58910600E-01	.12133180E+04	.33436940E+04	.23801320E-01
N=463	LAYER= 1	.69900000E+01	.36494730E+03	.40649040E+00	-.15728740E+00	.12133180E+04	.33436940E+04	.23801320E-01
N=463	LAYER= 1	.69900000E+01	.36494730E+03	.40649040E+00	-.15728740E+00	.12133180E+04	.33436940E+04	.23801320E-01

Pressure	Rate	Pressure	Rate	Pressure	Rate
4.000	.145	128.000	15.030	248.000	25.117
8.000	.628	132.000	15.457	252.000	25.017
12.000	1.390	136.000	16.193	256.000	25.225
16.000	2.129	140.000	16.040	260.000	25.897
20.000	2.967	144.000	16.423	264.000	26.483
24.000	3.543	148.000	15.496	268.000	26.926
28.000	3.841	152.000	16.639	272.000	27.216
32.000	4.131	156.000	14.397	276.000	27.464
36.000	4.793	160.000	16.541	280.000	27.703
40.000	5.164	164.000	18.599	284.000	28.002
44.000	5.558	168.000	20.057	288.000	28.491
48.000	6.919	172.000	19.753	292.000	28.706
52.000	6.419	176.000	19.039	296.000	28.625
56.000	6.171	180.000	19.104	300.000	28.954
60.000	7.748	184.000	18.216	304.000	29.095
64.000	8.309	188.000	18.223	308.000	28.869
68.000	8.470	192.000	18.295	312.000	28.499
72.000	6.756	196.000	19.979	316.000	28.044
76.000	9.022	200.000	21.948	320.000	27.468
80.000	10.947	204.000	22.666	324.000	26.862
84.000	11.795	208.000	23.229	328.000	26.293
88.000	11.591	212.000	23.654	332.000	25.615
92.000	11.109	216.000	23.772	336.000	24.819
96.000	12.375	220.000	23.937	340.000	23.525
100.000	10.918	224.000	23.985	344.000	21.754
104.000	11.740	228.000	23.843	348.000	19.870
108.000	11.203	232.000	24.101	352.000	17.488
112.000	11.242	236.000	23.906	356.000	14.848
116.000	13.243	240.000	23.731	360.000	11.765
120.000	16.227	244.000	24.524	364.000	7.163
124.000	14.583				

Table of Burn Rate Laws

RANGE PLOW MPa	PHIGH MPa	COEF CM/S-MPa^EXP	EXP	CORR-COEF
18.	37.	.308054E+00	.751852	.969462
37.	92.	.157450E+00	.944995	.944823
92.	276.	.221427E+00	.859388	.967566
30.	280.	.204503E+00	.876157	.990695
30.	300.	.206544E+00	.873784	.991358

INTENTIONALLY LEFT BLANK.

APPENDIX G

BRLCB RESULTS FOR TRACK 4

INTENTIONALLY LEFT BLANK.

BURNING RATE ANALYSIS
BRLCB V3.0
ADVANCED BALLISTIC CONCEPTS BRANCH - BRL

Project :	M5 BURN RATES	Requested by :	W. Oberle
Inf File:	a:m5t4.inf	Created From .MAS File :	a:m5.mas
P/T File:	a:m5t4.pvt	Calculation Output File:	a:m5t4.out
Smoothed:	a:m5t4.pdt	Graphics File :	a:m5t4.dat
Fired on:	23 Nov 92		

FIRING REMARKS:
Bill Aungst: Operator

REDUCTION REMARKS:
Reduced 12 Dec 92 by W. Oberle

IGNITER INFORMATION

The Igntier Used Is : Black Powder Lot: FFFG
The Source For The Igniter Is: Pellets, Milan Ord.

IGNITER THERMOCHEMICAL PROPERTIES:

Impetus (J/g) :	290.0	Molecular Weight:	66.37000
Flame Temperature (K):	2188.0	Covolume (g/cm^3) :	.78500
Density (g/cm^3) :	1.75000	Gamma :	1.21840

PROPELLANT INFORMATION

The Propellant Used Is : M5 Lot: RAD-64597 Of 1966
The Source For The Propellant Is : Radford Army Ammo Pl
Propellant Thermochemical Properties: Following Sheets of Output

PROPELLANT GRAIN GEOMETRY

Grain Type: 1-Perf. Cyl.

Length --- (cm.):	.574294
Outer Diam.(cm.):	.136906
Perf Diam. (cm.):	.040894
Inner Web (cm.):	.048006

Bomb Information		Gage Information	
Bomb Type :	Closed Chamber	Gage I.D. :	C14430
Bomb Vol (cm^3) :	209.0	Input Voltage :	11.5600
		Constants For Fit:	A+Bx+C^2
		A:	.20157E+01
		B:	.52474E-01
		C:	-.12544E-06

Temperature and Charge Mass Information

Propellant Mass (g) :	73.1632	Igniter Mass (g) :	1.5000
Initial Temp. Prop.(K) :	294.	Igniter Temp.(K) :	294.
Initial Bomb Temp. (K) :	294.		
Number of Propellant Grains:	5758.74		
Number of Wildpoint Passes :	1	Wildpoint Tolerance:	2.000
Number of Smoothing Passes :	1	Smoothing Option :	1
Bridge Length :	15		

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*****************************************************************************
  Total # Layers =  1
  Chamber Volume (cm3) =  209.000
  Heat-Loss-Fraction (n-d) =  .000
  Time Step (mil-sec) =  .10000000E-01      Max Time Steps =  1200
  Convergence Criterion =  .10000000E-04
  Computation Type (1=BURN-RATE, 2=PTGEN, 3=SURF AREA, 4=INTERR BOMB, 5=ETC) 1
*****************************************************************************
                     Beginning (1) of Layer          End (2) of Layer
*****************************************************************************
           Propellant Mass in grams
*****************************************************************************
          1                  73.16319
       Ignitor                1.50000
         Air                   .19722
*****************************************************************************
           Propellant Density in g/cm3
*****************************************************************************
          1                  1.65000                   1.65000
       Ignitor               1.75000
*****************************************************************************

           Propellant Impetus in J/g
*****************************************************************************
          1                1093.00000                1093.00000
       Ignitor              290.00000
*****************************************************************************
           Propellant Flame Temperature in deg K
*****************************************************************************
          1                3379.00000                3379.00000
       Ignitor             2188.00000
*****************************************************************************
           Propellant Molecular Weight in g/g-mol
*****************************************************************************
          1                 25.70266                  25.70266
       Ignitor              66.37000
         Air                28.90000
*****************************************************************************
           Propellant Gas Constant in cal/g-deg K
*****************************************************************************
          1                   .07731                    .07731
       Ignitor                .02994
         Air                  .06876
*****************************************************************************
           Gamma (Ratio of Specific Heats)
*****************************************************************************
          1                  1.22580                   1.22580
       Ignitor               1.21840
         Air                 1.40000
*****************************************************************************
           Specific Heat (Cv) in cal/g-deg K
*****************************************************************************
          1                   .34240                    .34240
       Ignitor                .13709
         Air                  .17190
*****************************************************************************
           Covolume in cm3/g
*****************************************************************************
          1                   .98400                    .98400
       Ignitor                .78500
         Air                  .98000
*****************************************************************************
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  ******* Maximum Chamber Properties are  *******
  Theoretical Maximum Chamber Pressure (MPa) =  .59318230E+03
  Theoretical Maximum Chamber Temperature (deg K) =  .33647870E+04
  **** Assuming a Heat-Loss-Fraction =  .001
  Maximum Total Heat Loss from Chamber (cal) =  .11461100E+03
  Maximum Chamber Pressure (MPa) w/Heat Loss =  .59238330E+03
  Maximum Chamber Temperature (deg K) w/Heat Loss =  .33602550E+04



   ** Results: Deduced Burning Rates Based on a given Chamber Pressure vs. Time **

   *** N *** LAYER *** TIME(ms) *** PCH(MPa) *** TPMR(gm) *** RBR(cm/s) *** ASUR(cm2) *** TCH(degK) ***
DEPTHB(cm) ***

   N = 1 LAYER = 1 .00000000E+00   .28108220E+01   .73163190E+02   .00000000E+00   .20017450E+04
.18760690E+04   .00000000E+00
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*** DEDUCED BURNING RATES ***

N= 3	LAYER= 1	.13300000E+01	.28246750E+01	.73161180E+02	-.30588620E-01	.20017450E+04	.18803730E+04	.00000000E+00
N= 4	LAYER= 1	.13400000E+01	.28122590E+01	.73162700E+02	-.76335440E-01	.20017450E+04	.18771440E+04	.00000000E+00
N= 5	LAYER= 1	.13500000E+01	.27934520E+01	.73166220E+02	-.76267750E-01	.20017450E+04	.18695530E+04	.00000000E+00
N= 6	LAYER= 1	.13600000E+01	.27801250E+01	.73167730E+02	.22941460E-01	.20017450E+04	.18662870E+04	.00000000E+00
N= 7	LAYER= 1	.13700000E+01	.27983820E+01	.73164710E+02	.91562380E-01	.20017450E+04	.18728300E+04	.00000000E+00
N= 8	LAYER= 1	.13800000E+01	.28202920E+01	.73161680E+02	.10672070E+00	.20017450E+04	.18792960E+04	.00000000E+00
N= 9	LAYER= 1	.13900000E+01	.28458540E+01	.73157660E+02	.53462140E-01	.20017450E+04	.18878450E+04	.00000000E+00
N= 10	LAYER= 1	.14000000E+01	.28471310E+01	.73158160E+02	.23009020E-01	.20017450E+04	.18867920E+04	.00000000E+00
N= 11	LAYER= 1	.14100000E+01	.28644770E+01	.73156140E+02	.76335820E-01	.20017450E+04	.18910420E+04	.00000000E+00
N= 12	LAYER= 1	.14200000E+01	.28836480E+01	.73153110E+02	.38032560E-01	.20017450E+04	.18973720E+04	.00000000E+00
N= 13	LAYER= 1	.14300000E+01	.28767100E+01	.73153630E+02	.75794040E-02	.20017450E+04	.18963020E+04	.00000000E+00
N= 14	LAYER= 1	.14400000E+01	.28840140E+01	.73152610E+02	.23076690E-01	.20017450E+04	.18984090E+04	.00000000E+00
N= 15	LAYER= 1	.14500000E+01	.28913180E+01	.73152100E+02	.37964880E-01	.20017450E+04	.18994660E+04	.00000000E+00
N= 16	LAYER= 1	.14600000E+01	.28986220E+01	.73150100E+02	-.45950140E-01	.20017450E+04	.19036160E+04	.00000000E+00
N= 17	LAYER= 1	.14700000E+01	.28637500E+01	.73155140E+02	-.68621020E-01	.20017450E+04	.18931420E+04	.00000000E+00
N= 18	LAYER= 1	.14800000E+01	.28674010E+01	.73154630E+02	-.30453120E-01	.20017450E+04	.18941920E+04	.00000000E+00
N= 19	LAYER= 1	.14900000E+01	.28531610E+01	.73157150E+02	-.22806000E-01	.20017450E+04	.18889170E+04	.00000000E+00
N= 20	LAYER= 1	.15000000E+01	.28613770E+01	.73156140E+02	.53394470E-01	.20017450E+04	.18910350E+04	.00000000E+00
N= 21	LAYER= 1	.15100000E+01	.28778080E+01	.73153620E+02	.91561910E-01	.20017450E+04	.18963110E+04	.00000000E+00
N= 22	LAYER= 1	.15200000E+01	.29024540E+01	.73150090E+02	.68621020E-01	.20017450E+04	.19036310E+04	.00000000E+00
N= 23	LAYER= 1	.15300000E+01	.29073830E+01	.73149090E+02	.38168100E-01	.20017450E+04	.19057000E+04	.00000000E+00
N= 24	LAYER= 1	.15400000E+01	.29187030E+01	.73147580E+02	.61041270E-01	.20017450E+04	.19088180E+04	.00000000E+00
N= 25	LAYER= 1	.15500000E+01	.29345860E+01	.73145060E+02	.10692370E+00	.20017450E+04	.19139590E+04	.00000000E+00
N= 26	LAYER= 1	.15600000E+01	.29674480E+01	.73140510E+02	.84186370E-01	.20017450E+04	.19231500E+04	.00000000E+00
N= 27	LAYER= 1	.15700000E+01	.29751160E+01	.73139500E+02	.30723810E-01	.20017450E+04	.19251890E+04	.00000000E+00
N= 28	LAYER= 1	.15800000E+01	.29836960E+01	.73138480E+02	.38100040E-01	.20017450E+04	.19272220E+04	.00000000E+00
N= 29	LAYER= 1	.15900000E+01	.29913640E+01	.73136980E+02	.37829540E-01	.20017450E+04	.19302170E+04	.00000000E+00
N= 30	LAYER= 1	.16000000E+01	.29962940E+01	.73135980E+02	.77824630E-02	.20017450E+04	.19322040E+04	.00000000E+00
N= 31	LAYER= 1	.16100000E+01	.29966590E+01	.73136470E+02	.45950370E-01	.20017450E+04	.19312390E+04	.00000000E+00
N= 32	LAYER= 1	.16200000E+01	.30185670E+01	.73132940E+02	.30182580E-01	.20017450E+04	.19382030E+04	.00000000E+00
N= 33	LAYER= 1	.16300000E+01	.30056030E+01	.73134470E+02	.38506080E-01	.20017450E+04	.19351940E+04	.00000000E+00
N= 34	LAYER= 1	.16400000E+01	.30384660E+01	.73130400E+02	.77012160E-01	.20017450E+04	.19431890E+04	.00000000E+00
N= 35	LAYER= 1	.16500000E+01	.30470480E+01	.73129380E+02	.45679900E-01	.20017450E+04	.19451810E+04	.00000000E+00
N= 36	LAYER= 1	.16600000E+01	.30574530E+01	.73127390E+02	.45882460E-01	.20017450E+04	.19490670E+04	.00000000E+00
N= 37	LAYER= 1	.16700000E+01	.30678620E+01	.73126350E+02	.45611770E-01	.20017450E+04	.19510650E+04	.00000000E+00
N= 38	LAYER= 1	.16800000E+01	.30764420E+01	.73124370E+02	.91833530E-01	.20017450E+04	.19548870E+04	.00000000E+00
N= 39	LAYER= 1	.16900000E+01	.31093070E+01	.73120290E+02	.99750880E-01	.20017450E+04	.19627000E+04	.00000000E+00
N= 40	LAYER= 1	.17000000E+01	.31242770E+01	.73117780E+02	.30114600E-01	.20017450E+04	.19674470E+04	.00000000E+00
N= 41	LAYER= 1	.17100000E+01	.31195320E+01	.73118290E+02	.46356640E-01	.20017450E+04	.19664750E+04	.00000000E+00
N= 42	LAYER= 1	.17200000E+01	.31478330E+01	.73114720E+02	.99819050E-01	.20017450E+04	.19732060E+04	.00000000E+00
N= 43	LAYER= 1	.17300000E+01	.31670040E+01	.73111700E+02	.61447310E-01	.20017450E+04	.19788390E+04	.00000000E+00
N= 44	LAYER= 1	.17400000E+01	.31770460E+01	.73110660E+02	-.14820440E-01	.20017450E+04	.19807720E+04	.00000000E+00
N= 45	LAYER= 1	.17500000E+01	.31637170E+01	.73112680E+02	-.46423850E-01	.20017450E+04	.19770190E+04	.00000000E+00
N= 46	LAYER= 1	.17600000E+01	.31531270E+01	.73113720E+02	-.45882930E-01	.20017450E+04	.19750680E+04	.00000000E+00
N= 47	LAYER= 1	.17700000E+01	.31434500E+01	.73115720E+02	.46085490E-01	.20017450E+04	.19713460E+04	.00000000E+00
N= 48	LAYER= 1	.17800000E+01	.31750380E+01	.73110680E+02	.53326520E-01	.20017450E+04	.19807330E+04	.00000000E+00

N= 49	LAYER= 1	.17900000E+01	.31653610E+01	.73112190E+02	-.38709490E-01	.20017450E+04	.19779300E+04	.00000000E+00
N= 50	LAYER= 1	.18000000E+01	.31547710E+01	.73113240E+02	.38370740E-01	.20017450E+04	.19759810E+04	.00000000E+00
N= 51	LAYER= 1	.18100000E+01	.31836190E+01	.73109660E+02	.30723660E-01	.20017450E+04	.19826370E+04	.00000000E+00
N= 52	LAYER= 1	.18200000E+01	.31693770E+01	.73111210E+02	-.54139150E-03	.20017450E+04	.19797560E+04	.00000000E+00
N= 53	LAYER= 1	.18300000E+01	.31803330E+01	.73109690E+02	.81208720E-03	.20017450E+04	.19825750E+04	.00000000E+00
N= 54	LAYER= 1	.18400000E+01	.31743070E+01	.73111160E+02	.16106230E-01	.20017450E+04	.19798490E+04	.00000000E+00
N= 55	LAYER= 1	.18500000E+01	.31916530E+01	.73108630E+02	.99344340E-01	.20017450E+04	.19845290E+04	.00000000E+00
N= 56	LAYER= 1	.18600000E+01	.32181280E+01	.73104590E+02	.83576460E-01	.20017450E+04	.19919280E+04	.00000000E+00
N= 57	LAYER= 1	.18700000E+01	.32257960E+01	.73103100E+02	.22670770E-01	.20017450E+04	.19946380E+04	.00000000E+00
N= 58	LAYER= 1	.18800000E+01	.32270750E+01	.73103100E+02	-.80531980E-02	.20017450E+04	.19946610E+04	.00000000E+00
N= 59	LAYER= 1	.18900000E+01	.32201360E+01	.73103640E+02	.21858460E-01	.20017450E+04	.19936720E+04	.00000000E+00
N= 60	LAYER= 1	.19000000E+01	.32310910E+01	.73101650E+02	.53800240E-01	.20017450E+04	.19972830E+04	.00000000E+00
N= 61	LAYER= 1	.19100000E+01	.32456980E+01	.73100080E+02	.24497960E-01	.20017450E+04	.20001080E+04	.00000000E+00
N= 62	LAYER= 1	.19200000E+01	.32497150E+01	.73100040E+02	-.14888270E-01	.20017450E+04	.20002000E+04	.00000000E+00
N= 63	LAYER= 1	.19300000E+01	.32413160E+01	.73101070E+02	.60499890E-01	.20017450E+04	.19983350E+04	.00000000E+00
N= 64	LAYER= 1	.19400000E+01	.32732680E+01	.73096040E+02	.13791810E+00	.20017450E+04	.20073660E+04	.00000000E+00
N= 65	LAYER= 1	.19500000E+01	.33033950E+01	.73091960E+02	.38100040E-01	.20017450E+04	.20146070E+04	.00000000E+00
N= 66	LAYER= 1	.19600000E+01	.32895190E+01	.73093520E+02	-.15023460E-01	.20017450E+04	.20118400E+04	.00000000E+00
N= 67	LAYER= 1	.19700000E+01	.32981000E+01	.73092950E+02	.46492000E-01	.20017450E+04	.20128560E+04	.00000000E+00
N= 68	LAYER= 1	.19800000E+01	.33130720E+01	.73090450E+02	.45882930E-01	.20017450E+04	.20172650E+04	.00000000E+00
N= 69	LAYER= 1	.19900000E+01	.33183680E+01	.73089920E+02	.11540070E+00	.20014360E+04	.20181990E+04	.24003000E-04
N= 70	LAYER= 1	.20000000E+01	.33667510E+01	.73082820E+02	.12954840E+00	.20014280E+04	.20306550E+04	.24603250E-04
N= 71	LAYER= 1	.20100000E+01	.33738730E+01	.73081360E+02	.60713240E-01	.20014240E+04	.20331860E+04	.24904100E-04
N= 72	LAYER= 1	.20200000E+01	.33919480E+01	.73078820E+02	.11641610E+00	.20014130E+04	.20375370E+04	.25804220E-04
N= 73	LAYER= 1	.20300000E+01	.34315640E+01	.73073670E+02	.15384830E+00	.20013930E+04	.20462570E+04	.27304070E-04
N= 74	LAYER= 1	.20400000E+01	.34629650E+01	.73068660E+02	.12217410E+00	.20013740E+04	.20546510E+04	.28803880E-04
N= 75	LAYER= 1	.20500000E+01	.34843250E+01	.73065610E+02	.68972220E-01	.20013620E+04	.20597070E+04	.29703930E-04
N= 76	LAYER= 1	.20600000E+01	.34938180E+01	.73064100E+02	.83051940E-01	.20013580E+04	.20621860E+04	.30004740E-04
N= 77	LAYER= 1	.20700000E+01	.35175520E+01	.73060120E+02	.63017190E-01	.20013390E+04	.20687000E+04	.31504470E-04
N= 78	LAYER= 1	.20800000E+01	.35270490E+01	.73059940E+02	.31609810E-01	.20013390E+04	.20689860E+04	.31505430E-04
N= 79	LAYER= 1	.20900000E+01	.35347160E+01	.73058030E+02	-.31407180E-01	.20013320E+04	.20720890E+04	.32105590E-04
N= 80	LAYER= 1	.21000000E+01	.35108000E+01	.73062010E+02	-.61256920E-01	.20013320E+04	.20656010E+04	.32107030E-04
N= 81	LAYER= 1	.21100000E+01	.35075140E+01	.73062080E+02	-.54149220E-03	.20013320E+04	.20655030E+04	.32107990E-04
N= 82	LAYER= 1	.21200000E+01	.35087930E+01	.73062050E+02	.81902360E-02	.20013310E+04	.20655450E+04	.32108950E-04
N= 83	LAYER= 1	.21300000E+01	.35128110E+01	.73061540E+02	.84068370E-01	.20013310E+04	.20663860E+04	.32109910E-04
N= 84	LAYER= 1	.21400000E+01	.35456730E+01	.73056500E+02	.47178090E-01	.20013280E+04	.20745630E+04	.32410710E-04
N= 85	LAYER= 1	.21500000E+01	.35372730E+01	.73058420E+02	.46569370E-01	.20013280E+04	.20714500E+04	.32412150E-04
N= 86	LAYER= 1	.21600000E+01	.35683080E+01	.73053420E+02	.16800270E+00	.20013160E+04	.20795090E+04	.33312620E-04
N= 87	LAYER= 1	.21700000E+01	.36102960E+01	.73047330E+02	.15297610E+00	.20012930E+04	.20891950E+04	.35112550E-04
N= 88	LAYER= 1	.21800000E+01	.36353070E+01	.73043320E+02	.69246600E-01	.20012770E+04	.20954790E+04	.36312780E-04
N= 89	LAYER= 1	.21900000E+01	.36415120E+01	.73042760E+02	.62883250E-01	.20012740E+04	.20963620E+04	.36613070E-04
N= 90	LAYER= 1	.22000000E+01	.36674370E+01	.73039170E+02	.85761990E-01	.20012580E+04	.21019330E+04	.37812780E-04
N= 91	LAYER= 1	.22100000E+01	.36833200E+01	.73037090E+02	.52392560E-01	.20012500E+04	.21051330E+04	.38412860E-04
N= 92	LAYER= 1	.22200000E+01	.36873370E+01	.73035710E+02	.22270270E-01	.20012460E+04	.21072590E+04	.38713620E-04
N= 93	LAYER= 1	.22300000E+01	.36913530E+01	.73035610E+02	-.22270040E-01	.20012460E+04	.21073970E+04	.38714580E-04
N= 94	LAYER= 1	.22400000E+01	.36793040E+01	.73037180E+02	-.54152620E-03	.20012460E+04	.21050010E+04	.38716020E-04
N= 95	LAYER= 1	.22500000E+01	.36897110E+01	.73035650E+02	.30460850E-01	.20012460E+04	.21073380E+04	.38717460E-04
N= 96	LAYER= 1	.22600000E+01	.36922690E+01	.73035160E+02	.77233770E-01	.20012430E+04	.21080870E+04	.39017730E-04

