LA-CP-98-100

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TITLE: T-1 HANDBOOK OF THE SESAME EQUATION OF STATE LIBRARY

VOLUME 2

AUTHOR(S): Stanford P. Lyon and J.D. Johnson, T-1

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MATERIAL NUMBER | SUMMARY

7030 MATERIAL. LEADED GLASS

COMP. WEIGHT FRACTION PB 0.696, O 0.198, AL 0.058, B 0.034, SI 0
.014
ATOMIC NUMBER. 1.9747E+01
ATOMIC MASS. 4.6452E+01
NORMAL DENSITY. 5.4600E+00

GAMMA(COMPUTED). 2.1751

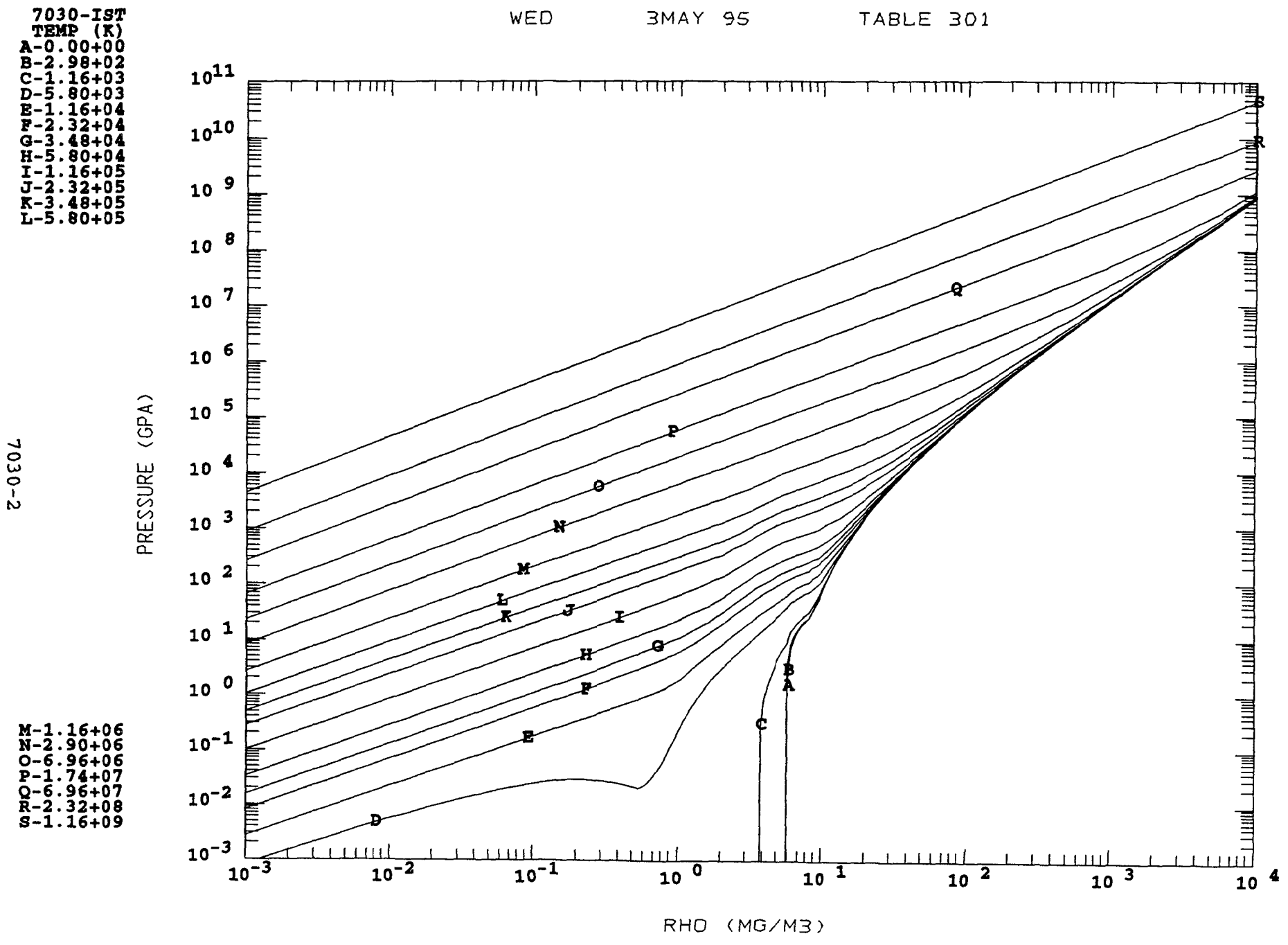
TABLE SUMMARY.

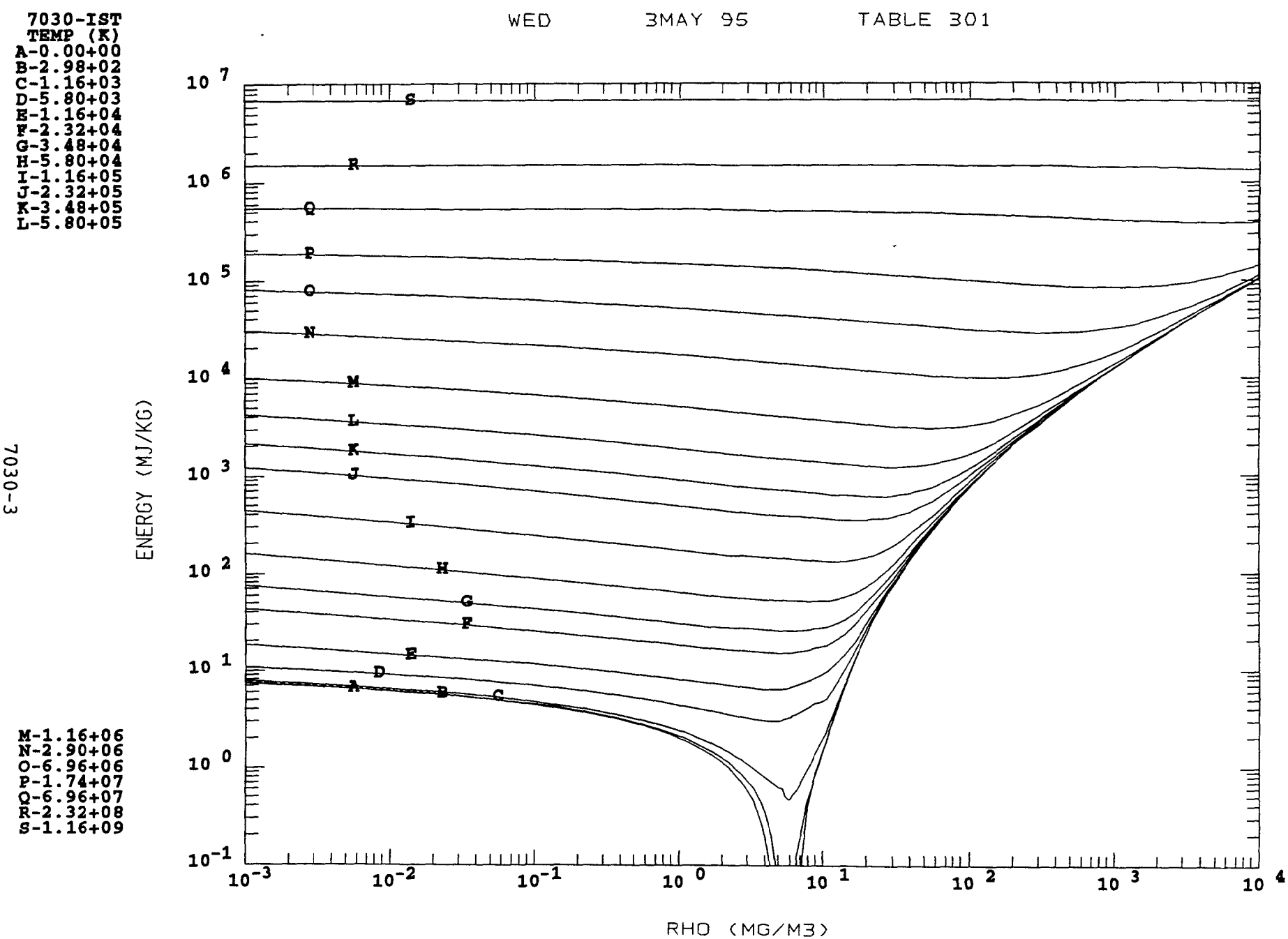
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	24					
102	82					
201	5					
301	7991	71	37	0.0000E+00	5.4600E-06	1.0920E+05
				0.0000E+00	1.2500E-02	9.9999E+04
304	7543	67	37	0.0000E+00	3.6097E-06	3.6097E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7879	70	37	5.4600E-06	1.0920E-05	1.0920E+05
				0.0000E+00	1.2500E-02	9.9999E+04
306	283	70	1	5.4600E-06	1.0920E-05	1.0920E+05
				0.0000E+00	-1.0555E-10	0.0000E+00
401	65					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JAN 93
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 12093.
DATE OF LAST UPDATE. 12193.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. INORDER TO OBTAIN THE ELECTRONIC TABLE, THE ELECTRONIC TABLES FOR THE INDIVIDUAL ELEMENTS WERE FIRST CALCULATED USING TFD IN GRIZZLY AND THEN MIXED USING ADDITIVE VOLUME MIXING. THE NUCLEAR AND COLD CURVE TABLES WERE THEN CALCULATED USING AVERAGE ATOM MODELING EXCEPT FOR THE IDEAL GAS PORTION OF THE NUCLEAR TABLE WHERE IDEAL MIXING WAS USED. JDJNUC NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN=1). GAMREF=2.2, TMELT=1100 KELVIN. COLD CURVE FROM SHOCK DATA.
USUP=(0.0,3.0),(0.38,3.75),(1.31,3.9),(3.84,8.00). ECOHKC=120, FACLJ=0.139, CMAT=1.923. THE CRITICAL TEMPERATURE IS 6000 KELVIN. 301 TABLE HAS VAN DER WAAL LOOPS. MELT (411,512) TABLES AVAILABLE.

