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Plane Shock Initiation of Detonation: Computer Simulation of a Gas-Gun Experiment

by

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PLANE SHOCK INITIATION OF DETONATION: COMPUTER SIMULATION OF A GAS-GUN EXPERIMENT

by

Wildon Fickett and Jack D. Jacobson

ABSTRACT

A numerical calculation of the early stages of plane-shock initiation in the high explosive PETN using very simple constitutive relations qualitatively reproduces the experimental results. The calculated results should be a useful guide to the planning and interpretation of experiments, and may be used to quantitatively assess the methods of analysis which deduce other variables from the experimental pressure-gauge records.

I. INTRODUCTION

Shock initiation of condensed explosives is commonly studied by taking pressure histories from quartz and Manganin gauges. Other variables may then in principle be determined by analysis of the gauge records, under some reasonable assumptions concerning neglect of transport properties.

In thinking about such an experiment it is useful to have a calculation which at least qualitatively reproduces it so that one can have some idea of what is going on "behind the scenes". The calculation can also serve as a quantitative test case for the method of analysis to be used on the experimental data.

Our calculation supplements the experimental work of Wackerle and Johnson on PETN.[1] With simple constitutive relations we are able to qualitatively reproduce the early motion. These would probably do less well if the calculation were extended to cover the entire process--that is, through the final transition to high-order detonation, although the calculated distance of run to high-order detonation is about right.

II. CONSTITUTIVE RELATIONS

The constitutive relations consist of two parts: an equation of state for the reactant-product mixture and a reaction rate. A sufficiently general representation for our purpose is

$$p = p(\rho,e,\lambda)$$

$$d\lambda/dt = r(\rho,T,\lambda) \quad , \quad T = T(\rho,e,\lambda)$$

where λ is the degree of reaction (zero for no reaction and one for complete reaction) and p, T, ρ, and e are the pressure, temperature, density and specific internal energy.

For the equation of state we take the pressure to be a simple linear combination of the pressures which the individual components (reactants and products) would have at the given density and energy

$$p = (1 - \lambda)p_1(\rho,e + \lambda q) + \lambda p_2(\rho,e + \lambda q)$$

where p_1 and p_2 are the equations of state of the pure reactants and products and q is the heat of reaction.

For the function p_1 describing the unreacted explosive we take the often-used form

$$p_1(\rho,e) = p_H(\rho) + \rho\Gamma\left(e - e_H(\rho)\right)$$

in which the Grüneisen parameter Γ is assumed inversely proportional to the density (constant $\rho\Gamma$) and the Hugoniot pressure and energy p_H and e_H are given by a Hugoniot (through the initial state) linear in U-u

$$U = a + bu$$

$$p_H = \rho_o a^2 \eta/(1 - b\eta)^2 \quad , \quad e_H = \eta p_H/2\rho_o \quad , \quad \eta = 1 - \rho_o/\rho$$

with U and u the shock and particle velocities.

For the function p_2 describing the reaction products we use a γ-law

$$p_2(\rho,e) = (\gamma - 1)\rho e \quad , \quad \gamma \text{ constant} \quad .$$

For the temperature, we take the temperature on the unreacted shock Hugoniot to be a linear function of pressure,[2] and get off this Hugoniot with a linear dependence of temperature on pressure at constant density.

$$T = T_o + \alpha p_H(\rho) + \beta[p - p_H(\rho)]$$

This simple description puts the entire burden of calculating the mixture temperature on the unreacted component of the equation of state. To get reasonable temperatures at large amounts of reaction it is necessary to choose a larger value of β than that characteristic of the pure unreacted solid.

For the reaction rate, we use the first-order Arrhenius form

$$r = Z(1 - \lambda)^{e^{-T^\dagger/T}}$$

with constant activation temperature $T^\dagger$ and frequency factor Z.

III. CHOICE OF PARAMETERS

The parameters are given in Table I. Values of ρ_o, a, b, D, and γ are taken from experimental data and Γ is a guess. Subscript j denotes the CJ state.

For the temperature function we take the value of α from Ref. 2 for TNT (no value is given for PETN). We estimate β as the ratio of the pressure and temperature differences between the CJ state and the unreacted shock Hugoniot at the CJ density ρ_j

$$\beta = [T_j - T_H(\rho_j)]/[p_j - p_H(\rho_j)] \quad ,$$

using an estimated value for T_j of 3000 K.

We decided to try the Arrhenius form for the rate when we noticed that the experimental gauge records suggested an initiation process similar to that calculated for an ideal gas with Arrhenius rate (but with stronger drive).[3] We determined the rate parameters by trial and error to approximately match the experimental gauge records. It is interesting to note that the ratios of the value of the exponential term $e^{-T^\dagger/T}$ at the CJ state to its value in the initial shock is roughly the same, about e^6, in both the present calculation and the ideal gas calculation of Ref. 3. Not surprisingly, the values of Z and $T^\dagger$ are very different from those determined from conventional heating experiments: $Z = 6.3 \times 10^{13}\ \mu s^{-1}$ $T^\dagger = 24000$ K. No doubt the shock-initiation mechanism is very different (plastic work, void-closing impact) and we have been fortunate to mock up even a portion of it with such a simple rate law.

The calculation uses a quartz driver plate; for its equation of state we use a two-piece version of the form used for the unreacted PETN, with the parameters given in Table I.

IV. RESULTS

The calculation was performed with the one-dimensional Lagrangian hydrocode PAD.[4] From left to right, the body consists of a 6-mm slab of quartz impacting a 10-mm slab of PETN explosive. The dimensions are nominal: rarefaction from the front and rear surfaces do not affect the gauge histories over the time of the calculation. Gauges are placed at the left edge of the PETN and at distances of 2, 3, and 4 mm into it. These are ideal nonperturbing

TABLE I

PARAMETERS[a]

PETN

$p(\rho,e,\lambda)$:

$\rho_o = 1.7$ mg/m^3 $\quad D_j = 8.2$ mm/μs

$a = 2.3$ mm/μs $\quad \gamma = 2.9$

$b = 2.3$ $\quad (p_j = 29.3$ GPa$)^b$

$\Gamma = 1.2$ $\quad (\rho_o q = 7.72$ GPa$)^b$

$T(\rho,e)$: $\quad r(T,\lambda)$:

$T_o = 300$ K $\quad Z = 150$ μs^{-1}

$\alpha = 70$ K/GPa $\quad T^\dagger = 3000$ K

$\beta = 111.25$ K/GPa

Quartz

$\rho_o = 2.65$ mg/m^3 , $\quad \Gamma = 1$

$a = 5.72$, $b = 0$ $\quad$ for $\rho \leq 2.7174$

$a = 5.57$, $b = 1.08$ for $\rho > 2.7174$

[a] The units are the coherent set based on mm, mg, μs.

[b] $p_j = \rho_o D_j^2/(\gamma + 1)$; $q = \frac{1}{2} D_j^2/(\gamma^2 - 1)$

gauges, that is, they simply record the particle (fluid element) histories at these points. (The pressures recorded by quartz gauges would, of course, be significantly higher because of the impedance mismatch.) At time zero, the moving slab of quartz with velocity 4 mm/μs impacts on the stationary PETN.

The program uses artificial viscosity to handle shocks. To have zero reaction rate in the quiescent state, we use an ignition pressure of 1 GPa to turn on the reaction. There are 200 computation cells in the quartz and 400 in the PETN. From two other runs with one-half and one-fourth as many cells and from other studies of the program's accuracy in solving the equations of motion (given the constitutive relations), we estimate typical errors to be 1-2% in pressure and particle velocity and 0.001 to 0.003 mm in position.

The computer output is given in the Appendix.

REFERENCES

1. J. Wackerle and J. O. Johnson, "Pressure Measurements on the Shock-Induced Decomposition of High-Density PETN," Los Alamos Scientific Laboratory report LA-5131 (November 1973). All numerical values used or quoted here are from this report or by private communication from the authors.

2. R. Shaw, "Calculated Shock Temperatures of Liquid TNT, Nitromethane, and Four Liquid Bis(Difluoramino) Alkanes," J. Chem. Phys. 54, 3657-58 (1971).

3. W. Fickett, J. D. Jacobson, and W. W. Wood, "The Method of Characteristics for One-Dimensional Flow with Chemical Reaction," Los Alamos Scientific Laboratory report LA-4269 (July 1970).

4. W. Fickett, "PAD, A One-Dimensional Lagrangian Hydrocode," Los Alamos Scientific Laboratory report LA-5910-MS (April 1975).

APPENDIX

COMPUTER RESULTS

The printout begins with the input data. Next are three printed snapshots at times 1.0, 1.375, and 1.75. Each begins with the last cell of the quartz and extends to the shock. The column labeled "TEMP OR S1" is temperature, that labeled "LAM OR S2" is λ, that labeled "VISCOSITY" is the artificial viscosity, and that labeled "C-SQ" is the square of the sound speed. Next are the particle histories (guage records).

The first set of graphs correspond to the printed snapshots, and the second to the printed particle histories. The next graph, marked "OVERVIEW" is a t-x (time-distance) plot with dots marking particles. A pseudo-schlieren system picks up additional particles at large pressure gradients to mark waves. Again most of the quartz is omitted. The second OVERVIEW plots p and x for each point shown on the first, and connects those at the times listed under "OVERVIEW TIMES" at the end of the printout to form a sequence of superimposed p-x snapshot profiles.

```
PAD3.2 - 74SEP23                RUN 1                                                               10/18/74
TFICKETIXN,      .002 SEC ON RUN,     1.350 SEC ON JOB                                             BEGIN RUN
JI. 1, 0            #FILM ONLY                                                  INP    .  1,COL  1
        FILM,PAPER,NO COMPRESS,KILL FILM
HERSAR     QUARTZ-PETN PLANE SHOCK INITIATION                   WFL-72-1        INP    .  2,COL  1
PLAB,      150 CELLS                                                            INP    .  3,COL  1
        PARAM LABEL
1. 1.8                                                                          INP    .  4,COL  1
        TF,XF, LONG IN,OUT PRINTS, SETUP
2, 0.3, 1                                                                       INP    .  5,COL  1
        VISC.- LANDS, VON NEU, PIC, SPARE
2.3, 0.5                                                                        INP    .  6,COL  1
        NO. CELLS FACTOR
3, . -6                                    #X0                                  INP    .  7,COL  1
        ALPHA,X0,SIGN,TO-ALPHA=0,1,2 FOR SLAB,CYL,SPH/LEFT BOUND/COORD DIR/TO
0AXR, X, 0, 6                                                                   INP    .  8,COL  1
        AXIS RANGES
7, 0, 0, 0, 0, 0, 0                                                             INP    .  9,COL  1
        DEL T#S OUT
7.1, 1, 0.375, 1.75                                                             INP    . 10,COL  1
        CYCLE PRINT TIMES
9.1, 1,1                                                                        INP    . 11,COL  1
        1,N,1,N-PRINT FROM/TO SHELL 1,CELL N
7.2, 1, 0.375, 1.75                                                             INP    . 12,COL  1
        CYC PLOT TIMES
8.2, P,X,0,0... U,X,0,0..                                                       INP    . 13,COL  1
    .RHO,X,0,0... TT,X,0,0..                                                    INP    . 14,COL  1
    .LAM,X,0,0... R,X,0,0..                                                     INP    . 15,COL  1
    .E,X,0,0..                                                                  INP    . 16,COL  1
        CYC PLOT
7.5, 0, 0.03125, 1.5,  0.015625, 10                                             INP    . 17,COL  1
        PARTICLE TIMES
8.5, P,T,0,0,0,0, U,T,0,0,0,0                                                   INP    . 18,COL  1
    .RHO,T,0,0,0,0, TT,T,0,0,0,0                                                INP    . 19,COL  1
    .LAM,T,0,0,0,0, R,T,0,0,0,0                                                 INP    . 20,COL  1
    .P,U,0,0,0,0, P,V,0,0,0,0                                                   INP    . 21,COL  1
        PART PLOT Y,X,YMIN,YMAX,XMIN,XMAX,...
9.5, 2,0,  2, 0.2,  2, 0.3,  2, 0.4                                             INP    . 22,COL  1
        PARTICLES - SHELL 1, FRAC F....
10.5, . PRINT                                                                   INP    . 23,COL  1
        PARTICLES
7.6, 0, 0.0234375, 10                                                           INP    . 24,COL  1
        OVERVIEW TIMES
9.6,  8, 80, 1, 0.85, 2, 0.6                                                    INP    . 25,COL  1
        OVERVIEW- EPS, NPARTS, SHELL, FRAC..  DO.

QUARTZP, QUARTZ PROJECTILE                                                      INP    . 26,COL  1
1, 6, 100, . . 0.4, . 300                                                       INP    . 27,COL  1
        X,N,RHO,P,U,E,TT,LAM-THICKNESS,CELLS,STATE
2, GRU, 2.65, 5.72, 0, 1, 0.368001, 0.388001, 5.58881, 1.08                     INP    . 28,COL  1
        GRUNEISEN/RHO,A,B,GAM;ALPHA,BETA,L1,L2

PETNT, PETN TARGET                                                              INP    . 29,COL  2
1, 10, 200, . . . . 300                                                         INP    . 30,COL  2
        X,N,RHO,P,U,E,TT,LAM-THICKNESS,CELLS,STATE
2, HET, 1.7, 2.3, 2.3, 1.2, 300, 70, 111.25, 8.2, 2.9, 1-10                     INP    . 31,COL  2
        RHO,MIE-GRUNEISEN P:A,B,GAMMA,T:A,B,DT/DP,PGAS:,D,GAMMA
4, ARR, 150, 3000, 0, 1, 1                                                      INP    . 32,COL  2
        ARRHENIUS RATE:SCALE,ACTIVATION T,RHO EXP,DEPLETION EXP,P-ON
ENDP                                                                            INP    . 33,COL  2

-------------------------------------------------------------------------------------
SLAB                            DENSITY   THICKNESS X(RIGHT)  CELLS     DELTA X
LEFT BOUNDAPY -  FREE SURF                            -6.000
QUARTZP, QUARTZ PROJECTI  2.850     6.000    -.2842E-13 50.00     .1200
```

```
PAD3.2 - 74SEP23              RUN 3                                                    10/18/74
TFICKETIXN,      .003 SEC ON RUN,   31.136 SEC ON JOB                                BEGIN RUN
HERSAR     QUARTZ-PETN PLANE SHOCK INITIATION                    HFL-72-1          INP    . 38.COL  1
PLAB,      600 CELLS                                                               INP    . 39.COL  1
       PARAM LABEL
2.3. 2                                                                             INP    . 40.COL  1
       NO. CELLS FACTOR
END                                                                                INP    . 41.COL  1

-------------------------------------------------------------------------------
SLAB                      DENSITY   THICKNESS X(RIGHT)  CELLS     DELTA X
LEFT BOUNDARY - FREE SURF                    -6.000
QUARTZP, QUARTZ PROJECTI  2.650     6.000    -.2842E-13 200.0     .3000E-01
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
PETNT, PETN TARGET        1.700     10.00    10.000     400.0     .2500E-01
                                  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
RIGHT BOUNDARY - FREE SURF                   10.000
-------------------------------------------------------------------------------

NEW DT AT CY   4, T 4.8828E-04. FROM 1.221E-04 TO 2.441E-04. CELL 200 COUR 5.245E-03 STABL 1.573E-03

NEW DT AT CY   6, T 9.7656E-04. FROM 2.441E-04 TO 4.883E-04. CELL 200 COUR 5.245E-03 STABL 1.573E-03

NEW DT AT CY   8, T 1.9531E-03. FROM 4.883E-04 TO 9.766E-04. CELL 200 COUR 5.245E-03 STABL 1.573E-03
```

```
PAD3.2 - 74SEP23              RUN 3    HERSAR     QUARTZ-PETN PLANE SHOCK INITIATION          HFL-72-1     10/18/74
TFICKETIXN,   17.405 SEC ON RUN,   48.547 SEC ON JOB                                          TIME= 1.0000E+00

   TIME        CYCLE  SHOCK    DELTA T      EINT          EKIN          ETOTAL       LEFT WORK     RIGHT WORK  ENERGY CK.
 1.00000E+00    1030    329  9.76563E-04  0.            0.            0.           0.            0.          0.

CELL   POSITION     PRESSURE     VELOCITY     DENSITY      INT. ENERGY   TEMP OR S1   LAM OR S2     VISCOSITY    C-SQ
QUARTZP, QUARTZ PROJECTILE
 200  .284742       2.28097      .249287      2.72127      .125103E-01   300.000      0.            .405773E-02  32.9124
PETNT, PETN TARGET
 201  .308844       2.28559      .253870      1.78334      -.173515E-02  539.550      .191985       0.           7.35807
 202  .332689       2.30215      .257584      1.78233      -.803178E-02  534.861      .183822       0.           7.72763
 203  .356469       2.30816      .281079      1.78719      -.755791E-02  533.822      .181559       0.           7.83242
 204  .380200       2.31359      .284431      1.79088      -.657695E-02  533.254      .179739       0.           7.91523
 205  .403888       2.31846      .287665      1.79416      -.544386E-02  532.749      .178057       0.           7.98988
 206  .427537       2.32282      .270778      1.79717      -.424514E-02  532.254      .176434       0.           8.06005
 207  .451149       2.32680      .273797      1.79989      -.308515E-02  531.805      .174940       0.           8.12434
 208  .474726       2.33027      .276709      1.80261      -.183966E-02  531.286      .173355       0.           8.18957
 209  .498269       2.33348      .279539      1.80524      -.577205E-03  530.757      .171772       0.           8.25379
 210  .521780       2.33624      .282250      1.80765       .602213E-03  530.246      .170287       0.           8.31323
 211  .545259       2.33847      .284930      1.81010       .183546E-02  529.655      .168696       0.           8.37440
 212  .568709       2.34052      .287474      1.81237       .300383E-02  529.095      .167193       0.           8.43204
 213  .592129       2.34191      .289855      1.81468       .420209E-02  528.443      .165585       0.           8.49101
 214  .615522       2.34331      .292374      1.81685       .534888E-02  527.833      .164061       0.           8.54729
 215  .638885       2.34409      .294860      1.81905       .652189E-02  527.135      .162433       0.           8.60507
 216  .662221       2.34477      .296973      1.82123       .769516E-02  526.427      .160793       0.           8.66300
 217  .685531       2.34518      .299104      1.82325       .878975E-02  525.741      .159237       0.           8.71725
 218  .708815       2.34486      .301235      1.82529       .989435E-02  524.960      .157577       0.           8.77265
 219  .732074       2.34501      .303302      1.82726       .109798E-01  524.251      .156000       0.           8.82692
 220  .755308       2.34415      .305222      1.82922       .120498E-01  523.429      .154322       0.           8.88136
 221  .778519       2.34353      .307240      1.83108       .130802E-01  522.663      .152727       0.           8.93382
 222  .801704       2.34268      .309024      1.83302       .141527E-01  521.837      .151032       0.           8.98903
 223  .824869       2.34089      .310861      1.83473       .150951E-01  520.987      .149421       0.           9.03825
 224  .848009       2.34010      .312857      1.83685       .161697E-01  520.164      .147713       0.           9.09434
```