N= 97	LAYER= 1	.22700000E+01	.37254960E+01	.73030560E+02	.14018750E+00	.20012270E+04	.21151100E+04	.40217870E-04
N= 98	LAYER= 1	.22800000E+01	.37596370E+01	.73025910E+02	.15311950E+00	.20012080E+04	.21221010E+04	.41717270E-04
N= 99	LAYER= 1	.22900000E+01	.37928640E+01	.73020440E+02	.14540280E+00	.20011850E+04	.21302390E+04	.43516400E-04
N=100	LAYER= 1	.23000000E+01	.38233530E+01	.73016300E+02	.86241380E-01	.20011690E+04	.21363170E+04	.44715940E-04
N=101	LAYER= 1	.23100000E+01	.38350400E+01	.73014750E+02	.62007270E-01	.20011650E+04	.21385970E+04	.45016660E-04
N=102	LAYER= 1	.23200000E+01	.38522010E+01	.73012210E+02	.83871920E-01	.20011540E+04	.21422800E+04	.45916400E-04
N=103	LAYER= 1	.23300000E+01	.38711890E+01	.73009210E+02	.11467420E+00	.20011420E+04	.21466210E+04	.46816130E-04
N=104	LAYER= 1	.23400000E+01	.39020420E+01	.73004640E+02	.15420880E+00	.20011270E+04	.21531570E+04	.48016070E-04
N=105	LAYER= 1	.23500000E+01	.39411100E+01	.72999020E+02	.11663720E+00	.20011040E+04	.21611040E+04	.49815450E-04
N=106	LAYER= 1	.23600000E+01	.39568090E+01	.72996930E+02	.62821130E-01	.20010960E+04	.21640310E+04	.50415870E-04
N=107	LAYER= 1	.23700000E+01	.39715940E+01	.72994870E+02	.10899080E+00	.20010880E+04	.21669030E+04	.51016270E-04
N=108	LAYER= 1	.23800000E+01	.40079220E+01	.72989740E+02	.16341870E+00	.20010650E+04	.21740120E+04	.52815060E-04
N=109	LAYER= 1	.23900000E+01	.40479030E+01	.72984090E+02	.17743350E+00	.20010460E+04	.21817420E+04	.54314070E-04
N=110	LAYER= 1	.24000000E+01	.40878840E+01	.72978020E+02	.23152840E+00	.20010230E+04	.21899190E+04	.56113210E-04
N=111	LAYER= 1	.24100000E+01	.41521440E+01	.72968800E+02	.25184570E+00	.20009610E+04	.22021520E+04	.60909160E-04
N=112	LAYER= 1	.24200000E+01	.41966900E+01	.72961400E+02	.15259400E+00	.20009570E+04	.22117860E+04	.61209780E-04
N=113	LAYER= 1	.24300000E+01	.42178670E+01	.72958720E+02	.86520950E-01	.20009450E+04	.22152240E+04	.62109220E-04
N=114	LAYER= 1	.24400000E+01	.42381320E+01	.72955680E+02	.70883320E-01	.20009340E+04	.22191110E+04	.63008640E-04
N=115	LAYER= 1	.24500000E+01	.42520090E+01	.72954040E+02	.68513330E-01	.20009260E+04	.22212010E+04	.63608420E-04
N=116	LAYER= 1	.24600000E+01	.42677120E+01	.72951160E+02	.12951370E+00	.20009190E+04	.22248520E+04	.64208650E-04
N=117	LAYER= 1	.24700000E+01	.43076920E+01	.72945490E+02	.16201250E+00	.20008950E+04	.22319600E+04	.66007430E-04
N=118	LAYER= 1	.24800000E+01	.43403700E+01	.72940460E+02	.15368500E+00	.20008760E+04	.22381930E+04	.67506510E-04
N=119	LAYER= 1	.24900000E+01	.43757890E+01	.72935340E+02	.15470350E+00	.20008570E+04	.22444690E+04	.69005550E-04
N=120	LAYER= 1	.25000000E+01	.44102900E+01	.72930240E+02	.13439390E+00	.20008340E+04	.22506450E+04	.70803670E-04
N=121	LAYER= 1	.25100000E+01	.44402310E+01	.72926470E+02	.10947700E+00	.20008220E+04	.22551780E+04	.71703410E-04
N=122	LAYER= 1	.25200000E+01	.44614080E+01	.72923010E+02	.12396780E+00	.20008070E+04	.22592950E+04	.72902730E-04
N=123	LAYER= 1	.25300000E+01	.44962760E+01	.72918280E+02	.16533880E+00	.20007870E+04	.22648840E+04	.74401110E-04
N=124	LAYER= 1	.25400000E+01	.45393590E+01	.72912090E+02	.16337560E+00	.20007640E+04	.22721050E+04	.76199500E-04
N=125	LAYER= 1	.25500000E+01	.45709410E+01	.72907490E+02	.19878990E+00	.20007450E+04	.22774220E+04	.77697780E-04
N=126	LAYER= 1	.25600000E+01	.46258870E+01	.72898970E+02	.21829650E+00	.20006830E+04	.22871290E+04	.82491570E-04
N=127	LAYER= 1	.25700000E+01	.46707930E+01	.72893080E+02	.19412220E+00	.20006830E+04	.22937370E+04	.82493010E-04
N=128	LAYER= 1	.25800000E+01	.47138760E+01	.72886150E+02	.21376200E+00	.20006640E+04	.23014070E+04	.83991090E-04
N=129	LAYER= 1	.25900000E+01	.47633480E+01	.72878970E+02	.18173870E+00	.20006020E+04	.23092500E+04	.88784250E-04
N=130	LAYER= 1	.26000000E+01	.47994910E+01	.72874160E+02	.23990080E+00	.20006020E+04	.23144340E+04	.88785690E-04
N=131	LAYER= 1	.26100000E+01	.48708670E+01	.72863130E+02	.29862170E+00	.20005410E+04	.23261390E+04	.93578380E-04
N=132	LAYER= 1	.26200000E+01	.49298300E+01	.72854450E+02	.22278130E+00	.20005410E+04	.23351760E+04	.93579820E-04
N=133	LAYER= 1	.26300000E+01	.49690770E+01	.72848420E+02	.23327740E+00	.20005170E+04	.23413510E+04	.95377490E-04
N=134	LAYER= 1	.26400000E+01	.50353400E+01	.72839040E+02	.23660510E+00	.20004560E+04	.23508180E+04	.10016950E-03
N=135	LAYER= 1	.26500000E+01	.50791500E+01	.72832800E+02	.19164060E+00	.20004560E+04	.23570280E+04	.10017090E-03
N=136	LAYER= 1	.26600000E+01	.51193110E+01	.72826390E+02	.24656040E+00	.20004280E+04	.23633270E+04	.10226730E-03
N=137	LAYER= 1	.26700000E+01	.51883130E+01	.72816530E+02	.32512630E+00	.20003670E+04	.23728660E+04	.10705860E-03
N=138	LAYER= 1	.26800000E+01	.52646170E+01	.72804930E+02	.30467460E+00	.20003480E+04	.23838540E+04	.10855640E-03
N=139	LAYER= 1	.26900000E+01	.53266820E+01	.72796410E+02	.33908360E+00	.20002860E+04	.23917690E+04	.11334710E-03
N=140	LAYER= 1	.27000000E+01	.54212370E+01	.72782550E+02	.35041100E+00	.20002250E+04	.24043930E+04	.11813730E-03
N=141	LAYER= 1	.27100000E+01	.54845820E+01	.72773280E+02	.28559780E+00	.20002250E+04	.24126450E+04	.11813880E-03
N=142	LAYER= 1	.27200000E+01	.55479230E+01	.72763690E+02	.29291830E+00	.20001630E+04	.24210440E+04	.12292850E-03
N=143	LAYER= 1	.27300000E+01	.56140000E+01	.72753950E+02	.33118980E+00	.20001470E+04	.24294270E+04	.12412660E-03
N=144	LAYER= 1	.27400000E+01	.56997900E+01	.72741840E+02	.37366680E+00	.20000860E+04	.24396460E+04	.12891570E-03

N=145	LAYER= 1	.27500000E+01	.57819280E+01	.72729290E+02	.34488860E+00	.20000240E+04	.24500060E+04	.13370440E-03
N=146	LAYER= 1	.27600000E+01	.58507410E+01	.72719070E+02	.31739150E+00	.20000130E+04	.24582680E+04	.13460250E-03
N=147	LAYER= 1	.27700000E+01	.59232040E+01	.72708340E+02	.33582480E+00	.19999510E+04	.24667950E+04	.13939060E-03
N=148	LAYER= 1	.27800000E+01	.60020580E+01	.72696910E+02	.33711640E+00	.19999240E+04	.24757000E+04	.14148520E-03
N=149	LAYER= 1	.27900000E+01	.60758010E+01	.72686090E+02	.35081320E+00	.19998620E+04	.24839670E+04	.14627260E-03
N=150	LAYER= 1	.28000000E+01	.61595820E+01	.72673760E+02	.42459250E+00	.19998010E+04	.24932130E+04	.15105950E-03
N=151	LAYER= 1	.28100000E+01	.62685500E+01	.72658070E+02	.45312020E+00	.19997400E+04	.25046960E+04	.15584600E-03
N=152	LAYER= 1	.28200000E+01	.63632820E+01	.72643850E+02	.40462570E+00	.19997200E+04	.25148490E+04	.15734230E-03
N=153	LAYER= 1	.28300000E+01	.64446880E+01	.72631370E+02	.42326780E+00	.19996590E+04	.25235730E+04	.16212810E-03
N=154	LAYER= 1	.28400000E+01	.65540180E+01	.72615920E+02	.45064150E+00	.19995970E+04	.25341170E+04	.16691340E-03
N=155	LAYER= 1	.28500000E+01	.66500240E+01	.72601630E+02	.45994130E+00	.19995350E+04	.25436510E+04	.17169830E-03
N=156	LAYER= 1	.28600000E+01	.67597190E+01	.72585570E+02	.49363220E+00	.19994740E+04	.25541040E+04	.17648270E-03
N=157	LAYER= 1	.28700000E+01	.68679520E+01	.72569060E+02	.56925390E+00	.19994120E+04	.25645870E+04	.18126660E-03
N=158	LAYER= 1	.28800000E+01	.70141460E+01	.72548010E+02	.60600160E+00	.19993470E+04	.25775600E+04	.18634840E-03
N=159	LAYER= 1	.28900000E+01	.71415370E+01	.72529080E+02	.55391810E+00	.19992740E+04	.25888850E+04	.19202690E-03
N=160	LAYER= 1	.29000000E+01	.72616250E+01	.72511470E+02	.51043030E+00	.19992040E+04	.25991300E+04	.19740590E-03
N=161	LAYER= 1	.29100000E+01	.73711320E+01	.72495400E+02	.51701980E+00	.19991390E+04	.26082480E+04	.20248600E-03
N=162	LAYER= 1	.29200000E+01	.74934120E+01	.72477360E+02	.57186450E+00	.19990700E+04	.26182370E+04	.20786430E-03
N=163	LAYER= 1	.29300000E+01	.76239030E+01	.72457680E+02	.62792340E+00	.19989930E+04	.26288400E+04	.21383940E-03
N=164	LAYER= 1	.29400000E+01	.77717310E+01	.72435940E+02	.65369580E+00	.19989080E+04	.26402100E+04	.22041120E-03
N=165	LAYER= 1	.29500000E+01	.79180970E+01	.72414560E+02	.63184600E+00	.19988240E+04	.26510610E+04	.22698200E-03
N=166	LAYER= 1	.29600000E+01	.80566140E+01	.72394260E+02	.64420540E+00	.19987470E+04	.26610680E+04	.23295470E-03
N=167	LAYER= 1	.29700000E+01	.82069860E+01	.72372060E+02	.71566500E+00	.19986590E+04	.26717010E+04	.23982190E-03
N=168	LAYER= 1	.29800000E+01	.83747000E+01	.72347060E+02	.71327620E+00	.19985360E+04	.26833070E+04	.24937510E-03
N=169	LAYER= 1	.29900000E+01	.85230620E+01	.72325030E+02	.75485010E+00	.19984740E+04	.26932210E+04	.25415170E-03
N=170	LAYER= 1	.30000000E+01	.87102910E+01	.72297280E+02	.80355260E+00	.19983520E+04	.27053090E+04	.26370310E-03
N=171	LAYER= 1	.30100000E+01	.88836530E+01	.72272030E+02	.86650320E+00	.19982710E+04	.27159380E+04	.26960960E-03
N=172	LAYER= 1	.30200000E+01	.90989800E+01	.72240140E+02	.99897220E+00	.19981440E+04	.27288970E+04	.27981560E-03
N=173	LAYER= 1	.30300000E+01	.93283500E+01	.72206160E+02	.96838180E+00	.19980140E+04	.27421510E+04	.28995780E-03
N=174	LAYER= 1	.30400000E+01	.95277960E+01	.72176280E+02	.96913110E+00	.19978870E+04	.27533660E+04	.29979970E-03
N=175	LAYER= 1	.30500000E+01	.97600740E+01	.72142270E+02	.11572940E+01	.19977600E+04	.27656600E+04	.30963950E-03
N=176	LAYER= 1	.30600000E+01	.10045810E+02	.72099990E+02	.12620950E+01	.19975760E+04	.27802780E+04	.32394940E-03
N=177	LAYER= 1	.30700000E+01	.10323150E+02	.72059070E+02	.12679590E+01	.19974380E+04	.27937740E+04	.33467800E-03
N=178	LAYER= 1	.30800000E+01	.10610880E+02	.72016410E+02	.12870680E+01	.19972540E+04	.28072060E+04	.34898040E-03
N=179	LAYER= 1	.30900000E+01	.10897510E+02	.71974240E+02	.13742290E+01	.19971080E+04	.28198890E+04	.36029910E-03
N=180	LAYER= 1	.31000000E+01	.11224270E+02	.71925840E+02	.14618160E+01	.19969170E+04	.28337640E+04	.37518820E-03
N=181	LAYER= 1	.31100000E+01	.11548110E+02	.71877910E+02	.14957550E+01	.19967290E+04	.28468390E+04	.38977550E-03
N=182	LAYER= 1	.31200000E+01	.11892360E+02	.71827290E+02	.15101340E+01	.19965340E+04	.28599780E+04	.40495340E-03
N=183	LAYER= 1	.31300000E+01	.12222200E+02	.71778410E+02	.16137760E+01	.19963430E+04	.28720590E+04	.41982850E-03
N=184	LAYER= 1	.31400000E+01	.12609490E+02	.71720970E+02	.17199830E+01	.19960940E+04	.28855520E+04	.43915890E-03
N=185	LAYER= 1	.31500000E+01	.12985990E+02	.71665120E+02	.18454210E+01	.19959030E+04	.28979960E+04	.45402380E-03
N=186	LAYER= 1	.31600000E+01	.13432340E+02	.71599430E+02	.20275330E+01	.19956430E+04	.29118460E+04	.47423280E-03
N=187	LAYER= 1	.31700000E+01	.13890350E+02	.71531590E+02	.20404080E+01	.19953790E+04	.29253280E+04	.49473080E-03
N=188	LAYER= 1	.31800000E+01	.14340320E+02	.71465070E+02	.21624610E+01	.19951190E+04	.29378090E+04	.51492250E-03
N=189	LAYER= 1	.31900000E+01	.14855020E+02	.71389210E+02	.23671790E+01	.19948100E+04	.29512200E+04	.53896530E-03
N=190	LAYER= 1	.32000000E+01	.15395040E+02	.71309240E+02	.24180060E+01	.19945040E+04	.29644990E+04	.56269990E-03
N=191	LAYER= 1	.32100000E+01	.15931570E+02	.71230060E+02	.24777210E+01	.19941990E+04	.29768480E+04	.58642250E-03
N=192	LAYER= 1	.32200000E+01	.16500350E+02	.71146190E+02	.25738150E+01	.19938710E+04	.29891480E+04	.61191000E-03

N=193	LAYER= 1	.32300000E+01	.17078950E+02	.71060710E+02	.26881100E+01	.19935050E+04	.30009230E+04	.64034450E-03
N=194	LAYER= 1	.32400000E+01	.17697090E+02	.70969350E+02	.27677030E+01	.19931780E+04	.30127400E+04	.66580330E-03
N=195	LAYER= 1	.32500000E+01	.18312630E+02	.70878670E+02	.28060340E+01	.19928120E+04	.30237530E+04	.69420840E-03
N=196	LAYER= 1	.32600000E+01	.18948020E+02	.70784810E+02	.29056470E+01	.19924470E+04	.30344690E+04	.72259640E-03
N=197	LAYER= 1	.32700000E+01	.19607790E+02	.70687620E+02	.30452180E+01	.19920780E+04	.30448980E+04	.75126210E-03
N=198	LAYER= 1	.32800000E+01	.20306550E+02	.70584630E+02	.32784180E+01	.19916490E+04	.30552740E+04	.78463290E-03
N=199	LAYER= 1	.32900000E+01	.21069400E+02	.70472150E+02	.34601500E+01	.19912240E+04	.30658860E+04	.81768890E-03
N=200	LAYER= 1	.33000000E+01	.21849710E+02	.70357250E+02	.35456650E+01	.19907830E+04	.30760220E+04	.85190010E-03
N=201	LAYER= 1	.33100000E+01	.22651100E+02	.70239210E+02	.36677180E+01	.19902980E+04	.30857670E+04	.88962420E-03
N=202	LAYER= 1	.33200000E+01	.23485960E+02	.70116360E+02	.38370420E+01	.19898130E+04	.30952570E+04	.92731450E-03
N=203	LAYER= 1	.33300000E+01	.24362500E+02	.69987260E+02	.39994200E+01	.19893280E+04	.31045810E+04	.96497850E-03
N=204	LAYER= 1	.33400000E+01	.25271030E+02	.69853810E+02	.41355580E+01	.19887840E+04	.31135880E+04	.10073120E-02
N=205	LAYER= 1	.33500000E+01	.26210640E+02	.69715840E+02	.43243720E+01	.19882400E+04	.31222890E+04	.10496080E-02
N=206	LAYER= 1	.33600000E+01	.27202830E+02	.69570080E+02	.45049540E+01	.19876960E+04	.31308760E+04	.10918700E-02
N=207	LAYER= 1	.33700000E+01	.28223330E+02	.69420340E+02	.46557350E+01	.19870920E+04	.31391090E+04	.11387850E-02
N=208	LAYER= 1	.33800000E+01	.29284530E+02	.69264790E+02	.47947840E+01	.19864890E+04	.31470950E+04	.11856530E-02
N=209	LAYER= 1	.33900000E+01	.30366770E+02	.69106030E+02	.49238160E+01	.19858790E+04	.31547060E+04	.12330580E-02
N=210	LAYER= 1	.34000000E+01	.31486950E+02	.68942110E+02	.50878370E+01	.19852130E+04	.31620490E+04	.12848000E-02
N=211	LAYER= 1	.34100000E+01	.32644170E+02	.68772710E+02	.52116130E+01	.19845520E+04	.31691400E+04	.13361940E-02
N=212	LAYER= 1	.34200000E+01	.33819640E+02	.68600790E+02	.53598140E+01	.19838920E+04	.31758710E+04	.13875320E-02
N=213	LAYER= 1	.34300000E+01	.35044920E+02	.68421810E+02	.55161090E+01	.19831720E+04	.31824250E+04	.14434750E-02
N=214	LAYER= 1	.34400000E+01	.36292020E+02	.68239800E+02	.56955240E+01	.19824530E+04	.31886630E+04	.14993510E-02
N=215	LAYER= 1	.34500000E+01	.37598140E+02	.68049210E+02	.57875880E+01	.19817200E+04	.31947760E+04	.15563210E-02
N=216	LAYER= 1	.34600000E+01	.38887390E+02	.67861310E+02	.58046560E+01	.19809800E+04	.32004230E+04	.16138010E-02
N=217	LAYER= 1	.34700000E+01	.40202670E+02	.67669740E+02	.59441600E+01	.19802040E+04	.32058260E+04	.16741060E-02
N=218	LAYER= 1	.34800000E+01	.41555450E+02	.67472880E+02	.60347700E+01	.19794290E+04	.32110420E+04	.17343330E-02
N=219	LAYER= 1	.34900000E+01	.42912820E+02	.67275540E+02	.61521490E+01	.19786550E+04	.32159570E+04	.17944870E-02
N=220	LAYER= 1	.35000000E+01	.44320370E+02	.67071170E+02	.62508160E+01	.19778680E+04	.32207460E+04	.18557160E-02
N=221	LAYER= 1	.35100000E+01	.45723790E+02	.66867560E+02	.63732950E+01	.19770360E+04	.32252390E+04	.9203210E-02
N=222	LAYER= 1	.35200000E+01	.47187360E+02	.66655360E+02	.64652210E+01	.19762060E+04	.32296510E+04	.9848360E-02
N=223	LAYER= 1	.35300000E+01	.48633470E+02	.66445930E+02	.65946610E+01	.19753770E+04	.32337580E+04	.20492600E-02
N=224	LAYER= 1	.35400000E+01	.50157010E+02	.66225470E+02	.68303260E+01	.19745350E+04	.32378380E+04	.21147460E-02
N=225	LAYER= 1	.35500000E+01	.51711390E+02	.66000870E+02	.70339570E+01	.19736450E+04	.32417590E+04	.21838700E-02
N=226	LAYER= 1	.35600000E+01	.53328590E+02	.65767340E+02	.70312810E+01	.19727020E+04	.32456050E+04	.22571850E-02
N=227	LAYER= 1	.35700000E+01	.54883530E+02	.65543140E+02	.73044320E+01	.19718190E+04	.32490940E+04	.23258090E-02
N=228	LAYER= 1	.35800000E+01	.56626380E+02	.65292050E+02	.77996510E+01	.19708200E+04	.32527850E+04	.24034560E-02
N=229	LAYER= 1	.35900000E+01	.58406720E+02	.65035870E+02	.80145860E+01	.19698220E+04	.32563340E+04	.24809810E-02
N=230	LAYER= 1	.36000000E+01	.60248810E+02	.64771060E+02	.81445470E+01	.19687680E+04	.32597920E+04	.25629280E-02
N=231	LAYER= 1	.36100000E+01	.62090370E+02	.64506730E+02	.82883520E+01	.19677160E+04	.32630490E+04	.26447270E-02
N=232	LAYER= 1	.36200000E+01	.64000920E+02	.64232860E+02	.82744670E+01	.19666470E+04	.32662340E+04	.27277950E-02
N=233	LAYER= 1	.36300000E+01	.65838800E+02	.63969720E+02	.83429050E+01	.19655980E+04	.32691290E+04	.28092970E-02
N=234	LAYER= 1	.36400000E+01	.67782490E+02	.63691700E+02	.85812230E+01	.19644930E+04	.32720240E+04	.28951730E-02
N=235	LAYER= 1	.36500000E+01	.69731780E+02	.63413410E+02	.86994400E+01	.19633900E+04	.32747680E+04	.29808840E-02
N=236	LAYER= 1	.36600000E+01	.71732300E+02	.63128060E+02	.86496540E+01	.19622310E+04	.32774330E+04	.30709260E-02
N=237	LAYER= 1	.36700000E+01	.73660790E+02	.62853310E+02	.87514100E+01	.19611330E+04	.32798680E+04	.31562930E-02
N=238	LAYER= 1	.36800000E+01	.75710940E+02	.62561680E+02	.93373900E+01	.19599790E+04	.32823240E+04	.32459850E-02
N=239	LAYER= 1	.36900000E+01	.77909680E+02	.62249390E+02	.97741830E+01	.19587660E+04	.32848170E+04	.33402590E-02
N=240	LAYER= 1	.37000000E+01	.80162560E+02	.61929890E+02	.98485680E+01	.19574950E+04	.32872320E+04	.34390830E-02