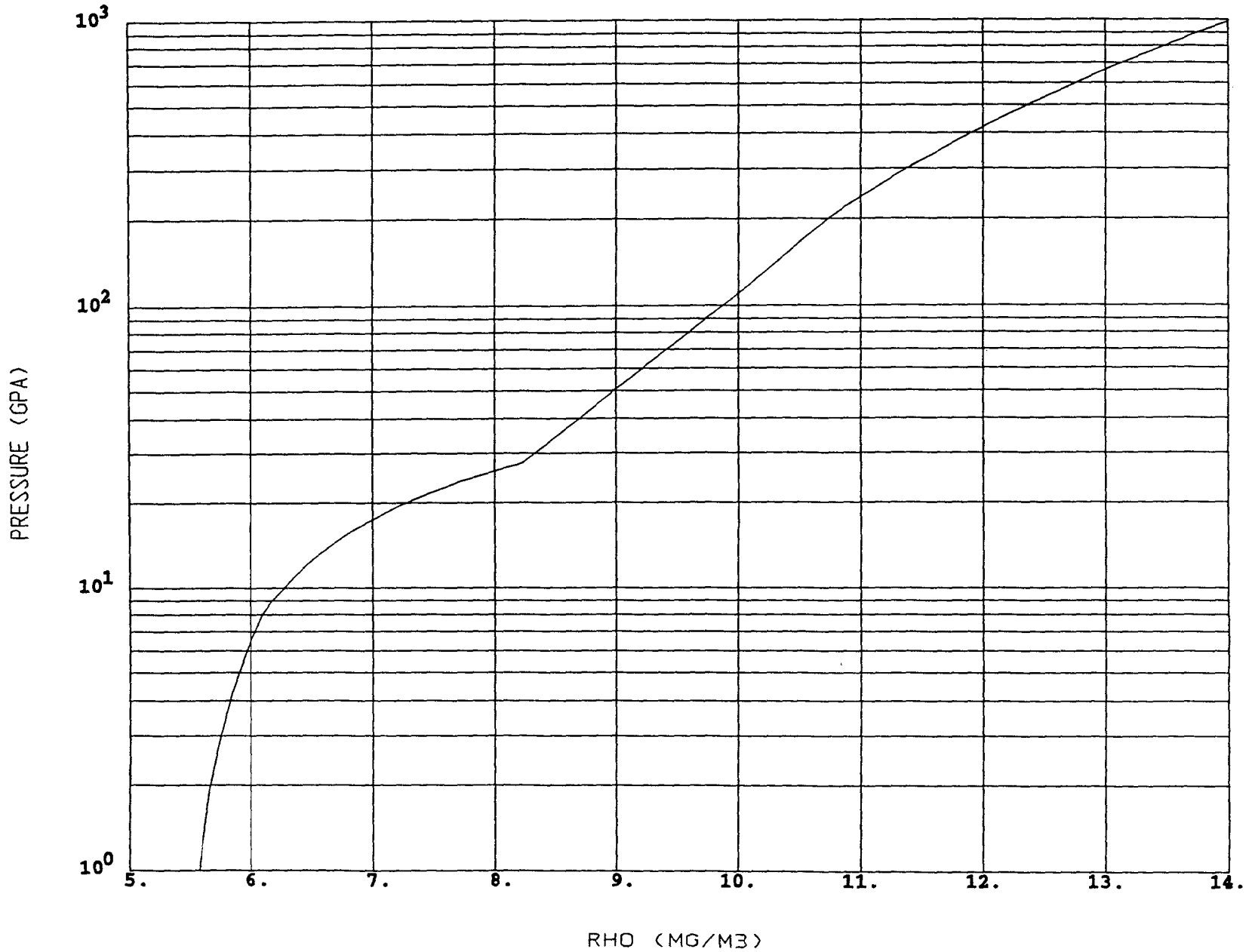

7030-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
7030-2
T1 SES2D CRA



T1 SES2D CRAY 02

7030-HU1
E0 MJ/KG
0.00+00

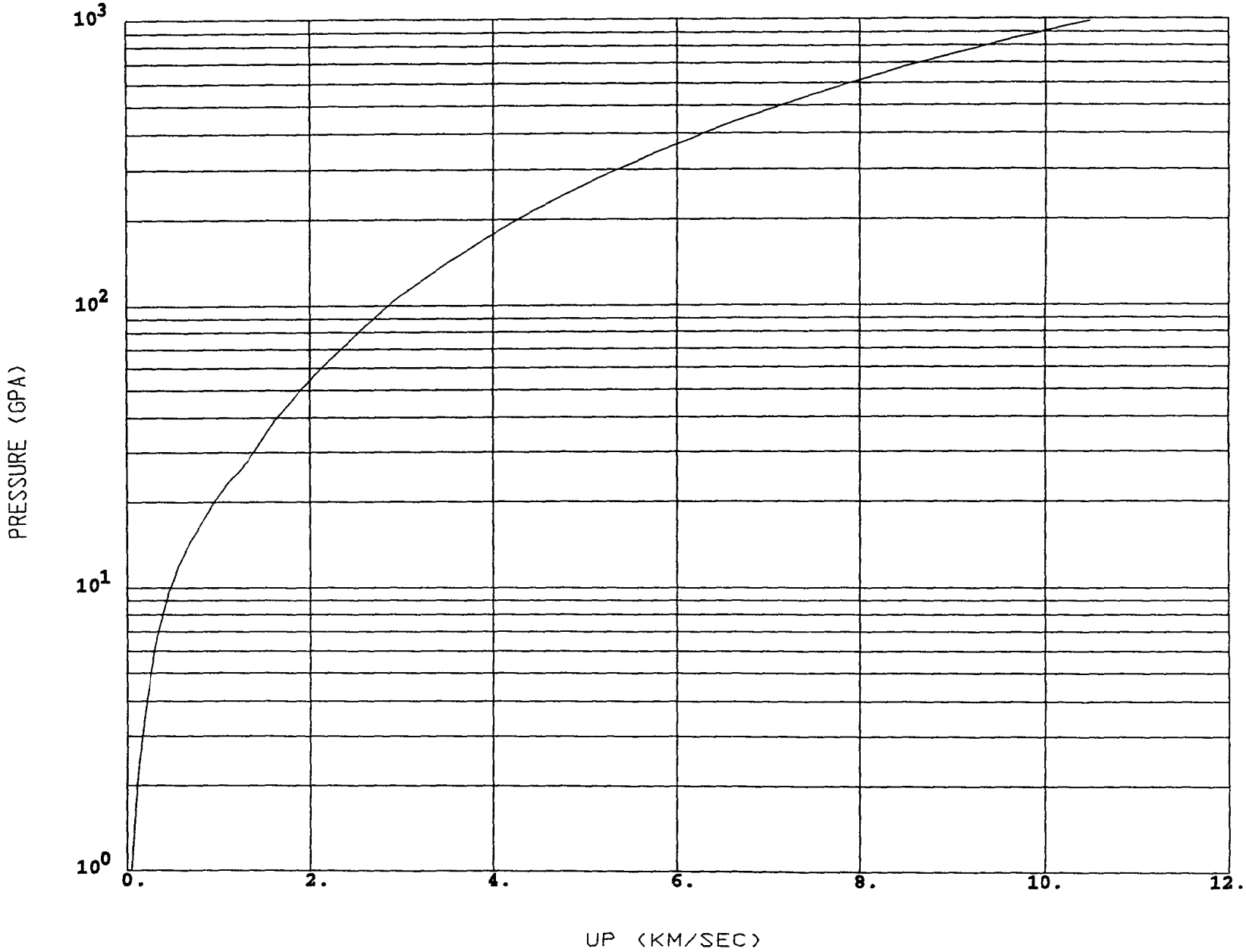
WED 3MAY 95 TABLE 301



T1 SES2D CRAY

7030-HU1
E0 MJ/KG
0.00+00

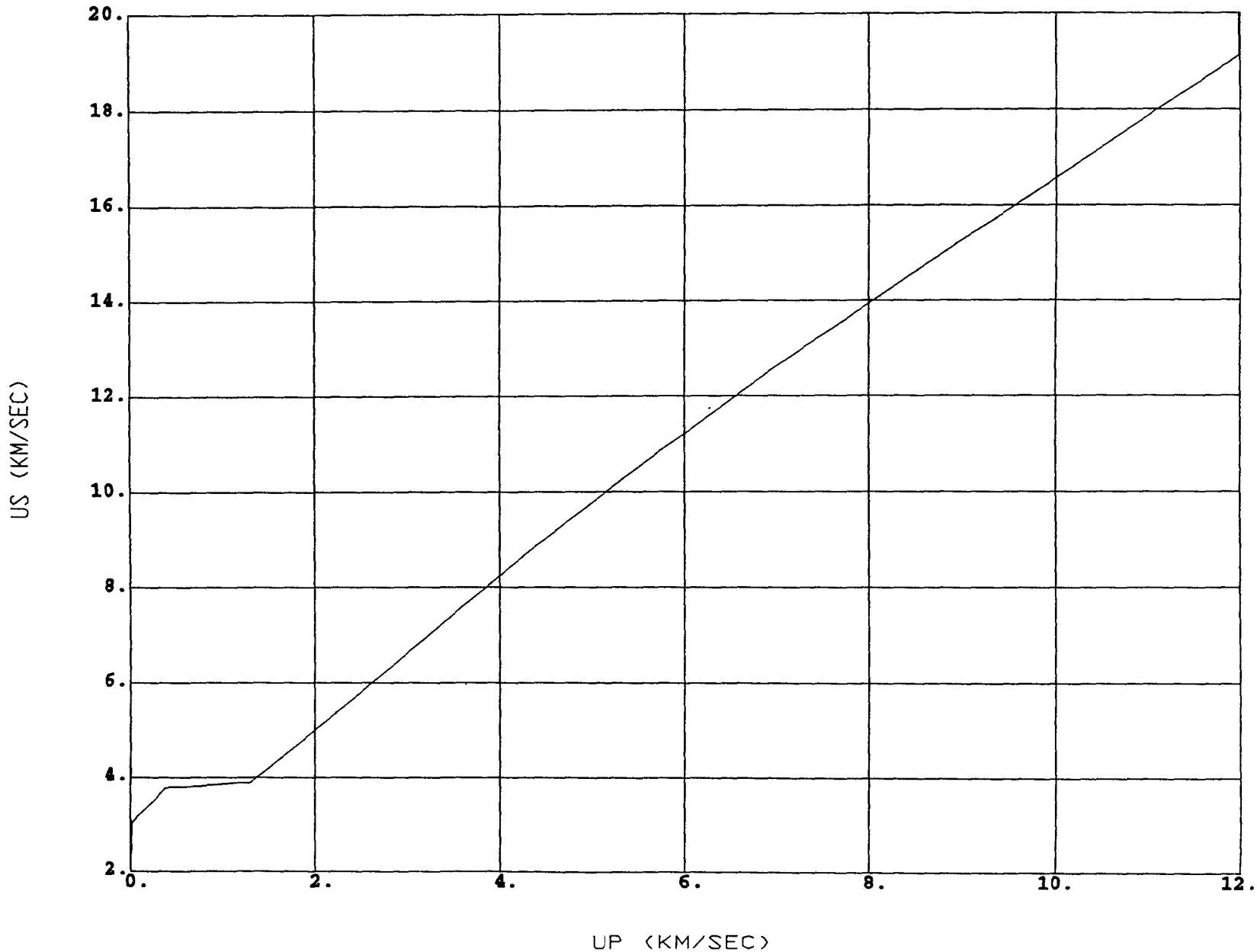
WED 3MAY 95 TABLE 301



T1 SES2D CRAY 02

7030-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRAY

MATERIAL NUMBER	SUMMARY
7100	MATERIAL. DRY SAND

COMP. 70.00% SIO2, 8.22% AL2O3, 4.53% FE2O3, 4.25% CAO, 3.87% CO 2, 3.02% H2O, 2.06% K2O, 1.89% MGO, 0.69% SO3, 0.58% TIO2, 0.58% NA2O BY WEIGHT