225	.871128	2.33803	.314232	1.83831	.170916E-01	519.293	.146087	0.	9.14330
226	.894224	2.33616	.316015	1.84008	.180785E-01	518.395	.144368	0.	9.19625
227	.917300	2.33474	.317539	1.84180	.190448E-01	517.567	.142731	0.	9.24801
228	.940355	2.33165	.319046	1.84341	.199351E-01	516.586	.141003	0.	9.29727
229	.963389	2.32998	.320684	1.84507	.208751E-01	515.742	.139357	0.	9.34864
230	.986403	2.32736	.321966	1.84672	.217916E-01	514.784	.137622	0.	9.39995
231	1.00940	2.32403	.323486	1.84818	.226025E-01	513.838	.135970	0.	9.44594
232	1.03237	2.32238	.324876	1.84989	.235770E-01	512.959	.134230	0.	9.50096
233	1.05533	2.31854	.326020	1.85128	.243439E-01	511.970	.132573	0.	9.54551
234	1.07827	2.31550	.327515	1.85273	.251614E-01	511.036	.130914	0.	9.59295
235	1.10119	2.31326	.328661	1.85434	.260741E-01	510.124	.129172	0.	9.64625
236	1.12409	2.30865	.329793	1.85560	.267719E-01	509.086	.127510	0.	9.68840
237	1.14698	2.30609	.331179	1.85715	.276460E-01	508.158	.125771	0.	9.74067
238	1.16984	2.30291	.332096	1.85854	.284310E-01	507.222	.124108	0.	9.78804
239	1.19270	2.29807	.333233	1.85982	.291350E-01	506.142	.122369	0.	9.83229
240	1.21553	2.29578	.334475	1.86127	.299640E-01	505.274	.120711	0.	9.88282
241	1.23835	2.29164	.335249	1.86260	.307029E-01	504.248	.118973	0.	9.92966
242	1.26115	2.28686	.336400	1.86376	.313509E-01	503.216	.117318	0.	9.97127
243	1.28394	2.28459	.337466	1.86517	.321595E-01	502.357	.115662	0.	10.0219
244	1.30671	2.27971	.338139	1.86638	.328263E-01	501.292	.113934	0.	10.0659
245	1.32947	2.27521	.339263	1.86753	.334723E-01	500.288	.112285	0.	10.1085
246	1.35221	2.27276	.340172	1.86895	.342791E-01	499.396	.110564	0.	10.1610
247	1.37493	2.26736	.340788	1.86999	.348652E-01	498.338	.108919	0.	10.2003
248	1.39765	2.26300	.341868	1.87118	.355218E-01	497.324	.107207	0.	10.2457

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR S1	LAM OR S2	VISCOSITY	C-SQ
249	1.42034	2.26028	.342652	1.87245	.362519E-01	496.457	.105570	0.	10.2944
250	1.44303	2.25457	.343211	1.87342	.367885E-01	495.389	.103935	0.	10.3322
251	1.46570	2.25028	.344230	1.87458	.374352E-01	494.394	.102237	0.	10.3776
252	1.48836	2.24747	.344935	1.87580	.381357E-01	493.532	.100611	0.	10.4256
253	1.51100	2.24168	.345422	1.87679	.386764E-01	492.441	.989190E-01	0.	10.4653
254	1.53364	2.23728	.346353	1.87783	.392618E-01	491.481	.973056E-01	0.	10.5072
255	1.55625	2.23434	.347016	1.87899	.399305E-01	490.623	.956930E-01	0.	10.5544
256	1.57886	2.22859	.347447	1.87994	.404511E-01	489.549	.940176E-01	0.	10.5937
257	1.60146	2.22394	.348299	1.88091	.410000E-01	488.584	.924179E-01	0.	10.6342
258	1.62404	2.22101	.348952	1.88209	.416721E-01	487.711	.907531E-01	0.	10.6835
259	1.64661	2.21546	.349301	1.88296	.421557E-01	486.694	.891619E-01	0.	10.7205
260	1.66917	2.21032	.350033	1.88384	.426555E-01	485.709	.875773E-01	0.	10.7587
261	1.69172	2.20740	.350713	1.88498	.433027E-01	484.851	.859312E-01	0.	10.8074
262	1.71425	2.20241	.351013	1.88586	.437989E-01	483.885	.843558E-01	0.	10.8458
263	1.73678	2.19676	.351596	1.88666	.442500E-01	482.878	.827871E-01	0.	10.8816
264	1.75929	2.19359	.352319	1.88773	.448587E-01	482.019	.811605E-01	0.	10.9287
265	1.78179	2.18933	.352617	1.88864	.453757E-01	481.115	.796018E-01	0.	10.9693
266	1.80429	2.18321	.353013	1.88936	.457817E-01	480.089	.780494E-01	0.	11.0027
267	1.82677	2.17949	.353765	1.89034	.463367E-01	479.207	.764428E-01	0.	11.0471
268	1.84924	2.17627	.354138	1.89130	.468908E-01	478.388	.749017E-01	0.	11.0909
269	1.87171	2.17001	.354296	1.89198	.472722E-01	477.366	.733659E-01	0.	11.1232
270	1.89416	2.16513	.355001	1.89281	.477425E-01	476.420	.717795E-01	0.	11.1625
271	1.91660	2.16301	.355546	1.89383	.483346E-01	475.689	.702573E-01	0.	11.2097
272	1.93903	2.15727	.355537	1.89457	.487482E-01	474.692	.686782E-01	.179880E-04	11.2455
273	1.96146	2.15106	.356081	1.89520	.491069E-01	473.693	.671716E-01	0.	11.2769
274	1.98387	2.14909	.356780	1.89620	.496861E-01	472.987	.656691E-01	0.	11.3240
275	2.00628	2.14471	.356797	1.89699	.501439E-01	472.107	.641389E-01	0.	11.3630
276	2.02867	2.13765	.357049	1.89754	.504532E-01	471.053	.626199E-01	0.	11.3916
277	2.05106	2.13467	.357804	1.89841	.509593E-01	470.291	.611371E-01	0.	11.4342
278	2.07344	2.13198	.358027	1.89930	.514770E-01	469.552	.596557E-01	0.	11.4778
279	2.09581	2.12529	.358000	1.89987	.518007E-01	468.524	.581249E-01	.522401E-04	11.5081
280	2.11817	2.12033	.358606	1.90053	.521876E-01	467.641	.566611E-01	0.	11.5425
281	2.14052	2.11846	.359105	1.90145	.527274E-01	466.971	.552002E-01	0.	11.5884
282	2.16286	2.11346	.359046	1.90214	.531219E-01	466.071	.536875E-01	.113904E-03	11.6244
283	2.18520	2.10691	.359321	1.90264	.534145E-01	465.093	.522411E-01	0.	11.6521
284	2.20753	2.10430	.359963	1.90346	.538992E-01	464.386	.508004E-01	0.	11.6945
285	2.22985	2.10112	.360060	1.90427	.543682E-01	463.623	.493069E-01	0.	11.7366

286	2.25216	2.09451	.360078	1.90473	.546451E-01	462.852	.478776E-01	0.	11.7633
287	2.27446	2.09066	.360672	1.90542	.550527E-01	461.874	.464559E-01	0.	11.8002
288	2.29676	2.08825	.360879	1.90622	.555274E-01	461.197	.450367E-01	0.	11.8425
289	2.31905	2.08220	.360860	1.90674	.558354E-01	460.256	.435703E-01	.357470E-04	11.8727
290	2.34133	2.07795	.361369	1.90737	.562096E-01	459.464	.421666E-01	0.	11.9074
291	2.36360	2.07539	.361560	1.90812	.566615E-01	458.789	.407659E-01	0.	11.9483
292	2.38587	2.06961	.361570	1.90860	.569559E-01	457.899	.393706E-01	0.	11.9768
293	2.40813	2.06555	.362038	1.90925	.573403E-01	457.110	.379316E-01	0.	12.0135
294	2.43038	2.06282	.362200	1.90997	.577698E-01	456.436	.365489E-01	0.	12.0531
295	2.45263	2.05712	.362208	1.91043	.580565E-01	455.563	.351716E-01	0.	12.0811
296	2.47487	2.05317	.362647	1.91102	.584204E-01	454.814	.338012E-01	0.	12.1156
297	2.49710	2.05042	.362774	1.91175	.588496E-01	454.131	.323846E-01	0.	12.1563
298	2.51933	2.04487	.362791	1.91219	.591315E-01	453.279	.310251E-01	0.	12.1842
299	2.54155	2.04119	.363203	1.91278	.594962E-01	452.560	.296721E-01	0.	12.2190
300	2.56376	2.03819	.363274	1.91342	.598889E-01	451.890	.283224E-01	0.	12.2562
301	2.58596	2.03275	.363348	1.91388	.601787E-01	451.038	.269297E-01	0.	12.2856

PAD3.2 - 74SEP23 RUN 3 HERSAR QUARTZ-PETN PLANE SHOCK INITIATION HFL-72-1 10/18/74
TFICKETIXN, 17.471 SEC ON RUN, 48.813 SEC ON JOB TIME= 1.0000E+00

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR S1	LAM OR S2	VISCOSITY	C-SQ
302	2.60816	2.02953	.363710	1.91449	.605529E-01	450.362	.255937E-01	0.	12.3215
303	2.63035	2.02603	.363714	1.91507	.609113E-01	449.668	.242610E-01	0.	12.3561
304	2.65254	2.02087	.363870	1.91550	.611920E-01	448.865	.229344E-01	0.	12.3841
305	2.67472	2.01806	.364162	1.91614	.615856E-01	448.209	.215643E-01	0.	12.4227
306	2.69690	2.01401	.364124	1.91665	.619092E-01	447.488	.202483E-01	.770697E-04	12.4545
307	2.71907	2.00925	.364356	1.91709	.621986E-01	446.723	.189385E-01	0.	12.4833
308	2.74123	2.00661	.364562	1.91769	.625782E-01	446.107	.176330E-01	0.	12.5201
309	2.76338	2.00208	.364530	1.91814	.628725E-01	445.363	.163315E-01	.656412E-04	12.5494
310	2.78554	1.99807	.364798	1.91885	.631971E-01	444.643	.149889E-01	0.	12.5823
311	2.80768	1.99520	.364877	1.91921	.635566E-01	444.020	.136989E-01	0.	12.6175
312	2.82982	1.99042	.364920	1.91962	.638320E-01	443.270	.124137E-01	0.	12.6452
313	2.85195	1.98722	.365180	1.92014	.641719E-01	442.631	.111338E-01	0.	12.6788
314	2.87408	1.98383	.365172	1.92064	.645018E-01	441.982	.985743E-02	.158996E-04	12.7114
315	2.89620	1.97920	.365298	1.92104	.647765E-01	441.252	.858636E-02	0.	12.7391
316	2.91832	1.97645	.365492	1.92161	.651374E-01	440.638	.727475E-02	0.	12.7754
317	2.94043	1.97244	.365946	1.92204	.654327E-01	439.956	.601343E-02	.941501E-04	12.8050
318	2.96254	1.96847	.365660	1.92247	.657276E-01	439.280	.475757E-02	0.	12.8346
319	2.98464	1.98519	.365263	1.92294	.660495E-01	438.655	.350532E-02	.863039E-03	12.8666
320	3.00675	1.94910	.362827	1.92241	.658388E-01	437.154	.226421E-02	.504585E-02	12.8484
321	3.02892	1.86660	.332901	1.91864	.628652E-01	431.097	.106943E-02	.624295E-01	12.5708
322	3.05166	1.31402	.207446	1.88959	.397996E-01	392.456	.147511E-03	.252709	10.4712
323	3.07550	.525149	.770928E-01	1.78230	.967214E-02	336.980	0.	.216563	7.41993
324	3.10013	.145890	.207023E-01	1.72598	.964405E-03	310.239	0.	.758369E-01	5.89841
325	3.12503	.352919E-01	.494245E-02	1.70837	.613725E-04	302.472	0.	.191992E-01	5.43887
326	3.15001	.821085E-02	.114726E-02	1.70155	.338970E-05	300.575	0.	.449255E-02	5.32474
327	3.17500	.189824E-02	.265711E-03	1.70038	.181841E-06	300.133	0.	.103625E-02	5.29804
328	3.20000	.438554E-03	.615249E-04	1.70008	.973967E-08	300.031	0.	.239628E-03	5.29186
329	3.22500	.104270E-03	.137748E-04	1.70002	.570692E-09	300.007	0.	.560174E-04	5.29044
330	3.25000	-.543142E-13	0.	1.70000	0.	300.000	0.	0.	5.29000
331	3.27500	-.543142E-13	0.	1.70000	0.	300.000	0.	0.	5.29000
332	3.30000	-.543142E-13	0.	1.70000	0.	300.000	0.	0.	5.29000

PAD3.2 - 74SEP23 RUN 3 HERSAR QUARTZ-PETN PLANE SHOCK INITIATION HFL-72-1 10/18/74
TFICKETIXN, 29.245 SEC ON RUN, 60.387 SEC ON JOB TIME= 1.3750E+00

TIME	CYCLE	SHOCK	DELTA T	EINT	EKIN	ETOTAL	LEFT WORK	RIGHT WORK	ENERGY CK.
1.37500E+00	1414	377	9.78563E-04	0.	0.	0.	0.	0.	0.