N=241	LAYER= 1	.37100000E+01	.82398560E+02	.61613180E+02	.10129980E+02	.19562290E+04	.32895010E+04	.35374070E-02
N=242	LAYER= 1	.37200000E+01	.84783530E+02	.61275940E+02	.10387400E+02	.19548570E+04	.32917920E+04	.36441210E-02
N=243	LAYER= 1	.37300000E+01	.87141370E+02	.60943100E+02	.10504840E+02	.19535440E+04	.32939360E+04	.37461520E-02
N=244	LAYER= 1	.37400000E+01	.89584540E+02	.60598720E+02	.10621830E+02	.19521770E+04	.32960400E+04	.38523750E-02
N=245	LAYER= 1	.37500000E+01	.92000100E+02	.60258820E+02	.10828420E+02	.19508130E+04	.32980120E+04	.39583450E-02
N=246	LAYER= 1	.37600000E+01	.94542370E+02	.59901630E+02	.11165870E+02	.19493970E+04	.32999810E+04	.40684630E-02
N=247	LAYER= 1	.37700000E+01	.97117280E+02	.59540510E+02	.11613810E+02	.19479270E+04	.33018720E+04	.41826950E-02
N=248	LAYER= 1	.37800000E+01	.99870480E+02	.59155080E+02	.12123200E+02	.19464040E+04	.33037880E+04	.43010190E-02
N=249	LAYER= 1	.37900000E+01	.10268470E+03	.58761830E+02	.12291930E+02	.19448300E+04	.33056410E+04	.44233990E-02
N=250	LAYER= 1	.38000000E+01	.10552130E+03	.58366180E+02	.12296720E+02	.19432460E+04	.33074100E+04	.45465140E-02
N=251	LAYER= 1	.38100000E+01	.10834360E+03	.57973280E+02	.12578020E+02	.19416690E+04	.33090800E+04	.46690150E-02
N=252	LAYER= 1	.38200000E+01	.11131630E+03	.57560240E+02	.13027690E+02	.19399930E+04	.33107490E+04	.47992900E-02
N=253	LAYER= 1	.38300000E+01	.11435220E+03	.57139250E+02	.12928850E+02	.19383180E+04	.33123640E+04	.49294540E-02
N=254	LAYER= 1	.38400000E+01	.11728580E+03	.56733270E+02	.12685940E+02	.19366520E+04	.33138470E+04	.50589460E-02
N=255	LAYER= 1	.38500000E+01	.12021620E+03	.56328490E+02	.12413700E+02	.19350500E+04	.33152560E+04	.51834960E-02
N=256	LAYER= 1	.38600000E+01	.12303000E+03	.55940570E+02	.12416010E+02	.19334520E+04	.33165470E+04	.53076680E-02
N=257	LAYER= 1	.38700000E+01	.12596790E+03	.55536310E+02	.13222180E+02	.19318560E+04	.33178340E+04	.54317550E-02
N=258	LAYER= 1	.38800000E+01	.12916250E+03	.55097630E+02	.13925970E+02	.19300480E+04	.33191680E+04	.55722400E-02
N=259	LAYER= 1	.38900000E+01	.13243400E+03	.54649330E+02	.14450000E+02	.19282460E+04	.33204680E+04	.57122640E-02
N=260	LAYER= 1	.39000000E+01	.13588040E+03	.54178150E+02	.15423870E+02	.19263420E+04	.33217700E+04	.58602850E-02
N=261	LAYER= 1	.39100000E+01	.13961420E+03	.53668860E+02	.16430420E+02	.19242810E+04	.33231090E+04	.60204290E-02
N=262	LAYER= 1	.39200000E+01	.14353950E+03	.53134790E+02	.17363960E+02	.19221210E+04	.33244420E+04	.61883490E-02
N=263	LAYER= 1	.39300000E+01	.14772040E+03	.52567460E+02	.18174890E+02	.19198070E+04	.33257840E+04	.63681430E-02
N=264	LAYER= 1	.39400000E+01	.15203720E+03	.51983340E+02	.18337770E+02	.19174500E+04	.33270930E+04	.65513570E-02
N=265	LAYER= 1	.39500000E+01	.15630730E+03	.51407140E+02	.18256050E+02	.19151030E+04	.33283180E+04	.67337520E-02
N=266	LAYER= 1	.39600000E+01	.16059950E+03	.50829610E+02	.18111210E+02	.19127630E+04	.33294830E+04	.69156040E-02
N=267	LAYER= 1	.39700000E+01	.16481530E+03	.50263910E+02	.17636070E+02	.19104370E+04	.33305690E+04	.70963830E-02
N=268	LAYER= 1	.39800000E+01	.16889670E+03	.49717740E+02	.17394940E+02	.19082230E+04	.33315690E+04	.72684520E-02
N=269	LAYER= 1	.39900000E+01	.17301190E+03	.49168520E+02	.17360070E+02	.19059690E+04	.33325300E+04	.74436180E-02
N=270	LAYER= 1	.40000000E+01	.17708900E+03	.48625840E+02	.17586110E+02	.19037250E+04	.33334380E+04	.76180260E-02
N=271	LAYER= 1	.40100000E+01	.18132350E+03	.48063730E+02	.18177060E+02	.19014390E+04	.33343380E+04	.77957110E-02
N=272	LAYER= 1	.40200000E+01	.18569310E+03	.47485300E+02	.18387220E+02	.18990590E+04	.33352230E+04	.79806770E-02
N=273	LAYER= 1	.40300000E+01	.19004070E+03	.46911420E+02	.18674810E+02	.18966900E+04	.33360650E+04	.81647890E-02
N=274	LAYER= 1	.40400000E+01	.19456130E+03	.46316420E+02	.19450080E+02	.18942740E+04	.33368990E+04	.83525420E-02
N=275	LAYER= 1	.40500000E+01	.19929240E+03	.45695560E+02	.20349240E+02	.18917170E+04	.33377320E+04	.85513140E-02
N=276	LAYER= 1	.40600000E+01	.20425740E+03	.45046050E+02	.21317400E+02	.18890270E+04	.33385650E+04	.87604050E-02
N=277	LAYER= 1	.40700000E+01	.20946780E+03	.44366710E+02	.22192100E+02	.18861990E+04	.33393960E+04	.89801610E-02
N=278	LAYER= 1	.40800000E+01	.21486990E+03	.43664740E+02	.22521580E+02	.18833310E+04	.33402160E+04	.92030740E-02
N=279	LAYER= 1	.40900000E+01	.22025820E+03	.42966990E+02	.22685490E+02	.18804290E+04	.33409930E+04	.94285940E-02
N=280	LAYER= 1	.41000000E+01	.22576020E+03	.42257000E+02	.23321360E+02	.18774510E+04	.33417490E+04	.96600250E-02
N=281	LAYER= 1	.41100000E+01	.23147610E+03	.41522080E+02	.23995860E+02	.18744360E+04	.33424950E+04	.98943920E-02
N=282	LAYER= 1	.41200000E+01	.23732600E+03	.40772700E+02	.24660690E+02	.18712920E+04	.33432220E+04	.10138750E-01
N=283	LAYER= 1	.41300000E+01	.24338690E+03	.39999240E+02	.25282690E+02	.18680760E+04	.33439380E+04	.10388650E-01
N=284	LAYER= 1	.41400000E+01	.24956310E+03	.39214140E+02	.25418900E+02	.18647860E+04	.33446320E+04	.10644410E-01
N=285	LAYER= 1	.41500000E+01	.25571660E+03	.38434980E+02	.25504800E+02	.18615170E+04	.33452890E+04	.10898470E-01
N=286	LAYER= 1	.41600000E+01	.26196150E+03	.37647370E+02	.25940400E+02	.18582230E+04	.33459250E+04	.11154460E-01
N=287	LAYER= 1	.41700000E+01	.26835460E+03	.36844280E+02	.26378630E+02	.18548570E+04	.33465450E+04	.11416090E-01
N=288	LAYER= 1	.41800000E+01	.27484150E+03	.36032720E+02	.26778390E+02	.18514200E+04	.33471440E+04	.11683180E-01

N=289	LAYER= 1	.41900000E+01	.28145910E+03	.35208230E+02	.27533040E+02	.18479620E+04	.33477270E+04	.11951930E-01
N=290	LAYER= 1	.42000000E+01	.28834700E+03	.34353710E+02	.28259290E+02	.18443440E+04	.33483050E+04	.12233110E-01
N=291	LAYER= 1	.42100000E+01	.29535340E+03	.33488270E+02	.29095250E+02	.18407080E+04	.33488650E+04	.12515710E-01
N=292	LAYER= 1	.42200000E+01	.30268830E+03	.32586320E+02	.29777580E+02	.18368720E+04	.33494230E+04	.12813820E-01
N=293	LAYER= 1	.42300000E+01	.31006630E+03	.31683240E+02	.30140210E+02	.18330240E+04	.33499570E+04	.13112940E-01
N=294	LAYER= 1	.42400000E+01	.31761850E+03	.30763140E+02	.30878490E+02	.18291180E+04	.33504780E+04	.13416510E-01
N=295	LAYER= 1	.42500000E+01	.32540200E+03	.29819380E+02	.31554910E+02	.18250680E+04	.33509890E+04	.13731250E-01
N=296	LAYER= 1	.42600000E+01	.33333060E+03	.28862700E+02	.32050720E+02	.18209670E+04	.33514850E+04	.14049950E-01
N=297	LAYER= 1	.42700000E+01	.34140370E+03	.27893420E+02	.32676560E+02	.18168170E+04	.33519660E+04	.14372500E-01
N=298	LAYER= 1	.42800000E+01	.34968980E+03	.26903570E+02	.32936830E+02	.18125770E+04	.33524360E+04	.14702040E-01
N=299	LAYER= 1	.42900000E+01	.35793820E+03	.25923250E+02	.33226440E+02	.18083720E+04	.33528820E+04	.15028840E-01
N=300	LAYER= 1	.43000000E+01	.36641680E+03	.24920730E+02	.33934570E+02	.18040450E+04	.33533190E+04	.15365180E-01
N=301	LAYER= 1	.43100000E+01	.37506950E+03	.23903000E+02	.34139110E+02	.17996350E+04	.33537440E+04	.15707870E-01
N=302	LAYER= 1	.43200000E+01	.38369930E+03	.22893320E+02	.34471730E+02	.17952310E+04	.33541490E+04	.16050200E-01
N=303	LAYER= 1	.43300000E+01	.39257120E+03	.21860840E+02	.35398130E+02	.17907480E+04	.33545460E+04	.16398560E-01
N=304	LAYER= 1	.43400000E+01	.40172430E+03	.20801470E+02	.36242120E+02	.17861530E+04	.33549370E+04	.16755710E-01
N=305	LAYER= 1	.43500000E+01	.41108080E+03	.19724610E+02	.36974740E+02	.17814080E+04	.33553180E+04	.17124480E-01
N=306	LAYER= 1	.43600000E+01	.42066520E+03	.18627840E+02	.37587570E+02	.17766400E+04	.33556900E+04	.17495040E-01
N=307	LAYER= 1	.43700000E+01	.43039520E+03	.17520870E+02	.38120690E+02	.17717730E+04	.33560500E+04	.17873330E-01
N=308	LAYER= 1	.43800000E+01	.44031460E+03	.16399020E+02	.38729560E+02	.17668100E+04	.33564010E+04	.18259050E-01
N=309	LAYER= 1	.43900000E+01	.45042160E+03	.15262790E+02	.39278900E+02	.17617970E+04	.33567410E+04	.18648690E-0'
N=310	LAYER= 1	.44000000E+01	.46069110E+03	.14115320E+02	.39941170E+02	.17566980E+04	.33570720E+04	.19044950E-01
N=311	LAYER= 1	.44100000E+01	.47120900E+03	.12947350E+02	.40561550E+02	.17515180E+04	.33573950E+04	.19447510E-01
N=312	LAYER= 1	.44200000E+01	.48187070E+03	.11770850E+02	.40290930E+02	.17462650E+04	.33577070E+04	.19855790E-01
N=313	LAYER= 1	.44300000E+01	.49231510E+03	.10625510E+02	.39535420E+02	.17411590E+04	.33579990E+04	.20252590E-01
N=314	LAYER= 1	.44400000E+01	.50264880E+03	.94992460E+01	.38921650E+02	.17360890E+04	.33582760E+04	.20646650E-01
N=315	LAYER= 1	.44500000E+01	.51283560E+03	.83956870E+01	.37520280E+02	.17311250E+04	.33585370E+04	.21032420E-01
N=316	LAYER= 1	.44600000E+01	.52249060E+03	.73558110E+01	.36017640E+02	.17264410E+04	.33587750E+04	.21396490E-01
N=317	LAYER= 1	.44700000E+01	.53194130E+03	.63436210E+01	.34949840E+02	.17218530E+04	.33589990E+04	.21753130E-01
N=318	LAYER= 1	.44800000E+01	.54108220E+03	.53699130E+01	.33044500E+02	.17174630E+04	.33592080E+04	.22094280E-01
N=319	LAYER= 1	.44900000E+01	.54956650E+03	.44707740E+01	.30665410E+02	.17133630E+04	.33593960E+04	.22412930E-01
N=320	LAYER= 1	.45000000E+01	.55748020E+03	.36360890E+01	.28140110E+02	.17095760E+04	.33595650E+04	.22707220E-01
N=321	LAYER= 1	.45100000E+01	.56464930E+03	.28832470E+01	.25083790E+02	.17061270E+04	.33597140E+04	.22975320E-01
N=322	LAYER= 1	.45200000E+01	.57095340E+03	.22238110E+01	.21853650E+02	.17030990E+04	.33598420E+04	.23210610E-01
N=323	LAYER= 1	.45300000E+01	.57640950E+03	.16550170E+01	.18525760E+02	.17005160E+04	.33599500E+04	.23411410E-01
N=324	LAYER= 1	.45400000E+01	.58093900E+03	.11841750E+01	.89692130E+01	.16983330E+04	.33600380E+04	.23581040E-01
N=325	LAYER= 1	.45500000E+01	.58124570E+03	.11523350E+01	.99587920E+00	.16982080E+04	.33600440E+04	.23590810E-01
N=326	LAYER= 1	.45600000E+01	.58147670E+03	.11283660E+01	.70741080E+00	.16980820E+04	.33600480E+04	.23600570E-01
N=327	LAYER= 1	.45700000E+01	.58162770E+03	.11126950E+01	.60479830E+00	.16980190E+04	.33600520E+04	.23605450E-01
N=328	LAYER= 1	.45800000E+01	.58180330E+03	.10944760E+01	.83762940E+00	.16979250E+04	.33600550E+04	.23612770E-01
N=329	LAYER= 1	.45900000E+01	.58208000E+03	.10657610E+01	.18481980E+02	.16977990E+04	.33600600E+04	.23622530E-01
N=330	LAYER= 1	.46000000E+01	.59181150E+03	.58975480E-01	.18722060E+02	.16931880E+04	.33602440E+04	.23980910E-01
N=330	LAYER= 1	.46000000E+01	.59181150E+03	.58975480E-01	.18722060E+02	.16931880E+04	.33602440E+04	.23980910E-01

Pressure	Rate	Pressure	Rate	Pressure	Rate
4.000	.152	200.000	20.487	396.000	35.714
8.000	.639	204.000	21.267	400.000	36.083
12.000	1.544	208.000	21.946	404.000	36.420
16.000	2.489	212.000	22.347	408.000	36.734
20.000	3.176	216.000	22.556	412.000	37.034
24.000	3.932	220.000	22.678	416.000	37.289
28.000	4.623	224.000	23.118	420.000	37.545
32.000	5.143	228.000	23.586	424.000	37.770
36.000	5.654	232.000	24.055	428.000	37.989
40.000	5.923	236.000	24.510	432.000	38.219
44.000	6.228	240.000	24.935	436.000	38.465
48.000	6.538	244.000	25.296	440.000	38.710
52.000	7.033	248.000	25.384	444.000	38.930
56.000	7.622	252.000	25.453	448.000	39.147
60.000	8.127	256.000	25.525	452.000	39.381
64.000	8.274	260.000	25.804	456.000	39.639
68.000	8.594	264.000	26.080	460.000	39.897
72.000	8.664	268.000	26.354	464.000	40.136
76.000	9.395	272.000	26.603	468.000	40.372
80.000	9.843	276.000	26.911	472.000	40.541
84.000	10.303	280.000	27.367	476.000	40.440
88.000	10.546	284.000	27.801	480.000	40.338
92.000	10.828	288.000	28.223	484.000	40.137
96.000	11.419	292.000	28.695	488.000	39.848
100.000	12.131	296.000	29.155	492.000	39.558
104.000	12.294	300.000	29.528	496.000	39.317
108.000	12.544	304.000	29.842	500.000	39.079
112.000	13.005	308.000	30.039	504.000	38.736
116.000	12.792	312.000	30.329	508.000	38.185
120.000	12.434	316.000	30.720	512.000	37.635
124.000	12.682	320.000	31.085	516.000	37.028
128.000	13.670	324.000	31.433	520.000	36.405
132.000	14.380	328.000	31.717	524.000	35.847
136.000	15.456	332.000	31.968	528.000	35.395
140.000	16.522	336.000	32.258	532.000	34.938
144.000	17.453	340.000	32.568	536.000	35.104
148.000	18.185	344.000	32.758	540.000	33.270
152.000	18.336	348.000	32.884	544.000	32.226
156.000	18.262	352.000	33.018	548.000	31.105
160.000	18.131	356.000	33.158	552.000	29.889
164.000	17.728	360.000	33.399	556.000	28.612
168.000	17.448	364.000	33.733	560.000	27.066
172.000	17.369	368.000	33.972	564.000	25.361
176.000	17.526	372.000	34.067	568.000	23.367
180.000	17.992	376.000	34.175	572.000	21.215
184.000	18.306	380.000	34.329	576.000	18.776
188.000	18.540	384.000	34.503	580.000	10.950
192.000	19.011	388.000	34.921	584.000	18.529
196.000	19.724	392.000	35.338	588.000	18.628

Table of Burn Rate Laws

Range PLOW MPa	PHIGH MPa	COEF CM/S-MPa^EXP	EXP	CORR COEF
30.	59.	.510368E+00	.665335	.989260
59.	148.	.274854E+00	.815497	.978654
148.	444.	.283246E+00	.810907	.991613
20.	420.	.315470E+00	.790155	.998209

APPENDIX H:

BRLCB RESULTS FOR TRACK 5

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BURNING RATE ANALYSIS
BRLCB V3.0
ADVANCED BALLISTIC CONCEPTS BRANCH - BRL

Project :	M5 BURN RATES	Requested by :	W. Oberle
Inf File:	a:m5t5.inf	Created From .MAS File :	a:m5.mas
P/T File:	a:m5t5.pvt	Calculation Output File:	a:m5t5.out
Smoothed:	a:m5t5.pdt	Graphics File :	a:m5t5.dat
Fired on:	23 Nov 92		

FIRING REMARKS:
Bill Aungst: Operator

REDUCTION REMARKS:
Reduced 12 Dec 92 by W. Oberle

IGNITER INFORMATION

The Igntier Used Is : Black Powder Lot: FFFG
The Source For The Igniter Is: Pellets, Milan Ord.

IGNITER THERMOCHEMICAL PROPERTIES:

Impetus (J/g) :	290.0	Molecular Weight:	66.37000
Flame Temperature (K):	2188.0	Covolume (g/cm^3) :	.78500
Density (g/cm^3) :	1.75000	Gamma :	1.21840

PROPELLANT INFORMATION

The Propellant Used Is : M5 Lot: RAD-64597 Of 1966
The Source For The Propellant Is : Radford Army Ammo Pl
Propellant Thermochemical Properties: Following Sheets of Output

PROPELLANT GRAIN GEOMETRY

Grain Type: 1-Perf. Cyl.