ATOMIC NUMBER. 9.5490E+00
ATOMIC MASS. 1.9124E+01
NORMAL DENSITY. 2.6000E+00

GAMMA(COMPUTED). 0.8530

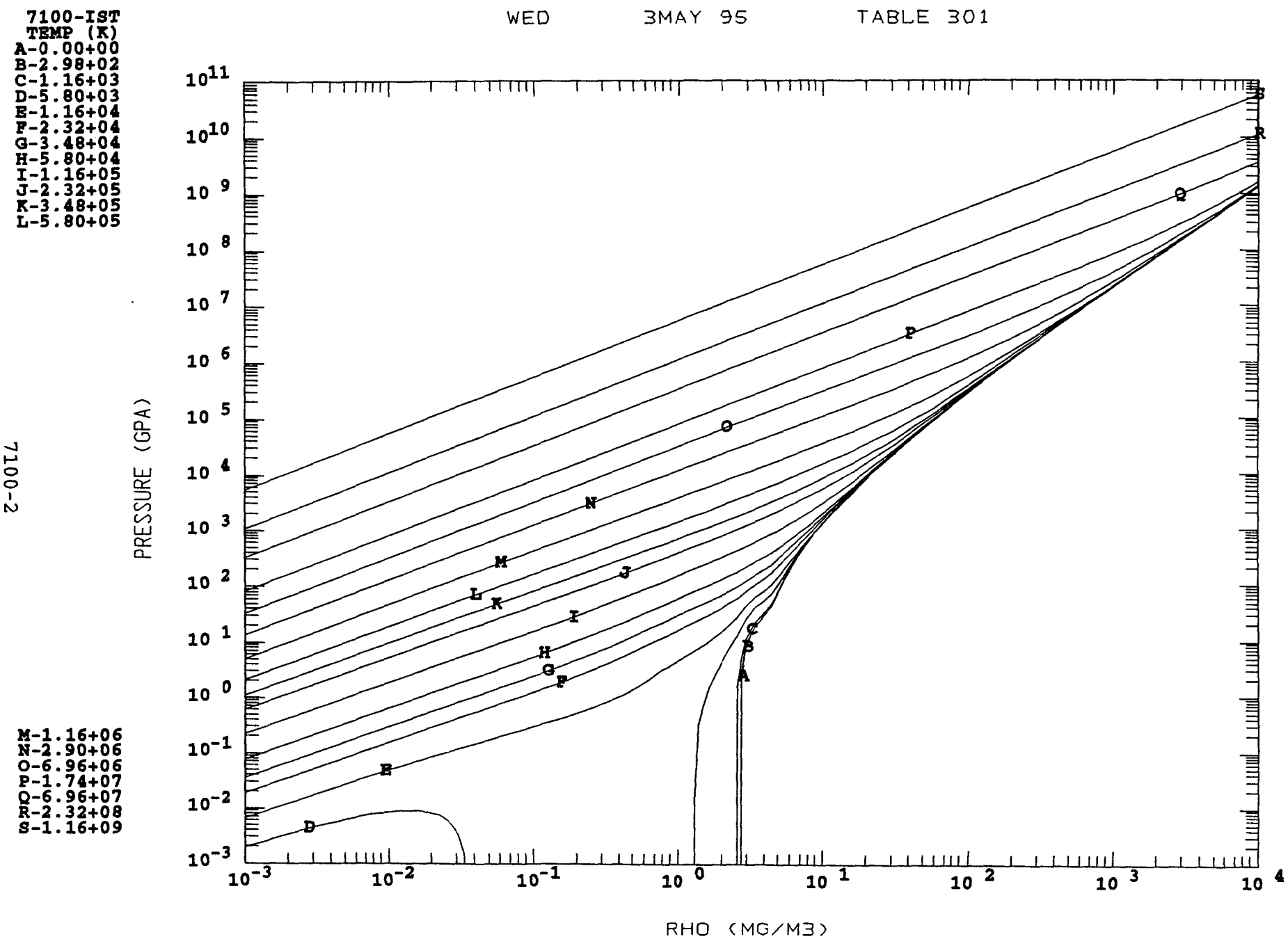
TABLE SUMMARY.

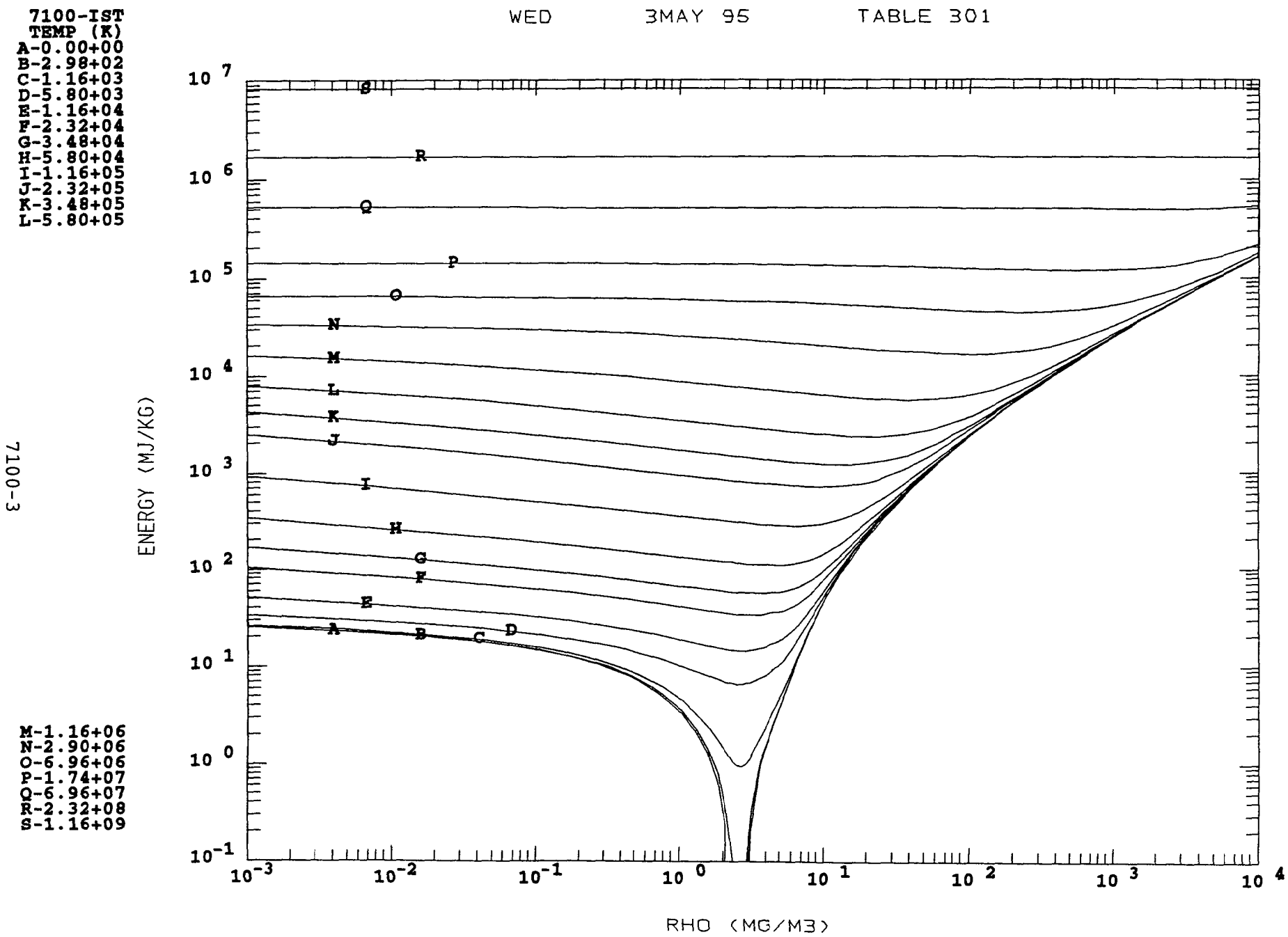
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	32					
102	96					
201	5					
301	8215	73	37	0.0000E+00	2.6000E-06	5.2000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	2.6000E-06	5.2000E-06	5.2000E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	8103	72	37	2.6000E-06	5.2000E-06	5.2000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	291	72	1	2.6000E-06	5.2000E-06	5.2000E+04
				0.0000E+00	-6.0952E-11	0.0000E+00
401	65					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 87
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 50787.
DATE OF LAST UPDATE. 22388.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH JD GAMMA (IGRUN = 7). GAMREF = 0.875, GAMEPS = (0.5,1.0), DGAMMA = (1.227,0.0), DEBKEL = 849.4, TMELT = 0. INORDER TO OBTAIN THE COLD CURVE, THE 5 MAJOR COMPONENTS OF THE SAND (INCLUDING WATER OF HYDRATION), WERE MIXED IN THEIR RELATIVE AMMOUNTS USING IDEAL MIXING TO PRODUCE A CHARACTERISTIC HUGONIOT. THE US-UP POINTS TAKEN FROM THIS CURVE WERE THEN (UP,US) = (0.0,3.875), (0.774,5.375), (1.786,5.813), (2.524,6.375), (4.00,8.750). CMAT = 1.85, ECOHKC = 136.7, FACLJ = 0.25. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 8500 K.