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR S1	LAM OR S2	VISCOSITY	C-SQ
QUARTZP, QUARTZ PROJECTILE									

200	.343099	7.54933	-.742102E-01	2.87210	.106100	300.000	0.	.509306E-01	36.9078
PETNT.	PETN TARGET								
201	.371175	7.72781	-.597961E-01	1.51373	-.400767	1187.45	.743570	0.	13.8772
202	.398725	7.81636	-.427091E-01	1.54268	-.403651	1194.39	.740569	0.	13.8138
203	.426149	7.90483	-.247376E-01	1.54969	-.406641	1203.47	.744534	0.	13.9286
204	.453475	7.99383	-.608687E-02	1.55531	-.408653	1212.73	.748763	0.	14.0541
205	.480706	8.08285	.131789E-01	1.56070	-.409604	1222.01	.752847	0.	14.1802
206	.507843	8.17205	.330295E-01	1.56617	-.409356	1231.29	.756672	0.	14.3046
207	.534885	8.26114	.533457E-01	1.57159	-.408031	1240.53	.760279	0.	14.4279
208	.561827	8.35016	.741130E-01	1.57749	-.405309	1249.69	.763449	0.	14.5458
209	.588663	8.43881	.952544E-01	1.58366	-.401336	1258.76	.766256	0.	14.6595
210	.615395	8.52674	.116614	1.58987	-.396282	1267.72	.768782	0.	14.7703
211	.642015	8.61366	.138197	1.59655	-.390936	1276.47	.770831	0.	14.8740
212	.668523	8.69910	.159864	1.60326	-.385618	1285.04	.772582	0.	14.9737
213	.694915	8.78253	.181530	1.61039	-.374191	1293.28	.773845	0.	15.0652
214	.721190	8.86316	.203191	1.61746	-.365054	1301.19	.774802	0.	15.1511
215	.747345	8.94117	.224715	1.62493	-.354911	1308.71	.775267	0.	15.2284
216	.773379	9.01567	.246076	1.63253	-.344084	1315.78	.775327	0.	15.2978
217	.799293	9.08642	.267163	1.64003	-.332674	1322.41	.775078	0.	15.3610
218	.825084	9.15291	.287923	1.64784	-.320603	1328.46	.774330	0.	15.4140
219	.850756	9.21466	.308339	1.65550	-.308191	1333.98	.773272	0.	15.4599
220	.876306	9.27155	.328337	1.66344	-.295206	1338.85	.771712	0.	15.4955
221	.901737	9.32265	.347916	1.67118	-.282090	1343.06	.769840	0.	15.5232
222	.927047	9.36836	.367064	1.67919	-.268487	1348.58	.767462	0.	15.5405
223	.952239	9.40798	.385630	1.68898	-.254795	1349.40	.764768	0.	15.5500
224	.977314	9.44072	.403663	1.69497	-.240903	1351.37	.761562	0.	15.5481
225	1.00227	9.46729	.421167	1.70275	-.226832	1352.83	.758039	0.	15.5388
226	1.02712	9.48664	.437974	1.71072	-.212800	1353.00	.753983	0.	15.5186
227	1.05185	9.49856	.454225	1.71842	-.198848	1352.54	.749631	0.	15.4902
228	1.07647	9.50342	.469818	1.72632	-.184891	1351.18	.744737	0.	15.4520
229	1.10098	9.49965	.484608	1.73388	-.170937	1348.88	.739524	0.	15.4049
230	1.12539	9.48813	.498849	1.74162	-.157120	1345.63	.733775	0.	15.3482
231	1.14968	9.46892	.512223	1.74907	-.143563	1341.52	.727708	0.	15.2846
232	1.17388	9.44000	.524793	1.75657	-.130310	1336.27	.721100	0.	15.2101
233	1.19797	9.40382	.536772	1.76390	-.117301	1330.21	.714187	0.	15.1302
234	1.22197	9.35915	.547690	1.77092	-.104587	1323.18	.706948	0.	15.0428
235	1.24587	9.30433	.557843	1.77802	-.923731E-01	1314.97	.698982	0.	14.9459
236	1.26968	9.24257	.567315	1.78485	-.804356E-01	1306.01	.690831	0.	14.8451
237	1.29340	9.17171	.575615	1.79171	-.688887E-01	1295.96	.682158	0.	14.7375
238	1.31704	9.09128	.583233	1.79805	-.582819E-01	1284.96	.673234	0.	14.6232
239	1.34059	9.00527	.590099	1.80462	-.474854E-01	1273.20	.663818	0.	14.5080
240	1.36406	8.91009	.595725	1.81065	-.377224E-01	1260.56	.654182	0.	14.3871
241	1.38746	8.80674	.600841	1.81668	-.284598E-01	1246.96	.644095	0.	14.2625
242	1.41078	8.69906	.605096	1.82237	-.195069E-01	1232.93	.633844	0.	14.1393
243	1.43403	8.58219	.608184	1.82786	-.116326E-01	1217.99	.623316	0.	14.0105
244	1.45722	8.45978	.610942	1.83298	-.409123E-02	1202.38	.612419	0.	13.8826
245	1.48034	8.33483	.612863	1.83801	.314855E-02	1186.55	.601442	0.	13.7583
246	1.50341	8.20108	.613745	1.84273	.931453E-02	1169.83	.590138	0.	13.6296
247	1.52641	8.06604	.614430	1.84716	.151539E-01	1153.04	.578833	0.	13.5055
248	1.54937	7.92726	.614195	1.85157	.208784E-01	1135.82	.567245	.476488E-03	13.3849

PAD3.2 - 74SEP23 RUN 3 HERBAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN. 29.276 SEC ON RUN. 80.418 SEC ON JOB TIME= 1.3750E+00

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR S1	LAM OR S2	VISCOSITY	C-SQ
249	1.57227	7.78451	.613380	1.85538	.251909E-01	1118.37	.555731	.164819E-02	13.2627
250	1.59514	7.64055	.612131	1.85901	.293194E-01	1100.84	.544172	.252132E-02	13.1449
251	1.61795	7.49595	.610421	1.86267	.332977E-01	1083.19	.532457	.344651E-02	13.0343
252	1.64073	7.35090	.608278	1.86589	.366282E-01	1065.67	.520910	.430943E-02	12.9256
253	1.66347	7.20617	.605778	1.86914	.398168E-01	1048.16	.509265	.501952E-02	12.8247
254	1.68617	7.06237	.602981	1.87196	.424568E-01	1030.91	.497850	.564369E-02	12.7263
255	1.70884	6.91991	.599871	1.87462	.447915E-01	1013.87	.486538	.618077E-02	12.6331
256	1.73148	6.77929	.596555	1.87733	.470678E-01	997.007	.475204	.662195E-02	12.5489
257	1.75409	6.64095	.593052	1.87966	.488959E-01	980.553	.464168	.698390E-02	12.4670
258	1.77667	6.50511	.589381	1.88206	.506997E-01	964.334	.453147	.730788E-02	12.3943
259	1.79923	6.37207	.585589	1.88410	.520998E-01	948.585	.442459	.753776E-02	12.3233

260	1.82176	6.24207	.581704	1.88601	.533293E-01	933.225	.431963	.771054E-02	12.2577
261	1.84428	6.11525	.577744	1.88800	.545781E-01	918.175	.421528	.785044E-02	12.2011
262	1.86677	5.99193	.573748	1.88968	.555099E-01	903.846	.411454	.791258E-02	12.1458
263	1.88924	5.87190	.569735	1.89127	.563313E-01	889.544	.401597	.793609E-02	12.0954
264	1.91169	5.75547	.565713	1.89294	.572040E-01	875.786	.391829	.794866E-02	12.0537
265	1.93412	5.64265	.561710	1.89433	.578285E-01	862.555	.382428	.790522E-02	12.0126
266	1.95654	5.53342	.557738	1.89566	.583810E-01	849.756	.373255	.783579E-02	11.9759
267	1.97895	5.42773	.553801	1.89708	.590056E-01	837.302	.364180	.776553E-02	11.9473
268	2.00134	5.32560	.549918	1.89826	.594333E-01	825.357	.355467	.765244E-02	11.9186
269	2.02371	5.22696	.546100	1.89939	.598182E-01	813.825	.346979	.752382E-02	11.8936
270	2.04607	5.13172	.542341	1.90061	.602648E-01	802.818	.338588	.740413E-02	11.8763
271	2.06842	5.03984	.538658	1.90163	.605919E-01	791.886	.330546	.725464E-02	11.8581
272	2.09076	4.95118	.535046	1.90275	.609876E-01	781.459	.322591	.711494E-02	11.8473
273	2.11308	4.86570	.531517	1.90368	.612400E-01	771.481	.314978	.694995E-02	11.8351
274	2.13540	4.78328	.528075	1.90457	.614766E-01	761.861	.307567	.678050E-02	11.8258
275	2.15770	4.70381	.524717	1.90550	.617515E-01	752.548	.300295	.661710E-02	11.8212
276	2.18000	4.62720	.521443	1.90638	.620077E-01	743.571	.293221	.645292E-02	11.8189
277	2.20228	4.55335	.518257	1.90718	.622065E-01	734.947	.286394	.628129E-02	11.8169
278	2.22456	4.48214	.515159	1.90795	.623998E-01	726.630	.279747	.611039E-02	11.8171
279	2.24682	4.41346	.512141	1.90882	.626718E-01	718.542	.273167	.595570E-02	11.8231
280	2.26908	4.34724	.509208	1.90953	.628515E-01	710.803	.266871	.579019E-02	11.8271
281	2.29133	4.28336	.506359	1.91024	.630298E-01	703.333	.260738	.562886E-02	11.8328
282	2.31357	4.22171	.503586	1.91103	.632620E-01	696.081	.254657	.548414E-02	11.8440
283	2.33580	4.16223	.500882	1.91188	.634538E-01	689.099	.248840	.533024E-02	11.8528
284	2.35802	4.10480	.498276	1.91233	.636262E-01	682.373	.243169	.517966E-02	11.8631
285	2.38024	4.04934	.495731	1.91307	.638883E-01	675.818	.237538	.504339E-02	11.8784
286	2.40245	3.99579	.493261	1.91388	.640393E-01	669.538	.232151	.489918E-02	11.8912
287	2.42465	3.94405	.490884	1.91428	.642131E-01	663.485	.226895	.475929E-02	11.9051
288	2.44684	3.89404	.488537	1.91487	.643888E-01	657.580	.221765	.462382E-02	11.9202
289	2.46903	3.84568	.486274	1.91554	.646298E-01	651.854	.216662	.450204E-02	11.9398
290	2.49121	3.79892	.484077	1.91610	.648028E-01	646.352	.211777	.437478E-02	11.9567
291	2.51338	3.75367	.481944	1.91685	.649828E-01	641.023	.207004	.425161E-02	11.9745
292	2.53555	3.70988	.479873	1.91720	.651657E-01	635.880	.202340	.413245E-02	11.9931
293	2.55771	3.66747	.477858	1.91782	.654007E-01	630.809	.197692	.402512E-02	12.0158
294	2.57987	3.62639	.475901	1.91834	.655863E-01	625.959	.193238	.391353E-02	12.0358
295	2.60201	3.58660	.474000	1.91886	.657731E-01	621.254	.188881	.380576E-02	12.0565
296	2.62416	3.54803	.472153	1.91937	.659838E-01	616.688	.184618	.370191E-02	12.0779
297	2.64629	3.51062	.470354	1.91985	.662002E-01	612.213	.180361	.360860E-02	12.1029
298	2.66842	3.47434	.468606	1.92044	.663926E-01	607.910	.176279	.351222E-02	12.1253
299	2.69055	3.43913	.466906	1.92093	.665877E-01	603.729	.172281	.341966E-02	12.1481
300	2.71267	3.40495	.465252	1.92141	.667851E-01	599.666	.168364	.333060E-02	12.1714
301	2.73478	3.37175	.463640	1.92186	.670228E-01	595.676	.164445	.325013E-02	12.1981

PAD3.2 - 74SEP23 RUN 3 HERBAR QUARTZ-PETN PLANE SHOCK INITIATION HFL-72-1 10/18/74
(FICKETIXN, 29.310 SEC ON RUN, 80.452 SEC ON JOB TIME= 1.3750E+00

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR S1	LAM OR S2	VISCOSITY	C-SQ
302	2.75688	3.33950	.462072	1.92242	.672215E-01	591.835	.160685	.316626E-02	12.2221
303	2.77899	3.30817	.460546	1.92287	.674226E-01	588.098	.156997	.308499E-02	12.2465
304	2.80109	3.27770	.459060	1.92333	.676260E-01	584.460	.153379	.300651E-02	12.2713
305	2.82318	3.24808	.457611	1.92384	.678680E-01	580.882	.149752	.293569E-02	12.2993
306	2.84526	3.21926	.456201	1.92428	.680707E-01	577.433	.146270	.286220E-02	12.3245
307	2.86735	3.19122	.454827	1.92472	.682777E-01	574.073	.142852	.279105E-02	12.3501
308	2.88942	3.16393	.453489	1.92515	.684866E-01	570.798	.139495	.272209E-02	12.3758
309	2.91149	3.13735	.452185	1.92558	.686972E-01	567.605	.136196	.265529E-02	12.4019
310	2.93356	3.11145	.450913	1.92606	.689392E-01	564.457	.132882	.259481E-02	12.4309
311	2.95562	3.08623	.449672	1.92648	.691508E-01	561.420	.129699	.253243E-02	12.4573
312	2.97768	3.06164	.448463	1.92689	.693641E-01	558.456	.126569	.247253E-02	12.4838
313	2.99973	3.03767	.447283	1.92730	.695791E-01	555.561	.123490	.241503E-02	12.5105
314	3.02177	3.01429	.446132	1.92770	.697958E-01	552.735	.120462	.235980E-02	12.5374
315	3.04382	2.99148	.445008	1.92910	.700139E-01	549.974	.117481	.230658E-02	12.5644
316	3.06585	2.96923	.443909	1.92855	.702585E-01	547.247	.114480	.225831E-02	12.5941
317	3.08789	2.94751	.442836	1.92894	.704777E-01	544.612	.111595	.220805E-02	12.6214
318	3.10992	2.92631	.441788	1.92933	.706988E-01	542.036	.108753	.215914E-02	12.6487
319	3.13194	2.90561	.440765	1.92971	.709213E-01	539.517	.105954	.211165E-02	12.6761
320	3.15396	2.88539	.439764	1.93009	.711451E-01	537.052	.103196	.206568E-02	12.7037

321	3.17598	2.86563	.438787	1.93047	.713701E-01	534.640	.100478	.202132E-02	12.7313
322	3.19799	2.84631	.437830	1.93089	.716177E-01	532.253	.877353E-01	.198125E-02	12.7615
323	3.21999	2.82742	.436895	1.93126	.718431E-01	529.943	.950963E-01	.193985E-02	12.7892
324	3.24199	2.80895	.435980	1.93163	.720698E-01	527.681	.924939E-01	.189980E-02	12.8169
325	3.26399	2.79088	.435085	1.93199	.722976E-01	525.465	.899269E-01	.186097E-02	12.8447
326	3.28599	2.77320	.434209	1.93235	.725265E-01	523.284	.873945E-01	.182326E-02	12.8726
327	3.30798	2.75590	.433351	1.93270	.727563E-01	521.166	.848955E-01	.178660E-02	12.9004
328	3.32996	2.73896	.432512	1.93306	.729871E-01	519.080	.824291E-01	.175093E-02	12.9283
329	3.35194	2.72238	.431691	1.93341	.732187E-01	517.035	.799943E-01	.171619E-02	12.9563
330	3.37392	2.70613	.430886	1.93379	.734692E-01	515.005	.775305E-01	.168445E-02	12.9865
331	3.39590	2.69022	.430097	1.93414	.737014E-01	513.039	.751581E-01	.165142E-02	13.0144
332	3.41786	2.67463	.429325	1.93448	.739349E-01	511.109	.728146E-01	.161929E-02	13.0424
333	3.43983	2.65936	.428569	1.93481	.741696E-01	509.216	.704995E-01	.158807E-02	13.0703
334	3.46179	2.64439	.427828	1.93515	.744053E-01	507.358	.682118E-01	.155775E-02	13.0983
335	3.48375	2.62971	.427102	1.93548	.746421E-01	505.533	.659509E-01	.152837E-02	13.1262
336	3.50571	2.61532	.426390	1.93581	.748799E-01	503.742	.637161E-01	.149997E-02	13.1542
337	3.52766	2.60120	.425692	1.93614	.751188E-01	501.983	.615066E-01	.147263E-02	13.1822
338	3.54960	2.58735	.425008	1.93646	.753587E-01	500.255	.593217E-01	.144643E-02	13.2101
339	3.57155	2.57377	.424336	1.93678	.755998E-01	498.557	.571609E-01	.142133E-02	13.2381
340	3.59349	2.56045	.423676	1.93710	.758417E-01	496.889	.550235E-01	.139708E-02	13.2661
341	3.61542	2.54737	.423029	1.93742	.760849E-01	495.249	.529089E-01	.137319E-02	13.2841
342	3.63736	2.53453	.422393	1.93774	.763292E-01	493.638	.508165E-01	.134909E-02	13.3220
343	3.65929	2.52192	.421770	1.93805	.765742E-01	492.053	.487458E-01	.132466E-02	13.3500
344	3.68121	2.50953	.421159	1.93836	.768198E-01	490.494	.466961E-01	.130040E-02	13.3779
345	3.70313	2.49736	.420559	1.93870	.770780E-01	488.941	.446145E-01	.127845E-02	13.4077
346	3.72505	2.48539	.419970	1.93900	.773259E-01	487.432	.426061E-01	.125638E-02	13.4355
347	3.74697	2.47364	.419391	1.93930	.775733E-01	485.948	.406172E-01	.123525E-02	13.4633
348	3.76888	2.46208	.418823	1.93980	.778224E-01	484.487	.386473E-01	.121469E-02	13.4910
349	3.79079	2.45073	.418265	1.93990	.780728E-01	483.049	.366959E-01	.119494E-02	13.5188
350	3.81269	2.43956	.417717	1.94020	.783244E-01	481.633	.347625E-01	.117513E-02	13.5465
351	3.83459	2.42858	.417178	1.94049	.785772E-01	480.239	.328467E-01	.115610E-02	13.5741
352	3.85649	2.41778	.416649	1.94078	.788313E-01	478.866	.309479E-01	.113753E-02	13.6018
353	3.87839	2.40716	.416128	1.94107	.790866E-01	477.514	.290655E-01	.111942E-02	13.6294
354	3.90028	2.39671	.415617	1.94136	.793431E-01	476.182	.272001E-01	.110177E-02	13.6570