Length --- (cm.):	.574294
Outer Diam.(cm.):	.136906
Perf Diam. (cm.):	.040894
Inner Web (cm.):	.048006

Bomb Information		Gage Information	
Bomb Type :	Closed Chamber	Gage I.D. :	C14430
Bomb Vol (cm^3) :	209.0	Input Voltage :	11.5600
		Constants For Fit:	A+Bx+C^2
		A:	.20157E+01
		B:	.52474E-01
		C:	-.12544E-06

Temperature and Charge Mass Information

Propellant Mass (g) :	73.1950	Igniter Mass (g) :	1.5000
Initial Temp. Prop.(K) :	294.	Igniter Temp.(K) :	294.
Initial Bomb Temp. (K) :	294.		
Number of Propellant Grains:	5761.24		
Number of Wildpoint Passes :	1	Wildpoint Tolerance:	2.000
Number of Smoothing Passes :	1	Smoothing Option :	1
Bridge Length :	15		

****

```
*****************************************************************************
  Total # Layers =  1
  Chamber Volume (cm3) =  209.000
  Heat-Loss-Fraction (n-d) =  .000
  Time Step (mil-sec) =  .10000000E-01     Max Time Steps =  1200
  Convergence Criterion =  .10000000E-04
  Computation Type (1=BURN-RATE, 2=PTGEN, 3=SURF AREA, 4=INTERR BOMB, 5=ETC) 1
*****************************************************************************
                     Beginning (1) of Layer        End (2) of Layer
*****************************************************************************
           Propellant Mass in grams
*****************************************************************************
          1                 73.19500
       Ignitor               1.50000
         Air                  .19719
*****************************************************************************
           Propellant Density in g/cm3
*****************************************************************************
          1                 1.65000                  1.65000
       Ignitor              1.75000
*****************************************************************************
           Propellant Impetus in J/g
*****************************************************************************
          1               1093.00000               1093.00000
       Ignitor             290.00000
*****************************************************************************
           Propellant Flame Temperature in deg K
*****************************************************************************
          1               3379.00000               3379.00000
       Ignitor            2188.00000
*****************************************************************************
           Propellant Molecular Weight in g/g-mole
*****************************************************************************
          1                25.70266                 25.70266
       Ignitor             66.37000
         Air               28.90000
*****************************************************************************
           Propellant Gas Constant in cal/g-deg K
*****************************************************************************
          1                  .07731                   .07731
       Ignitor               .02994
         Air                 .06876
*****************************************************************************
           Gamma (Ratio of Specific Heats)
*****************************************************************************
          1                 1.22580                  1.22580
       Ignitor              1.21840
         Air                1.40000
*****************************************************************************
           Specific Heat (Cv) in cal/g-deg K
*****************************************************************************
          1                  .34240                   .34240
       Ignitor               .13709
         Air                 .17190
*****************************************************************************
           Covolume in cm3/g
*****************************************************************************
          1                  .98400                   .98400
       Ignitor               .78500
         Air                 .98000
*****************************************************************************
```

```
*****************************************************************************************************

  ******* Maximum Chamber Properties are  *******
  Theoretical Maximum Chamber Pressure (MPa) =  .59357530E+03
  Theoretical Maximum Chamber Temperature (deg K) =  .33647930E+04
  **** Assuming a Heat-Loss-Fraction =  .006
  Maximum Total Heat Loss from Chamber (cal) =  .49874310E+03
  Maximum Chamber Pressure (MPa) w/Heat Loss =  .59009800E+03
  Maximum Chamber Temperature (deg K) w/Heat Loss =  .33450810E+04



  ** Results: Deduced Burning Rates Based on a given Chamber Pressure vs. Time **

  *** N *** LAYER *** TIME(ms) *** PCH(MPa) *** TPMR(gm) *** RBR(cm/s) *** ASUR(cm2) *** TCH(degK) ***
DEPTHB(cm) ***

  N = 1 LAYER = 1   .00000000E+00   .27997050E+01   .73195000E+02   .00000000E+00   .20026150E+04
.18684790E+04   .00000000E+00

  *** PROPELLANT LAYER J = 1 has Burned out on Step N = 319 Before TIME (millisec) of .41200000E+01
          Chamber Pressure (MPa) at Burnout =  .59009800E+03
          Chamber Temperature (deg K) at Burnout =  .33450820E+04
          Depth of Layer (cm) at Burnout =  .48006000E-01
```

*** DEDUCED BURNING RATES ***

N= 3	LAYER= 1	.96000000E+00	.28406300E+01	.73188460E+02	.12967390E+00	.20026150E+04	.18823350E+04	.00000000E+00
N= 4	LAYER= 1	.97000000E+00	.28664880E+01	.73185420E+02	.83878370E-01	.20026150E+04	.18886440E+04	.00000000E+00
N= 5	LAYER= 1	.98000000E+00	.28823300E+01	.73182910E+02	.22728450E-01	.20026150E+04	.18938520E+04	.00000000E+00
N= 6	LAYER= 1	.98999990E+00	.28721320E+01	.73183920E+02	.45795340E-01	.20026150E+04	.18917720E+04	.00000000E+00
N= 7	LAYER= 1	.99999990E+00	.29021770E+01	.73179890E+02	.11465690E+00	.20026150E+04	.19000660E+04	.00000000E+00
N= 8	LAYER= 1	.10100000E+01	.29304010E+01	.73176350E+02	.30439730E-01	.20026150E+04	.19072630E+04	.00000000E+00
N= 9	LAYER= 1	.10200000E+01	.29147400E+01	.73177880E+02	-.53303350E-01	.20026150E+04	.19041730E+04	.00000000E+00
N= 10	LAYER= 1	.10300000E+01	.29078210E+01	.73179870E+02	-.30169310E-01	.20026150E+04	.19000830E+04	.00000000E+00
N= 11	LAYER= 1	.10400000E+01	.29078220E+01	.73179870E+02	.53236240E-01	.20026150E+04	.19000830E+04	.00000000E+00
N= 12	LAYER= 1	.10500000E+01	.29283990E+01	.73176350E+02	.53235710E-01	.20026150E+04	.19072620E+04	.00000000E+00
N= 13	LAYER= 1	.10600000E+01	.29293100E+01	.73176350E+02	-.15084580E-01	.20026150E+04	.19072580E+04	.00000000E+00
N= 14	LAYER= 1	.10700000E+01	.29247570E+01	.73177350E+02	-.61083000E-01	.20026150E+04	.19052240E+04	.00000000E+00
N= 15	LAYER= 1	.10800000E+01	.29005370E+01	.73180390E+02	-.91657880E-01	.20026150E+04	.18990420E+04	.00000000E+00
N= 16	LAYER= 1	.10900000E+01	.28826910E+01	.73183410E+02	-.13528770E-03	.20026150E+04	.18928210E+04	.00000000E+00
N= 17	LAYER= 1	.11000000E+01	.28972600E+01	.73180400E+02	.53235980E-01	.20026150E+04	.18990350E+04	.00000000E+00
N= 18	LAYER= 1	.11100000E+01	.29021760E+01	.73179890E+02	.22999020E-01	.20026150E+04	.19000660E+04	.00000000E+00
N= 19	LAYER= 1	.11200000E+01	.29098250E+01	.73178880E+02	.30575170E-01	.20026150E+04	.19021310E+04	.00000000E+00
N= 20	LAYER= 1	.11300000E+01	.29183840E+01	.73177870E+02	.91725510E-01	.20026150E+04	.19041870E+04	.00000000E+00
N= 21	LAYER= 1	.11400000E+01	.29538940E+01	.73172810E+02	.12223240E+00	.20026150E+04	.19143800E+04	.00000000E+00
N= 22	LAYER= 1	.11500000E+01	.29742890E+01	.73169790E+02	.76708500E-01	.20026150E+04	.19204290E+04	.00000000E+00
N= 23	LAYER= 1	.11600000E+01	.29919530E+01	.73167750E+02	.12987750E+00	.20026150E+04	.19244660E+04	.00000000E+00
N= 24	LAYER= 1	.11700000E+01	.30329270E+01	.73161210E+02	.14496080E+00	.20026150E+04	.19372990E+04	.00000000E+00
N= 25	LAYER= 1	.11800000E+01	.30551430E+01	.73158160E+02	.91251550E-01	.20026150E+04	.19431780E+04	.00000000E+00
N= 26	LAYER= 1	.11900000E+01	.30709860E+01	.73155170E+02	.22796090E-01	.20026150E+04	.19489370E+04	.00000000E+00
N= 27	LAYER= 1	.12000000E+01	.30644310E+01	.73156660E+02	.33822090E-03	.20026150E+04	.19460840E+04	.00000000E+00
N= 28	LAYER= 1	.12100000E+01	.30739000E+01	.73155150E+02	.79143690E-02	.20026150E+04	.19489690E+04	.00000000E+00
N= 29	LAYER= 1	.12200000E+01	.30697110E+01	.73156140E+02	.77113980E-02	.20026150E+04	.19470740E+04	.00000000E+00
N= 30	LAYER= 1	.12300000E+01	.30779060E+01	.73154650E+02	.72379270E-02	.20026150E+04	.19499420E+04	.00000000E+00
N= 31	LAYER= 1	.12400000E+01	.30700750E+01	.73155660E+02	.15558240E-01	.20026150E+04	.19480030E+04	.00000000E+00
N= 32	LAYER= 1	.12500000E+01	.30864640E+01	.73153620E+02	.68523210E-01	.20026150E+04	.19518910E+04	.00000000E+00
N= 33	LAYER= 1	.12600000E+01	.30992110E+01	.73151130E+02	.53168060E-01	.20026150E+04	.19566220E+04	.00000000E+00
N= 34	LAYER= 1	.12700000E+01	.31083160E+01	.73150100E+02	-.71026750E-02	.20026150E+04	.19585590E+04	.00000000E+00
N= 35	LAYER= 1	.12800000E+01	.30995760E+01	.73151600E+02	.78467250E-02	.20026150E+04	.19557190E+04	.00000000E+00
N= 36	LAYER= 1	.12900000E+01	.31132330E+01	.73149580E+02	.15355150E-01	.20026150E+04	.19595330E+04	.00000000E+00
N= 37	LAYER= 1	.13000000E+01	.31072240E+01	.73150590E+02	-.45727470E-01	.20026150E+04	.19576380E+04	.00000000E+00
N= 38	LAYER= 1	.13100000E+01	.30933860E+01	.73152600E+02	.14814080E-01	.20026150E+04	.19538150E+04	.00000000E+00
N= 39	LAYER= 1	.13200000E+01	.31101380E+01	.73149600E+02	.76437930E-01	.20026150E+04	.19594930E+04	.00000000E+00
N= 40	LAYER= 1	.13300000E+01	.31278000E+01	.73147550E+02	.76370670E-01	.20026150E+04	.19633400E+04	.00000000E+00
N= 41	LAYER= 1	.13400000E+01	.31445520E+01	.73144560E+02	.13007910E+00	.20026150E+04	.19689330E+04	.00000000E+00
N= 42	LAYER= 1	.13500000E+01	.31864340E+01	.73138960E+02	.14550190E+00	.20026150E+04	.19792500E+04	.00000000E+00
N= 43	LAYER= 1	.13600000E+01	.32113810E+01	.73134940E+02	.13731840E+00	.20026150E+04	.19865650E+04	.00000000E+00
N= 44	LAYER= 1	.13700000E+01	.32459800E+01	.73129880E+02	.46268620E-01	.20026150E+04	.19956680E+04	.00000000E+00
N= 45	LAYER= 1	.13800000E+01	.32339630E+01	.73131890E+02	.15693370E-01	.20026150E+04	.19920750E+04	.00000000E+00
N= 46	LAYER= 1	.13900000E+01	.32552690E+01	.73128850E+02	.99775170E-01	.20026150E+04	.19975140E+04	.00000000E+00
N= 47	LAYER= 1	.14000000E+01	.32802140E+01	.73125290E+02	.53574190E-01	.20026150E+04	.20038190E+04	.00000000E+00
N= 48	LAYER= 1	.14100000E+01	.32791210E+01	.73125310E+02	.22931380E-01	.20026150E+04	.20037920E+04	.00000000E+00

N= 49	LAYER= 1	.14200000E+01	.32904090E+01	.73123780E+02	.45592180E-01	.20026150E+04	.20064880E+04	.00000000E+00
N= 50	LAYER= 1	.14300000E+01	.32980570E+01	.73122290E+02	.22931260E-01	.20026150E+04	.20090990E+04	.00000000E+00
N= 51	LAYER= 1	.14400000E+01	.33002400E+01	.73122260E+02	-.75085040E-02	.20026150E+04	.20091470E+04	.00000000E+00
N= 52	LAYER= 1	.14500000E+01	.32951420E+01	.73122790E+02	.76979080E-01	.20026150E+04	.20082260E+04	.00000000E+00
N= 53	LAYER= 1	.14600000E+01	.33366560E+01	.73117170E+02	.99993030E-01	.20023060E+04	.20181230E+04	.24003480E-04
N= 54	LAYER= 1	.14700000E+01	.33424830E+01	.73116180E+02	.38089550E-01	.20023060E+04	.20198440E+04	.24004920E-04
N= 55	LAYER= 1	.14800000E+01	.33528620E+01	.73114650E+02	.22799700E-01	.20022980E+04	.20224640E+04	.24605170E-04
N= 56	LAYER= 1	.14900000E+01	.33517690E+01	.73114680E+02	.53785640E-01	.20022980E+04	.20224370E+04	.24606140E-04
N= 57	LAYER= 1	.15000000E+01	.33776260E+01	.73111110E+02	.10750420E+00	.20022870E+04	.20285420E+04	.25506260E-04
N= 58	LAYER= 1	.15100000E+01	.34007530E+01	.73107570E+02	.30647920E-01	.20022710E+04	.20345260E+04	.26706250E-04
N= 59	LAYER= 1	.15200000E+01	.33914650E+01	.73109080E+02	.37819590E-01	.20022710E+04	.20319790E+04	.26707690E-04
N= 60	LAYER= 1	.15300000E+01	.34160460E+01	.73105070E+02	.14661140E+00	.20022630E+04	.20387360E+04	.27308390E-04
N= 61	LAYER= 1	.15400000E+01	.34602910E+01	.73099390E+02	.78075610E-01	.20022400E+04	.20481720E+04	.29108550E-04
N= 62	LAYER= 1	.15500000E+01	.34561040E+01	.73099910E+02	-.81187810E-03	.20022400E+04	.20473160E+04	.29109510E-04
N= 63	LAYER= 1	.15600000E+01	.34573770E+01	.73099440E+02	.21853270E-01	.20022400E+04	.20480940E+04	.29110470E-04
N= 64	LAYER= 1	.15700000E+01	.34622940E+01	.73098470E+02	.30107350E-01	.20022360E+04	.20497120E+04	.29411280E-04
N= 65	LAYER= 1	.15800000E+01	.34690300E+01	.73097460E+02	-.13531350E-03	.20022320E+04	.20513790E+04	.29712100E-04
N= 66	LAYER= 1	.15900000E+01	.34615650E+01	.73098480E+02	.46818720E-01	.20022320E+04	.20496930E+04	.29713540E-04
N= 67	LAYER= 1	.16000000E+01	.34925200E+01	.73094360E+02	.55411490E-01	.20022210E+04	.20564380E+04	.30613570E-04
N= 68	LAYER= 1	.16100000E+01	.34919750E+01	.73094820E+02	-.15290590E-01	.20022210E+04	.20556900E+04	.30614530E-04
N= 69	LAYER= 1	.16200000E+01	.34859660E+01	.73095380E+02	-.15561300E-02	.20022210E+04	.20547910E+04	.30615490E-04
N= 70	LAYER= 1	.16300000E+01	.34863300E+01	.73094920E+02	.76384920E-01	.20022210E+04	.20555340E+04	.30616450E-04
N= 71	LAYER= 1	.16400000E+01	.35191060E+01	.73090320E+02	.85451660E-01	.20022050E+04	.20629930E+04	.31816790E-04
N= 72	LAYER= 1	.16500000E+01	.35280300E+01	.73089270E+02	.76115820E-01	.20022010E+04	.20646840E+04	.32117590E-04
N= 73	LAYER= 1	.16600000E+01	.35515190E+01	.73085300E+02	.13031000E+00	.20021860E+04	.20710740E+04	.33317900E-04
N= 74	LAYER= 1	.16700000E+01	.35859330E+01	.73080670E+02	.19316640E+00	.20021670E+04	.20784150E+04	.34817520E-04
N= 75	LAYER= 1	.16800000E+01	.36418300E+01	.73072530E+02	.13153450E+00	.20021050E+04	.20911140E+04	.39615600E-04
N= 76	LAYER= 1	.16900000E+01	.36474750E+01	.73071980E+02	.54332120E-01	.20021050E+04	.20919710E+04	.39616560E-04
N= 77	LAYER= 1	.17000000E+01	.36673210E+01	.73068950E+02	.14540360E+00	.20021050E+04	.20966310E+04	.39618000E-04
N= 78	LAYER= 1	.17100000E+01	.37113850E+01	.73062370E+02	.15345750E+00	.20020970E+04	.21066380E+04	.40218540E-04
N= 79	LAYER= 1	.17200000E+01	.37357820E+01	.73058810E+02	.15961590E+00	.20020820E+04	.21119860E+04	.41418640E-04
N= 80	LAYER= 1	.17300000E+01	.37789350E+01	.73051820E+02	.19331260E+00	.20020540E+04	.21223610E+04	.43517560E-04
N= 81	LAYER= 1	.17400000E+01	.38248190E+01	.73046040E+02	.12680150E+00	.20020310E+04	.21308010E+04	.45316630E-04
N= 82	LAYER= 1	.17500000E+01	.38437540E+01	.73043440E+02	.21855410E-01	.20020230E+04	.21345400E+04	.45917100E-04
N= 83	LAYER= 1	.17600000E+01	.38320990E+01	.73044590E+02	.35794520E-01	.20020230E+04	.21329000E+04	.45918540E-04
N= 84	LAYER= 1	.17700000E+01	.38543120E+01	.73041080E+02	.39651230E-01	.20020120E+04	.21379570E+04	.46818270E-04
N= 85	LAYER= 1	.17800000E+01	.38523090E+01	.73041970E+02	.23005830E-01	.20020120E+04	.21366670E+04	.46819710E-04
N= 86	LAYER= 1	.17900000E+01	.38645100E+01	.73039560E+02	.53184710E-01	.20020080E+04	.21401310E+04	.47120410E-04
N= 87	LAYER= 1	.18000000E+01	.38748880E+01	.73038450E+02	.62860290E-01	.20020040E+04	.21417050E+04	.47421120E-04
N= 88	LAYER= 1	.18100000E+01	.38952800E+01	.73035410E+02	.10806080E+00	.20019930E+04	.21460320E+04	.48321300E-04
N= 89	LAYER= 1	.18200000E+01	.39238670E+01	.73031320E+02	.71184840E-01	.20019730E+04	.21517950E+04	.49820450E-04
N= 90	LAYER= 1	.18300000E+01	.39309700E+01	.73030700E+02	.38366740E-01	.20019730E+04	.21526420E+04	.49821410E-04
N= 91	LAYER= 1	.18400000E+01	.39408030E+01	.73028790E+02	.76124010E-01	.20019660E+04	.21553400E+04	.50421830E-04
N= 92	LAYER= 1	.18500000E+01	.39633810E+01	.73025670E+02	.79440080E-01	.20019540E+04	.21596500E+04	.51321950E-04
N= 93	LAYER= 1	.18600000E+01	.39808630E+01	.73023540E+02	.11577720E+00	.20019470E+04	.21625990E+04	.51922350E-04
N= 94	LAYER= 1	.18700000E+01	.40156420E+01	.73018030E+02	.22134170E+00	.20019230E+04	.21701420E+04	.53721580E-04
N= 95	LAYER= 1	.18800000E+01	.40764550E+01	.73008910E+02	.22425830E+00	.20018610E+04	.21824170E+04	.58517770E-04
N= 96	LAYER= 1	.18900000E+01	.41176060E+01	.73003210E+02	.22303800E+00	.20018610E+04	.21899520E+04	.58519210E-04

N= 97	LAYER= 1	.19000000E+01	.41756860E+01	.72994180E+02	.29809250E+00	.20018000E+04	.22017250E+04	.63314920E-04
N= 98	LAYER= 1	.19100000E+01	.42470610E+01	.72983520E+02	.22243940E+00	.20017880E+04	.22153040E+04	.64214330E-04
N= 99	LAYER= 1	.19200000E+01	.42736450E+01	.72979480E+02	.12519500E+00	.20017730E+04	.22203640E+04	.65413830E-04
N=100	LAYER= 1	.19300000E+01	.43056910E+01	.72975250E+02	.12817230E+00	.20017570E+04	.22256110E+04	.66613310E-04
N=101	LAYER= 1	.19400000E+01	.43377360E+01	.72971020E+02	.13115090E+00	.20017420E+04	.22308160E+04	.67812750E-04
N=102	LAYER= 1	.19500000E+01	.43643170E+01	.72966580E+02	.13548330E+00	.20017220E+04	.22362240E+04	.69311300E-04
N=103	LAYER= 1	.19600000E+01	.43936310E+01	.72962070E+02	.11802440E+00	.20017070E+04	.22416860E+04	.70510670E-04
N=104	LAYER= 1	.19700000E+01	.44202120E+01	.72958790E+02	.69299940E-01	.20016920E+04	.22455980E+04	.71710020E-04
N=105	LAYER= 1	.19800000E+01	.44244000E+01	.72957490E+02	.11396610E+00	.20016880E+04	.22471590E+04	.72010570E-04
N=106	LAYER= 1	.19900000E+01	.44688240E+01	.72951260E+02	.11186830E+00	.20016650E+04	.22545180E+04	.73809050E-04
N=107	LAYER= 1	.20000000E+01	.44793850E+01	.72950100E+02	.17095180E+00	.20016570E+04	.22558720E+04	.74408680E-04
N=108	LAYER= 1	.20100000E+01	.45465690E+01	.72939970E+02	.32465610E+00	.20015950E+04	.22676170E+04	.79202800E-04
N=109	LAYER= 1	.20200000E+01	.46246750E+01	.72928660E+02	.27626270E+00	.20015760E+04	.22804330E+04	.80701470E-04
N=110	LAYER= 1	.20300000E+01	.46680060E+01	.72921720E+02	.26097810E+00	.20015140E+04	.22881560E+04	.85494960E-04
N=111	LAYER= 1	.20400000E+01	.47391920E+01	.72911420E+02	.26619320E+00	.20015060E+04	.22994060E+04	.86094450E-04
N=112	LAYER= 1	.20500000E+01	.47907160E+01	.72904140E+02	.17015600E+00	.20014450E+04	.23072150E+04	.90887400E-04
N=113	LAYER= 1	.20600000E+01	.48152930E+01	.72900180E+02	.16000510E+00	.20014450E+04	.23114190E+04	.90888840E-04
N=114	LAYER= 1	.20700000E+01	.48595330E+01	.72893570E+02	.25557600E+00	.20014370E+04	.23183590E+04	.91488250E-04
N=115	LAYER= 1	.20800000E+01	.49298100E+01	.72883300E+02	.22221230E+00	.20013750E+04	.23289580E+04	.96280670E-04
N=116	LAYER= 1	.20900000E+01	.49644030E+01	.72878900E+02	.24076060E+00	.20013750E+04	.23334300E+04	.96282110E-04
N=117	LAYER= 1	.21000000E+01	.50383200E+01	.72867400E+02	.32124640E+00	.20013140E+04	.23449540E+04	.10107400E-03
N=118	LAYER= 1	.21100000E+01	.51040450E+01	.72857680E+02	.22702440E+00	.20012980E+04	.23544910E+04	.10227260E-03
N=119	LAYER= 1	.21200000E+01	.51419160E+01	.72852400E+02	.20611510E+00	.20012790E+04	.23595860E+04	.10377060E-03
N=120	LAYER= 1	.21300000E+01	.52003580E+01	.72844070E+02	.19637380E+00	.20012170E+04	.23675390E+04	.10856170E-03
N=121	LAYER= 1	.21400000E+01	.52318550E+01	.72839440E+02	.16611390E+00	.20012170E+04	.23719030E+04	.10856320E-03
N=122	LAYER= 1	.21500000E+01	.52706360E+01	.72833100E+02	.21262150E+00	.20012020E+04	.23778270E+04	.10976160E-03
N=123	LAYER= 1	.21600000E+01	.53230660E+01	.72825390E+02	.18121780E+00	.20011400E+04	.23849200E+04	.11455220E-03
N=124	LAYER= 1	.21700000E+01	.53540140E+01	.72821130E+02	.19414550E+00	.20011400E+04	.23887970E+04	.11455360E-03
N=125	LAYER= 1	.21800000E+01	.54100850E+01	.72812580E+02	.25717340E+00	.20011210E+04	.23965020E+04	.11605070E-03
N=126	LAYER= 1	.21900000E+01	.54697960E+01	.72804150E+02	.22590300E+00	.20010590E+04	.24039580E+04	.12084060E-03
N=127	LAYER= 1	.22000000E+01	.55116660E+01	.72797650E+02	.25460370E+00	.20010590E+04	.24096340E+04	.12084210E-03
N=128	LAYER= 1	.22100000E+01	.55823000E+01	.72787330E+02	.30200610E+00	.20009980E+04	.24185130E+04	.12563150E-03
N=129	LAYER= 1	.22200000E+01	.56460170E+01	.72777720E+02	.31114730E+00	.20009860E+04	.24266460E+04	.12652980E-03
N=130	LAYER= 1	.22300000E+01	.57215660E+01	.72766780E+02	.37370940E+00	.20009250E+04	.24357050E+04	.13131870E-03
N=131	LAYER= 1	.22400000E+01	.58135030E+01	.72753040E+02	.39627010E+00	.20008630E+04	.24468690E+04	.13610710E-03
N=132	LAYER= 1	.22500000E+01	.58985200E+01	.72740620E+02	.33689710E+00	.20008440E+04	.24567170E+04	.13760400E-03
N=133	LAYER= 1	.22600000E+01	.59656950E+01	.72730800E+02	.35294690E+00	.20007820E+04	.24643640E+04	.14239180E-03
N=134	LAYER= 1	.22700000E+01	.60579920E+01	.72717320E+02	.37686210E+00	.20007200E+04	.24746380E+04	.14717910E-03
N=135	LAYER= 1	.22800000E+01	.61360910E+01	.72705910E+02	.36000940E+00	.20007050E+04	.24831550E+04	.14837610E-03
N=136	LAYER= 1	.22900000E+01	.62150970E+01	.72693550E+02	.42495110E+00	.20006430E+04	.24922120E+04	.15316280E-03
N=137	LAYER= 1	.23000000E+01	.63237740E+01	.72677860E+02	.45747090E+00	.20005820E+04	.25034320E+04	.15794900E-03
N=138	LAYER= 1	.23100000E+01	.64228020E+01	.72663350E+02	.48518050E+00	.20005200E+04	.25135490E+04	.16273480E-03
N=139	LAYER= 1	.23200000E+01	.65414900E+01	.72645830E+02	.48965990E+00	.20004580E+04	.25254580E+04	.16752010E-03
N=140	LAYER= 1	.23300000E+01	.66405150E+01	.72631030E+02	.40374380E+00	.20003970E+04	.25352630E+04	.17230490E-03
N=141	LAYER= 1	.23400000E+01	.67207920E+01	.72619170E+02	.38025690E+00	.20003350E+04	.25429500E+04	.17708920E-03
N=142	LAYER= 1	.23500000E+01	.68092600E+01	.72605930E+02	.41323290E+00	.20003160E+04	.25513760E+04	.17858430E-03
N=143	LAYER= 1	.23600000E+01	.69050060E+01	.72591900E+02	.44000070E+00	.20002550E+04	.25601060E+04	.18336800E-03
N=144	LAYER= 1	.23700000E+01	.70071240E+01	.72576880E+02	.43764820E+00	.20001930E+04	.25692470E+04	.18815120E-03