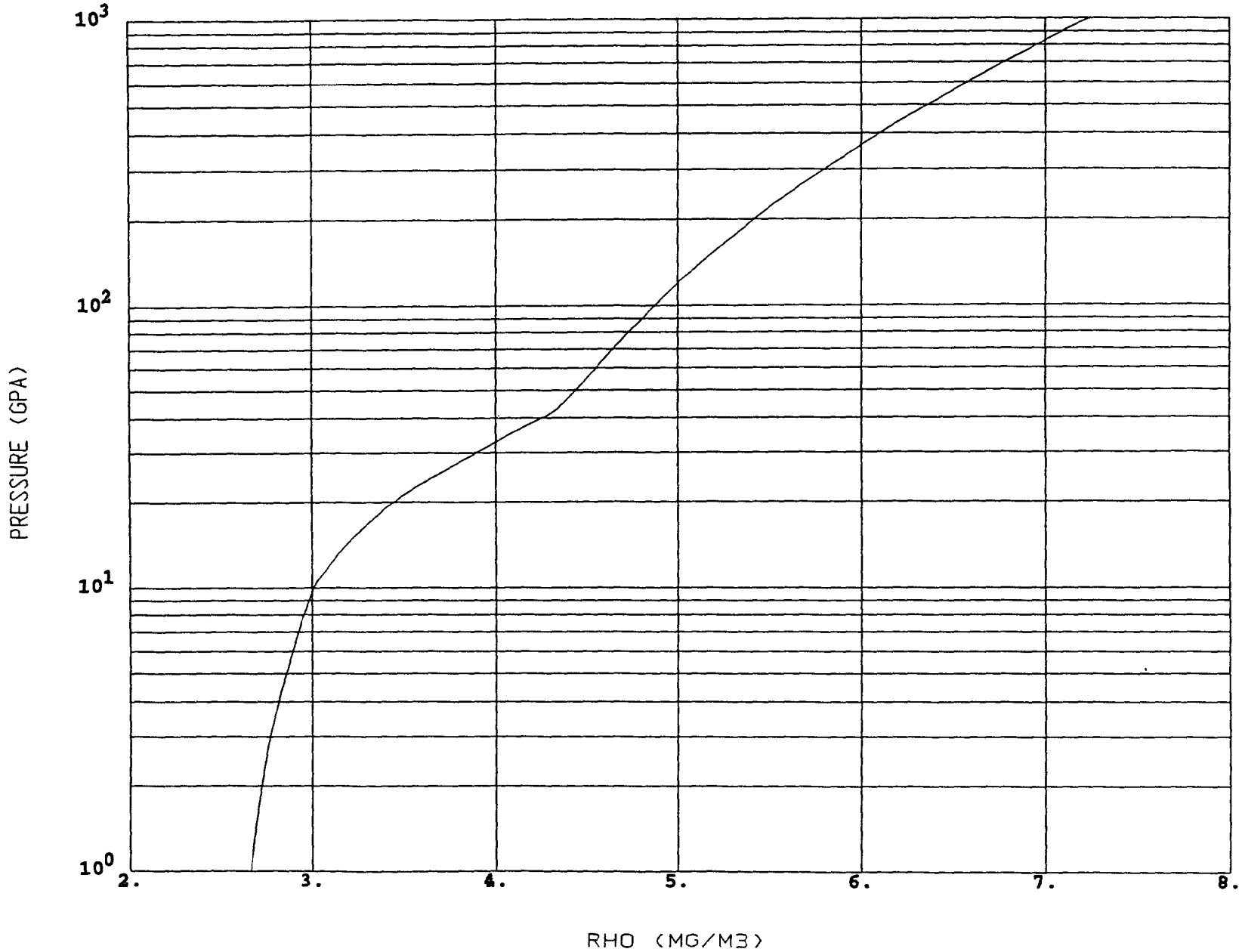

7100-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA



T1 SES2D CRAY 02

7100-HU1
E0 MJ/KG
0.00+00

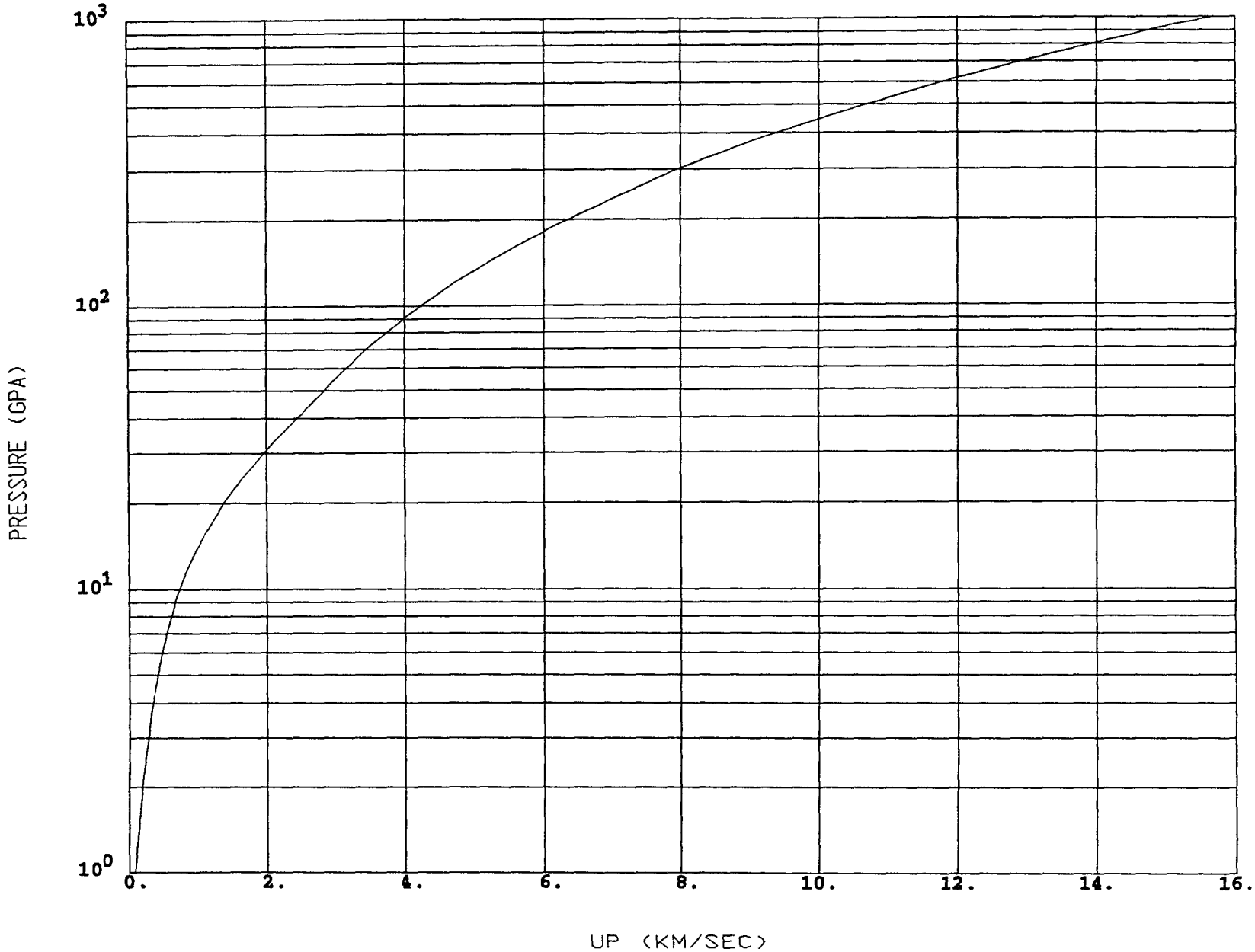
WED 3MAY 95 TABLE 301



T1 SES2D CRA

7100-HU1
E0 MJ/KG
0.00+00

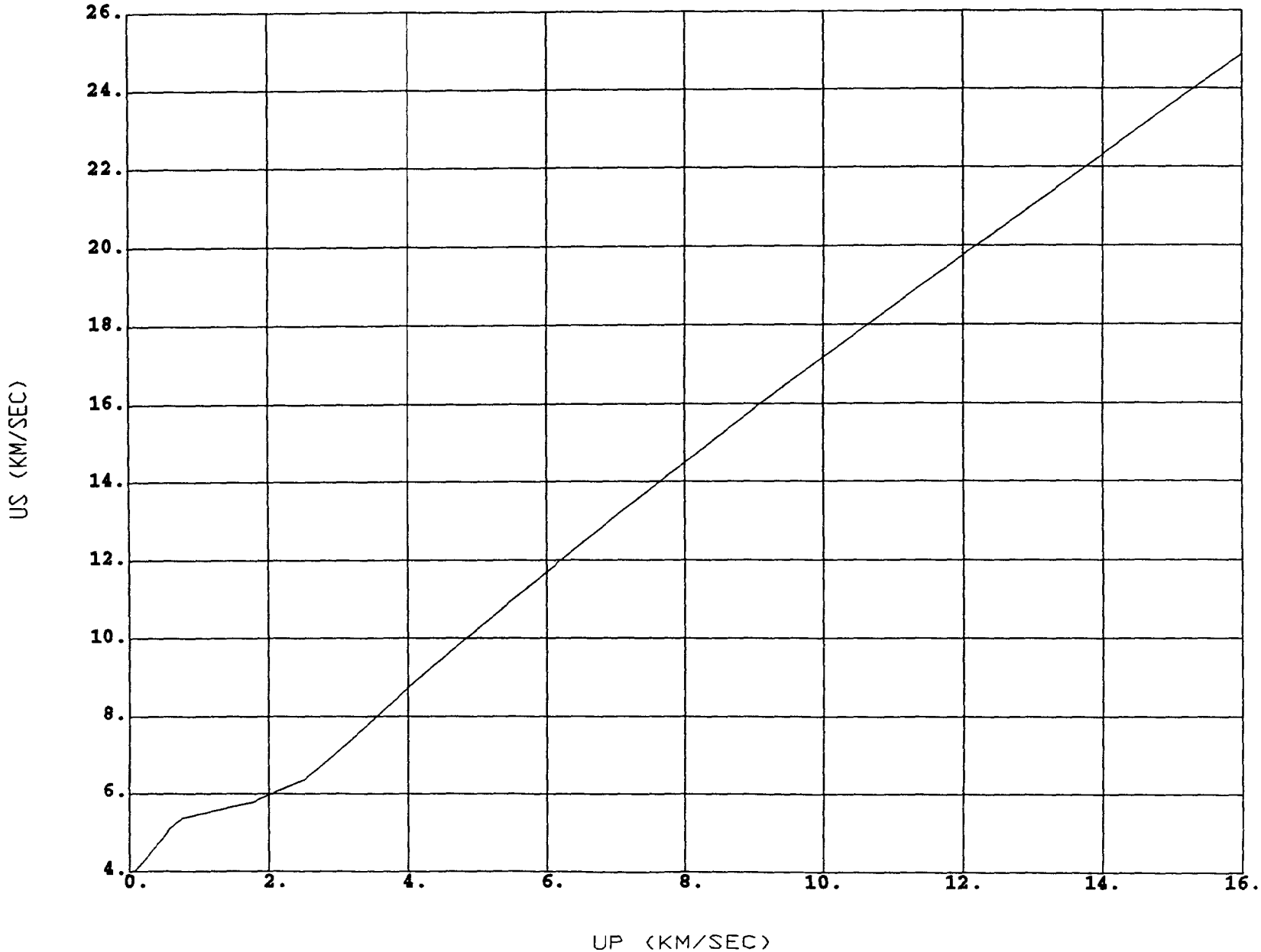
WED 3MAY 95 TABLE 301



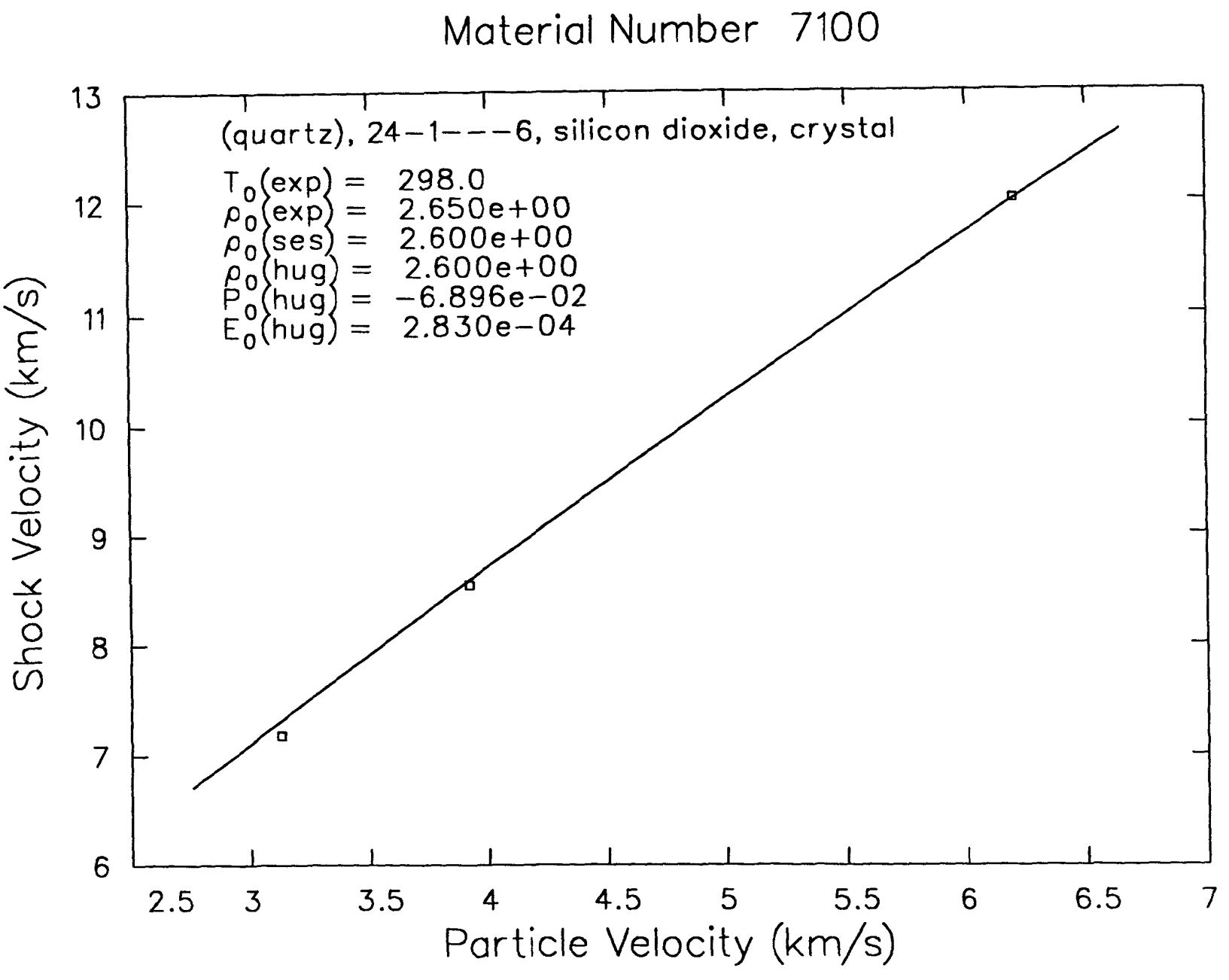
T1 SES2D CRAY 02

7100-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRA1


Material Number 7100
(quartz), 24-1---6, silicon dioxide, crystal
T_0(exp) = 298.0
ρ_0(exp) = 2.650e+00
ρ_0(ses) = 2.600e+00
ρ_0(hug) = 2.600e+00
P_0(hug) = -6.896e-02
E_0(hug) = 2.830e-04
Shock Velocity (km/s)
Particle Velocity (km/s)
13
12
11
10
9
8
7
6
2.5
3
3.5
4
4.5
5
5.5
6
6.5
7

MATERIAL NUMBER | SUMMARY

7102 MATERIAL. DRY CLAY

COMP. 50.65% SIO2, 15.10% AL2O3, 7.19% CAO, 6.47% FE2O3, 6.10% CO2, 5.58% H2O, 3.49% K2O, 3.31% MGO, 0.81% NA2O3, 0.78% TIO2, 0.63% SO3 BY WEIGHT
ATOMIC NUMBER. 9.1540E+00
ATOMIC MASS. 1.8312E+01
NORMAL DENSITY. 3.0200E+00