PAD3.2 - 74SEP23 RUN 3 HERBAR QUARTZ-PETN PLANE SHOCK INITIATION HFL-72-1 10/18/74
TFICKETIXN. 29.342 SEC ON RUN. 80.484 SEC ON JOB TIME= 1.3750E+00

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR S1	LAM OR S2	VISCOSITY	C-SQ
355	3.92217	2.38842	.415114	1.94184	.798010E-01	474.870	.253501E-01	.108453E-02	13.6846
356	3.94405	2.37831	.414819	1.94192	.799801E-01	473.577	.235157E-01	.106768E-02	13.7121
357	3.96594	2.38835	.414132	1.94220	.801209E-01	472.303	.216962E-01	.105122E-02	13.7396
358	3.98782	2.35854	.413854	1.94245	.803732E-01	471.063	.199396E-01	.103417E-02	13.7653
359	4.00969	2.34888	.413184	1.94273	.806373E-01	469.825	.181492E-01	.101847E-02	13.7927
360	4.03157	2.33739	.412721	1.94301	.809025E-01	468.603	.163727E-01	.100315E-02	13.8202
361	4.05344	2.32803	.412266	1.94328	.811691E-01	467.399	.146095E-01	.988407E-03	13.8476
362	4.07530	2.31880	.411818	1.94355	.814369E-01	466.212	.128604E-01	.972680E-03	13.8749
363	4.09717	2.30974	.411375	1.94382	.817071E-01	465.041	.111238E-01	.964285E-03	13.9023
364	4.11903	2.30074	.410949	1.94409	.819760E-01	463.882	.939990E-02	.926057E-03	13.9295
365	4.14089	2.29206	.410479	1.94436	.822547E-01	462.751	.768821E-02	.102566E-02	13.9573
366	4.16274	2.28277	.410184	1.94459	.825030E-01	461.586	.598901E-02	.686695E-03	13.9822
367	4.18459	2.27409	.408731	1.94484	.827741E-01	460.467	.430095E-02	.313211E-02	14.0090
368	4.20646	2.24735	.405758	1.94379	.822639E-01	458.122	.263857E-02	.649469E-02	13.9645
369	4.22843	2.10045	.352711	1.93393	.785112E-01	447.546	.106381E-02	.117323	13.4503
370	4.25124	1.25154	.184170	1.86332	.398772E-01	388.225	.852518E-04	.346367	10.2207
371	4.27532	.401323	.558315E-01	1.78527	.634769E-02	328.263	0.	.205044	6.92831
372	4.30007	.943567E-01	.126998E-01	1.71714	.434320E-03	306.618	0.	.555791E-01	5.68539
373	4.32501	.200476E-01	.267384E-02	1.70376	.207268E-04	301.404	0.	.120349E-01	5.37471
374	4.35000	.416344E-02	.555158E-03	1.70079	.903604E-06	300.291	0.	.249739E-02	5.30762
375	4.37500	.864143E-03	.115421E-03	1.70016	.389799E-07	300.060	0.	.516337E-03	5.29366
376	4.40000	.180225E-03	.243139E-04	1.70003	.171385E-08	300.013	0.	.106891E-03	5.29076
377	4.42500	.348380E-04	.204675E-05	1.70001	.741200E-10	300.002	0.	.261206E-04	5.29015
378	4.45000	-.543142E-13	0.	1.70000	0.	300.000	0.	0.	5.29000
379	4.47500	-.543142E-13	0.	1.70000	0.	300.000	0.	0.	5.29000
380	4.50000	-.543142E-13	0.	1.70000	0.	300.000	0.	0.	5.29000

TIME	CYCLE	SHOCK	DELTA T	EINT	EKIN	ETOTAL	LEFT WORK	RIGHT WORK	ENERGY CK.
1.75000E+00	1798	426	9.78563E-04	0.	0.	0.	0.	0.	0.

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR S1	LAM OR S2	VISCOSITY	C-SQ
QUARTZP. QUARTZ PROJECTILE									
200	.286075	8.41894	-.118103	2.00047	.128774	300.000	0.	0.	37.5204
PETNT. PETN TARGET									
201	.317952	8.40778	-.113320	1.33324	-1.21442	1273.65	.999358	0.	18.2849
202	.349474	8.39997	-.108612	1.34027	-1.25442	1272.30	.999349	0.	18.0641
203	.380908	8.39268	-.103935	1.35206	-1.28650	1271.38	.999363	0.	17.9981
204	.412271	8.38637	-.993151E-01	1.35508	-1.27833	1270.55	.999378	0.	17.9445
205	.443570	8.38044	-.948839E-01	1.35789	-1.28047	1269.79	.999394	0.	17.8947
206	.474804	8.37524	-.901225E-01	1.36066	-1.29417	1268.11	.999410	0.	17.8473
207	.505978	8.37060	-.855890E-01	1.36332	-1.30238	1268.49	.999426	0.	17.8027
208	.537088	8.36681	-.810297E-01	1.36612	-1.31055	1267.98	.999443	0.	17.7583
209	.568134	8.36340	-.764909E-01	1.36883	-1.31858	1267.47	.999459	0.	17.7147
210	.599118	8.36080	-.719832E-01	1.37170	-1.32615	1267.07	.999474	0.	17.6735
211	.630036	8.35881	-.674570E-01	1.37458	-1.33375	1266.73	.999490	0.	17.6322
212	.660891	8.35740	-.629473E-01	1.37743	-1.34096	1266.46	.999505	0.	17.5930
213	.691679	8.35655	-.584488E-01	1.38038	-1.34821	1266.24	.999520	0.	17.5536
214	.722403	8.35638	-.538516E-01	1.38328	-1.35503	1266.09	.999535	0.	17.5166
215	.753061	8.35686	-.494333E-01	1.38628	-1.36188	1265.99	.999549	0.	17.4793
216	.783652	8.35761	-.449345E-01	1.38931	-1.36852	1265.98	.999563	0.	17.4433
217	.814177	8.35934	-.403533E-01	1.39227	-1.37488	1266.02	.999577	0.	17.4098
218	.844636	8.36184	-.357828E-01	1.39534	-1.38084	1266.13	.999590	0.	17.3764
219	.875028	8.36481	-.311543E-01	1.39835	-1.38650	1266.33	.999603	0.	17.3457
220	.905354	8.36885	-.264852E-01	1.40148	-1.39212	1266.61	.999615	0.	17.3151
221	.935614	8.37318	-.217812E-01	1.40450	-1.39728	1266.98	.999627	0.	17.2871
222	.965806	8.37857	-.170251E-01	1.40765	-1.40235	1267.40	.999639	0.	17.2596
223	.995933	8.38461	-.122248E-01	1.41072	-1.40809	1267.91	.999650	0.	17.2345
224	1.02599	8.39157	-.735547E-02	1.41390	-1.41148	1268.52	.999661	0.	17.2100
225	1.05598	8.39929	-.240229E-02	1.41702	-1.41554	1269.21	.999671	0.	17.1881
226	1.08591	8.40780	.258882E-02	1.42023	-1.41952	1268.98	.999681	0.	17.1666
227	1.11577	8.41713	.768540E-02	1.42338	-1.42301	1270.84	.999691	0.	17.1476
228	1.14556	8.42738	.127883E-01	1.42684	-1.42640	1271.79	.999700	0.	17.1293
229	1.17528	8.43844	.180288E-01	1.42984	-1.42932	1272.83	.999709	0.	17.1135
230	1.20494	8.45029	.233501E-01	1.43314	-1.43217	1273.98	.999717	0.	17.0981
231	1.23452	8.46338	.287827E-01	1.43640	-1.43446	1275.21	.999726	0.	17.0858
232	1.26404	8.47725	.343231E-01	1.43976	-1.43688	1276.55	.999734	0.	17.0739
233	1.29348	8.49237	.398507E-01	1.44308	-1.43935	1278.02	.999741	0.	17.0650
234	1.32288	8.50819	.457154E-01	1.44643	-1.43979	1279.56	.999748	0.	17.0573
235	1.35219	8.52542	.515575E-01	1.44981	-1.44101	1281.25	.999755	0.	17.0508
236	1.38143	8.54328	.575629E-01	1.45333	-1.44185	1283.01	.999762	0.	17.0464
237	1.41060	8.56285	.637115E-01	1.45690	-1.44241	1284.94	.999768	0.	17.0435
238	1.43970	8.58337	.700302E-01	1.46043	-1.44252	1286.98	.999774	0.	17.0432
239	1.46873	8.60550	.764727E-01	1.46411	-1.44237	1289.18	.999780	0.	17.0442
240	1.49769	8.62888	.831251E-01	1.46774	-1.44178	1291.48	.999785	0.	17.0476
241	1.52657	8.65356	.898278E-01	1.47155	-1.44089	1293.98	.999791	0.	17.0527
242	1.55538	8.67942	.968030E-01	1.47531	-1.43957	1296.57	.999795	0.	17.0602
243	1.58411	8.70713	.104061	1.47915	-1.43778	1299.36	.999800	0.	17.0702
244	1.61277	8.73588	.111402	1.48313	-1.43567	1302.26	.999804	0.	17.0809
245	1.64134	8.76682	.118978	1.48712	-1.43330	1305.36	.999809	0.	17.0952
246	1.66984	8.79890	.126708	1.49125	-1.43059	1308.59	.999812	0.	17.1103
247	1.69826	8.83300	.134747	1.49539	-1.42722	1312.04	.999816	0.	17.1290
248	1.72660	8.86881	.142988	1.49970	-1.42360	1315.85	.999820	0.	17.1490

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR SI	LAM OR S2	VISCOSITY	C-SQ
249	1.75486	8.90596	.151316	1.50399	-1.41949	1319.41	.999823	0.	17.1718
250	1.78304	8.94535	.159932	1.50839	-1.41486	1323.39	.999826	0.	17.1974
251	1.81113	8.98621	.168824	1.51294	-1.41004	1327.52	.999828	0.	17.2240
252	1.83913	9.02957	.177980	1.51754	-1.40447	1331.92	.999831	0.	17.2548
253	1.86705	9.07450	.187304	1.52229	-1.39875	1336.45	.999833	0.	17.2864
254	1.89488	9.12170	.197006	1.52708	-1.39233	1341.23	.999835	0.	17.3219
255	1.92263	9.17122	.206861	1.53198	-1.38539	1346.24	.999837	0.	17.3602
256	1.95028	9.22221	.217015	1.53703	-1.37829	1351.39	.999839	0.	17.3993
257	1.97783	9.27613	.227482	1.54216	-1.37039	1356.85	.999840	0.	17.4429
258	2.00530	9.33199	.238155	1.54746	-1.36224	1362.48	.999841	0.	17.4879
259	2.03267	9.39019	.249177	1.55279	-1.35342	1368.36	.999842	0.	17.5365
260	2.05994	9.45083	.260374	1.55825	-1.34409	1374.48	.999843	0.	17.5880
261	2.08712	9.51326	.271902	1.56387	-1.33455	1380.77	.999843	0.	17.6405
262	2.11420	9.57909	.283787	1.56958	-1.32414	1387.40	.999844	0.	17.6979
263	2.14117	9.64679	.295728	1.57539	-1.31335	1394.21	.999844	0.	17.7573
264	2.16805	9.71594	.307982	1.58132	-1.30247	1401.13	.999844	0.	17.8173
265	2.19482	9.78836	.320590	1.58735	-1.28072	1408.41	.999843	0.	17.8820
266	2.22150	9.86299	.333290	1.59350	-1.27856	1415.88	.999843	0.	17.9490
267	2.24806	9.93910	.346214	1.59977	-1.26629	1423.48	.999842	0.	18.0166
268	2.27452	10.0177	.359353	1.60608	-1.25338	1431.32	.999840	0.	18.0877
269	2.30088	10.0981	.372635	1.61248	-1.24015	1439.33	.999839	0.	18.1605
270	2.32713	10.1807	.386190	1.61905	-1.22665	1447.52	.999837	0.	18.2348
271	2.35327	10.2656	.399790	1.62584	-1.21258	1455.94	.999835	0.	18.3123
272	2.37931	10.3509	.413373	1.63231	-1.19886	1464.35	.999833	0.	18.3889
273	2.40524	10.4379	.427311	1.63888	-1.18426	1472.94	.999830	0.	18.4681
274	2.43106	10.5285	.441427	1.64582	-1.16920	1481.85	.999827	0.	18.5510
275	2.45679	10.6196	.455293	1.65270	-1.15419	1490.77	.999823	0.	18.6336
276	2.48239	10.7101	.469278	1.65952	-1.13936	1499.61	.999819	0.	18.7152
277	2.50789	10.8040	.483696	1.66646	-1.12384	1508.76	.999815	0.	18.8005
278	2.53329	10.9009	.498063	1.67354	-1.10777	1518.18	.999810	0.	18.8889
279	2.55858	10.9988	.512142	1.68062	-1.09214	1527.45	.999805	0.	18.9748
280	2.58376	11.0929	.526421	1.68760	-1.07841	1536.71	.999799	0.	19.0613
281	2.60884	11.1822	.541011	1.69474	-1.06007	1546.27	.999793	0.	19.1511
282	2.63381	11.2937	.555482	1.70203	-1.04353	1555.98	.999786	0.	19.2420
283	2.65867	11.3945	.569780	1.70918	-1.02707	1565.59	.999778	0.	19.3324
284	2.68344	11.4958	.584235	1.71635	-1.01058	1575.22	.999770	0.	19.4230
285	2.70809	11.6000	.598889	1.72370	-.993784	1585.06	.999761	0.	19.5154
286	2.73264	11.7059	.613496	1.73104	-.976826	1595.04	.999751	0.	19.6100
287	2.75709	11.8119	.627984	1.73838	-.959357	1604.99	.999740	0.	19.7042
288	2.78144	11.9186	.642557	1.74589	-.942145	1614.95	.999728	0.	19.7987
289	2.80568	12.0273	.657262	1.75317	-.924745	1625.04	.999715	0.	19.8941
290	2.82982	12.1379	.671999	1.76084	-.906838	1635.27	.999701	0.	19.9917
291	2.85386	12.2493	.686890	1.76813	-.888037	1645.53	.999686	0.	20.0899
292	2.87779	12.3616	.701416	1.77583	-.871058	1655.81	.999669	0.	20.1884
293	2.90162	12.4756	.716232	1.78326	-.852980	1666.17	.999650	0.	20.2873
294	2.92535	12.5913	.731122	1.79087	-.834516	1676.66	.999630	0.	20.3884
295	2.94898	12.7086	.746060	1.79854	-.815827	1687.23	.999608	0.	20.4907
296	2.97251	12.8274	.761043	1.80625	-.796851	1697.86	.999583	0.	20.5939
297	2.99594	12.9477	.776091	1.81407	-.777989	1708.56	.999556	0.	20.6975
298	3.01927	13.0697	.791198	1.82187	-.758674	1719.34	.999527	0.	20.8029
299	3.04250	13.1934	.806391	1.82973	-.739109	1730.22	.999495	0.	20.9097
300	3.06562	13.3191	.821688	1.83785	-.719862	1741.19	.999459	0.	21.0179
301	3.08865	13.4469	.837104	1.84671	-.699826	1752.25	.999419	0.	21.1270

PAD3.2 - 74SEP23 RUN 3 HERSAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN. 43.941 SEC ON RUN. 75.083 SEC ON JOB TIME= 1.7500E+00

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR SI	LAM OR S2	VISCOSITY	C-SQ
302	3.11158	13.5769	.852607	1.85377	-.678743	1763.44	.999376	0.	21.2385
303	3.13440	13.7087	.868193	1.86198	-.658005	1774.70	.999328	0.	21.3513
304	3.15713	13.8426	.883901	1.87006	-.636963	1786.05	.999275	0.	21.4656
305	3.17976	13.9788	.899777	1.87838	-.615692	1797.48	.999215	0.	21.5810
306	3.20228	14.1180	.915854	1.88673	-.593840	1809.08	.999149	0.	21.6994
307	3.22471	14.2601	.932101	1.89519	-.571533	1820.83	.999076	0.	21.8201