N=145	LAYER= 1	.23800000E+01	.71005070E+01	.72563010E+02	.48967220E+00	.20001310E+04	.25775080E+04	.19293400E-03
N=146	LAYER= 1	.23900000E+01	.72244650E+01	.72544560E+02	.52964800E+00	.20000700E+04	.25882350E+04	.19771620E-03
N=147	LAYER= 1	.24000000E+01	.73360430E+01	.72528050E+02	.52614750E+00	.20000080E+04	.25975860E+04	.20249800E-03
N=148	LAYER= 1	.24100000E+01	.74603690E+01	.72509830E+02	.54750120E+00	.19999430E+04	.26076460E+04	.20757760E-03
N=149	LAYER= 1	.24200000E+01	.75805030E+01	.72491910E+02	.58022550E+00	.19998740E+04	.26172880E+04	.21295530E-03
N=150	LAYER= 1	.24300000E+01	.77197460E+01	.72471540E+02	.62557120E+00	.19997970E+04	.26279520E+04	.21892990E-03
N=151	LAYER= 1	.24400000E+01	.78593500E+01	.72450630E+02	.71319530E+00	.19997120E+04	.26385870E+04	.22550040E-03
N=152	LAYER= 1	.24500000E+01	.80349910E+01	.72424480E+02	.69866650E+00	.19995890E+04	.26514670E+04	.23505740E-03
N=153	LAYER= 1	.24600000E+01	.81716830E+01	.72404530E+02	.65906200E+00	.19995270E+04	.26609800E+04	.23983550E-03
N=154	LAYER= 1	.24700000E+01	.83293000E+01	.72380990E+02	.73749290E+00	.19994050E+04	.26718880E+04	.24938870E-03
N=155	LAYER= 1	.24800000E+01	.84978320E+01	.72355870E+02	.79692880E+00	.19993430E+04	.26831620E+04	.25416530E-03
N=156	LAYER= 1	.24900000E+01	.86809240E+01	.72328410E+02	.86223820E+00	.19992200E+04	.26950730E+04	.26371660E-03
N=157	LAYER= 1	.25000000E+01	.88822150E+01	.72298980E+02	.88472090E+00	.19990970E+04	.27073750E+04	.27326610E-03
N=158	LAYER= 1	.25100000E+01	.90774950E+01	.72270040E+02	.90352870E+00	.19989740E+04	.27190420E+04	.28281260E-03
N=159	LAYER= 1	.25200000E+01	.92827830E+01	.72239380E+02	.91692670E+00	.19988900E+04	.27309630E+04	.28937480E-03
N=160	LAYER= 1	.25300000E+01	.94857030E+01	.72209560E+02	.90750560E+00	.19987630E+04	.27421340E+04	.29921680E-03
N=161	LAYER= 1	.25400000E+01	.96862490E+01	.72179520E+02	.92741130E+00	.19986400E+04	.27530000E+04	.30875910E-03
N=162	LAYER= 1	.25500000E+01	.98968010E+01	.72148390E+02	.92984990E+00	.19985180E+04	.27638630E+04	.31829950E-03
N=163	LAYER= 1	.25600000E+01	.10101340E+02	.72118200E+02	.92726340E+00	.19983950E+04	.27740330E+04	.32783800E-03
N=164	LAYER= 1	.25700000E+01	.10309890E+02	.72087240E+02	.10054060E+01	.19982720E+04	.27841110E+04	.33737460E-03
N=165	LAYER= 1	.25800000E+01	.10544810E+02	.72051900E+02	.10755110E+01	.19981490E+04	.27952060E+04	.34690930E-03
N=166	LAYER= 1	.25900000E+01	.10786470E+02	.72016330E+02	.10468230E+01	.19980190E+04	.28059450E+04	.35703720E-03
N=167	LAYER= 1	.26000000E+01	.11013370E+02	.71982880E+02	.11197720E+01	.19978850E+04	.28156790E+04	.36746030E-03
N=168	LAYER= 1	.26100000E+01	.11283950E+02	.71942500E+02	.12650130E+01	.19977010E+04	.28269890E+04	.38175140E-03
N=169	LAYER= 1	.26200000E+01	.11572530E+02	.71899480E+02	.13700790E+01	.19975630E+04	.28385340E+04	.39246710E-03
N=170	LAYER= 1	.26300000E+01	.11892390E+02	.71852180E+02	.15042080E+01	.19973750E+04	.28506630E+04	.40704910E-03
N=171	LAYER= 1	.26400000E+01	.12240810E+02	.71800330E+02	.16224630E+01	.19971760E+04	.28633320E+04	.42251890E-03
N=172	LAYER= 1	.26500000E+01	.12613240E+02	.71745250E+02	.16845330E+01	.19969270E+04	.28761210E+04	.44184820E-03
N=173	LAYER= 1	.26600000E+01	.12989110E+02	.71689320E+02	.17108620E+01	.19967400E+04	.28884530E+04	.45641510E-03
N=174	LAYER= 1	.26700000E+01	.13372060E+02	.71632510E+02	.18005180E+01	.19964950E+04	.29003540E+04	.47543590E-03
N=175	LAYER= 1	.26800000E+01	.13789930E+02	.71570700E+02	.19546260E+01	.19962500E+04	.29126420E+04	.49444710E-03
N=176	LAYER= 1	.26900000E+01	.14240890E+02	.71503750E+02	.20373720E+01	.19960050E+04	.29252360E+04	.51345260E-03
N=177	LAYER= 1	.27000000E+01	.14693460E+02	.71436500E+02	.20551830E+01	.19957530E+04	.29371970E+04	.53304360E-03
N=178	LAYER= 1	.27100000E+01	.15154030E+02	.71368400E+02	.21591200E+01	.19954860E+04	.29486560E+04	.55381220E-03
N=179	LAYER= 1	.27200000E+01	.15653130E+02	.71294320E+02	.22416510E+01	.19951800E+04	.29604430E+04	.57753930E-03
N=180	LAYER= 1	.27300000E+01	.16149670E+02	.71220810E+02	.23136580E+01	.19948750E+04	.29714920E+04	.60125200E-03
N=181	LAYER= 1	.27400000E+01	.16681090E+02	.71142010E+02	.24259400E+01	.19945700E+04	.29826810E+04	.62495300E-03
N=182	LAYER= 1	.27500000E+01	.17226850E+02	.71061130E+02	.25605110E+01	.19942650E+04	.29935180E+04	.64864450E-03
N=183	LAYER= 1	.27600000E+01	.17818420E+02	.70973500E+02	.27707190E+01	.19939410E+04	.30045830E+04	.67380270E-03
N=184	LAYER= 1	.27700000E+01	.18457600E+02	.70878810E+02	.28913690E+01	.19935720E+04	.30158150E+04	.70249810E-03
N=185	LAYER= 1	.27800000E+01	.19102380E+02	.70783290E+02	.30289300E+01	.19931950E+04	.30264550E+04	.73176650E-03
N=186	LAYER= 1	.27900000E+01	.19803470E+02	.70679590E+02	.31431330E+01	.19927690E+04	.30372880E+04	.76485950E-03
N=187	LAYER= 1	.28000000E+01	.20499790E+02	.70576590E+02	.31336020E+01	.19923890E+04	.30473770E+04	.79438510E-03
N=188	LAYER= 1	.28100000E+01	.21195900E+02	.70473560E+02	.31632150E+01	.19919600E+04	.30568620E+04	.82772510E-03
N=189	LAYER= 1	.28200000E+01	.21906340E+02	.70368660E+02	.32811960E+01	.19915730E+04	.30659490E+04	.85780070E-03
N=190	LAYER= 1	.28300000E+01	.22656160E+02	.70257910E+02	.33238860E+01	.19911410E+04	.30749730E+04	.89139390E-03
N=191	LAYER= 1	.28400000E+01	.23384680E+02	.70150250E+02	.33569250E+01	.19907120E+04	.30832340E+04	.92466890E-03
N=192	LAYER= 1	.28500000E+01	.24149830E+02	.70037380E+02	.35222020E+01	.19902760E+04	.30914000E+04	.95850850E-03

N=193	LAYER= 1	.28600000E+01	.24951650E+02	.69918910E+02	.36205930E+01	.19897880E+04	.30994710E+04	.99644050E-03
N=194	LAYER= 1	.28700000E+01	.25759950E+02	.69799640E+02	.37549030E+01	.19893420E+04	.31071260E+04	.10311090E-02
N=195	LAYER= 1	.28800000E+01	.26623070E+02	.69672420E+02	.38820960E+01	.19888430E+04	.31148130E+04	.10698630E-02
N=196	LAYER= 1	.28900000E+01	.27489380E+02	.69544850E+02	.40786030E+01	.19883440E+04	.31220700E+04	.11085850E-02
N=197	LAYER= 1	.29000000E+01	.28440100E+02	.69404790E+02	.43574630E+01	.19877940E+04	.31295620E+04	.11513780E-02
N=198	LAYER= 1	.29100000E+01	.29430520E+02	.69259020E+02	.44225930E+01	.19871910E+04	.31368780E+04	.11982290E-02
N=199	LAYER= 1	.29200000E+01	.30411790E+02	.69114780E+02	.45636980E+01	.19866480E+04	.31436780E+04	.12403580E-02
N=200	LAYER= 1	.29300000E+01	.31465460E+02	.68959820E+02	.47813920E+01	.19860460E+04	.31505400E+04	.12871240E-02
N=201	LAYER= 1	.29400000E+01	.32544060E+02	.68801400E+02	.49252390E+01	.19854230E+04	.31571240E+04	.13355930E-02
N=202	LAYER= 1	.29500000E+01	.33663190E+02	.68637120E+02	.50668970E+01	.19847620E+04	.31635310E+04	.13869320E-02
N=203	LAYER= 1	.29600000E+01	.34806030E+02	.68469540E+02	.52775750E+01	.19841020E+04	.31696670E+04	.14382130E-02
N=204	LAYER= 1	.29700000E+01	.36019890E+02	.68291570E+02	.54446190E+01	.19834200E+04	.31757810E+04	.14911820E-02
N=205	LAYER= 1	.29800000E+01	.37238710E+02	.68113170E+02	.55799470E+01	.19827010E+04	.31815320E+04	.15470010E-02
N=206	LAYER= 1	.29900000E+01	.38514410E+02	.67926490E+02	.57857140E+01	.19819840E+04	.31871810E+04	.16027530E-02
N=207	LAYER= 1	.30000000E+01	.39825510E+02	.67734760E+02	.59759610E+01	.19812070E+04	.31926260E+04	.16630720E-02
N=208	LAYER= 1	.30100000E+01	.41187600E+02	.67535770E+02	.60722090E+01	.19804320E+04	.31979290E+04	.17233180E-02
N=209	LAYER= 1	.30200000E+01	.42543770E+02	.67337910E+02	.61480030E+01	.19796570E+04	.32028830E+04	.17834870E-02
N=210	LAYER= 1	.30300000E+01	.43941290E+02	.67134130E+02	.64277950E+01	.19788610E+04	.32076810E+04	.18453080E-02
N=211	LAYER= 1	.30400000E+01	.45424420E+02	.66918150E+02	.62829000E+01	.19780110E+04	.32124600E+04	.19113750E-02
N=212	LAYER= 1	.30500000E+01	.46758560E+02	.66724030E+02	.61968330E+01	.19772390E+04	.32165100E+04	.19712980E-02
N=213	LAYER= 1	.30600000E+01	.48203920E+02	.66513820E+02	.67426940E+01	.19764100E+04	.32206540E+04	.20357490E-02
N=214	LAYER= 1	.30700000E+01	.49784850E+02	.66284260E+02	.69708980E+01	.19755070E+04	.32249180E+04	.21058520E-02
N=215	LAYER= 1	.30800000E+01	.51334300E+02	.66059380E+02	.69653130E+01	.19746210E+04	.32288520E+04	.21747030E-02
N=216	LAYER= 1	.30900000E+01	.52914250E+02	.65830380E+02	.71847060E+01	.19737140E+04	.32326320E+04	.22451650E-02
N=217	LAYER= 1	.31000000E+01	.54565180E+02	.65591420E+02	.74295760E+01	.19727720E+04	.32363540E+04	.23183830E-02
N=218	LAYER= 1	.31100000E+01	.56256770E+02	.65346700E+02	.76303890E+01	.19717720E+04	.32399490E+04	.23960460E-02
N=219	LAYER= 1	.31200000E+01	.57999780E+02	.65094920E+02	.79226640E+01	.19707740E+04	.32434380E+04	.24735750E-02
N=220	LAYER= 1	.31300000E+01	.59826110E+02	.64831440E+02	.84747220E+01	.19697630E+04	.32468820E+04	.25521170E-02
N=221	LAYER= 1	.31400000E+01	.61820390E+02	.64544040E+02	.87069140E+01	.19685930E+04	.32504160E+04	.26430150E-02
N=222	LAYER= 1	.31500000E+01	.63753710E+02	.64265820E+02	.85065900E+01	.19675240E+04	.32536360E+04	.27260830E-02
N=223	LAYER= 1	.31600000E+01	.65660570E+02	.63991730E+02	.86282500E+01	.19664130E+04	.32566310E+04	.28123870E-02
N=224	LAYER= 1	.31700000E+01	.67652080E+02	.63705920E+02	.85632920E+01	.19653000E+04	.32595810E+04	.28988220E-02
N=225	LAYER= 1	.31800000E+01	.69532190E+02	.63436350E+02	.80752520E+01	.19641970E+04	.32622150E+04	.29845160E-02
N=226	LAYER= 1	.31900000E+01	.71305680E+02	.63182490E+02	.83707940E+01	.19632120E+04	.32645740E+04	.30610550E-02
N=227	LAYER= 1	.32000000E+01	.73322850E+02	.62894050E+02	.88849920E+01	.19620550E+04	.32671220E+04	.31509380E-02
N=228	LAYER= 1	.32100000E+01	.75331630E+02	.62607210E+02	.88784590E+01	.19609000E+04	.32695250E+04	.32406400E-02
N=229	LAYER= 1	.32200000E+01	.77348720E+02	.62319520E+02	.89993540E+01	.19597910E+04	.32718160E+04	.33268130E-02
N=230	LAYER= 1	.32300000E+01	.79415670E+02	.62025190E+02	.92088400E+01	.19586190E+04	.32740440E+04	.34178420E-02
N=231	LAYER= 1	.32400000E+01	.81531200E+02	.61724320E+02	.98161130E+01	.19574100E+04	.32762090E+04	.35117540E-02
N=232	LAYER= 1	.32500000E+01	.83877720E+02	.61391120E+02	.10456370E+02	.19560890E+04	.32784860E+04	.36143680E-02
N=233	LAYER= 1	.32600000E+01	.86288400E+02	.61049350E+02	.10710730E+02	.19547180E+04	.32806960E+04	.37209080E-02
N=234	LAYER= 1	.32700000E+01	.88754680E+02	.60700220E+02	.11386450E+02	.19533360E+04	.32828360E+04	.38282960E-02
N=235	LAYER= 1	.32800000E+01	.91478520E+02	.60315370E+02	.11836130E+02	.19517930E+04	.32850670E+04	.39481260E-02
N=236	LAYER= 1	.32900000E+01	.94154890E+02	.59937870E+02	.11637460E+02	.19502620E+04	.32871340E+04	.40670670E-02
N=237	LAYER= 1	.33000000E+01	.96793330E+02	.59566400E+02	.11728010E+02	.19487910E+04	.32890610E+04	.41813110E-02
N=238	LAYER= 1	.33100000E+01	.99517030E+02	.59183640E+02	.12043700E+02	.19472650E+04	.32909440E+04	.42999080E-02
N=239	LAYER= 1	.33200000E+01	.10230510E+03	.58792480E+02	.12255560E+02	.19456900E+04	.32927690E+04	.44222880E-02
N=240	LAYER= 1	.33300000E+01	.10513150E+03	.58396740E+02	.12397580E+02	.19441120E+04	.32945210E+04	.45448720E-02