GAMMA(COMPUTED). 1.0108

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	33					
102	84					
201	5					
301	7991	71	37	0.0000E+00	3.0200E-06	6.0400E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	3.0200E-06	6.0400E-06	6.0400E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	7879	70	37	3.0200E-06	6.0400E-06	6.0400E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	283	70	1	3.0200E-06	6.0400E-06	6.0400E+04
				0.0000E+00	-1.0349E-10	0.0000E+00
401	65					

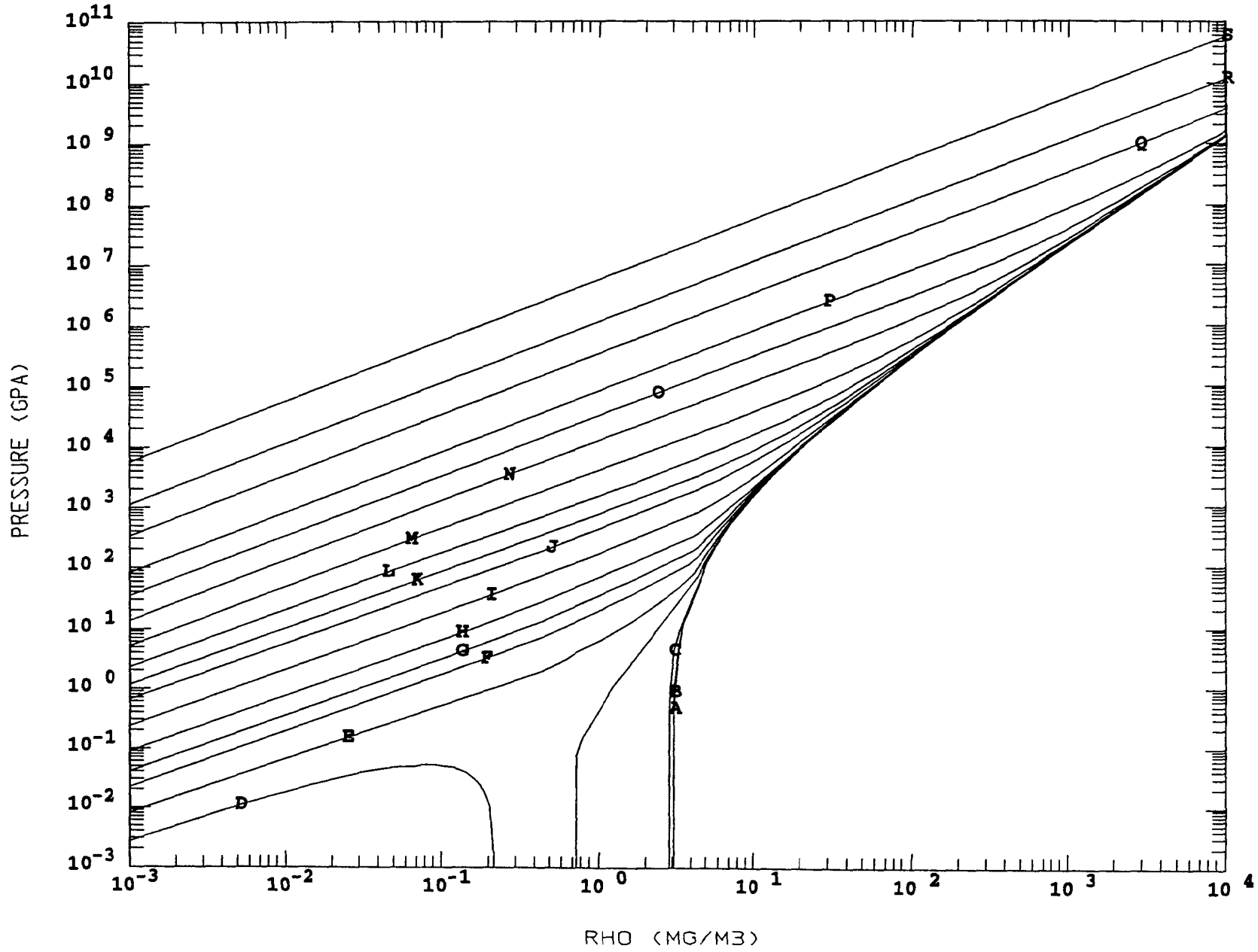
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 87
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 60387.
DATE OF LAST UPDATE. 22388.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN = 1). GAMREF = 1.055, DEBKEL = 766.9, TMELT = 0. INORDER TO OBTAIN THE COLD CURVE, THE 5 MAJOR COMPONENTS OF THE CLAY (INCLUDING WATER OF HYDRATION) WERE MIXED IN THEIR RELATIVE AMMOUNTS TO PRODUCE A CHARACTERISTIC HUGONIOT. THE US-UP POINT TAKEN FROM THIS CURVE WERE THEN (UP,US) = (0.0,4.33), (2.10,7.14), (3.18,9.00). CMAT = 1.55, ECOHKC = 129, FACLJ = 0.20. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 6800 K.

7102-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05

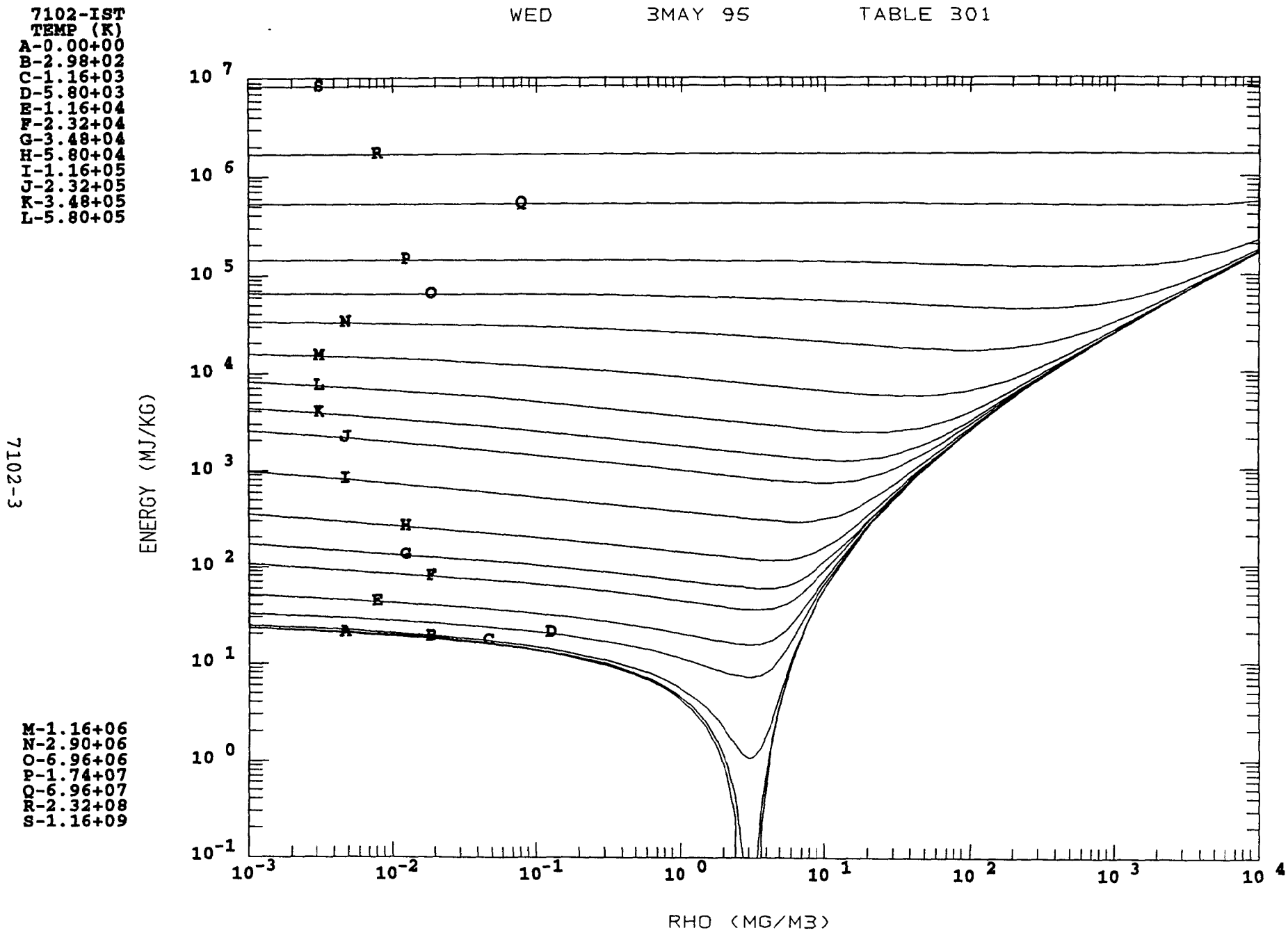
WED 3MAY 95 TABLE 301



M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09

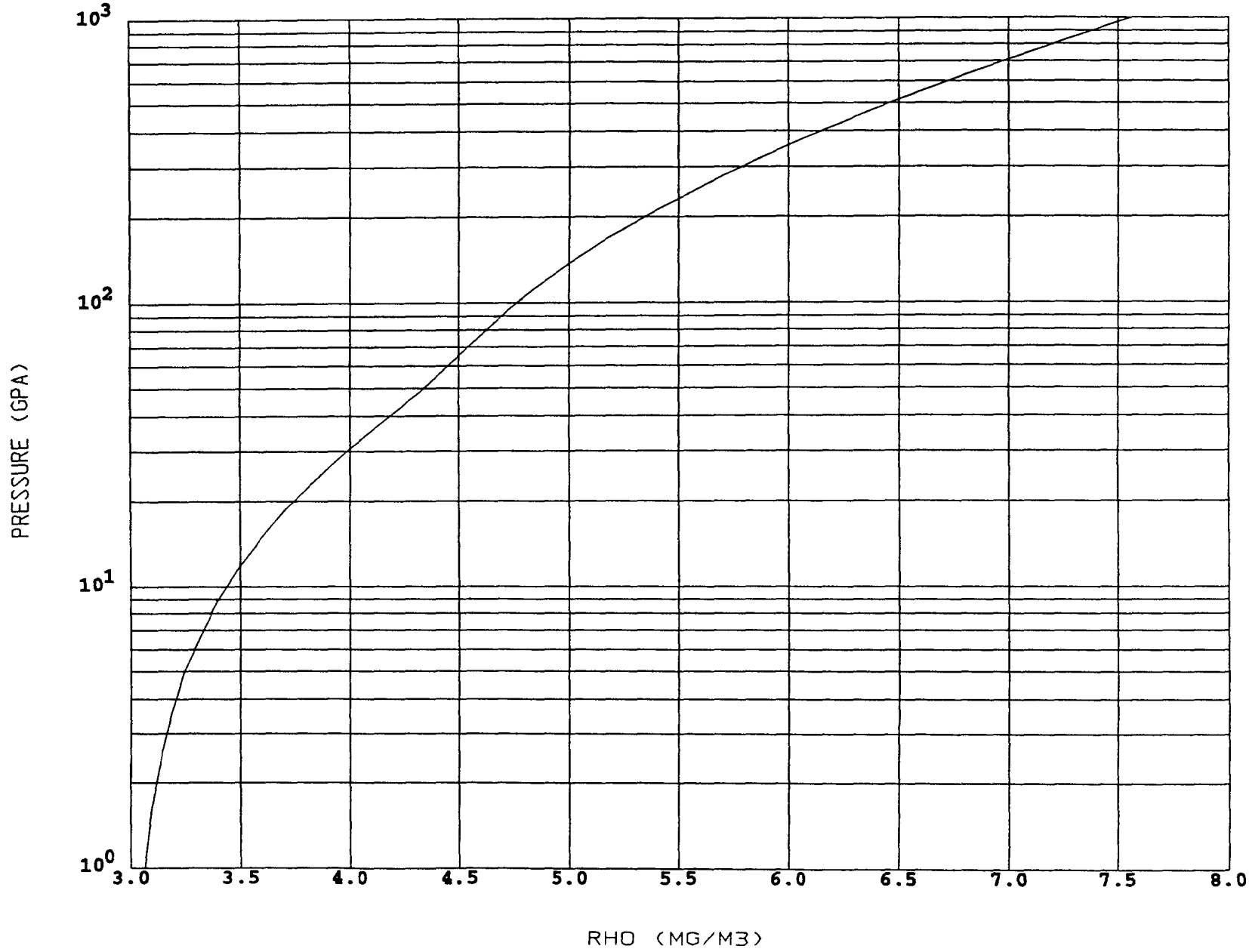
7102-2

T1 SES2D CRAY


7102-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
10 7
10 6
10 5
10 4
10 3
10 2
10 1
10 0
10-1
10-3
10-2
10-1
10 0
10 1
10 2
10 3
10 4
T1 SES2D CRAY 02