308	3.24703	14.4048	.948484	1.90373	-.548822	1832.68	.998995	0.	21.9428
309	3.26926	14.5519	.964992	1.91234	-.525744	1844.61	.998904	0.	22.0673
310	3.29138	14.7015	.981669	1.92109	-.502399	1856.58	.998802	0.	22.1929
311	3.31340	14.8544	.998596	1.92988	-.478429	1868.71	.998688	0.	22.3218
312	3.33532	15.0109	1.01581	1.93882	-.453851	1881.00	.998561	0.	22.4536
313	3.35714	15.1717	1.03334	1.94790	-.428589	1893.48	.998418	0.	22.5889
314	3.37885	15.3365	1.05113	1.95712	-.402650	1906.11	.998257	0.	22.7274
315	3.40047	15.5052	1.06917	1.96647	-.376097	1918.85	.998076	0.	22.8689
316	3.42198	15.6775	1.08746	1.97600	-.349031	1931.65	.997869	0.	23.0127
317	3.44338	15.8536	1.10603	1.98560	-.321233	1944.56	.997638	0.	23.1600
318	3.46468	16.0340	1.12485	1.99535	-.292700	1957.56	.997376	0.	23.3108
319	3.48587	16.2185	1.14428	2.00528	-.263288	1970.69	.997079	0.	23.4657
320	3.50696	16.4106	1.16409	2.01542	-.232920	1983.96	.996742	0.	23.6254
321	3.52794	16.6080	1.18441	2.02579	-.201440	1997.38	.996359	0.	23.7904
322	3.54881	16.8119	1.20524	2.03646	-.168913	2010.88	.995919	0.	23.9603
323	3.56957	17.0223	1.22659	2.04732	-.135120	2024.50	.995421	0.	24.1366
324	3.59022	17.2393	1.24845	2.05843	-.100122	2038.15	.994852	0.	24.3188
325	3.61075	17.4629	1.27082	2.06978	-.639237E-01	2051.76	.994201	0.	24.5069
326	3.63117	17.9831	1.29373	2.08140	-.264681E-01	2065.28	.993455	0.	24.7014
327	3.65147	17.9302	1.31720	2.09328	.123039E-01	2078.62	.992600	0.	24.9027
328	3.67166	18.1744	1.34126	2.10545	.524888E-01	2091.72	.991619	0.	25.1117
329	3.69172	18.4262	1.36597	2.11793	.941380E-01	2104.49	.990492	0.	25.3293
330	3.71167	18.6860	1.39134	2.13079	.137370	2116.79	.989190	0.	25.5566
331	3.73149	18.9541	1.41740	2.14398	.182371	2128.59	.987700	0.	25.7958
332	3.75119	19.2307	1.44419	2.15750	.229184	2139.88	.985986	0.	26.0485
333	3.77076	19.5162	1.47170	2.17142	.277877	2148.88	.984015	0.	26.3170
334	3.79021	19.8101	1.49989	2.18573	.328459	2159.94	.981748	0.	26.6040
335	3.80952	20.1124	1.52872	2.20043	.380835	2166.60	.979142	0.	26.9132
336	3.82870	20.4223	1.55812	2.21549	.435237	2172.53	.976150	0.	27.2492
337	3.84776	20.7388	1.58795	2.23088	.491202	2176.38	.972719	0.	27.6173
338	3.86667	21.0603	1.61806	2.24654	.548803	2177.78	.968793	0.	28.0245
339	3.88546	21.3860	1.64822	2.26238	.607110	2176.33	.964311	0.	28.4795
340	3.90411	21.7101	1.67819	2.27829	.666259	2171.68	.959211	0.	28.9924
341	3.92264	22.0327	1.70785	2.29414	.725401	2163.52	.953428	0.	29.5752
342	3.94104	22.3493	1.73629	2.30877	.784125	2151.67	.946899	0.	30.2416
343	3.95932	22.6561	1.76378	2.32500	.841463	2136.11	.939564	0.	31.0064
344	3.97748	22.9494	1.78979	2.33988	.896739	2116.98	.931366	0.	31.8848
345	3.99554	23.2254	1.81405	2.35382	.948218	2094.52	.922220	0.	32.8941
346	4.01350	23.4812	1.83636	2.36683	.996347	2069.80	.912149	0.	34.0425
347	4.03137	23.7146	1.85666	2.37886	1.04385	2042.78	.901082	0.	35.3431
348	4.04915	23.9241	1.87480	2.38988	1.09084	2014.83	.888983	0.	36.8030
349	4.06686	24.1087	1.89048	2.39941	1.12178	1986.54	.875822	0.	38.4258
350	4.08451	24.2683	1.90428	2.40812	1.15448	1958.61	.861563	0.	40.2121
351	4.10211	24.4043	1.91612	2.41578	1.18321	1931.84	.846170	0.	42.1617
352	4.11966	24.5163	1.92580	2.42240	1.20806	1906.13	.829601	0.	44.2675
353	4.13715	24.6022	1.93374	2.42788	1.22906	1882.46	.811802	0.	46.5133
354	4.15463	24.6648	1.94038	2.43286	1.24867	1860.81	.792709	0.	48.8967

PAD3.2 - 74SEP23 RUN 3 HERBAR QUARTZ-PETN PLANE SHOCK INITIATION HFL-72-1 10/18/74
TFICKETIXN. 43.972 SEC ON RUN. 75.114 SEC ON JOB TIME= 1.7500E+00

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR S1	LAM OR S2	VISCOSITY	C-SQ
355	4.17207	24.7203	1.94850	2.43678	1.26247	1841.07	.772247	0.	51.4681
356	4.18948	24.7881	1.95017	2.44034	1.27845	1823.44	.750330	0.	54.2235
357	4.20688	24.7661	1.95085	2.44262	1.28858	1808.24	.726849	0.	56.9827
358	4.22427	24.7182	1.94967	2.44380	1.28074	1795.12	.701736	.558708E-02	59.7284
359	4.24166	24.6506	1.94746	2.44441	1.29385	1783.50	.674740	.129034E-01	62.5762
360	4.25905	24.5610	1.94424	2.44444	1.29497	1773.34	.645766	.192623E-01	65.4986
361	4.27643	24.4588	1.93910	2.44405	1.29473	1764.59	.614644	.314189E-01	68.5317
362	4.29383	24.3239	1.93448	2.44295	1.29195	1756.87	.581187	.288747E-01	71.5676
363	4.31124	24.1758	1.92483	2.44144	1.28779	1750.35	.545180	.616650E-01	74.6910
364	4.32866	24.0206	1.91758	2.43958	1.28246	1745.23	.506413	.472333E-01	77.9189
365	4.34611	23.8935	1.90758	2.43530	1.28760	1736.23	.464619	.662192E-01	80.3774
366	4.36358	23.5890	1.88919	2.43349	1.26268	1735.97	.419590	.259203	84.0953
367	4.38115	22.3989	1.83300	2.41845	1.20598	1693.16	.371672	.240058	82.0667
368	4.39808	18.7380	1.37495	2.37019	1.01923	1526.67	.323278	2.84154	67.4654

369	4.41838	10.3345	.974196	2.20184	.482923	1078.22	.288716	1.74346	32.6707
370	4.43850	7.64413	.860660	2.11299	.292228	911.123	.270206	.368198	23.3893
371	4.45886	6.90713	.816872	2.08694	.247051	859.337	.254755	.129848	21.3844
372	4.47935	6.50551	.786721	2.07420	.226370	828.229	.241048	.864638E-01	20.5209
373	4.49994	6.19096	.761726	2.06470	.211541	802.868	.228438	.701131E-01	19.9175
374	4.52060	5.92287	.740074	2.05676	.199582	780.803	.216807	.596605E-01	19.4334
375	4.54133	5.68857	.720987	2.04991	.189612	761.218	.206017	.518006E-01	19.0301
376	4.56212	5.48099	.703971	2.04392	.181157	743.642	.195961	.455794E-01	18.6878
377	4.56297	5.29522	.688669	2.03862	.173900	727.737	.186552	.405220E-01	18.3937
378	4.60387	5.12764	.674809	2.03390	.167611	713.246	.177717	.363324E-01	18.1385
379	4.62481	4.97543	.662181	2.02963	.162099	700.003	.169464	.328057E-01	17.9123
380	4.64579	4.83639	.650615	2.02581	.157268	687.776	.161599	.298069E-01	17.7158
381	4.66680	4.70872	.639973	2.02234	.152995	676.488	.154148	.272280E-01	17.5420
382	4.68785	4.59099	.630142	2.01919	.149197	665.969	.147071	.249907E-01	17.3874
383	4.70893	4.48198	.621028	2.01630	.145806	656.186	.140333	.230351E-01	17.2496
384	4.73003	4.38068	.612550	2.01364	.142761	647.057	.133936	.213127E-01	17.1248
385	4.75117	4.28626	.604640	2.01119	.140023	638.500	.127824	.197873E-01	17.0126
386	4.77232	4.19798	.597241	2.00895	.137562	630.445	.121939	.184301E-01	16.9130
387	4.79350	4.11522	.590302	2.00688	.135338	622.855	.116292	.172148E-01	16.8232
388	4.81470	4.03744	.583780	2.00495	.133324	615.688	.110864	.161217E-01	16.7421
389	4.83591	3.96417	.577638	2.00314	.131483	608.931	.105701	.151325E-01	16.6685
390	4.85715	3.89500	.571840	2.00148	.129824	602.500	.100666	.142388E-01	16.6003
391	4.87840	3.82957	.566358	1.99993	.128315	596.392	.958052E-01	.134269E-01	16.5404
392	4.89966	3.76757	.561165	1.99849	.126941	590.580	.911066E-01	.126864E-01	16.4863
393	4.92094	3.70873	.556239	1.99711	.125679	585.064	.866166E-01	.120063E-01	16.4351
394	4.94224	3.65278	.551556	1.99585	.124540	579.778	.822118E-01	.113831E-01	16.3909
395	4.96355	3.59951	.547105	1.99467	.123502	574.728	.779384E-01	.108089E-01	16.3511
396	4.98486	3.54870	.542862	1.99356	.122557	569.880	.737880E-01	.102792E-01	16.3153
397	5.00619	3.50019	.538815	1.99249	.121687	565.277	.698093E-01	.978818E-02	16.2808
398	5.02754	3.45381	.534950	1.99151	.120906	560.831	.658848E-01	.933462E-02	16.2519
399	5.04889	3.40941	.531255	1.99059	.120198	556.560	.620617E-01	.891216E-02	16.2262
400	5.07025	3.36685	.527719	1.98970	.119548	552.472	.583878E-01	.851641E-02	16.2012
401	5.09161	3.32602	.524331	1.98888	.118966	548.518	.547530E-01	.814931E-02	16.1808
402	5.11299	3.28680	.521082	1.98811	.118443	544.708	.512027E-01	.780803E-02	16.1630
403	5.13438	3.24910	.517963	1.98738	.117986	541.052	.477841E-01	.748869E-02	16.1454
404	5.15577	3.21283	.514986	1.98668	.117548	537.506	.443921E-01	.719119E-02	16.1320
405	5.17717	3.17790	.512082	1.98603	.117179	534.081	.410712E-01	.691132E-02	16.1206
406	5.19858	3.14423	.509308	1.98540	.116845	530.785	.378686E-01	.664469E-02	16.1092
407	5.21999	3.11174	.506637	1.98482	.116561	527.580	.348818E-01	.639313E-02	16.1014

PA03.2 - 74SEP23 RUN 3 HERGAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN, 44.003 SEC ON RUN, 75.144 SEC ON JOB TIME= 1.7500E+00

CELL	POSITION	PRESSURE	VELOCITY	DENSITY	INT. ENERGY	TEMP OR S1	LAM OR S2	VISCOSITY	C-SQ
408	5.24141	3.08038	.504063	1.98428	.118316	524.474	.315551E-01	.615920E-02	16.0952
409	5.26283	3.05005	.501579	1.98374	.118102	521.482	.286365E-01	.594058E-02	16.0887
410	5.28426	3.02075	.499180	1.98325	.115931	518.565	.255242E-01	.573369E-02	16.0856
411	5.30569	2.99241	.496865	1.98277	.115787	515.750	.226110E-01	.553085E-02	16.0821
412	5.32713	2.96490	.494633	1.98233	.115680	512.997	.197018E-01	.533186E-02	16.0814
413	5.34858	2.93836	.492456	1.98192	.115610	510.329	.168381E-01	.519797E-02	16.0825
414	5.37003	2.91237	.490415	1.98150	.115549	507.733	.140679E-01	.487254E-02	16.0818
415	5.39148	2.88780	.488182	1.98116	.115556	505.237	.112921E-01	.533252E-02	16.0867
416	5.41293	2.86251	.486842	1.98073	.115515	502.723	.860553E-02	.319710E-02	16.0850
417	5.43440	2.83725	.482095	1.98030	.115479	500.213	.590716E-02	.113449E-01	16.0837
418	5.45588	2.78809	.477609	1.97832	.114346	496.116	.333196E-02	.106783E-01	15.9839
419	5.47763	2.39772	.358805	1.95394	.971846E-01	468.660	.972161E-03	.287926	14.5511
420	5.50073	1.01945	.135842	1.83965	.308395E-01	372.082	.230091E-04	.454574	9.31805
421	5.52515	.237323	.301827E-01	1.74077	.262503E-02	316.697	0.	.155532	6.27001
422	5.55003	.443685E-01	.551363E-02	1.70823	.105204E-03	303.109	0.	.305228E-01	5.47690
423	5.57500	.783342E-02	.970076E-03	1.70148	.336295E-05	300.548	0.	.538261E-02	5.32314
424	5.60000	.137542E-02	.170807E-03	1.70026	.103899E-06	300.096	0.	.939183E-03	5.29582
425	5.62500	.241613E-03	.302511E-04	1.70005	.322960E-08	300.017	0.	.164923E-03	5.29102
426	5.65000	.419764E-04	.324591E-05	1.70001	.107018E-09	300.003	0.	.316789E-04	5.29018
427	5.67500	-.543142E-13	0.	1.70000	0.	300.000	0.	0.	5.29000
428	5.70000	-.543142E-13	0.	1.70000	0.	300.000	0.	0.	5.29000
429	5.72500	-.543142E-13	0.	1.70000	0.	300.000	0.	0.	5.29000

PAD3.2 - 74SEP23 RUN 3 HERBAR QUARTZ-PETN PLANE SHOCK INITIATION MFL-72-1 10/18/74
TFICKETIXN, 46.402 SEC ON RUN, 77.544 SEC ON JOB PARTICLES

TIME	CELL	X	P	U	RHO	CELL	X	P	U	RHO
0.000000000	201	.0250000	-.00000000	0.000000000	1.700000000	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.031250000	201	.0323428	1.52508738	.298003846	1.883588299	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.062500000	201	.0417119	1.53220029	.299917182	1.881955239	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.093750000	201	.0510631	1.54177373	.298801800	1.880457221	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.125000000	201	.0603961	1.55142297	.298467685	1.878868963	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.156250000	201	.0697122	1.56031955	.297784178	1.877108902	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.187500000	201	.0790092	1.57016880	.297242099	1.875327745	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.218750000	201	.0882882	1.57965871	.296625945	1.873395077	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.250000000	201	.0975471	1.59012779	.295958129	1.871428237	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.281250000	201	.1067858	1.60068339	.295332353	1.869332594	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.312500000	201	.1160028	1.61211245	.294580600	1.867172874	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.343750000	201	.1251972	1.62403503	.293876802	1.864900251	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.375000000	201	.1343678	1.63665084	.293064373	1.862520748	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.406250000	201	.1435129	1.65010932	.292249746	1.860033892	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.437500000	201	.1526316	1.66425797	.291373032	1.857407309	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.468750000	201	.1617217	1.67946048	.290425026	1.854658191	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.500000000	201	.1707817	1.69561899	.289444224	1.851754448	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.531250000	201	.1798093	1.71294742	.288371543	1.848692840	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.562500000	201	.1888026	1.73153345	.287228379	1.845453106	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.593750000	201	.1977591	1.75143901	.286011504	1.842008571	280	2.0000000	-.00000000	0.000000000	1.700000000
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.625000000	201	.2066760	1.77295695	.284686717	1.838351297	280	2.0000046	.00495305	.000717105	1.700934298
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.656250000	201	.2155500	1.79633424	.283263252	1.834462552	280	2.0007868	.69469408	.107127593	1.803883173
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.687500000	201	.2243778	1.82161729	.281736405	1.830293692	280	2.0096266	1.78777921	.339124308	1.909422163
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.718750000	201	.2331553	1.84928848	.280061054	1.825835438	280	2.0202508	1.80841749	.340615508	1.908447056
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.750000000	201	.2418781	1.87963420	.278228302	1.821044953	280	2.0309119	1.83354925	.341677229	1.907690881
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.781250000	201	.2505410	1.91304042	.276223805	1.815875726	280	2.0416166	1.85924143	.343430260	1.906810859
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.812500000	201	.2591380	1.94991505	.274005139	1.810265855	280	2.0523674	1.88583601	.344614702	1.905818013
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.843750000	201	.2676621	1.99103610	.271551495	1.804173467	280	2.0631680	1.91872164	.346521565	1.905138815
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.875000000	201	.2761051	2.03708013	.268830281	1.797515102	280	2.0740277	1.95010238	.348544970	1.904092585
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.906250000	201	.2844573	2.08909177	.265749284	1.790214417	280	2.0849482	1.98638773	.350296513	1.903189062
	320	3.0000000	-.00000000	0.000000000	1.700000000	360	4.0000000	-.00000000	0.000000000	1.700000000
.937500000	201	.2927072	2.14823559	.262282374	1.782157831	280	2.0959385	2.02894214	.352951992	1.902505486