N=241	LAYER= 1	.33400000E+01	.10799120E+03	.57997100E+02	.12594960E+02	.19424890E+04	.32962000E+04	.46708950E-02
N=242	LAYER= 1	.33500000E+01	.11091400E+03	.57589370E+02	.12834960E+02	.19408680E+04	.32978280E+04	.47968350E-02
N=243	LAYER= 1	.33600000E+01	.11389040E+03	.57175040E+02	.12977830E+02	.19392000E+04	.32994000E+04	.49264620E-02
N=244	LAYER= 1	.33700000E+01	.11688570E+03	.56758870E+02	.13450390E+02	.19375290E+04	.33009020E+04	.50562340E-02
N=245	LAYER= 1	.33800000E+01	.12008650E+03	.56315050E+02	.14207640E+02	.19357390E+04	.33024240E+04	.51952740E-02
N=246	LAYER= 1	.33900000E+01	.12343860E+03	.55851290E+02	.14193040E+02	.19338650E+04	.33039340E+04	.53408380E-02
N=247	LAYER= 1	.34000000E+01	.12664040E+03	.55409280E+02	.13926660E+02	.19320540E+04	.33053010E+04	.54816160E-02
N=248	LAYER= 1	.34100000E+01	.12987740E+03	.54963370E+02	.14733360E+02	.19302470E+04	.33066150E+04	.56219320E-02
N=249	LAYER= 1	.34200000E+01	.13346090E+03	.54470790E+02	.15404800E+02	.19282830E+04	.33079950E+04	.57745180E-02
N=250	LAYER= 1	.34300000E+01	.13701750E+03	.53983110E+02	.15201540E+02	.19263190E+04	.33092930E+04	.59270750E-02
N=251	LAYER= 1	.34400000E+01	.14051620E+03	.53504460E+02	.15361460E+02	.19243660E+04	.33105060E+04	.60788160E-02
N=252	LAYER= 1	.34500000E+01	.14415680E+03	.53007590E+02	.15939520E+02	.19223620E+04	.33117050E+04	.62344730E-02
N=253	LAYER= 1	.34600000E+01	.14793410E+03	.52493290E+02	.16262180E+02	.19202660E+04	.33128860E+04	.63973760E-02
N=254	LAYER= 1	.34700000E+01	.15173510E+03	.51977070E+02	.16459620E+02	.19181770E+04	.33140160E+04	.65596430E-02
N=255	LAYER= 1	.34800000E+01	.15561550E+03	.51451390E+02	.16989710E+02	.19160390E+04	.33151110E+04	.67256950E-02
N=256	LAYER= 1	.34900000E+01	.15967540E+03	.50902820E+02	.17508100E+02	.19138010E+04	.33161990E+04	.68995900E-02
N=257	LAYER= 1	.35000000E+01	.16381010E+03	.50345660E+02	.18132180E+02	.19115260E+04	.33172520E+04	.70763560E-02
N=258	LAYER= 1	.35100000E+01	.16817510E+03	.49759060E+02	.19022990E+02	.19091020E+04	.33183060E+04	.72646230E-02
N=259	LAYER= 1	.35200000E+01	.17274160E+03	.49147200E+02	.19571600E+02	.19066340E+04	.33193510E+04	.74563590E-02
N=260	LAYER= 1	.35300000E+01	.17737930E+03	.48527630E+02	.19682980E+02	.19040730E+04	.33203570E+04	.76552860E-02
N=261	LAYER= 1	.35400000E+01	.18201340E+03	.47910450E+02	.19656070E+02	.19015280E+04	.33213090E+04	.78529850E-02
N=262	LAYER= 1	.35500000E+01	.18665440E+03	.47294190E+02	.20055970E+02	.18990350E+04	.33222150E+04	.80467020E-02
N=263	LAYER= 1	.35600000E+01	.19149380E+03	.46653550E+02	.20263270E+02	.18964050E+04	.33231120E+04	.82510100E-02
N=264	LAYER= 1	.35700000E+01	.19624850E+03	.46026080E+02	.20109840E+02	.18937890E+04	.33239490E+04	.84542530E-02
N=265	LAYER= 1	.35800000E+01	.20103180E+03	.45396800E+02	.20252220E+02	.18911920E+04	.33247510E+04	.86559550E-02
N=266	LAYER= 1	.35900000E+01	.20587090E+03	.44762150E+02	.20743630E+02	.18886030E+04	.33255220E+04	.88571220E-02
N=267	LAYER= 1	.36000000E+01	.21090540E+03	.44103970E+02	.21480890E+02	.18858810E+04	.33262870E+04	.90685470E-02
N=268	LAYER= 1	.36100000E+01	.21611360E+03	.43425330E+02	.22062440E+02	.18830740E+04	.33270390E+04	.92866040E-02
N=269	LAYER= 1	.36200000E+01	.22144500E+03	.42732980E+02	.22535060E+02	.18801840E+04	.33277710E+04	.95111310E-02
N=270	LAYER= 1	.36300000E+01	.22689930E+03	.42027110E+02	.23127230E+02	.18772610E+04	.33284830E+04	.97382100E-02
N=271	LAYER= 1	.36400000E+01	.23253590E+03	.41300250E+02	.23969330E+02	.18742500E+04	.33291830E+04	.99721200E-02
N=272	LAYER= 1	.36500000E+01	.23841740E+03	.40544600E+02	.24667840E+02	.18710680E+03	.33298760E+04	.10219320E-01
N 273	LAYER= 1	.36600000E+01	.24441340E+03	.39777150E+02	.24921510E+02	.18679010E+04	.33305470E+04	.10465390E-01
N=274	LAYER= 1	.36700000E+01	.25044260E+03	.39008410E+02	.25050220E+02	.18646570E+04	.33311880E+04	.10717360E-01
N=275	LAYER= 1	.36800000E+01	.25652620E+03	.38235710E+02	.25428380E+02	.18614410E+04	.33318030E+04	.10967180E-01
N=276	LAYER= 1	.36900000E+01	.26276470E+03	.37446430E+02	.25768900E+02	.18581040E+04	.33324030E+04	.11226430E-01
N=277	LAYER= 1	.37000000E+01	.26904010E+03	.36655620E+02	.26078910E+02	.18547910E+04	.33329760E+04	.11483850E-01
N=278	LAYER= 1	.37100000E+01	.27545760E+03	.35850150E+02	.26733900E+02	.18514060E+04	.33335340E+04	.11746810E-01
N=279	LAYER= 1	.37200000E+01	.28208090E+03	.35022270E+02	.27580400E+02	.18479060E+04	.33340820E+04	.12018710E-01
N=280	LAYER= 1	.37300000E+01	.28894200E+03	.34168300E+02	.28508380E+02	.18442930E+04	.33346210E+04	.12299370E-01
N=281	LAYER= 1	.37400000E+01	.29605220E+03	.33287200E+02	.29492790E+02	.18405700E+04	.33351520E+04	.12588570E-01
N=282	LAYER= 1	.37500000E+01	.30343110E+03	.32376940E+02	.30574550E+02	.18366950E+04	.33356750E+04	.12889600E-01
N=283	LAYER= 1	.37600000E+01	.31111050E+03	.31434070E+02	.31404160E+02	.18327180E+04	.33361900E+04	.13198620E-01
N=284	LAYER= 1	.37700000E+01	.31893840E+03	.30477620E+02	.31823680E+02	.18286410E+04	.33366880E+04	.13515310E-01
N=285	LAYER= 1	.37800000E+01	.32686640E+03	.29513660E+02	.32429280E+02	.18245130E+04	.33371660E+04	.13836000E-01
N=286	LAYER= 1	.37900000E+01	.33503740E+03	.28525120E+02	.32895250E+02	.18202910E+04	.33376330E+04	.14164010E-01
N=287	LAYER= 1	.38000000E+01	.34324110E+03	.27537650E+02	.32859610E+02	.18160220E+04	.33380770E+04	.14495650E-01
N=288	LAYER= 1	.38100000E+01	.35143880E+03	.26555880E+02	.33427190E+02	.18118380E+04	.33384980E+04	.14820680E-01

N=289	LAYER= 1	.38200000E+01	.35997360E+03	.25539010E+02	.34375400E+02	.18074380E+04	.33389150E+04	.15162440E-01
N=290	LAYER= 1	.38300000E+01	.36869390E+03	.24505530E+02	.34550130E+02	.18029570E+04	.33393170E+04	.15510590E-01
N=291	LAYER= 1	.38400000E+01	.37736460E+03	.23483390E+02	.34755010E+02	.17985230E+04	.33396980E+04	.15855060E-01
N=292	LAYER= 1	.38500000E+01	.38623960E+03	.22442770E+02	.35299900E+02	.17940130E+04	.33400670E+04	.16205450E-01
N=293	LAYER= 1	.38600000E+01	.39523690E+03	.21393550E+02	.35782250E+02	.17894700E+04	.33404220E+04	.16558340E-01
N=294	LAYER= 1	.38700000E+01	.40440950E+03	.20329770E+02	.36607890E+02	.17848160E+04	.33407650E+04	.16919880E-01
N=295	LAYER= 1	.38800000E+01	.41388240E+03	.19237370E+02	.37642730E+02	.17800150E+04	.33411020E+04	.17292900E-01
N=296	LAYER= 1	.38900000E+01	.42364080E+03	.18118570E+02	.38405800E+02	.17751120E+04	.33414290E+04	.17673730E-01
N=297	LAYER= 1	.39000000E+01	.43356410E+03	.16987600E+02	.38859810E+02	.17701560E+04	.33417460E+04	.18058800E-01
N=298	LAYER= 1	.39100000E+01	.44361800E+03	.15848600E+02	.39314150E+02	.17651050E+04	.33420490E+04	.18451130E-01
N=299	LAYER= 1	.39200000E+01	.45383980E+03	.14697600E+02	.40306310E+02	.17600070E+04	.33423410E+04	.18847200E-01
N=300	LAYER= 1	.39300000E+01	.46447410E+03	.13507590E+02	.40837490E+02	.17547540E+04	.33426290E+04	.19255260E-01
N=301	LAYER= 1	.39400000E+01	.47503880E+03	.12332820E+02	.40668790E+02	.17494980E+04	.33429000E+04	.19663600E-01
N=302	LAYER= 1	.39500000E+01	.48565530E+03	.11159680E+02	.40862460E+02	.17442800E+04	.33431570E+04	.20068960E-01
N=303	LAYER= 1	.39600000E+01	.49639180E+03	.99807630E+01	.40710250E+02	.17389940E+04	.33434040E+04	.20479630E-01
N=304	LAYER= 1	.39700000E+01	.50699870E+03	.88233940E+01	.39628580E+02	.17337850E+04	.33436340E+04	.20884280E-01
N=305	LAYER= 1	.39800000E+01	.51723380E+03	.77134090E+01	.37902900E+02	.17287930E+04	.33438450E+04	.21272060E-01
N=306	LAYER= 1	.39900000E+01	.52699500E+03	.66610180E+01	.35814960E+02	.17240460E+04	.33440380E+04	.21640880E-01
N=307	LAYER= 1	.40000000E+01	.53618430E+03	.56757620E+01	.33607350E+02	.17195680E+04	.33442100E+04	.21988760E-01
N=308	LAYER= 1	.40100000E+01	.54482640E+03	.47539750E+01	.31304920E+02	.17153810E+04	.33443650E+04	.22313990E-01
N=309	LAYER= 1	.40200000E+01	.55283690E+03	.39036950E+01	.28384080E+02	.17115130E+04	.33445030E+04	.22614480E-01
N=310	LAYER= 1	.40300000E+01	.55996080E+03	.31508380E+01	.25017660E+02	.17080820E+04	.33446220E+04	.22881030E-01
N=311	LAYER= 1	.40400000E+01	.56620470E+03	.24935260E+01	.21710720E+02	.17050750E+04	.33447220E+04	.23114690E-01
N=312	LAYER= 1	.40500000E+01	.57158310E+03	.19292250E+01	.10328010E+02	.17025120E+04	.33448070E+04	.23313750E-01
N=313	LAYER= 1	.40600000E+01	.57173560E+03	.19132540E+01	.53306790E+00	.17024170E+04	.33448090E+04	.23321160E-01
N=314	LAYER= 1	.40700000E+01	.57186900E+03	.18992780E+01	.14098220E+00	.17023530E+04	.33448110E+04	.23326090E-01
N=315	LAYER= 1	.40800000E+01	.57181120E+03	.19053350E+01	-.19787910E+00	.17023850E+04	.33448100E+04	.23323620E-01
N=316	LAYER= 1	.40900000E+01	.57176290E+03	.19103950E+01	-.52884980E+00	.17024170E+04	.33448090E+04	.23321160E-01
N=317	LAYER= 1	.41000000E+01	.57152760E+03	.19350450E+01	.30844290E+02	.17025120E+04	.33448060E+04	.23313750E-01

Pressure	Rate	Pressure	Rate	Pressure	Rate
4.000	.174	196.000	20.118	384.000	35.162
8.000	.702	200.000	20.222	388.000	35.394
12.000	1.541	204.000	20.554	392.000	35.609
16.000	2.292	208.000	21.055	396.000	35.851
20.000	3.140	212.000	21.603	400.000	36.211
24.000	3.490	216.000	22.050	404.000	36.571
28.000	4.228	220.000	22.407	408.000	37.000
32.000	4.853	224.000	22.812	412.000	37.437
36.000	5.442	228.000	23.292	416.000	37.808
40.000	5.988	232.000	23.889	420.000	38.121
44.000	6.422	236.000	24.381	424.000	38.422
48.000	6.666	240.000	24.735	428.000	38.605
52.000	7.058	244.000	24.904	432.000	38.788
56.000	7.600	248.000	24.998	436.000	38.970
60.000	8.495	252.000	25.147	440.000	39.151
64.000	8.522	256.000	25.396	444.000	39.351
68.000	8.473	260.000	25.618	448.000	39.739
72.000	8.548	264.000	25.830	452.000	40.128
76.000	8.919	268.000	26.028	456.000	40.414
80.000	9.377	272.000	26.381	460.000	40.614
84.000	10.469	276.000	26.803	464.000	40.814
88.000	11.180	280.000	27.314	468.000	40.781
92.000	11.797	284.000	27.840	472.000	40.717
96.000	11.701	288.000	28.381	476.000	40.686
100.000	12.080	292.000	28.932	480.000	40.759
104.000	12.341	296.000	29.486	484.000	40.832
108.000	12.596	300.000	30.072	488.000	40.829
112.000	12.887	304.000	30.636	492.000	40.773
116.000	13.311	308.000	31.068	496.000	40.716
120.000	14.187	312.000	31.452	500.000	40.342
124.000	14.146	316.000	31.666	504.000	39.934
128.000	14.265	320.000	31.905	508.000	39.460
132.000	15.131	324.000	32.210	512.000	38.785
136.000	15.260	328.000	32.494	516.000	38.111
140.000	15.338	332.000	32.722	520.000	37.311
144.000	15.915	336.000	32.891	524.000	36.456
148.000	16.266	340.000	32.874	528.000	35.574
152.000	16.496	344.000	32.912	532.000	34.613
156.000	17.039	348.000	33.189	536.000	33.652
160.000	17.557	352.000	33.490	540.000	32.591
164.000	18.171	356.000	34.934	544.000	31.525
168.000	18.987	360.000	34.376	548.000	30.148
172.000	19.483	364.000	34.456	552.000	28.689
176.000	19.650	368.000	34.536	556.000	26.889
180.000	19.668	372.000	34.628	560.000	24.997
184.000	19.827	376.000	34.723	564.000	22.878
188.000	20.114	380.000	34.917	568.000	17.911
192.000	20.247				

Table of Burn Rate Laws

RANGE PLOW MPa	PHIGH MPa	COEF CM/S-MPa^EXP	EXP	CORR COEF
				.991201
30.	59.	.323998E+00	.783304	
59.	148.	.282177E+00	.811974	.981494
148.	443.	.284842E+00	.811954	.996450
30.	440.	.295513E+00	.804638	.998717

APPENDIX I:

BRLCB RESULTS FOR TRACK 6

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BURNING RATE ANALYSIS
BRLCB V3.0
ADVANCED BALLISTIC CONCEPTS BRANCH - BRL

Project :	M5 BURN RATES	Requested by :	W. Oberle
Inf File:	a:m5t6.inf	Created From .MAS File :	a:m5.mas
P/T File:	a:m5t6.pvt	Calculation Output File:	a:m5t6.out
Smoothed:	a:m5t6.pdt	Graphics File :	a:m5t6.dat
Fired on:	24 Nov 92		

FIRING REMARKS:
Bill Aungst: Operator

REDUCTION REMARKS:
Reduced on 12 Dec 92 by W. Oberle

IGNITER INFORMATION

The Igntier Used Is : Black Powder Lot: FFFG
The Source For The Igniter Is: Pellets, Milan Ord.

IGNITER THERMOCHEMICAL PROPERTIES:

Impetus (J/g) :	290.0	Molecular Weight:	66.37000
Flame Temperature (K):	2188.0	Covolume (g/cm^3) :	.78500
Density (g/cm^3) :	1.75000	Gamma :	1.21840

PROPELLANT INFORMATION

The Propellant Used Is : M5 Lot: RAD-64597 Of 1966
The Source For The Propellant Is : Radford Army Ammo Pl
Propellant Thermochemical Properties: Following Sheets of Output

PROPELLANT GRAIN GEOMETRY

Grain Type: 1-Perf. Cyl.

Length --- (cm.):	.574294
Outer Diam.(cm.):	.136906
Perf Diam. (cm.):	.040894
Inner Web (cm.):	.048006

Bomb Information		Gage Information	
Bomb Type :	Closed Chamber	Gage I.D. :	C14430
Bomb Vol (cm^3) :	209.0	Input Voltage :	11.5600
		Constants For Fit:	A+Bx+C^2
		A:	.20157E+01
		B:	.52474E-01
		C:	-.12544E-06

Temperature and Charge Mass Information

Propellant Mass (g) :	73.4889	Igniter Mass (g) :	1.5000
Initial Temp. Prop.(K) :	294.	Igniter Temp.(K) :	294.
Initial Bomb Temp. (K) :	294.		
Number of Propellant Grains:	5784.37		
Number of Wildpoint Passes :	1	Wildpoint Tolerance:	2.000
Number of Smoothing Passes :	1	Smoothing Option :	1
Bridge Length :	15		

****

```
*****************************************************************************
  Total # Layers =  1
  Chamber Volume (cm³) =  209.000
  Heat-Loss-Fraction (n-d) =  .000
  Time Step (mil-sec) =  .10000000E-01     Max Time Steps =  1200
  Convergence Criterion =  .10000000E-04
  Computation Type (1=BURN-RATE, 2=PTGEN, 3=SURF AREA, 4=INTERR BOMB, 5=ETC) 1
*****************************************************************************
                      Beginning (1) of Layer          End (2) of Layer
*****************************************************************************
          Propellant Mass in grams
*****************************************************************************
          1                 73.48890
       Ignitor               1.50000
         Air                  .19698
*****************************************************************************
          Propellant Density in g/cm³
*****************************************************************************
          1                 1.65000                   1.65000
       Ignitor              1.75000
*****************************************************************************
          Propellant Impetus in J/g
*****************************************************************************
          1               1093.00000               1093.00000
       Ignitor             290.00000
*****************************************************************************
          Propellant Flame Temperature in deg K
*****************************************************************************
          1               3379.00000               3379.00000
       Ignitor            2188.00000
*****************************************************************************
          Propellant Molecular Weight in g/g-mole
*****************************************************************************
          1                 25.70266                 25 70266
       Ignitor              66.37000
         Air                28.90000
*****************************************************************************
          Propellant Gas Constant in cal/g-deg K
*****************************************************************************
          1                  .07731                   .07731
       Ignitor               .02994
         Air                 .06876
*****************************************************************************
          Gamma (Ratio of Specific Heats)
*****************************************************************************
          1                 1.22580                   1.22580
       Ignitor              1.21840
         Air                1.40000
*****************************************************************************
          Specific Heat (Cv) in cal/g-deg K
*****************************************************************************
          1                  .34240                   .34240
       Ignitor               .13709
         Air                 .17190
*****************************************************************************
          Covolume in cm³/g
*****************************************************************************
          1                  .98400                   .98400
       Ignitor               .78500
         Air                 .98000
*****************************************************************************
```

```
*****************************************************************************************************

  ******* Maximum Chamber Properties are  *******
  Theoretical Maximum Chamber Pressure (MPa) =  .59721620E+03
  Theoretical Maximum Chamber Temperature (deg K) =  .33648540E+04
  **** Assuming a Heat-Loss-Fraction =  .009
  Maximum Total Heat Loss from Chamber (cal) =  .79299800E+03
  Maximum Chamber Pressure (MPa) w/Heat Loss =  .59167540E+03
  Maximum Chamber Temperature (deg K) w/Heat Loss =  .33336360E+04


   ** Results: Deduced Burning Rates Based on a given Chamber Pressure vs. Time **

  *** N *** LAYER *** TIME(ms) *** PCH(MPa) *** TPMR(gm) *** RBR(cm/s) *** ASUR(cm2) *** TCH(degK) ***
DEPTHB(cm) ***

  N=    1 LAYER= 1   .00000000E+00   .27938490E+01   .73488900E+02   .00000000E+00   .20106560E+04
.18630090E+04   .00000000E+00
```

*** DEDUCED BURNING RATES ***

N= 3	LAYER= 1	.84000000E+00	.28082940E+01	.73486880E+02	.37998650E-01	.20106560E+04	.18672820E+04	.00000000E+00
N= 4	LAYER= 1	.85000000E+00	.28187070E+01	.73485370E+02	-.15226490E-01	.20106560E+04	.18704740E+04	.00000000E+00
N= 5	LAYER= 1	.86000000E+00	.27966020E+01	.73487890E+02	-.75862740E-01	.20106560E+04	.18651730E+04	.00000000E+00
N= 6	LAYER= 1	.87000000E+00	.27805260E+01	.73490400E+02	-.37863810E-01	.20106560E+04	.18598100E+04	.00000000E+00
N= 7	LAYER= 1	.88000000E+00	.27823520E+01	.73490400E+02	.75458130E-02	.20106560E+04	.18598000E+04	.00000000E+00
N= 8	LAYER= 1	.89000000E+00	.27878340E+01	.73489910E+02	-.76805980E-02	.20106560E+04	.18608550E+04	.00000000E+00
N= 9	LAYER= 1	.90000000E+00	.27827220E+01	.73490910E+02	-.37931370E-01	.20106560E+04	.18586910E+04	.00000000E+00
N= 10	LAYER= 1	.91000000E+00	.27651850E+01	.73492420E+02	.75458510E-02	.20106560E+04	.18554980E+04	.00000000E+00
N= 11	LAYER= 1	.92000000E+00	.27880190E+01	.73490410E+02	.91021820E-01	.20106560E+04	.18597490E+04	.00000000E+00
N= 12	LAYER= 1	.93000000E+00	.28090260E+01	.73486380E+02	.15947350E+00	.20106560E+04	.18683630E+04	.00000000E+00
N= 13	LAYER= 1	.94000000E+00	.28561550E+01	.73479830E+02	.17463250E+00	.20106560E+04	.18820640E+04	.00000000E+00
N= 14	LAYER= 1	.95000000E+00	.28890360E+01	.73474790E+02	.83610710E-01	.20106560E+04	.18924510E+04	.00000000E+00
N= 15	LAYER= 1	.96000000E+00	.28939680E+01	.73474280E+02	-.15091700E-01	.20106560E+04	.18934820E+04	.00000000E+00
N= 16	LAYER= 1	.97000000E+00	.28833720E+01	.73475790E+02	-.60703370E-01	.20106560E+04	.18903890E+04	.00000000E+00
N= 17	LAYER= 1	.98000000E+00	.28691240E+01	.73478310E+02	-.45544600E-01	.20106560E+04	.18851970E+04	.00000000E+00
N= 18	LAYER= 1	.98999990E+00	.28630960E+01	.73478810E+02	.22705040E-01	.20106560E+04	.18841610E+04	.00000000E+00
N= 19	LAYER= 1	.99999990E+00	.28777090E+01	.73476810E+02	.15159070E-01	.20106560E+04	.18883130E+04	.00000000E+00
N= 20	LAYER= 1	.10100000E+01	.28707680E+01	.73477810E+02	-.15226370E-01	.20106560E+04	.18862380E+04	.00000000E+00
N= 21	LAYER= 1	.10200000E+01	.28683930E+01	.73477810E+02	.30385370E-01	.20106560E+04	.18862420E+04	.00000000E+00
N= 22	LAYER= 1	.10300000E+01	.28830060E+01	.73475790E+02	.76132240E-02	.20106560E+04	.18903920E+04	.00000000E+00
N= 23	LAYER= 1	.10400000E+01	.28724120E+01	.73477310E+02	.76806370E-02	.20106560E+04	.18872770E+04	.00000000E+00
N= 24	LAYER= 1	.10500000E+01	.28906780E+01	.73475290E+02	.99106160E-01	.20106560E+04	.18914190E+04	.00000000E+00
N= 25	LAYER= 1	.10600000E+01	.29235560E+01	.73470730E+02	.12154150E+00	.20106560E+04	.19006740E+04	.00000000E+00
N= 26	LAYER= 1	.10700000E+01	.29431000E+01	.73467220E+02	.91089660E-01	.20106560E+04	.19077690E+04	.00000000E+00
N= 27	LAYER= 1	.10800000E+01	.29617310E+01	.73464690E+02	.68721140E-01	.20106560E+04	.19128070E+04	.00000000E+00
N= 28	LAYER= 1	.10900000E+01	.29776230E+01	.73462660E+02	.53494420E-01	.20106560E+04	.19168270E+04	.00000000E+00
N= 29	LAYER= 1	.11000000E+01	.29889480E+01	.73461140E+02	.74784770E-02	.20106560E+04	.19198230E+04	.00000000E+00
N= 30	LAYER= 1	.11100000E+01	.29796300E+01	.73462170E+02	-.23176540E-01	.20106560E+04	.19178130E+04	.00000000E+00
N= 31	LAYER= 1	.11200000E+01	.29739680E+01	.73462680E+02	.68519020E-01	.20106560E+04	.19168120E+04	.00000000E+00
N= 32	LAYER= 1	.11300000E+01	.30105020E+01	.73457620E+02	.12208110E+00	.20106560E+04	.19267390E+04	.00000000E+00
N= 33	LAYER= 1	.11400000E+01	.30327870E+01	.73454570E+02	.53763910E-01	.20106560E+04	.19326370E+04	.00000000E+00
N= 34	LAYER= 1	.11500000E+01	.30389980E+01	.73454050E+02	.83475970E-01	.20106560E+04	.19336390E+04	.00000000E+00
N= 35	LAYER= 1	.11600000E+01	.30676780E+01	.73449040E+02	.14458460E+00	.20106560E+04	.19432830E+04	.00000000E+00
N= 36	LAYER= 1	.11700000E+01	.31027500E+01	.73444460E+02	.10631510E+00	.20106560E+04	.19519420E+04	.00000000E+00
N= 37	LAYER= 1	.11800000E+01	.31144430E+01	.73441990E+02	.98162930E-01	.20106560E+04	.19566120E+04	.00000000E+00
N= 38	LAYER= 1	.11900000E+01	.31412970E+01	.73437940E+02	.11440050E+00	.20106560E+04	.19641270E+04	.00000000E+00
N= 39	LAYER= 1	.12000000E+01	.31672370E+01	.73434390E+02	.13730750E+00	.20106560E+04	.19706590E+04	.00000000E+00
N= 40	LAYER= 1	.12100000E+01	.32046860E+01	.73428830E+02	.91965050E-01	.20106560E+04	.19807730E+04	.00000000E+00
N= 41	LAYER= 1	.12200000E+01	.32114450E+01	.73428290E+02	.39211280E-01	.20106560E+04	.19817370E+04	.00000000E+00
N= 42	LAYER= 1	.12300000E+01	.32278850E+01	.73426230E+02	-.30452890E-01	.20106560E+04	.19854270E+04	.00000000E+00
N= 43	LAYER= 1	.12400000E+01	.31975630E+01	.73430310E+02	-.84419630E-01	.20106560E+04	.19780780E+04	.00000000E+00
N= 44	LAYER= 1	.12500000E+01	.31869660E+01	.73431830E+02	-.31126480E-01	.20106560E+04	.19753190E+04	.00000000E+00
N= 45	LAYER= 1	.12600000E+01	.31800250E+01	.73432380E+02	.14283140E-01	.20106560E+04	.19743460E+04	.00000000E+00
N= 46	LAYER= 1	.12700000E+01	.31886100E+01	.73430890E+02	.38066310E-01	.20106560E+04	.19770720E+04	.00000000E+00
N= 47	LAYER= 1	.12800000E+01	.31971920E+01	.73429860E+02	.23782910E-01	.20106560E+04	.19789380E+04	.00000000E+00
N= 48	LAYER= 1	.12900000E+01	.32039500E+01	.73429310E+02	.46218100E-01	.20106560E+04	.19799050E+04	.00000000E+00