7102-HU1
E0 MJ/KG
0.00+00

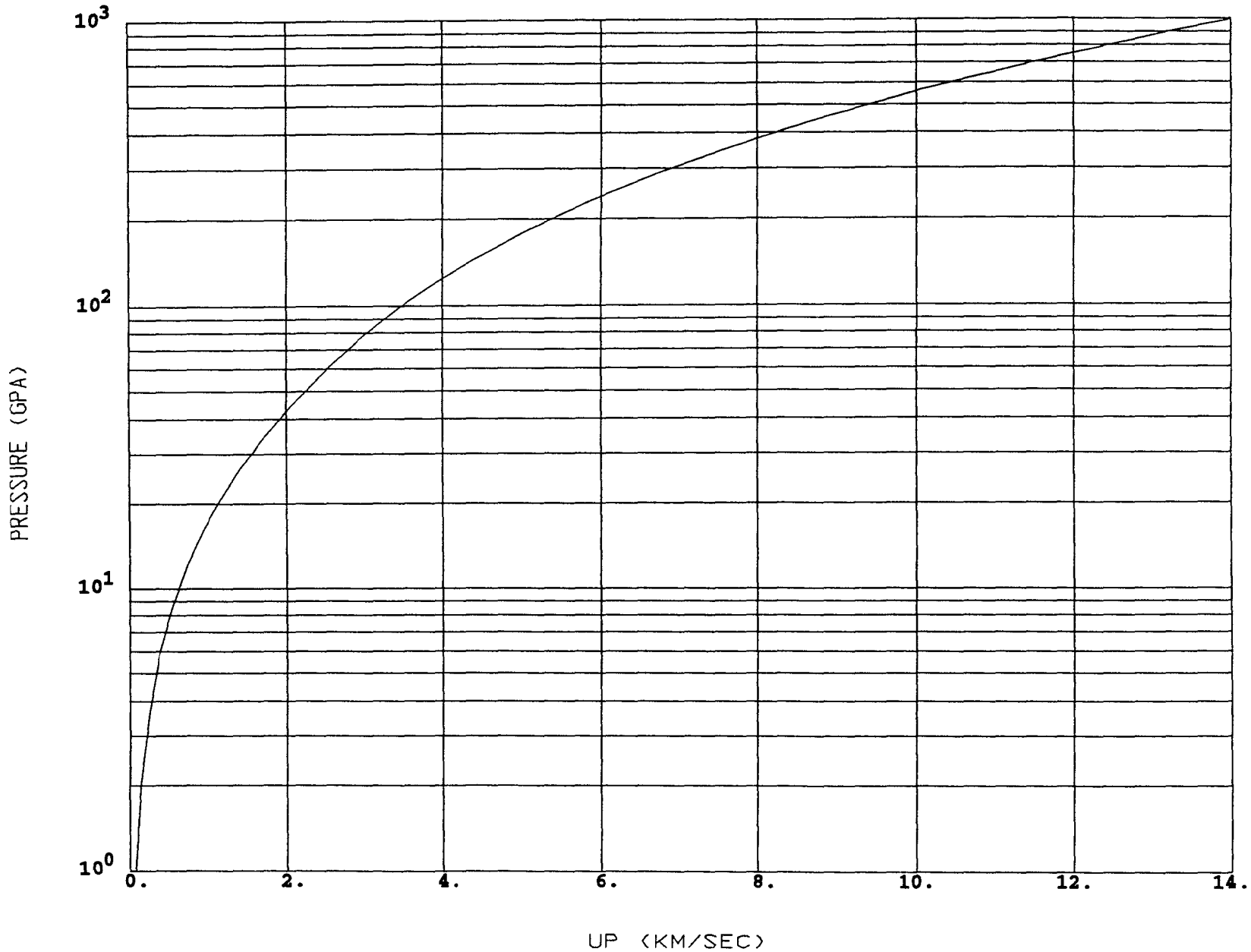
WED 3MAY 95 TABLE 301



T1 SES2D CRA

7102-HU1
E0 MJ/KG
0.00+00

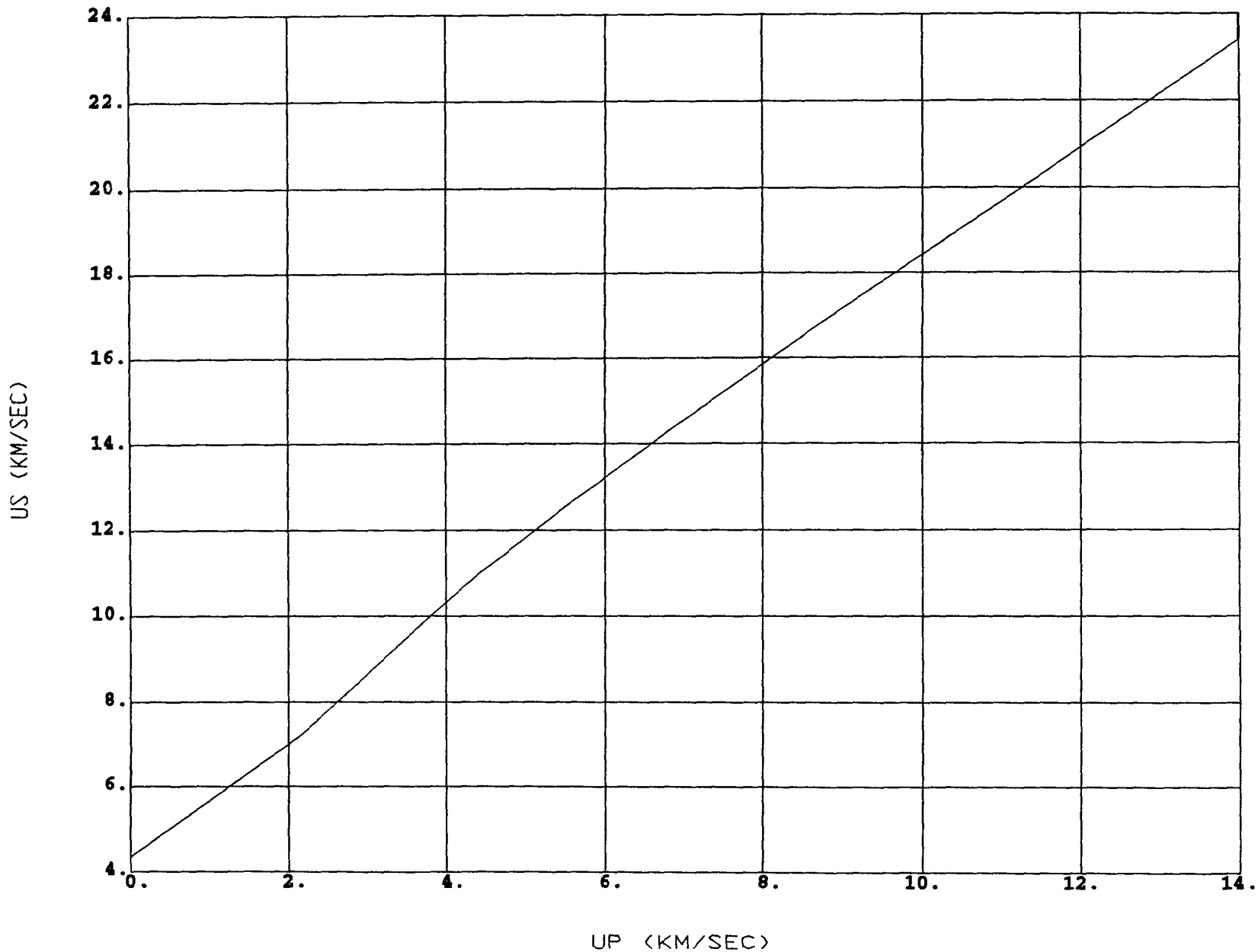
WED 3MAY 95 TABLE 301



T1 SES2D CRAY 02

7102-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRAY

MATERIAL NUMBER | SUMMARY

7111 MATERIAL. NEVADA ALLUVIUM

COMP. SIO2 71.6 WT%, AL2O3 12.1 WT%, H2O 4.0 WT%, K2O 3.5 WT%, CAO 2.4 WT% PLUS LESSER AMOUNTS OF OTHER OXIDES
ATOMIC NUMBER. 9.3659E+00
ATOMIC MASS. 1.8761E+01
NORMAL DENSITY. 2.3500E+00

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	30					
102	65					
201	5					
301	4725	100	23	1.8359E-02	3.5029E-02	4.7000E+04
				0.0000E+00	2.5000E-02	3.2000E+04
303	4725	100	23	1.8359E-02	3.5029E-02	4.7000E+04
				0.0000E+00	2.5000E-02	3.2000E+04
304	4725	100	23	1.8359E-02	3.5029E-02	4.7000E+04
				0.0000E+00	2.5000E-02	3.2000E+04
305	4725	100	23	1.8359E-02	3.5029E-02	4.7000E+04
				0.0000E+00	2.5000E-02	3.2000E+04
306	303	100	1	1.8359E-02	3.5029E-02	4.7000E+04
				0.0000E+00	0.0000E+00	0.0000E+00