	320	3.0000005	.00060381	.000085011	1.700114112	360	4.0000000	-.00000000	0.000000000	1.700000000
.968750000	201	.3008411	2.21635037	.258337857	1.773250405	280	2.1070097	2.07247120	.355805110	1.901543149
	320	3.0001434	.16378371	.023363781	1.728965966	360	4.0000000	-.00000000	0.000000000	1.700000000
1.000000000	201	.3088438	2.29559359	.253870274	1.763344155	280	2.1181692	2.12033454	.358606228	1.900531571
	320	3.0067499	1.94909562	.362826928	1.922413328	360	4.0000000	-.00000000	0.000000000	1.700000000
1.031250000	201	.3166948	2.38861037	.248625661	1.752233390	280	2.1294283	2.17596984	.361805012	1.899695266
	320	3.0182137	1.99790166	.368617686	1.923183469	360	4.0000000	-.00000000	0.000000000	1.700000000
1.062500000	201	.3243680	2.49908697	.242450489	1.739676632	280	2.1408022	2.24080514	.365794417	1.899066344
	320	3.0297796	2.03697050	.371559201	1.922969805	360	4.0000000	-.00000000	0.000000000	1.700000000
1.093750000	201	.3318286	2.63256607	.235033116	1.725447821	280	2.1523104	2.31387209	.370636521	1.898442411
	320	3.0414456	2.08115464	.375010785	1.922897256	360	4.0000000	-.00000000	0.000000000	1.700000000
1.125000000	201	.3390321	2.79632497	.225930109	1.709224226	280	2.1639744	2.39615811	.376061097	1.897750972
	320	3.0532240	2.12938218	.378767497	1.922842643	360	4.0000000	-.00000000	0.000000000	1.700000000
1.156250000	201	.3459163	3.00138705	.214554523	1.690732071	280	2.1758200	2.49190445	.382249102	1.897154128
	320	3.0651280	2.18384074	.383038882	1.922927450	360	4.0000000	-.00000000	0.000000000	1.700000000
1.187500000	201	.3523957	3.26353731	.199943254	1.669705527	280	2.1878819	2.60651046	.3896878#1	1.896837098
	320	3.0771742	2.24502992	.387871620	1.923127926	360	4.0000000	-.00000000	0.000000000	1.700000000
1.218750000	201	.3583474	3.60617979	.180616270	1.646047310	280	2.2002063	2.74548650	.398963792	1.896871369
	320	3.0893823	2.31455679	.393403579	1.923489878	360	4.0000000	-.00000000	0.000000000	1.700000000
1.250000000	201	.3635922	4.06347920	.154473567	1.620005864	280	2.2128544	2.91582269	.410525158	1.897262759
	320	3.1017767	2.39433148	.399794007	1.924058316	360	4.0000001	.00019277	.000026313	1.700036438
1.281250000	201	.3678691	4.68245050	.118470234	1.592452563	280	2.2259095	3.13045376	.425177779	1.898216667
	320	3.1143874	2.43691943	.407257094	1.924894654	360	4.0000659	.08599213	.011717533	1.715675131
1.312500000	201	.3708204	5.51314425	.069613983	1.564783362	280	2.2394923	3.41086417	.444456432	1.900108050
	320	3.1272525	2.59587686	.416095906	1.926086360	360	4.0061762	2.18372781	.396294722	1.939450794
1.343750000	201	.3720265	6.56687319	.007695816	1.538457301	280	2.2537843	3.79351177	.470901656	1.903513328
	320	3.1404215	2.72621197	.426731895	1.927755899	360	4.0187673	2.26644553	.406302183	1.941852733
1.375000000	201	.3711751	7.72780899	-.059796059	1.513730335	280	2.2690774	4.34724012	.509208418	1.909534822
	320	3.1539596	2.88538695	.439764463	1.930092221	360	4.0315653	2.33738581	.412721062	1.943006802
1.406250000	201	.3683295	8.73144963	-.117639599	1.489580319	280	2.2858764	5.21477097	.568849106	1.920451264
	320	3.1679559	3.08484858	.456146376	1.933384811	360	4.0445792	2.41886350	.420120317	1.944457382
1.437500000	201	.3640045	9.35822991	-.159194128	1.465647413	280	2.3051379	6.71671529	.670359386	1.941173617
	320	3.1825377	3.34329018	.477408850	1.938111386	360	4.0578433	2.51363553	.428737596	1.946291441
1.468750000	201	.3588854	9.60628419	-.169963692	1.442928241	280	2.3287571	9.50966856	.852693352	1.979953546
	320	3.1978962	3.69353661	.506204683	1.945117943	360	4.0714006	2.62555541	.438908998	1.948631583
1.500000000	201	.3535153	9.60570358	-.171991191	1.422487268	280	2.3595308	13.73814140	1.109059177	2.025742294
	320	3.2143391	4.19911347	.547586396	1.866053860	360	4.0853075	2.75997300	.451142409	1.951640962
1.515625000	201	.3508431	9.55323019	-.169952485	1.413277892	280	2.3776722	15.48272357	1.198386222	2.030401382
	320	3.2231222	4.54830203	.575986842	1.963989227	360	4.0924146	2.83805788	.458245282	1.953474573
1.531250000	201	.3482125	9.48127232	-.166815991	1.404722951	280	2.3967297	16.40486479	1.228055575	2.016337120
	320	3.2324125	5.00046051	.612509595	1.974580955	360	4.0996392	2.92518578	.466162989	1.955584689
1.546875000	201	.3456368	9.39825506	-.163025304	1.396810081	280	2.4157589	16.55797233	1.202205783	1.988594724
	320	3.2423680	5.60982613	.661245565	1.989248648	360	4.1069954	3.02316714	.475052804	1.958029430
1.562500000	201	.3431243	9.30929756	-.158785218	1.389500290	280	2.4340954	16.24282054	1.145024266	1.955155925
	320	3.2532340	6.47465463	.729431542	2.010555042	360	4.1145000	3.13430381	.485123385	1.960881088
1.578125000	201	.3406797	9.21824516	-.154389664	1.382727284	280	2.4514287	15.74194470	1.077644451	1.922292688
	320	3.2654164	7.78765040	.830796420	2.043459106	360	4.1221736	3.26164769	.496644504	1.964236101
1.593750000	201	.3383038	9.12792376	-.150003407	1.376469683	280	2.4677082	15.18761378	1.010493803	1.891731600
	320	3.2796371	9.95540085	.992808193	2.097911896	360	4.1300417	3.40938197	.509974691	1.968228758
1.609375000	201	.3359964	9.03992666	-.145645274	1.370682681	280	2.4829627	14.64272157	.946852978	1.863931282
	320	3.2972097	13.71053066	1.260086948	2.187492596	360	4.1381365	3.58333403	.525612675	1.973046231
1.625000000	201	.3337555	8.95539903	-.141474142	1.365333570	280	2.4972575	14.12478774	.887318284	1.838448202
	320	3.3195898	18.34041154	1.570783638	2.277213736	360	4.1464996	3.79188978	.544275557	1.978957608
1.640625000	201	.3315784	8.87497771	-.137461357	1.360388731	280	2.5106584	13.64312682	.832093309	1.815063002
	320	3.3455511	20.84486377	1.713119637	2.301227883	360	4.1551866	4.04764291	.567031973	1.986366996
1.656250000	201	.3294635	8.79810144	-.133501177	1.355769614	280	2.5232277	13.19651128	.780575695	1.793400463
	320	3.3725381	21.41151032	1.720470891	2.278498364	360	4.1642743	4.37062066	.595550025	1.995919243
1.671875000	201	.3274095	8.72419310	-.129684978	1.351409423	280	2.5350202	12.78187787	.732323525	1.773162481
	320	3.3988372	20.83580430	1.642327686	2.229488017	360	4.1738739	4.79503645	.632627973	2.008718395
1.687500000	201	.3254134	8.65382081	-.126067698	1.347311870	280	2.5460814	12.39756513	.686872013	1.754203936
	320	3.4236234	19.86835084	1.535219225	2.175669548	360	4.1841577	5.38570520	.683455341	2.026858295
1.703125000	201	.3234723	8.58716909	-.122654842	1.343467656	280	2.5564527	12.03758381	.643678954	1.736213640
	320	3.4467082	18.86092022	1.427518431	2.126456523	360	4.1954215	6.28896936	.759327800	2.055079144
1.718750000	201	.3215834	8.52410162	-.119359591	1.339855526	280	2.5661697	11.70200707	.602883949	1.719197796
	320	3.4681841	17.93848061	1.329355206	2.083907143	360	4.2082906	8.03770821	.897077953	2.111050621
1.734375000	201	.3197443	8.46429723	-.116272230	1.336447928	280	2.5752616	11.38917193	.563851429	1.703092939
	320	3.4882152	17.12178847	1.241778576	2.047184207	360	4.2290941	22.98560185	1.855660719	2.426713933
1.750000000	201	.3179522	8.40777952	-.113319982	1.333238749	280	2.5837604	11.09276265	.526420610	1.687597295
	320	3.5069604	16.41058668	1.164089467	2.015421436	360	4.2590451	24.56097440	1.944238817	2.444442292
1.765625000	201	.3162052	8.35412010	-.110501665	1.330199247	280	2.5916904	10.81845121	.491136482	1.673033516
	320	3.5245696	15.79512094	1.095494682	1.987836996	360	4.2896013	24.98765956	1.956519836	2.441826646

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 1.781250000  201      .3145007   8.30331056  -.107851894  1.327325083  280     2.5990771  10.56026686   .456923913  1.659117653
              320     3.5411650  15.24875271  1.033497257  1.963141129  380     4.3199981  24.83406203  1.930299934  2.423831852
 1.796875000  201      .3128370   8.25494596  -.105290309  1.324591188  280     2.6059491  10.31856144   .424728764  1.645896066
              320     3.5568366  14.76111693   .976898629  1.940831718  360     4.3487033  24.22128448  1.869996133  2.390383173
OVERVIEW - NO. POINTS, TIMES
                5693
                   0
              .0703125
              .1875000
              .3046875
              .4218750
              .5390625
              .6562500
              .7734375
              .8906250
             1.0078125
             1.1250000
             1.2421875
             1.3593750
             1.4765625
             1.5937500
             1.7109375

TFICKETIXN.   50.662 SEC ON RUN.   81.794 SEC ON JOB

      1850 CYCLES.       580184 POINTS.       85.8 MUSECS/PT.
$$$$$$$$$ $$$$$$$$$ $$$$$$$$$ $$$$$$$$$ $$$$$$$$$ $$$$$$$$$ $$$$$$$$$ $$$$$$$$$ $$$$$$$$$ $$$$$$$$$ $$$$$$$$$

*** EOI  1.OUT  ***********************************************************************************************************
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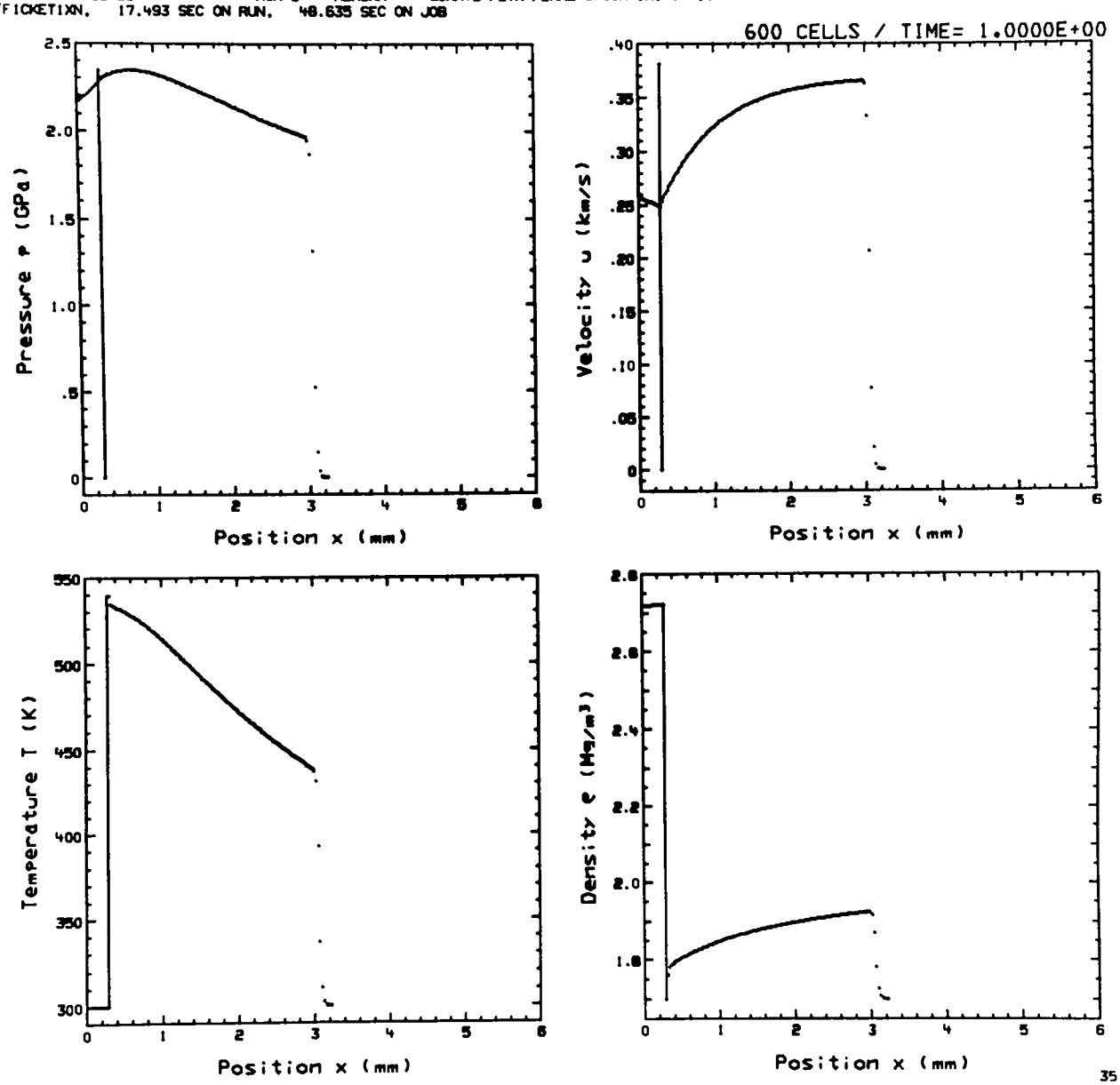
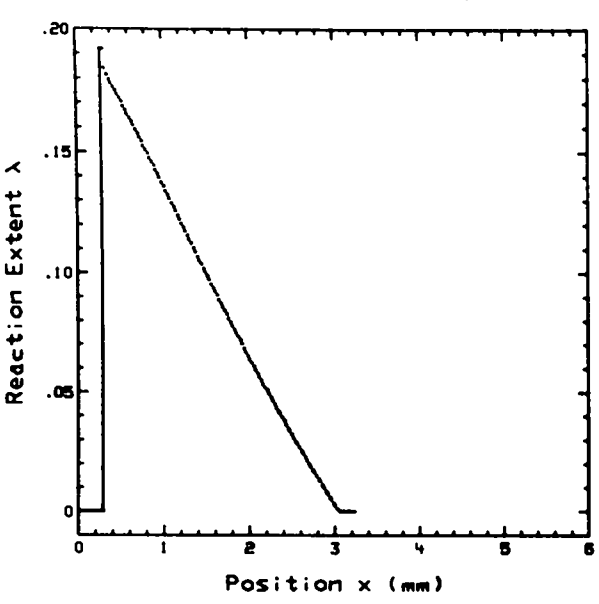
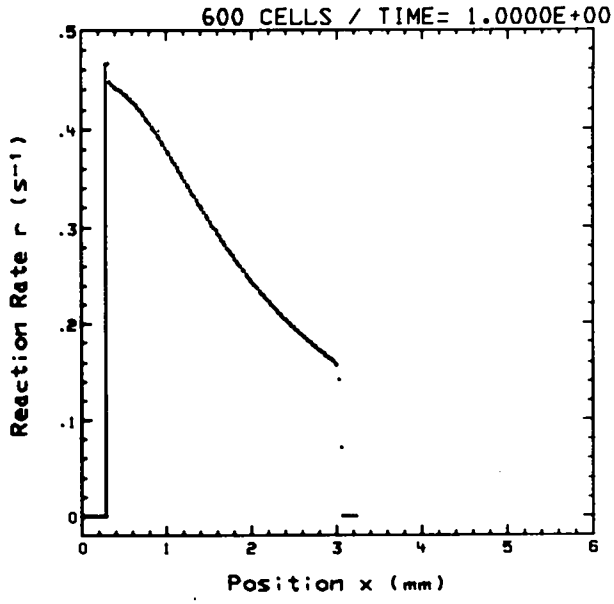
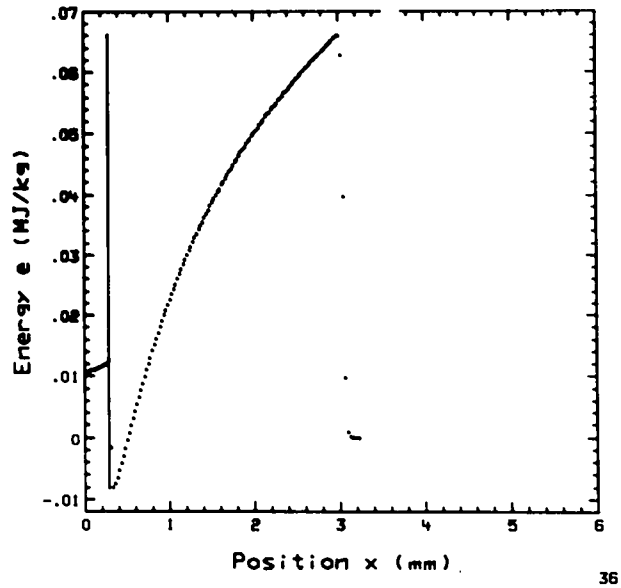