N= 49	LAYER= 1	.13000000E+01	.32207540E+01	.73426790E+02	.91560800E-01	.20106560E+04	.19844540E+04	.00000000E+00
N= 50	LAYER= 1	.13100000E+01	.32457780E+01	.73423230E+02	.12922270E+00	.20106560E+04	.19908000E+04	.00000000E+00
N= 51	LAYER= 1	.13200000E+01	.32771950E+01	.73418210E+02	.13845290E+00	.20106560E+04	.19996890E+04	.00000000E+00
N= 52	LAYER= 1	.13300000E+01	.33131790E+01	.73414050E+02	.15383860E+00	.20103460E+04	.20070560E+04	.24003480E-04
N= 53	LAYER= 1	.13400000E+01	.33519030E+01	.73408000E+02	.18227370E+00	.20103380E+04	.20174810E+04	.24603730E-04
N= 54	LAYER= 1	.13500000E+01	.33915410E+01	.73401950E+02	.90362970E-01	.20103140E+04	.20277650E+04	.26404000E-04
N= 55	LAYER= 1	.13600000E+01	.33880690E+01	.73402010E+02	.30795150E-01	.20103140E+04	.20276840E+04	.26404950E-04
N= 56	LAYER= 1	.13700000E+01	.34061530E+01	.73399910E+02	.53975680E-01	.20103070E+04	.20311900E+04	.27005660E-04
N= 57	LAYER= 1	.13800000E+01	.34141890E+01	.73398430E+02	.61859570E-01	.20103030E+04	.20336770E+04	.27306490E-04
N= 58	LAYER= 1	.13900000E+01	.34364730E+01	.73395810E+02	.92049110E-01	.20102910E+04	.20380200E+04	.28206570E-04
N= 59	LAYER= 1	.14000000E+01	.34569330E+01	.73392330E+02	.83895910E-01	.20102790E+04	.20437860E+04	.29107110E-04
N= 60	LAYER= 1	.14100000E+01	.34737380E+01	.73390240E+02	.85176740E-01	.20102680E+04	.20471910E+04	.30007150E-04
N= 61	LAYER= 1	.14200000E+01	.34987620E+01	.73386670E+02	.74732240E-01	.20102560E+04	.20529920E+04	.30907180E-04
N= 62	LAYER= 1	.14300000E+01	.35022340E+01	.73385280E+02	.29448110E-01	.20102490E+04	.20552760E+04	.31507350E-04
N= 63	LAYER= 1	.14400000E+01	.35084450E+01	.73384720E+02	.47171120E-01	.20102490E+04	.20561690E+04	.31508310E-04
N= 64	LAYER= 1	.14500000E+01	.35274430E+01	.73382160E+02	.10000330E+00	.20102370E+04	.20602880E+04	.32408310E-04
N= 65	LAYER= 1	.14600000E+01	.35555740E+01	.73378080E+02	.13100200E+00	.20102210E+04	.20667750E+04	.33608610E-04
N= 66	LAYER= 1	.14700000E+01	.35891850E+01	.73373470E+02	.15310720E+00	.20102060E+04	.20740550E+04	.34808880E-04
N= 67	LAYER= 1	.14800000E+01	.36246220E+01	.73367930E+02	.15317640E+00	.20101820E+04	.20826850E+04	.36608760E-04
N= 68	LAYER= 1	.14900000E+01	.36582330E+01	.73363300E+02	.10041140E+00	.20101630E+04	.20898000E+04	.38108280E-04
N= 69	LAYER= 1	.15000000E+01	.36721180E+01	.73361270E+02	.16733040E+00	.20101560E+04	.20929030E+04	.38708360E-04
N= 70	LAYER= 1	.15100000E+01	.37309350E+01	.73352200E+02	.26727740E+00	.20100940E+04	.21065730E+04	.43506050E-04
N= 71	LAYER= 1	.15200000E+01	.37906660E+01	.73343540E+02	.16241660E+00	.20100860E+04	.21193460E+04	.44106050E-04
N= 72	LAYER= 1	.15300000E+01	.38072890E+01	.73341430E+02	.11625360E+00	.20100780E+04	.21224030E+04	.44706060E-04
N= 73	LAYER= 1	.15400000E+01	.38454660E+01	.73335830E+02	.90576650E-01	.20100590E+04	.21304850E+04	.46205810E-04
N= 74	LAYER= 1	.15500000E+01	.38450990E+01	.73335420E+02	.59710610E-01	.20100550E+04	.21310830E+04	.46506040E-04
N= 75	LAYER= 1	.15600000E+01	.38690260E+01	.73331860E+02	.11524470E+00	.20100430E+04	.21361490E+04	.47406240E-04
N= 76	LAYER= 1	.15700000E+01	.38975190E+01	.73327770E+02	.11679500E+00	.20100280E+04	.21419280E+04	.48606170E-04
N= 77	LAYER= 1	.15800000E+01	.39250970E+01	.73324120E+02	.16902640E+00	.20100120E+04	.21470390E+04	.49806060E-04
N= 78	LAYER= 1	.15900000E+01	.39742300E+01	.73316570E+02	.22342210E+00	.20099500E+04	.21574960E+04	.54602640E-04
N= 79	LAYER= 1	.16000000E+01	.40270160E+01	.73309300E+02	.23124020E+00	.20099500E+04	.21673520E+04	.54604080E-04
N= 80	LAYER= 1	.16100000E+01	.40798020E+01	.73301220E+02	.19862600E+00	.20098880E+04	.21781450E+04	.59400180E-04
N= 81	LAYER= 1	.16200000E+01	.41146900E+01	.73296130E+02	.16809490E+00	.20098880E+04	.21848600E+04	.59401620E-04
N= 82	LAYER= 1	.16300000E+01	.41541430E+01	.73290080E+02	.17004850E+00	.20098800E+04	.21927300E+04	.60001920E-04
N= 83	LAYER= 1	.16400000E+01	.41926830E+01	.73284850E+02	.19107930E+00	.20098570E+04	.21994290E+04	.61800350E-04
N= 84	LAYER= 1	.16500000E+01	.42385270E+01	.73277400E+02	.18845840E+00	.20097950E+04	.22088690E+04	.66595730E-04
N= 85	LAYER= 1	.16600000E+01	.42719500E+01	.73272350E+02	.15718190E+00	.20097950E+04	.22151830E+04	.66597170E-04
N= 86	LAYER= 1	.16700000E+01	.43141420E+01	.73266980E+02	.16190070E+00	.20097870E+04	.22217870E+04	.67196900E-04
N= 87	LAYER= 1	.16800000E+01	.43453730E+01	.73261610E+02	.13709930E+00	.20097680E+04	.22283550E+04	.68695460E-04
N= 88	LAYER= 1	.16900000E+01	.43738630E+01	.73257890E+02	.12698900E+00	.20097520E+04	.22328450E+04	.69894370E-04
N= 89	LAYER= 1	.17000000E+01	.44078330E+01	.73253190E+02	.18960780E+00	.20097370E+04	.22384580E+04	.71093730E-04
N= 90	LAYER= 1	.17100000E+01	.44555030E+01	.73245320E+02	.20552360E+00	.20096750E+04	.22477850E+04	.75888180E-04
N= 91	LAYER= 1	.17200000E+01	.44971470E+01	.73239560E+02	.24711360E+00	.20096750E+04	.22544760E+04	.75889620E-04
N= 92	LAYER= 1	.17300000E+01	.45676470E+01	.73228930E+02	.27569990E+00	.20096130E+04	.22666530E+04	.80683580E-04
N= 93	LAYER= 1	.17400000E+01	.46193370E+01	.73221280E+02	.23188490E+00	.20096090E+04	.22752400E+04	.80984070E-04
N= 94	LAYER= 1	.17500000E+01	.46728530E+01	.73213550E+02	.18760340E+00	.20095470E+04	.22837790E+04	.85777520E-04
N= 95	LAYER= 1	.17600000E+01	.47066440E+01	.73208830E+02	.21423270E+00	.20095470E+04	.22889090E+04	.85778940E-04
N= 96	LAYER= 1	.17700000E+01	.47674640E+01	.73199340E+02	.29000330E+00	.20095240E+04	.22991350E+04	.87576410E-04

N= 97	LAYER= 1	.17800000E+01	.48337620E+01	.73189610E+02	.25064280E+00	.20094620E+04	.23094040E+04	.92369210E-04
N= 98	LAYER= 1	.17900000E+01	.48839880E+01	.73182720E+02	.28745340E+00	.20094620E+04	.23165270E+04	.92370650E-04
N= 99	LAYER= 1	.18000000E+01	.49648990E+01	.73170540E+02	.37900950E+00	.20094000E+04	.23289270E+04	.97162980E-04
N=100	LAYER= 1	.18100000E+01	.50549390E+01	.73157590E+02	.30951370E+00	.20093380E+04	.23417850E+04	.10195480E-03
N=101	LAYER= 1	.18200000E+01	.51046130E+01	.73150020E+02	.26293140E+00	.20093340E+04	.23491580E+04	.10225520E-03
N=102	LAYER= 1	.18300000E+01	.51730980E+01	.73140150E+02	.25781560E+00	.20092720E+04	.23585940E+04	.10704650E-03
N=103	LAYER= 1	.18400000E+01	.52227720E+01	.73132930E+02	.24749830E+00	.20092680E+04	.23653970E+04	.10734680E-03
N=104	LAYER= 1	.18500000E+01	.52843200E+01	.73123740E+02	.30852270E+00	.20092060E+04	.23739160E+04	.11213770E-03
N=105	LAYER= 1	.18600000E+01	.53604770E+01	.73112460E+02	.44613510E+00	.20091870E+04	.23841680E+04	.11363480E-03
N=106	LAYER= 1	.18700000E+01	.54824710E+01	.73094160E+02	.41008250E+00	.20091170E+04	.24003780E+04	.11902310E-03
N=107	LAYER= 1	.18800000E+01	.55443830E+01	.73085280E+02	.29162460E+00	.20090560E+04	.24080390E+04	.12381280E-03
N=108	LAYER= 1	.18900000E+01	.56172530E+01	.73074830E+02	.38575280E+00	.20090400E+04	.24168960E+04	.12501080E-03
N=109	LAYER= 1	.19000000E+01	.57162340E+01	.73059700E+02	.44726040E+00	.20089780E+04	.24294420E+04	.12979990E-03
N=110	LAYER= 1	.19100000E+01	.58161310E+01	.73045170E+02	.41518090E+00	.20089170E+04	.24411680E+04	.13458850E-03
N=111	LAYER= 1	.19200000E+01	.59054340E+01	.73032180E+02	.41006880E+00	.20088540E+04	.24514080E+04	.13937660E-03
N=112	LAYER= 1	.19300000E+01	.59993020E+01	.73017990E+02	.46901600E+00	.20087930E+04	.24623390E+04	.14416420E-03
N=113	LAYER= 1	.19400000E+01	.61128910E+01	.73001090E+02	.46444470E+00	.20087310E+04	.24750150E+04	.14895130E-03
N=114	LAYER= 1	.19500000E+01	.62067550E+01	.72987210E+02	.34306710E+00	.20086690E+04	.24851590E+04	.15373800E-03
N=115	LAYER= 1	.19600000E+01	.62675670E+01	.72978350E+02	.30860590E+00	.20086650E+04	.24915020E+04	.15403800E-03
N=116	LAYER= 1	.19700000E+01	.63484640E+01	.72966740E+02	.40654550E+00	.20086030E+04	.24996720E+04	.15882420E-03
N=117	LAYER= 1	.19800000E+01	.64467100E+01	.72951400E+02	.48587330E+00	.20085410E+04	.25102690E+04	.16360990E-03
N=118	LAYER= 1	.19900000E+01	.65595650E+01	.72934540E+02	.58307350E+00	.20084790E+04	.25215980E+04	.16839500E-03
N=119	LAYER= 1	.20000000E+01	.67122260E+01	.72912760E+02	.67125580E+00	.20084100E+04	.25357740E+04	.17377720E-03
N=120	LAYER= 1	.20100000E+01	.68615980E+01	.72890050E+02	.56829580E+00	.20082860E+04	.25500660E+04	.18334360E-03
N=121	LAYER= 1	.20200000E+01	.69627630E+01	.72875090E+02	.57625030E+00	.20082630E+04	.25592090E+04	.18513790E-03
N=122	LAYER= 1	.20300000E+01	.71198020E+01	.72851860E+02	.78534310E+00	.20081400E+04	.25729970E+04	.19470210E-03
N=123	LAYER= 1	.20400000E+01	.73139060E+01	.72823040E+02	.75556350E+00	.20080620E+04	.25894530E+04	.20067890E-03
N=124	LAYER= 1	.20500000E+01	.74579770E+01	.72801800E+02	.60730370E+00	.20079770E+04	.26011460E+04	.20725200E-03
N=125	LAYER= 1	.20600000E+01	.75854330E+01	.72782810E+02	.72519580E+00	.20079040E+04	.26113020E+04	.21292850E-03
N=126	LAYER= 1	.20700000E+01	.77824480E+01	.72753750E+02	.83184530E+00	.20077760E+04	.26263160E+04	.22278620E-03
N=127	LAYER= 1	.20800000E+01	.79564540E+01	.72727690E+02	.73567000E+00	.20076530E+04	.26392730E+04	.23234280E-03
N=128	LAYER= 1	.20900000E+01	.81092760E+01	.72705000E+02	.76478260E+00	.20075910E+04	.26501850E+04	.23712120E-03
N=129	LAYER= 1	.21000000E+01	.82955040E+01	.72677020E+02	.87528710E+00	.20074680E+04	.26631940E+04	.24667590E-03
N=130	LAYER= 1	.21100000E+01	.85009050E+01	.72647020E+02	.98512830E+00	.20073440E+04	.26766070E+04	.25622770E-03
N=131	LAYER= 1	.21200000E+01	.87391670E+01	.72611760E+02	.10495260E+01	.20072210E+04	.26917220E+04	.26577870E-03
N=132	LAYER= 1	.21300000E+01	.89681160E+01	.72577500E+02	.10953510E+01	.20070980E+04	.27057840E+04	.27532770E-03
N=133	LAYER= 1	.21400000E+01	.92262700E+01	.72539220E+02	.11246470E+01	.20069510E+04	.27208000E+04	.28666380E-03
N=134	LAYER= 1	.21500000E+01	.94678000E+01	.72503010E+02	.11239260E+01	.20068120E+04	.27343770E+04	.29740090E-03
N=135	LAYER= 1	.21600000E+01	.97275840E+01	.72464780E+02	.11844300E+01	.20066620E+04	.27480860E+04	.30902950E-03
N=136	LAYER= 1	.21700000E+01	.99977730E+01	.72424580E+02	.12471120E+01	.20064770E+04	.27618670E+04	.32333810E-03
N=137	LAYER= 1	.21800000E+01	.10282920E+02	.72382210E+02	.12316810E+01	.20063380E+04	.27757260E+04	.33406700E-03
N=138	LAYER= 1	.21900000E+01	.10544140E+02	.72343030E+02	.11820840E+01	.20061540E+04	.27879790E+04	.34836810E-03
N=139	LAYER= 1	.22000000E+01	.10808460E+02	.72303950E+02	.13429970E+01	.20060300E+04	.27996880E+04	.35790050E-03
N=140	LAYER= 1	.22100000E+01	.11142690E+02	.72254130E+02	.14693770E+01	.20058380E+04	.28139340E+04	.37279090E-03
N=141	LAYER= 1	.22200000E+01	.11461560E+02	.72206690E+02	.14769420E+01	.20056530E+04	.28268310E+04	.38708180E-03
N=142	LAYER= 1	.22300000E+01	.11800880E+02	.72156370E+02	.16428310E+01	.20054610E+04	.28398490E+04	.40196300E-03
N=143	LAYER= 1	.22400000E+01	.12194030E+02	.72097970E+02	.17414160E+01	.20052110E+04	.28541780E+04	.42130250E-03
N=144	LAYER= 1	.22500000E+01	.12576390E+02	.72041150E+02	.18197640E+01	.20050070E+04	.28673690E+04	.43706500E-03

N=145	LAYER= 1	.22600000E+01	.13004370E+02	.71977560E+02	.18980660E+01	.20047570E+04	.28813260E+04	.45639020E-03
N=146	LAYER= 1	.22700000E+01	.13421570E+02	.71915570E+02	.19667760E+01	.20045110E+04	.28941810E+04	.47541100E-03
N=147	LAYER= 1	.22800000E+01	.13878350E+02	.71847460E+02	.20949310E+01	.20042500E+04	.29075230E+04	.49561150E-03
N=148	LAYER= 1	.22900000E+01	.14353170E+02	.71777020E+02	.22111630E+01	.20039430E+04	.29205270E+04	.51936520E-03
N=149	LAYER= 1	.23000000E+01	.14863020E+02	.71701230E+02	.23112000E+01	.20036790E+04	.29336930E+04	.53984370E-03
N=150	LAYER= 1	.23100000E+01	.15380850E+02	.71624190E+02	.23997970E+01	.20033720E+04	.29462820E+04	.56357770E-03
N=151	LAYER= 1	.23200000E+01	.15931880E+02	.71542580E+02	.24752170E+01	.20030580E+04	.29588140E+04	.58789200E-03
N=152	LAYER= 1	.23300000E+01	.16483060E+02	.71460580E+02	.25175770E+01	.20027360E+04	.29706550E+04	.61278650E-03
N=153	LAYER= 1	.23400000E+01	.17052270E+02	.71376200E+02	.26601940E+01	.20024070E+04	.29821160E+04	.63825990E-03
N=154	LAYER= 1	.23500000E+01	.17667430E+02	.71284800E+02	.28622630E+01	.20020400E+04	.29937800E+04	.66668140E-03
N=155	LAYER= 1	.23600000E+01	.18326690E+02	.71187100E+02	.29902560E+01	.20016690E+04	.30054600E+04	.69538110E-03
N=156	LAYER= 1	.23700000E+01	.18998500E+02	.71087270E+02	.30906430E+01	.20012790E+04	.30166360E+04	.72554100E-03
N=157	LAYER= 1	.23800000E+01	.19703470E+02	.70982980E+02	.31509250E+01	.20008470E+04	.30275650E+04	.75893330E-03
N=158	LAYER= 1	.23900000E+01	.20404020E+02	.70879230E+02	.31671690E+01	.20004660E+04	.30377550E+04	.78846250E-03
N=159	LAYER= 1	.24000000E+01	.21112920E+02	.70773900E+02	.31886780E+01	.20000340E+04	.30474690E+04	.82181020E-03
N=160	LAYER= 1	.24100000E+01	.21823230E+02	.70668770E+02	.33451740E+01	.19996080E+04	.30565820E+04	.85483680E-03
N=161	LAYER= 1	.24200000E+01	.22604970E+02	.70553160E+02	.36297320E+01	.19991810E+04	.30659940E+04	.88784360E-03
N=162	LAYER= 1	.24300000E+01	.23442070E+02	.70429300E+02	.38038900E+01	.19986940E+04	.30754350E+04	.92553880E-03
N=163	LAYER= 1	.24400000E+01	.24300630E+02	.70302270E+02	.39970580E+01	.19982040E+04	.30844940E+04	.96349790E-03
N=164	LAYER= 1	.24500000E+01	.25223630E+02	.70165730E+02	.42462440E+01	.19976520E+04	.30935920E+04	.10061300E-02
N=165	LAYER= 1	.24600000E+01	.26194670E+02	.70022350E+02	.44118050E+01	.19971060E+04	.31025030E+04	.10484320E-02
N=166	LAYER= 1	.24700000E+01	.27193160E+02	.69874980E+02	.47297420E+01	.19964990E+04	.31110430E+04	.10953850E-02
N=167	LAYER= 1	.24800000E+01	.28305600E+02	.69710730E+02	.48414400E+01	.19958850E+04	.31199000E+04	.11428820E-02
N=168	LAYER= 1	.24900000E+01	.29354980E+02	.69556100E+02	.50102570E+01	.19952760E+04	.31276620E+04	.11900380E-02
N=169	LAYER= 1	.25000000E+01	.30544330E+02	.69380840E+02	.50667270E+01	.19945870E+04	.31358560E+04	.12432910E-02
N=170	LAYER= 1	.25100000E+01	.31619390E+02	.69222600E+02	.50435370E+01	.19939680E+04	.31427560E+04	.12912220E-02
N=171	LAYER= 1	.25200000E+01	.32800110E+02	.69048960E+02	.50748110E+01	.19932850E+04	.31498390E+04	.13440660E-02
N=172	LAYER= 1	.25300000E+01	.33889490E+02	.68888790E+02	.50414810E+01	.19926180E+04	.31559600E+04	.13956810E-02
N=173	LAYER= 1	.25400000E+01	.35055730E+02	.68717450E+02	.51678990E+01	.19919550E+04	.31621110E+04	.14469480E-02
N=174	LAYER= 1	.25500000E+01	.36202410E+02	.68549080E+02	.53462030E+01	.19912930E+04	.31677910E+04	.14981590E-02
N=175	LAYER= 1	.25600000E+01	.37449620E+02	.68366140E+02	.55953800E+01	.19905720E+04	.31735880E+04	.15539640E-02
N=176	LAYER= 1	.25700000E+01	.38709630E+02	.68181530E+02	.57240420E+01	.19898520E+04	.31790800E+04	.16097070E-02
N=177	LAYER= 1	.25800000E+01	.40015350E+02	.67990270E+02	.58383120E+01	.19891170E+04	.31844250E+04	.16665410E-02
N=178	LAYER= 1	.25900000E+01	.41327000E+02	.67798290E+02	.59728470E+01	.19883390E+04	.31894670E+04	.17267770E-02
N=179	LAYER= 1	.26000000E+01	.42695080E+02	.67598360E+02	.61659580E+01	.19875610E+04	.31944040E+04	.17869420E-02
N=180	LAYER= 1	.26100000E+01	.44095380E+02	.67393870E+02	.64552530E+01	.19867700E+04	.31991530E+04	.18481810E-02
N=181	LAYER= 1	.26200000E+01	.45594120E+02	.67175130E+02	.66606910E+01	.19858750E+04	.32039260E+04	.19174110E-02
N=182	LAYER= 1	.26300000E+01	.47088540E+02	.66957370E+02	.67940380E+01	.19850410E+04	.32083890E+04	.19819370E-02
N=183	LAYER= 1	.26400000E+01	.48649680E+02	.66730080E+02	.68359410E+01	.19841490E+04	.32127700E+04	.20509730E-02
N=184	LAYER= 1	.26500000E+01	.50163900E+02	.66509770E+02	.69982300E+01	.19832580E+04	.32167670E+04	.21199010E-02
N=185	LAYER= 1	.26600000E+01	.51799520E+02	.66272060E+02	.71299130E+01	.19823090E+04	.32208290E+04	.21933130E-02
N=186	LAYER= 1	.26700000E+01	.53375340E+02	.66043370E+02	.74801500E+01	.19814210E+04	.32245130E+04	.22620310E-02
N=187	LAYER= 1	.26800000E+01	.55171440E+02	.65782970E+02	.77925300E+01	.19804090E+04	.32284630E+04	.23403680E-02
N=188	LAYER= 1	.26900000E+01	.56890190E+02	.65534090E+02	.78369850E+01	.19794050E+04	.32320140E+04	.24179990E-02
N=189	LAYER= 1	.27000000E+01	.58708700E+02	.65271040E+02	.80472320E+01	.19783820E+04	.32355520E+04	.24972060E-02
N=190	LAYER= 1	.27100000E+01	.60524140E+02	.65008720E+02	.81536880E+01	.19773230E+04	.32388770E+04	.25791150E-02
N=191	LAYER= 1	.27200000E+01	.62393220E+02	.64739010E+02	.81329480E+01	.19762660E+04	.32421020E+04	.26608860E-02
N=192	LAYER= 1	.27300000E+01	.64202380E+02	.64478310E+02	.82668580E+01	.19752120E+04	.32450480E+04	.27425010E-02