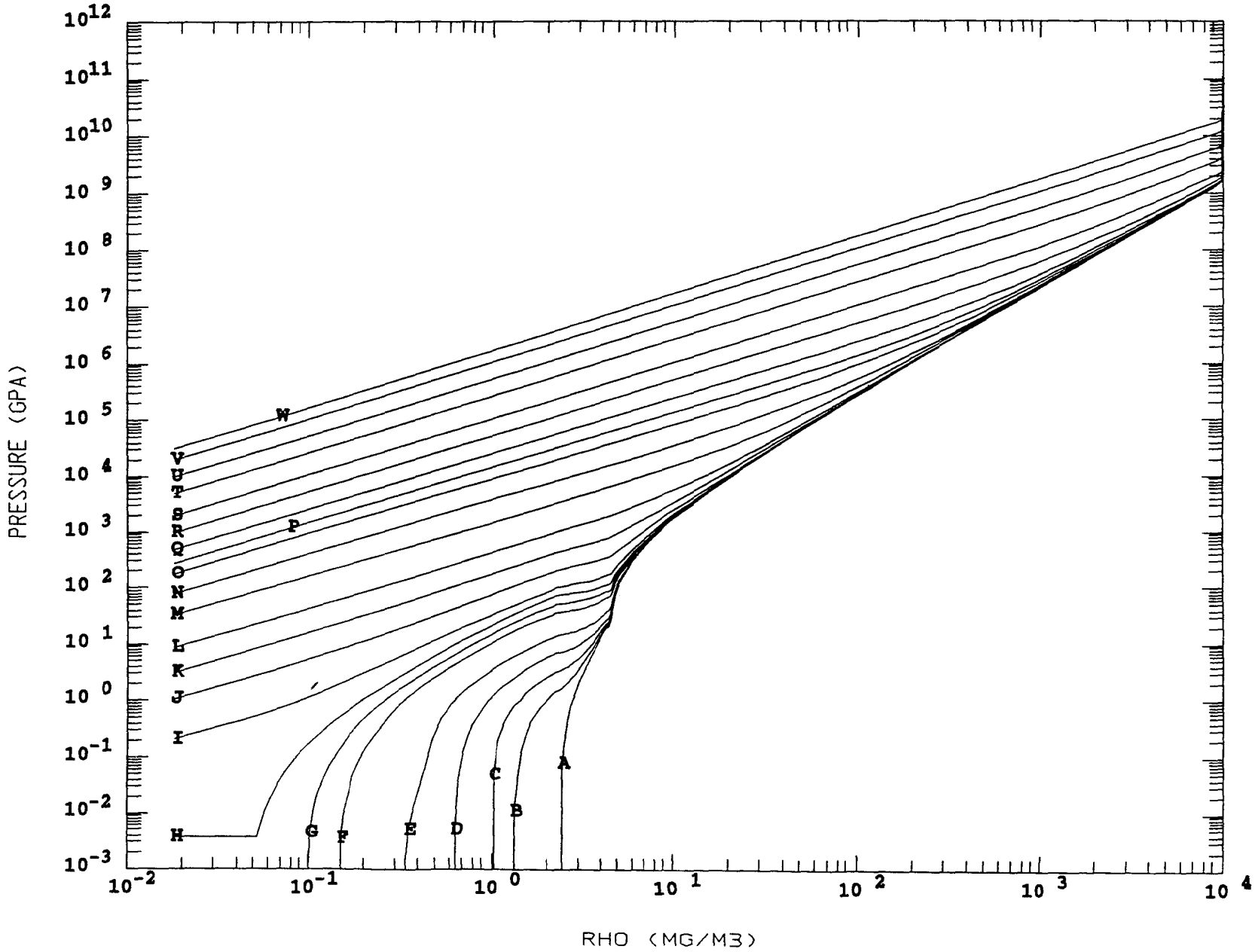
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. SEPT 75
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 91875.
DATE OF LAST UPDATE. 101582.
SOURCE. J. BARNES, J. ROOD
REFS. NONE
CODES. SESAME I

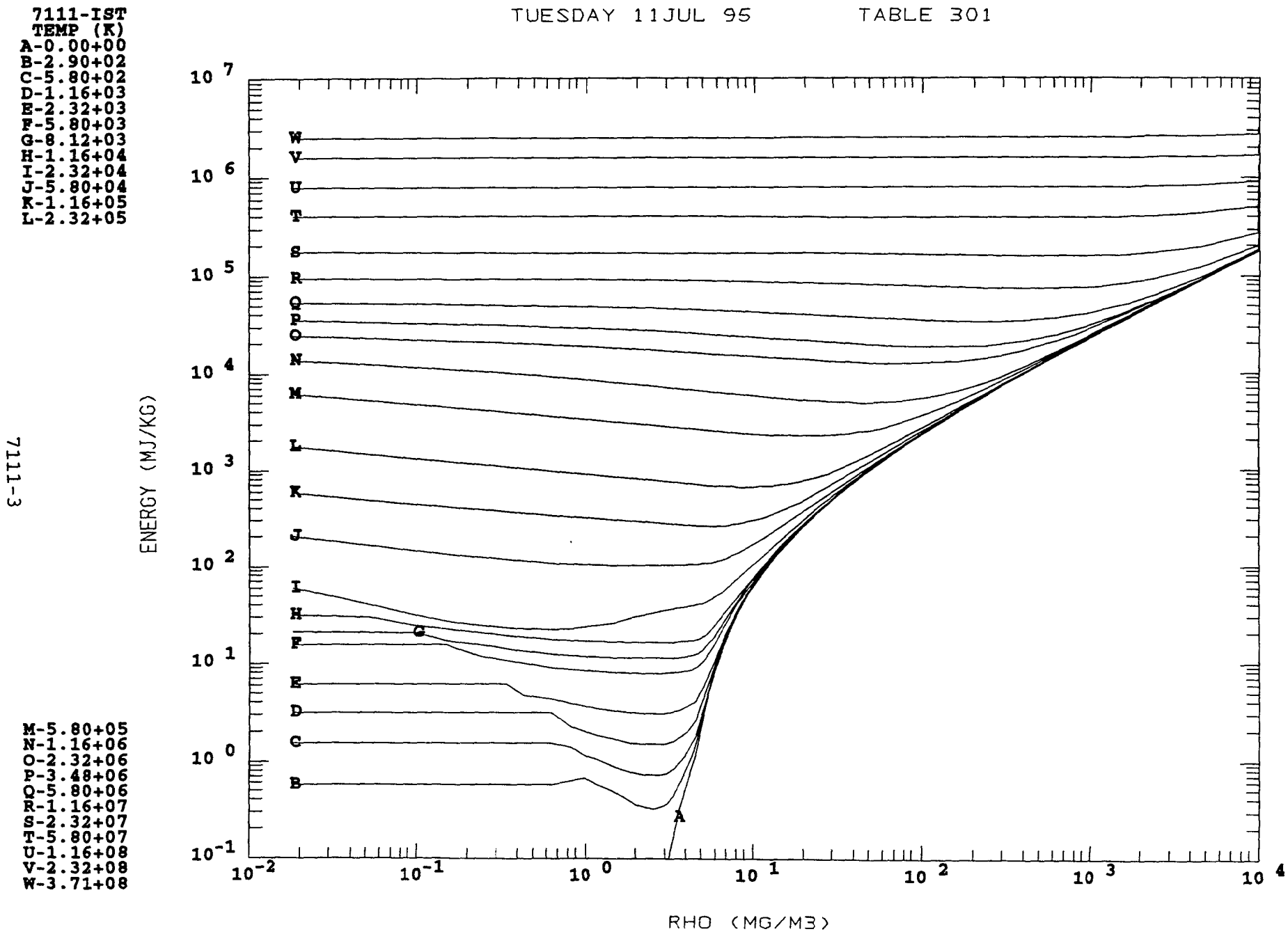
COMMENTS. THE TWO TEMPERATURE TABLES FOR THIS MATERIAL (TABLES 303-306) ARE A VERY ROUGH APPROXIMATION AND WERE DERIVED FROM THE CODE TWOTEMP (AND NOT FROM THE ORIGINAL EOS CALCULATIONS, WHICH IN MOST CASES ARE NO LONGER REPRODUCIBLE). THE TABLES ARE VERY NOISY DUE BOTH TO NOISE IN THE ORIGINAL DATA (WHICH SHOWS UP WHEN THE COLD CURVE IS SUBTRACTED TO GENERATE THE THERMAL CONTRIBUTION) AND TO THE CONSTRAINT THAT NO CROSSING ISOTHERMS ARE ALLOWED. IF YOU HAVE ANY PROBLEMS USING THESE TABLES, CONTACT BOB ALBERS (T-4).

7111-IST
TEMP (K)
A-0.00+00
B-2.90+02
C-5.80+02
D-1.16+03
E-2.32+03
F-5.80+03
G-8.12+03
H-1.16+04
I-2.32+04
J-5.80+04
K-1.16+05
L-2.32+05