600 CELLS / TIME= 1.0000E+00
Pressure P (GPa)
Velocity u (km/s)
Temperature T (K)
Density ρ (Mg/m³)
Position x (mm)
Position x (mm)
Position x (mm)
Position x (mm)

35

PAD3.2 - 74SEP23 RUN 3 HERBAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN. 17.652 SEC ON RUN. 48.794 SEC ON JOB







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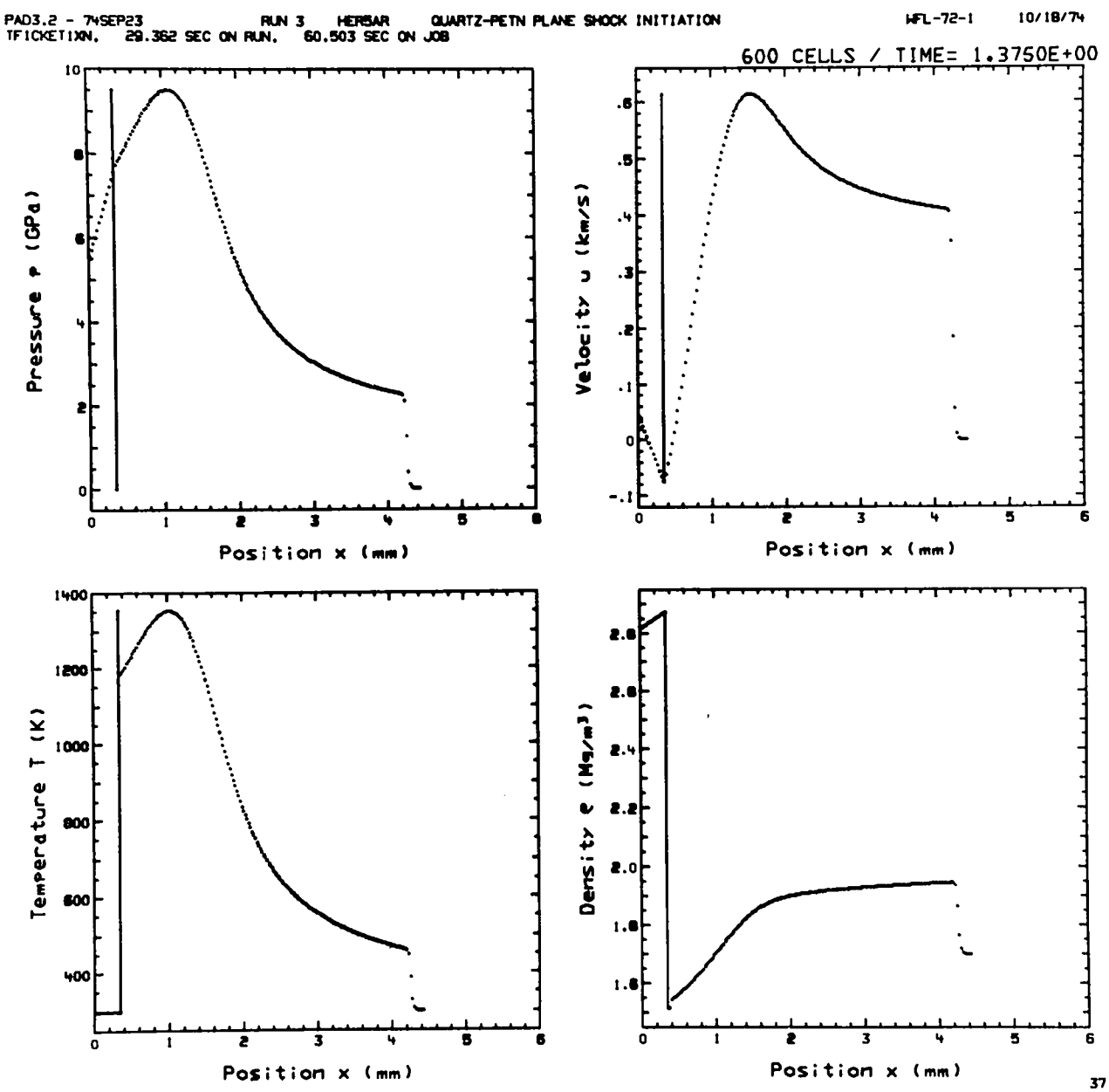
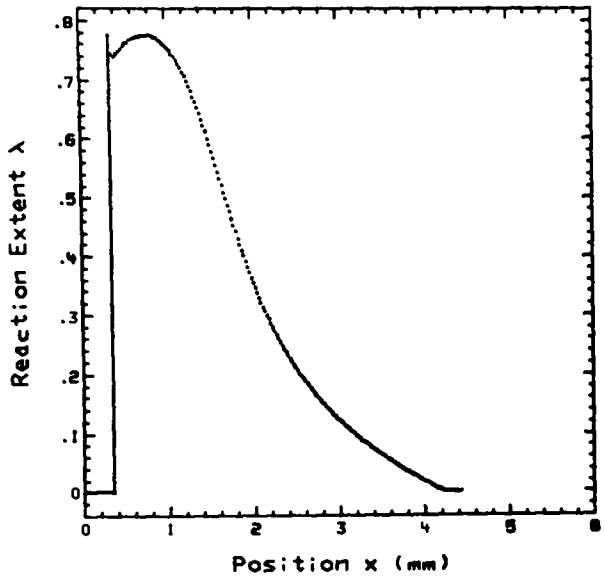
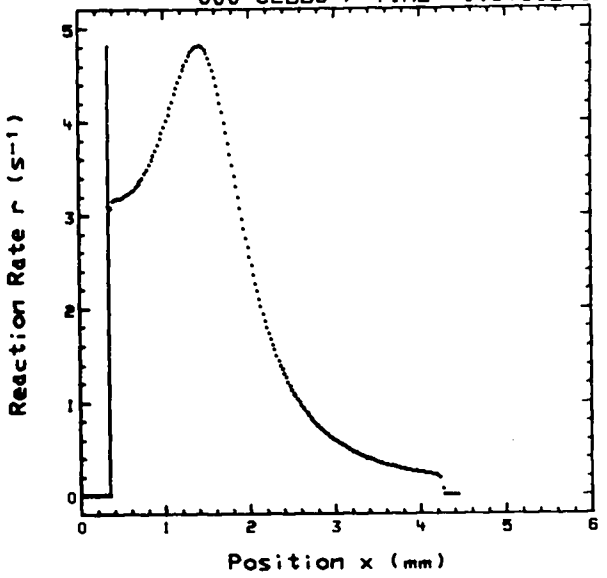

PAD3.2 - 74SEP23 RUN 3 HERSAR QUARTZ-PETN PLANE SHOCK INITIATION HFL-72-1 10/18/74
TFICKETIXN, 29.362 SEC ON RUN, 60.503 SEC ON JOB
600 CELLS / TIME= 1.3750E+00
Pressure P (GPa)
Position x (mm)
Velocity u (km/s)
Position x (mm)
Temperature T (K)
Position x (mm)
Density ρ (Mg/m³)
Position x (mm)

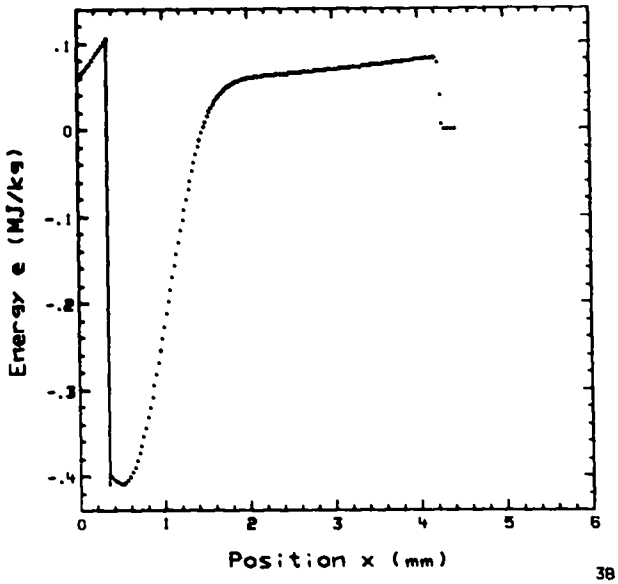
37

PAD3.2 - 74SEP23 RUN 3 HERSAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN. 29.516 SEC ON RUN. 60.658 SEC ON JOB

600 CELLS / TIME= 1.3750E+00







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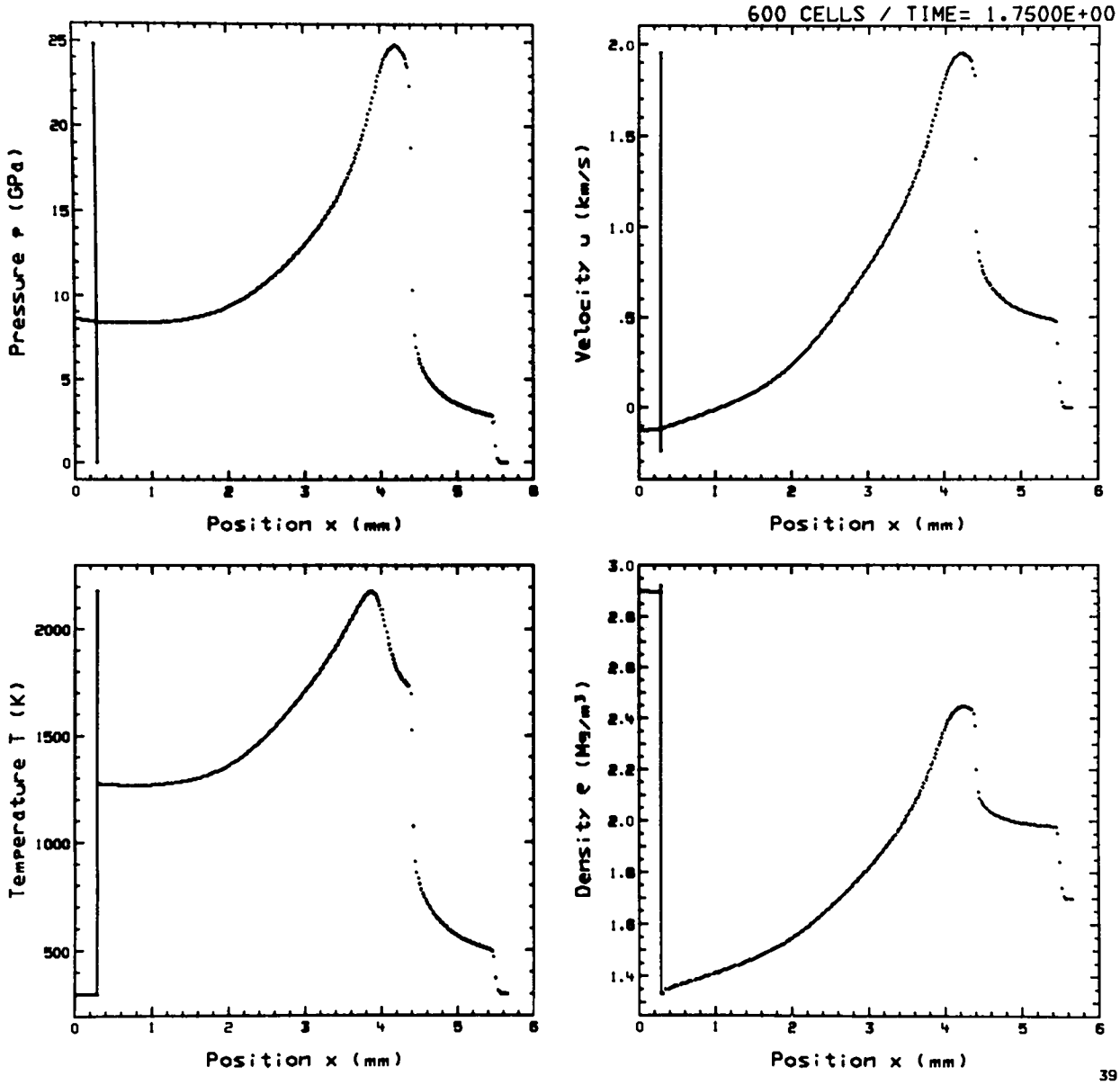
PAD3.2 - 74SEP23 RUN 3 HERBAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN, 44.021 SEC ON RUN, 75.183 SEC ON JOB