N=193	LAYER= 1	.27400000E+01	.66134570E+02	.64200160E+02	.83526740E+01	.19741370E+04	.32480210E+04	.28256720E-02
N=194	LAYER= 1	.27500000E+01	.67985370E+02	.63934170E+02	.83620640E+01	.19730820E+04	.32507120E+04	.29072800E-02
N=195	LAYER= 1	.27600000E+01	.69924970E+02	.63655690E+02	.88062040E+01	.19719750E+04	.32533830E+04	.29929690E-02
N=196	LAYER= 1	.27700000E+01	.71979760E+02	.63361100E+02	.88691560E+01	.19708070E+04	.32560580E+04	.30832770E-02
N=197	LAYER= 1	.27800000E+01	.73950650E+02	.63078870E+02	.89541210E+01	.19696860E+04	.32584870E+04	.31700310E-02
N=198	LAYER= 1	.27900000E+01	.76047340E+02	.62779080E+02	.93529890E+01	.19684660E+04	.32609340E+04	.32644580E-02
N=199	LAYER= 1	.28000000E+01	.78202740E+02	.62471300E+02	.98112440E+01	.19672510E+04	.32633150E+04	.33584150E-02
N=200	LAYER= 1	.28100000E+01	.80511610E+02	.62142150E+02	.10517170E+02	.19659250E+04	.32657260E+04	.34610950E-02
N=201	LAYER= 1	.28200000E+01	.82992570E+02	.61788990E+02	.10722710E+02	.19645430E+04	.32681690E+04	.35680040E-02
N=202	LAYER= 1	.28300000E+01	.85399280E+02	.61447000E+02	.10842920E+02	.19631640E+04	.32704050E+04	.36746460E-02
N=203	LAYER= 1	.28400000E+01	.87939890E+02	.61086540E+02	.11294280E+02	.19617320E+04	.32726330E+04	.37854740E-02
N=204	LAYER= 1	.28500000E+01	.90557040E+02	.60715830E+02	.11330670E+02	.19602460E+04	.32748000E+04	.39004390E-02
N=205	LAYER= 1	.28600000E+01	.93119340E+02	.60353580E+02	.11330060E+02	.19588180E+04	.32768030E+04	.40109830E-02
N=206	LAYER= 1	.28700000E+01	.95742010E+02	.59983450E+02	.11627610E+02	.19573360E+04	.32787430E+04	.41256470E-02
N=207	LAYER= 1	.28800000E+01	.98445450E+02	.59602530E+02	.11353260E+02	.19558050E+04	.32806350E+04	.42441220E-02
N=208	LAYER= 1	.28900000E+01	.10094700E+03	.59250690E+02	.11251680E+02	.19543910E+04	.32822970E+04	.43535300E-02
N=209	LAYER= 1	.29000000E+01	.10360970E+03	.58876860E+02	.11826030E+02	.19528670E+04	.32839770E+04	.44713770E-02
N=210	LAYER= 1	.29100000E+01	.10638040E+03	.58488570E+02	.11886630E+02	.19513450E+04	.32856370E+04	.45891930E-02
N=211	LAYER= 1	.29200000E+01	.10907610E+03	.58111420E+02	.12221270E+02	.19498300E+04	.32871700E+04	.47064220E-02
N=212	LAYER= 1	.29300000E+01	.11200680E+03	.57702200E+02	.12722530E+02	.19481510E+04	.32887540E+04	.48363150E-02
N=213	LAYER= 1	.29400000E+01	.11493970E+03	.57293500E+02	.13142180E+02	.19465330E+04	.32902580E+04	.49615130E-02
N=214	LAYER= 1	.29500000E+01	.11807100E+03	.56857990E+02	.13932680E+02	.19447530E+04	.32917800E+04	.50992470E-02
N=215	LAYER= 1	.29600000E+01	.12137560E+03	.56399350E+02	.14409250E+02	.19429230E+04	.32933020E+04	.52408240E-02
N=216	LAYER= 1	.29700000E+01	.12473530E+03	.55934130E+02	.14767810E+02	.19410440E+04	.32947650E+04	.53862150E-02
N=217	LAYER= 1	.29800000E+01	.12821470E+03	.55453400E+02	.15005850E+02	.19391160E+04	.32962000E+04	.55353930E-02
N=218	LAYER= 1	.29900000E+01	.13169310E+03	.54973900E+02	.14629180E+02	.19371880E+04	.32975580E+04	.56845610E-02
N=219	LAYER= 1	.30000000E+01	.13500630E+03	.54518200E+02	.14877170E+02	.19353260E+04	.32987850E+04	.58286970E-02
N=220	LAYER= 1	.30100000E+01	.13860970E+03	.54023740E+02	.15520230E+02	.19333090E+04	.33000520E+04	.59847460E-02
N=221	LAYER= 1	.30200000E+01	.14223070E+03	.53528020E+02	.15526290E+02	.19312990E+04	.33012610E+04	.61402110E-02
N=222	LAYER= 1	.30300000E+01	.14584650E+03	.53034210E+02	.16062540E+02	.19292970E+04	.33024060E+04	.62951060E-02
N=223	LAYER= 1	.30400000E+01	.14972820E+03	.52505370E+02	.16589600E+02	.19271410E+04	.33035730E+04	.64619270E-02
N=224	LAYER= 1	.30500000E+01	.15360030E+03	.51979190E+02	.16705090E+02	.19250410E+04	.33046780E+04	.66244760E-02
N=225	LAYER= 1	.30600000E+01	.15754770E+03	.51444160E+02	.17265970E+02	.19228450E+04	.33057470E+04	.67943890E-02
N=226	LAYER= 1	.30700000E+01	.16169450E+03	.50883600E+02	.17767430E+02	.19205550E+04	.33068130E+04	.69715800E-02
N=227	LAYER= 1	.30800000E+01	.16588920E+03	.50318100E+02	.18256250E+02	.19182680E+04	.33078350E+04	.71485370E-02
N=228	LAYER= 1	.30900000E+01	.17027920E+03	.49727930E+02	.19053690E+02	.19158390E+04	.33088490E+04	.73364620E-02
N=229	LAYER= 1	.31000000E+01	.17486340E+03	.49113460E+02	.19625800E+02	.19133160E+04	.33098520E+04	.75316640E-02
N=230	LAYER= 1	.31100000E+01	.17953780E+03	.48488770E+02	.19494580E+02	.19107530E+04	.33108210E+04	.77299730E-02
N=231	LAYER= 1	.31200000E+01	.18407500E+03	.47884240E+02	.19247530E+02	.19083040E+04	.33117130E+04	.79195290E-02
N=232	LAYER= 1	.31300000E+01	.18864850E+03	.47276660E+02	.19060020E+02	.19058100E+04	.33125670E+04	.81124320E-02
N=233	LAYER= 1	.31400000E+01	.19311150E+03	.46685520E+02	.19603460E+02	.19033750E+04	.33133600E+04	.83009040E-02
N=234	LAYER= 1	.31500000E+01	.19795910E+03	.46045350E+02	.20124540E+02	.19007070E+04	.33141780E+04	.85073370E-02
N=235	LAYER= 1	.31600000E+01	.20268470E+03	.45423240E+02	.20482880E+02	.18981550E+04	.33149380E+04	.87048060E-02
N=236	LAYER= 1	.31700000E+01	.20772080E+03	.44762330E+02	.21210280E+02	.18954120E+04	.33157060E+04	.89170150E-02
N=237	LAYER= 1	.31800000E+01	.21281050E+03	.44096560E+02	.21345710E+02	.18926840E+04	.33164450E+04	.91280900E-02
N=238	LAYER= 1	.31900000E+01	.21793010E+03	.43429090E+02	.22021380E+02	.18899210E+04	.33171500E+04	.93418950E-02
N=239	LAYER= 1	.32000000E+01	.22336300E+03	.42723160E+02	.23042470E+02	.18869730E+04	.33178620E+04	.95700160E-02
N=240	LAYER= 1	.32100000E+01	.22899270E+03	.41994240E+02	.23783380E+02	.18839430E+04	.33185620E+04	.98044500E-02

N=241	LAYER= 1	.32200000E+01	.23480440E+03	.41244530E+02	.24123800E+02	.18808320E+04	.33192470E+04	.10045100E-01
N=242	LAYER= 1	.32300000E+01	.24062120E+03	.40496950E+02	.24625520E+02	.18777360E+04	.33198970E+04	.10284730E-01
N=243	LAYER= 1	.32400000E+01	.24670020E+03	.39718620E+02	.25371490E+02	.18744700E+04	.33205410E+04	.10537420E-01
N=244	LAYER= 1	.32500000E+01	.25290300E+03	.38927520E+02	.25333490E+02	.18711770E+04	.33211640E+04	.10792200E-01
N=245	LAYER= 1	.32600000E+01	.25898950E+03	.38154310E+02	.25511070E+02	.18679070E+04	.33217440E+04	.11045240E-01
N=246	LAYER= 1	.32700000E+01	.26530630E+03	.37354990E+02	.26262990E+02	.18645630E+04	.33223150E+04	.11303960E-01
N=247	LAYER= 1	.32800000E+01	.27178650E+03	.36538310E+02	.26968720E+02	.18611480E+04	.33228710E+04	.11568230E-01
N=248	LAYER= 1	.32900000E+01	.27847690E+03	.35698640E+02	.27418900E+02	.18576100E+04	.33234150E+04	.11841930E-01
N=249	LAYER= 1	.33000000E+01	.28520730E+03	.34857510E+02	.28089850E+02	.18540590E+04	.33239340E+04	.12116740E-01
N=250	LAYER= 1	.33100000E+01	.29225940E+03	.33979990E+02	.28980120E+02	.18503480E+04	.33244490E+04	.12403860E-01
N=251	LAYER= 1	.33200000E+01	.29946040E+03	.33087960E+02	.29575950E+02	.18465690E+04	.33249470E+04	.12696260E-01
N=252	LAYER= 1	.33300000E+01	.30684170E+03	.32177730E+02	.30475520E+02	.18426910E+04	.33254300E+04	12996330E-01
N=253	LAYER= 1	.33400000E+01	.31452490E+03	.31234750E+02	.31394760E+02	.18386640E+04	.33259060E+04	13307880E-01
N=254	LAYER= 1	.33500000E+01	.32240050E+03	.30272820E+02	.31778070E+02	.18345830E+04	.33263670E+04	.13623630E-01
N=255	LAYER= 1	.33600000E+01	.33031510E+03	.29310880E+02	.31860260E+02	.18304510E+04	.33268050E+04	.13943370E-01
N=256	LAYER= 1	.33700000E+01	.33827400E+03	.28348300E+02	.32460100E+02	.18263580E+04	.33272210E+04	.14260120E-01
N=257	LAYER= 1	.33800000E+01	.34653210E+03	.27354520E+02	.32818670E+02	.18220840E+04	.33276300E+04	.14590750E-01
N=258	LAYER= 1	.33900000E+01	.35471370E+03	.26374940E+02	.32591340E+02	.18178520E+04	.33280120E+04	.14918200E-01
N=259	LAYER= 1	.34000000E+01	.36290290E+03	.25399390E+02	.33322650E+02	.18136620E+04	.33283750E+04	.15242450E-01
N=260	LAYER= 1	.34100000E+01	.37149930E+03	.24380590E+02	.34527930E+02	.18092580E+04	.33287350E+04	.15583160E-01
N=261	LAYER= 1	.34200000E+01	.38034470E+03	.23337870E+02	.35079370E+02	.18047330E+04	.33290840E+04	.15933340E-01
N=262	LAYER= 1	.34300000E+01	.38927040E+03	.22291390E+02	.35633160E+02	.18001730E+04	.33294180E+04	.16286130E-01
N=263	LAYER= 1	.34400000E+01	.39844960E+03	.21221090E+02	.36377410E+02	.17955000E+04	.33297410E+04	.16647710E-01
N=264	LAYER= 1	.34500000E+01	.40780870E+03	.20135960E+02	.37015200E+02	.17907580E+04	.33300520E+04	.17014670E-01
N=265	LAYER= 1	.34600000E+01	.41737030E+03	.19033670E+02	.37725170E+02	.17859510E+04	.33303520E+04	.17386560E-01
N=266	LAYER= 1	.34700000E+01	.42715230E+03	.17912570E+02	.38728370E+02	.17810050E+04	.33306410E+04	.17769300E-01
N=267	LAYER= 1	.34800000E+01	.43729140E+03	.16757470E+02	.39378750E+02	.17759260E+04	.33309220E+04	.18162260E-01
N=268	LAYER= 1	.34900000E+01	.44747180E+03	.15604740E+02	.39668700E+02	.17708360E+04	.33311880E+04	.18556100E-01
N=269	LAYER= 1	.35000000E+01	.45782770E+03	.14439320E+02	.40257380E+02	.17656980E+04	.33314420E+04	.18953610E-01
N=270	LAYER= 1	.35100000E+01	.46838110E+03	.13259060E+02	.40414750E+02	.17604420E+04	.33316860E+04	.19360370E-01
N=271	LAYER= 1	.35200000E+01	.47888720E+03	.12091440E+02	.39839040E+02	.17552590E+04	.33319130E+04	.19761400E-01
N=272	LAYER= 1	.35300000E+01	.48920830E+03	.10951430E+02	.39561120E+02	.17501500E+04	.33321230E+04	.20156690E-01
N=273	LAYER= 1	.35400000E+01	.49963680E+03	.98066220E+01	.39528600E+02	.17450040E+04	.33323220E+04	.20554860E-01
N=274	LAYER= 1	.35500000E+01	.51000700E+03	.86751650E+01	.38729070E+02	.17399310E+04	.33325090E+04	.20947430E-01
N=275	LAYER= 1	.35600000E+01	.52007890E+03	.75828330E+01	.37450150E+02	.17349990E+04	.33326790E+04	.21329000E-01
N=276	LAYER= 1	.35700000E+01	.52983440E+03	.65309490E+01	.36023640E+02	.17302420E+04	.33328350E+04	.21697050E-01
N=277	LAYER= 1	.35800000E+01	.53920700E+03	.55259890E+01	.33996910E+02	.17256880E+04	.33329760E+04	.22049440E-01
N=278	LAYER= 1	.35900000E+01	54793660E+03	.45948950E+01	.31171810E+02	.17214600E+04	.33331010E+04	.22376570E-01
N=279	LAYER= 1	.36000000E+01	.55584780E+03	.37551680E+01	.28319950E+02	.17176510E+04	.33332090E+04	.22671290E-01
N=280	LAYER= 1	.36100000E+01	.56309130E+03	.29896760E+01	.25338640E+02	.17141490E+04	.33333030E+04	.22942310E-01
N=281	LAYER= 1	.36200000E+01	.56943570E+03	.23218330E+01	.21538270E+02	.17111030E+04	.33333820E+04	.23177960E-01
N=282	LAYER= 1	.36300000E+01	.57466250E+03	.17734820E+01	.18200190E+02	.17086000E+04	.33334450E+04	.23371610E-01
N=283	LAYER= 1	.36400000E+01	.57923010E+03	.12956330E+01	.15121750E+02	.17064050E+04	.33334980E+04	.23541500E-01
N=284	LAYER= 1	.36500000E+01	.58281040E+03	.92195280E+00	.11558900E+02	.17046660E+04	.33335390E+04	.23676000E-01
N=285	LAYER= 1	.36600000E+01	.58546480E+03	.64540970E+00	.86491970E+01	.17034090E+04	.33335680E+04	.23773290E-01
N=286	LAYER= 1	.36700000E+01	.58747980E+03	.43575780E+00	.37443330E+01	.17024380E+04	.33335910E+04	.23848410E-01
N=287	LAYER= 1	.36800000E+01	.58748660E+03	.43505050E+00	-.16546110E+00	.17024380E+04	.33335910E+04	.23848410E-01
N=288	LAYER= 1	.36900000E+01	.58739040E+03	.44505340E+00	-.31731240E+00	.17024690E+04	.33335900E+04	.23845990E-01

N=289	LAYER= 1	.37000000E+01	.58731510E+03	.45287770E+00	-.43308980E+00	.17025010E+04	.33335890E+04	.23843580E-01
N=290	LAYER= 1	.37100000E+01	.58715640E+03	.46938600E+00	.17188730E+00	.17025940E+04	.33335870E+04	.23836330E-01
N=291	LAYER= 1	.37200000E+01	.58740800E+03	.44322000E+00	.82309160E+01	.17024690E+04	.33335900E+04	.23846000E-01
N=292	LAYER= 1	.37300000E+01	.59160830E+03	.69684500E-02	.78983480E+01	.17004710E+04	.33336350E+04	.24000600E-01
N=292	LAYER= 1	.37300000E+01	.59160830E+03	.69684500E-02	.78983480E+01	.17004710E+04	.33336350E+04	.24000600E-01

Pressure	Rate	Pressure	Rate	Pressure	Rate
4.000	.227	200.000	20.279	396.000	36.179
8.000	.744	204.000	20.673	400.000	36.483
12.000	1.693	208.000	21.218	404.000	36.756
16.000	2.480	212.000	21.324	408.000	37.029
20.000	3.158	216.000	21.767	412.000	37.326
24.000	3.929	220.000	22.410	416.000	37.623
28.000	4.811	224.000	23.126	420.000	37.995
32.000	5.054	228.000	23.653	424.000	38.405
36.000	5.315	232.000	23.960	428.000	38.783
40.000	5.837	236.000	24.227	432.000	39.039
44.000	6.436	240.000	24.572	436.000	39.296
48.000	6.819	244.000	25.040	440.000	39.456
52.000	7.174	248.000	25.364	444.000	39.570
56.000	7.814	252.000	25.339	448.000	39.699
60.000	8.123	256.000	25.424	452.000	39.926
64.000	8.252	260.000	25.631	456.000	40.153
68.000	8.365	264.000	26.107	460.000	40.290
72.000	8.870	268.000	26.556	464.000	40.349
76.000	9.344	272.000	26.983	468.000	40.409
80.000	10.361	276.000	27.252	472.000	40.216
84.000	10.773	280.000	27.571	476.000	39.997
88.000	11.295	284.000	27.969	480.000	39.809
92.000	11.330	288.000	28.442	484.000	39.701
96.000	11.601	292.000	28.947	488.000	39.594
100.000	11.290	296.000	29.290	492.000	39.552
104.000	11.835	300.000	29.642	496.000	39.540
108.000	12.088	304.000	30.129	500.000	39.501
112.000	12.721	308.000	30.614	504.000	39.192
116.000	13.410	312.000	31.093	508.000	38.884
120.000	14.211	316.000	31.467	512.000	38.476
124.000	14.689	320.000	31.661	516.000	37.968
128.000	14.991	324.000	31.795	520.000	37.460
132.000	14.652	328.000	31.836	524.000	36.877
136.000	15.055	332.000	31.987	528.000	36.292
140.000	15.523	336.000	32.289	532.000	35.555
144.000	15.789	340.000	32.535	536.000	34.690
148.000	16.355	344.000	32.709	540.000	33.740
152.000	16.657	348.000	32.778	544.000	32.446
156.000	17.046	352.000	32.667	548.000	31.149
160.000	17.563	356.000	32.706	552.000	29.707
164.000	18.036	360.000	33.063	556.000	28.257
168.000	18.640	364.000	33.476	560.000	26.611
172.000	19.268	368.000	34.037	564.000	24.794
176.000	19.594	372.000	34.559	568.000	22.398
180.000	19.469	376.000	34.809	572.000	19.901
184.000	19.252	380.000	35.058	576.000	17.299
188.000	19.087	384.000	35.306	580.000	14.356
192.000	19.468	388.000	35.554	584.000	10.255
196.000	19.914	392.000	35.854	588.000	8.184

Table of Burn Rate Laws

RANGE PLOW MPa	RANGE PHIGH MPa	COEF CM/S-MPa^EXP	EXP	CORR COEF
30.	59.	.326743E+00	.785039	.991744
59.	148.	.288910E+00	.806760	.989202
148.	444.	.281014E+00	.813606	.997024
40.	420.	.300348E+00	.801057	.998757

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