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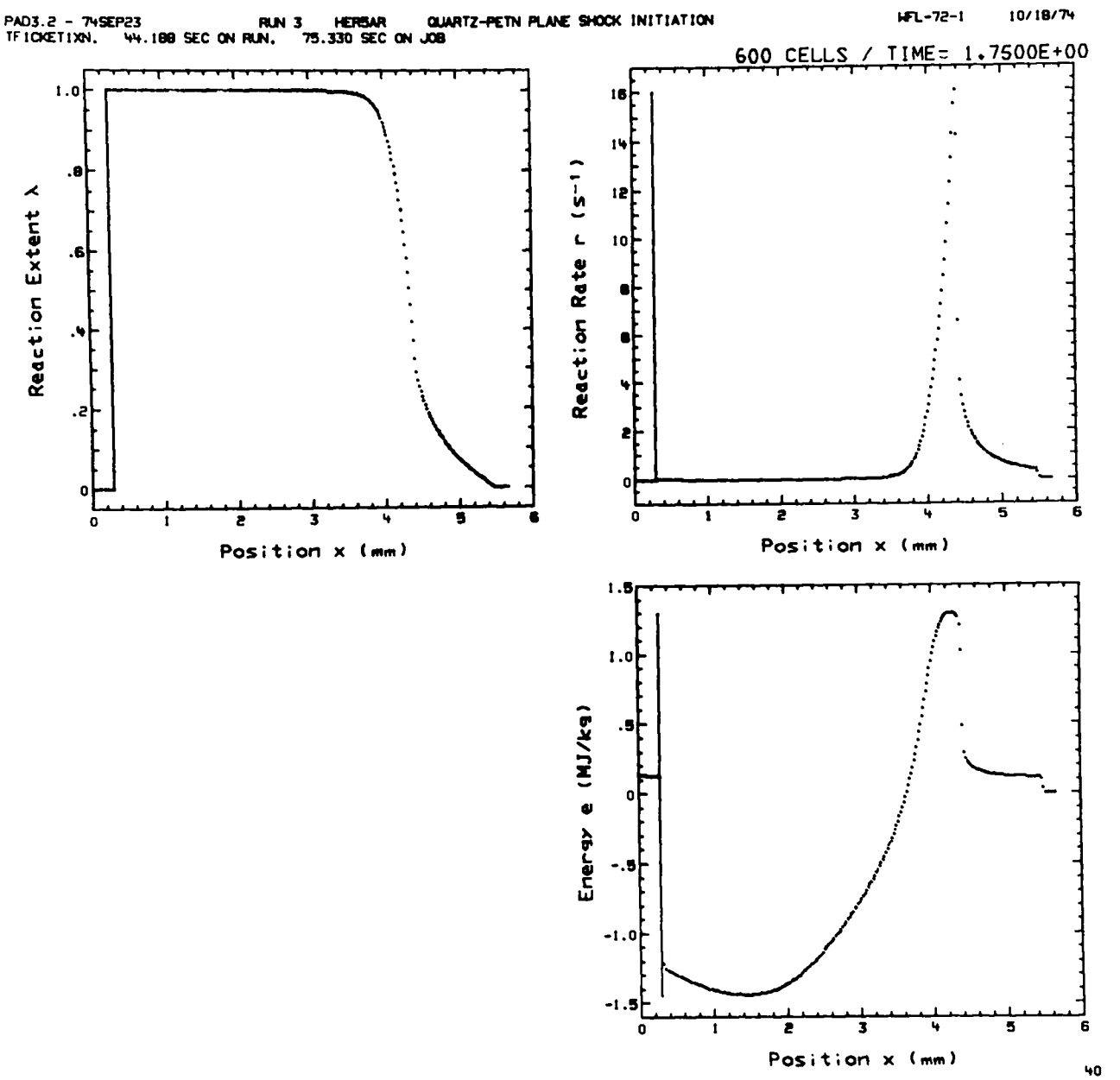
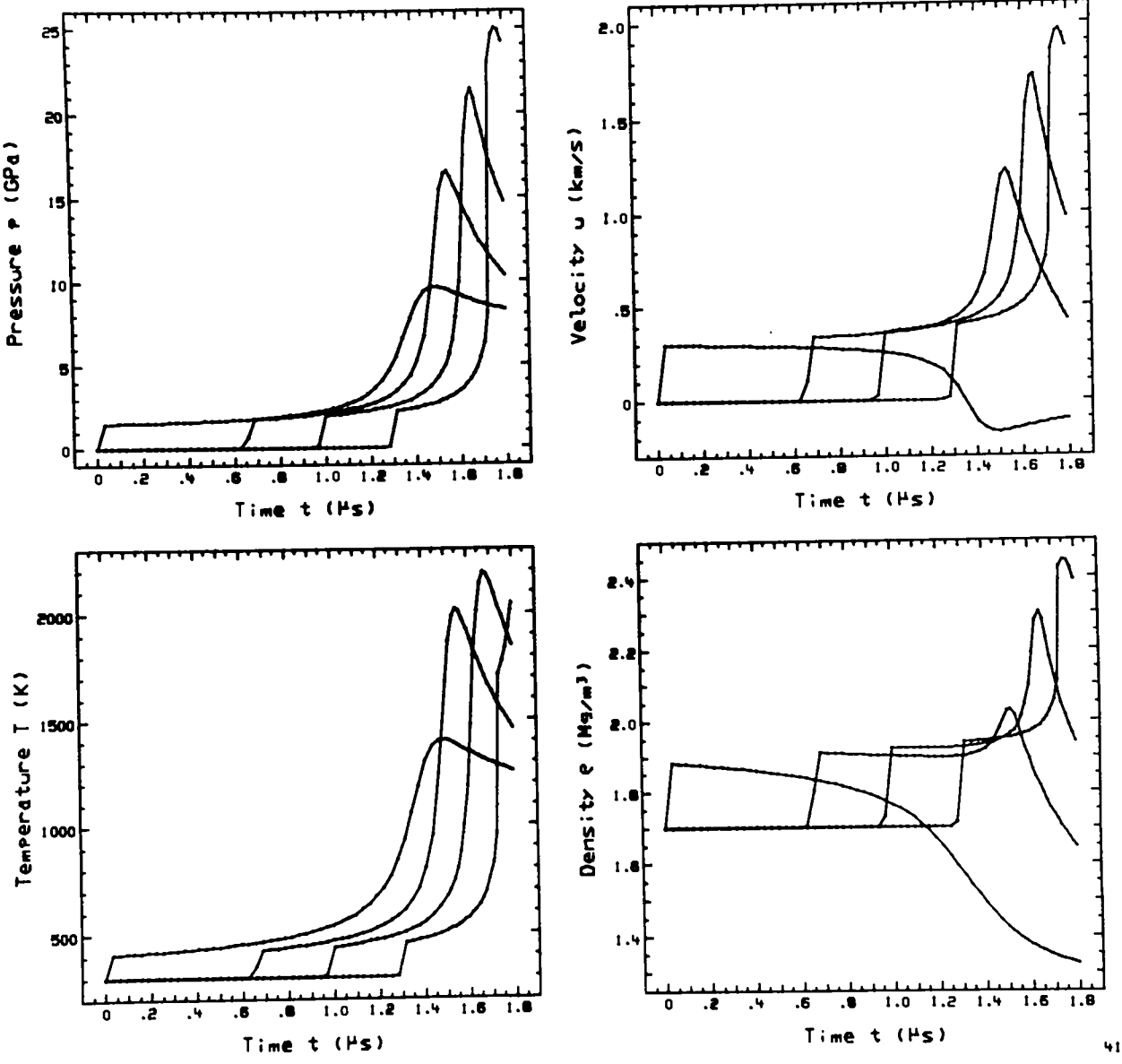

PAD3.2 - 74SEP23 RUN 3 HERSAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN. 44.188 SEC ON RUN. 75.330 SEC ON JOB
600 CELLS / TIME= 1.7500E+00
Reaction Extent λ
Position x (mm)
Reaction Rate r (s⁻¹)
Position x (mm)
Energy e (MJ/kg)
Position x (mm)

PAD3.2 - 74SEP23 RUN 3 HERSAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN. 46.502 SEC ON RUN. 77.644 SEC ON JOB

600 CELLS / PARTICLES



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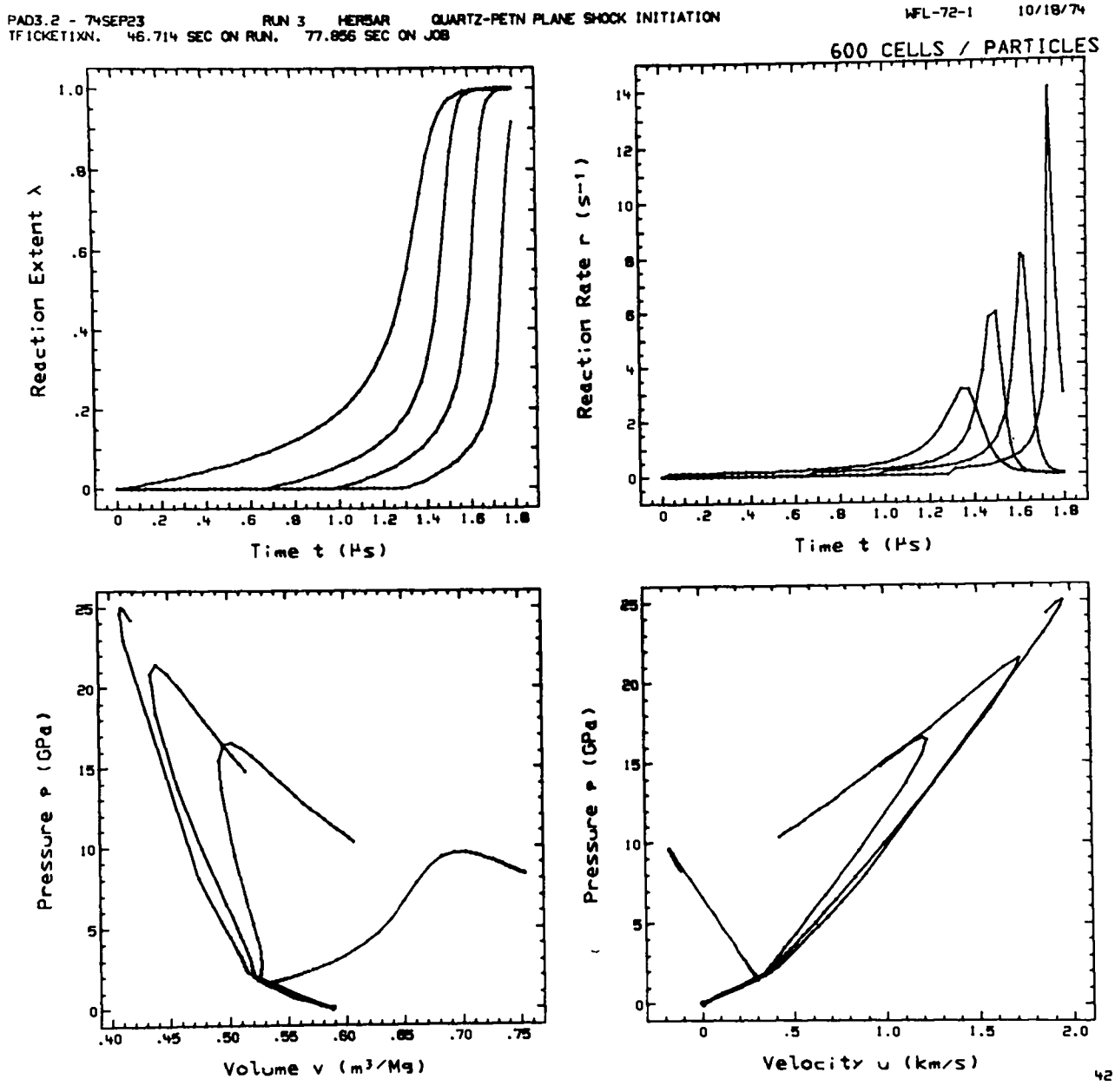
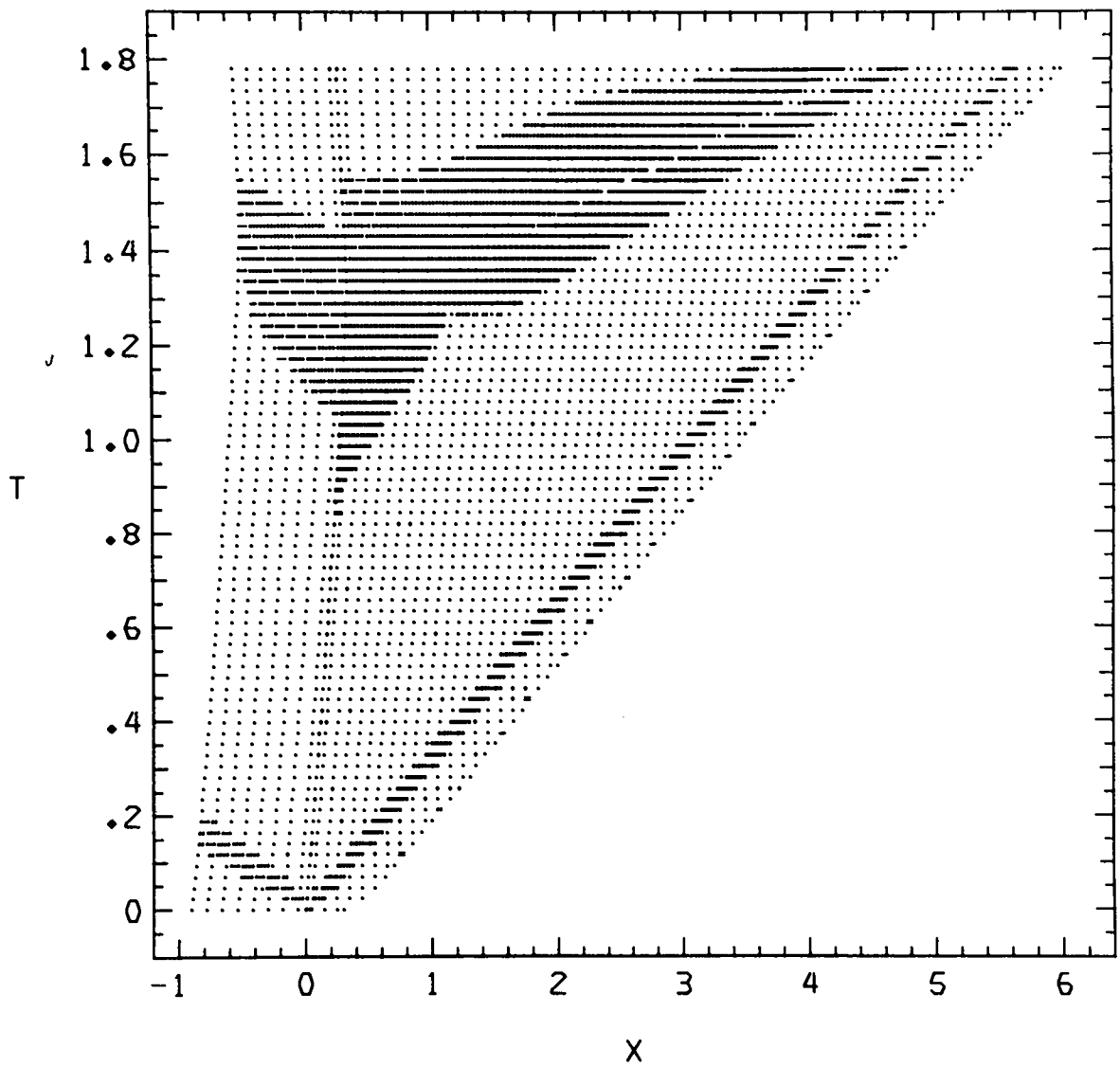

PAD3.2 - 74SEP23 RUN 3 HERSAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN. 46.714 SEC ON RUN. 77.856 SEC ON JOB
600 CELLS / PARTICLES
Reaction Extent λ
Time t (μs)
Reaction Rate r (s⁻¹)
Time t (μs)
Pressure P (GPa)
Volume v (m³/Mg)
Pressure P (GPa)
Velocity u (km/s)

42

PAD3.2 - 74SEP23 RUN 3 HERSAR QUARTZ-PETN PLANE SHOCK INITIATION WFL-72-1 10/18/74
TFICKETIXN. 49.486 SEC ON RUN. 80.628 SEC ON JOB

600 CELLS / OVERVIEW



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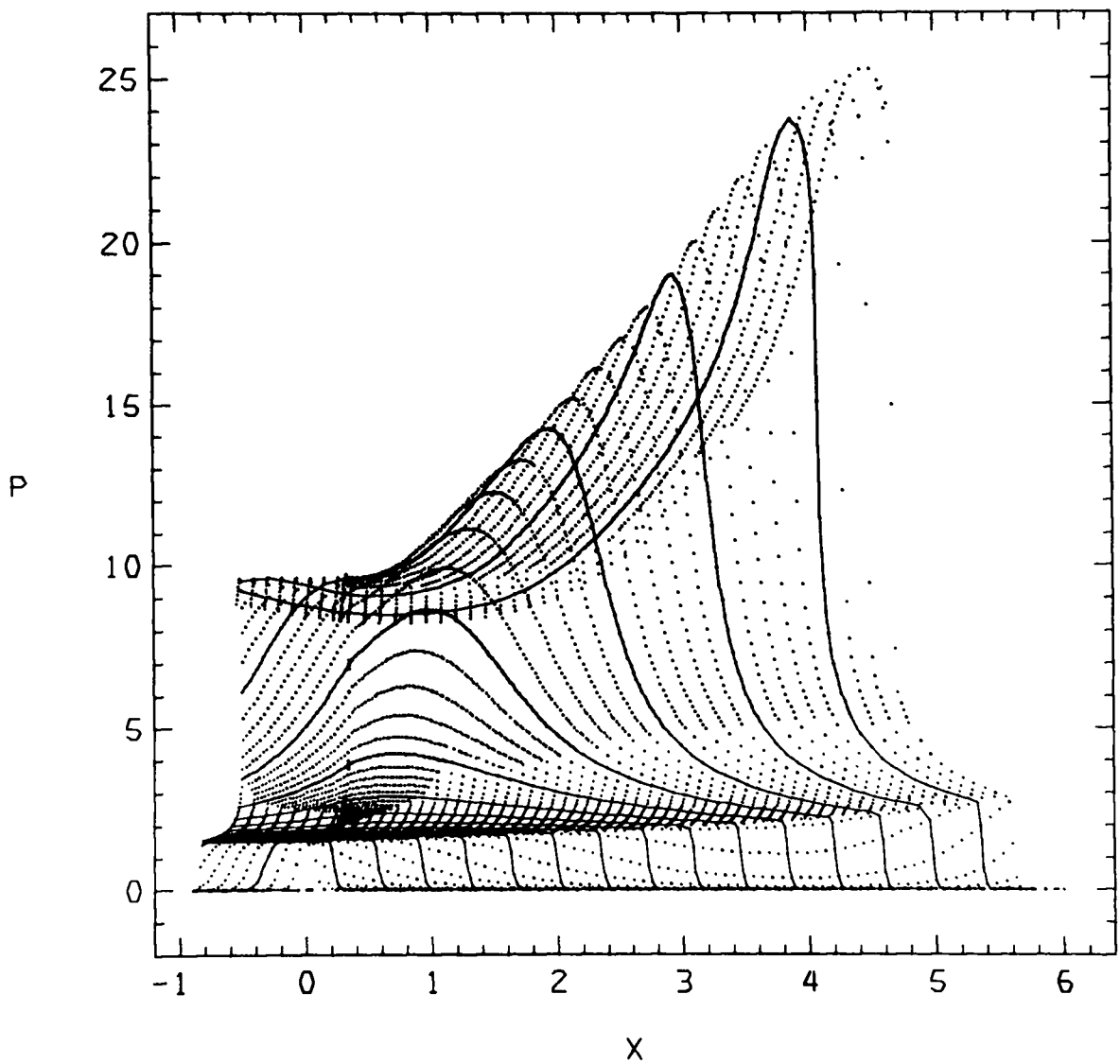
PAD3.2 - 74SEP23 RUN 3 HERBAR QUARTZ-PETN PLANE SHOCK INITIATION HFL-72-1 10/18/74
TFICKETIXN, 49.856 SEC ON RUN, 80.998 SEC ON JOB

600 CELLS / OVERVIEW



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