TUESDAY 11JUL 95 TABLE 301



M-5.80+05
N-1.16+06
O-2.32+06
P-3.48+06
Q-5.80+06
R-1.16+07
S-2.32+07
T-5.80+07
U-1.16+08
V-2.32+08
W-3.71+08

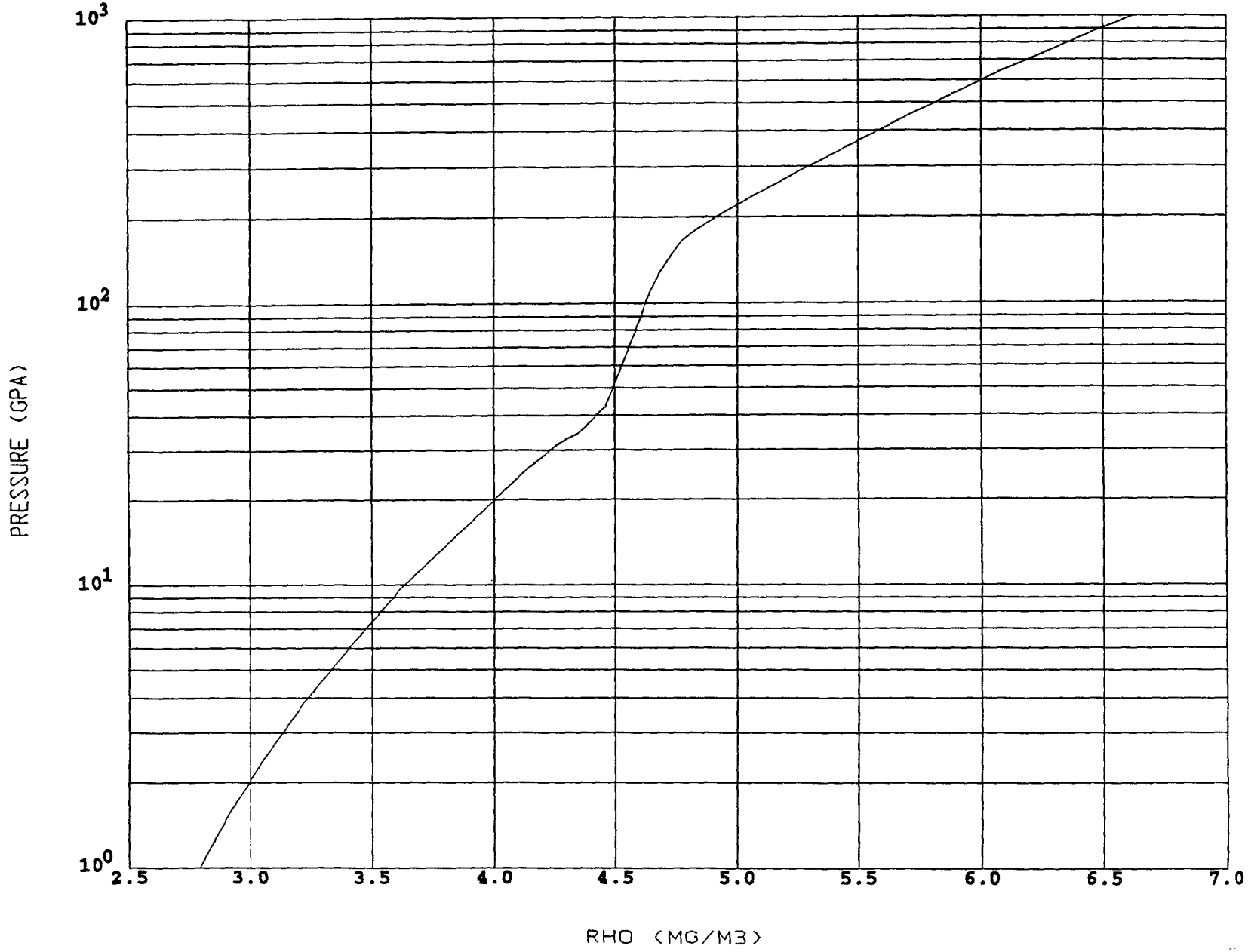


7111-3

T1 SES2D CRAY 02

7111-HU1
E0 MJ/KG
0.00+00

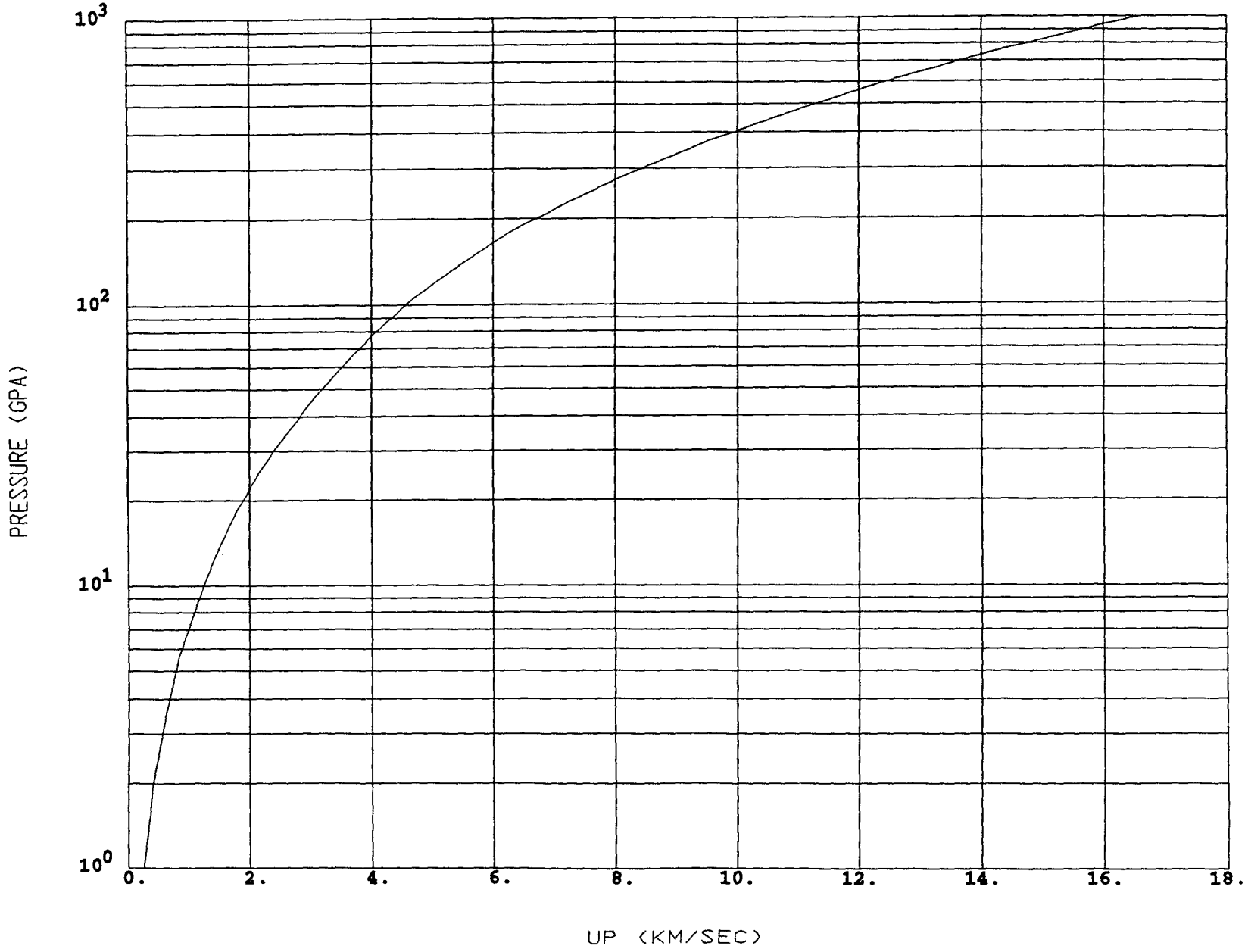
TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRAY

7111-HU1
E0 MJ/KG
0.00+00

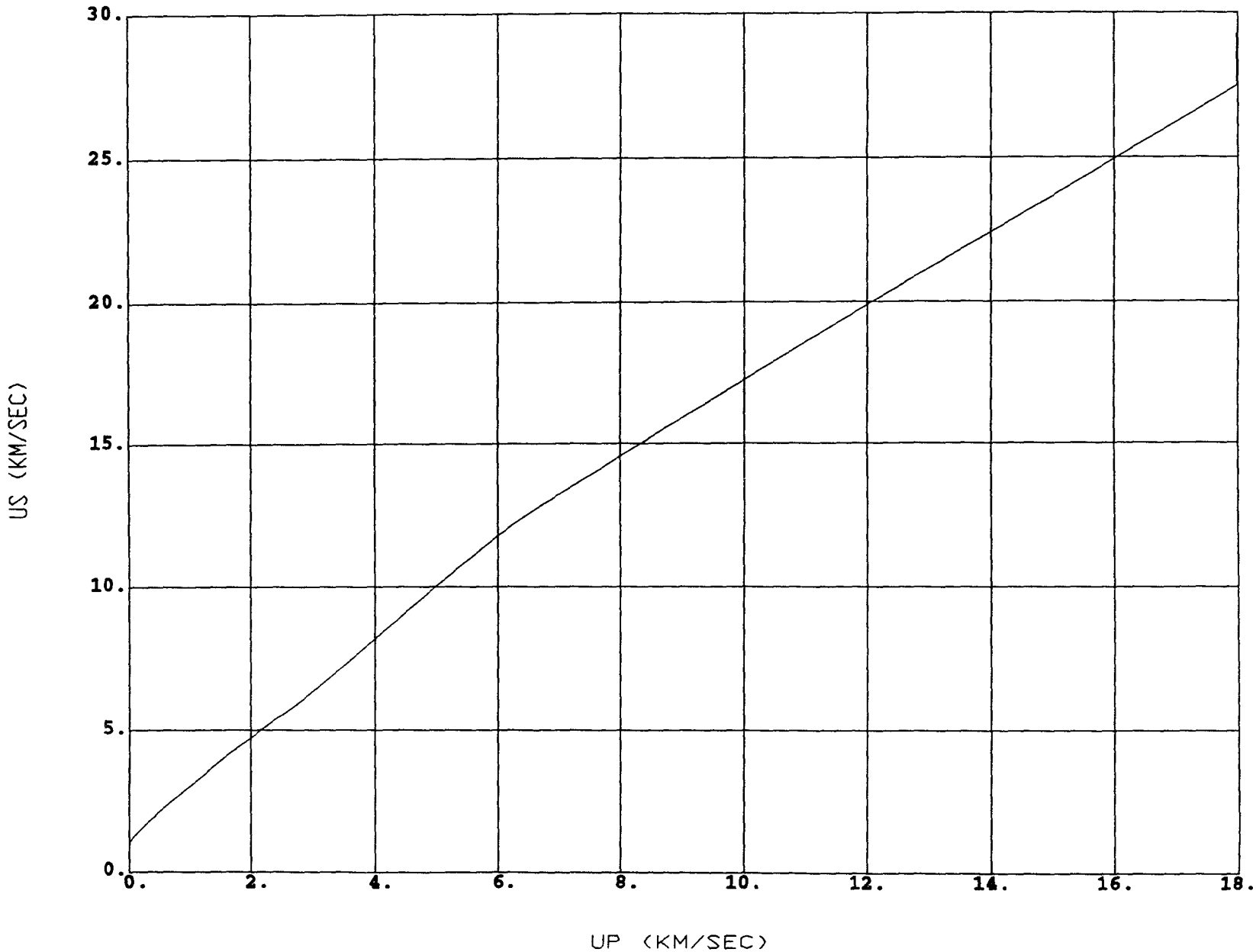
TUESDAY 11JUL 95 TABLE 301



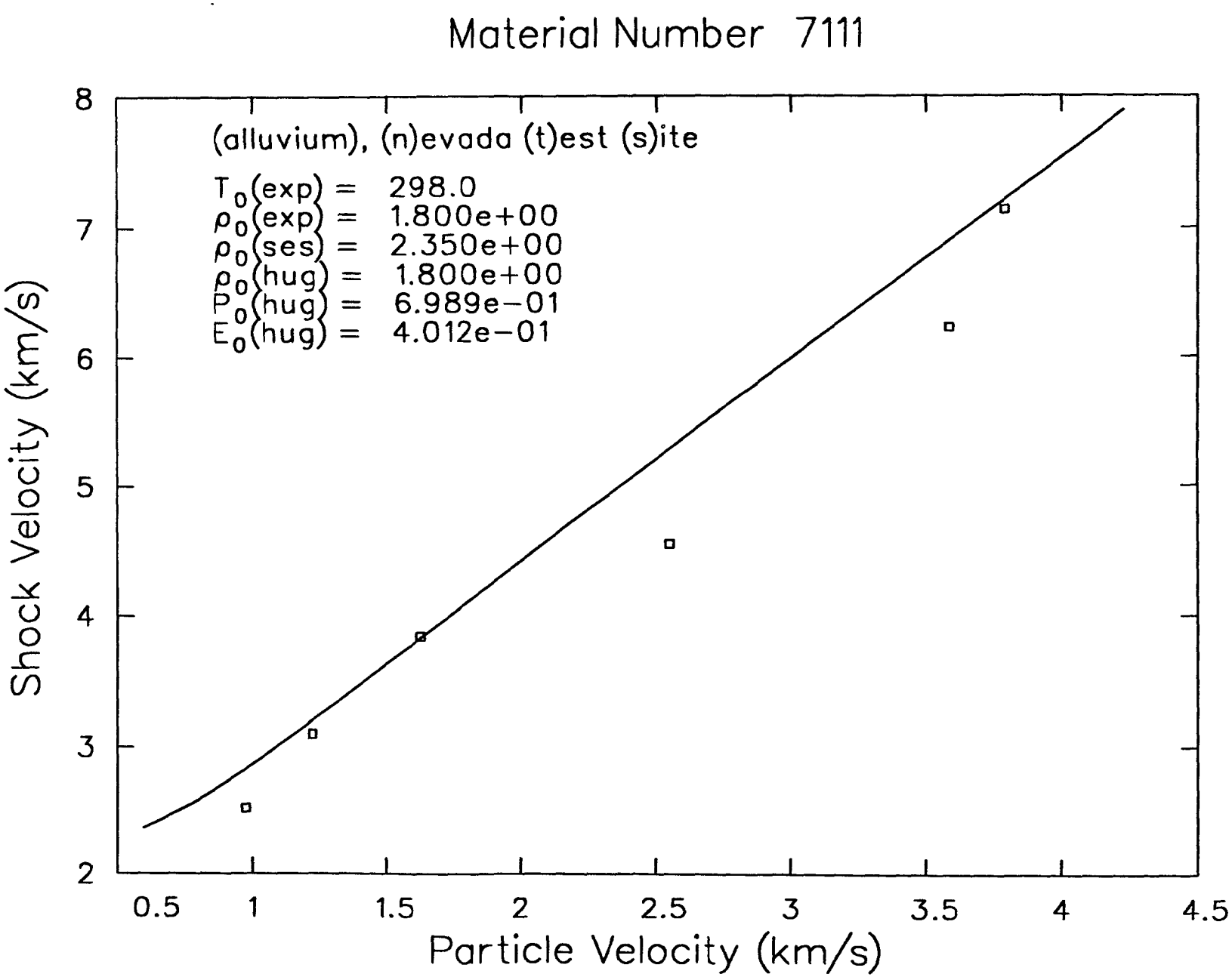
T1 SES2D CRAY 02

7111-HU1
E0 MJ/KG
0.00+00

TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRAY


Material Number 7111
(alluvium), (n)evada (t)est (s)ite
T_0(exp) = 298.0
ρ_0(exp) = 1.800e+00
ρ_0(ses) = 2.350e+00
ρ_0(hug) = 1.800e+00
P_0(hug) = 6.989e−01
E_0(hug) = 4.012e−01
Shock Velocity (km/s)
Particle Velocity (km/s)
2
3
4
5
6
7
8
0.5
1
1.5
2
2.5
3
3.5
4
4.5

MATERIAL NUMBER SUMMARY

7112 MATERIAL. NEVADA ALLUVIUM

COMP. NUMBER FRACTION O 0.5592, SI 0.2241, AL 0.0446, H 0.0839, S 0.0482
ATOMIC NUMBER. 9.3700E+00
ATOMIC MASS. 1.8761E+01
NORMAL DENSITY. 2.3500E+00

GAMMA(COMPUTED). 0.6594

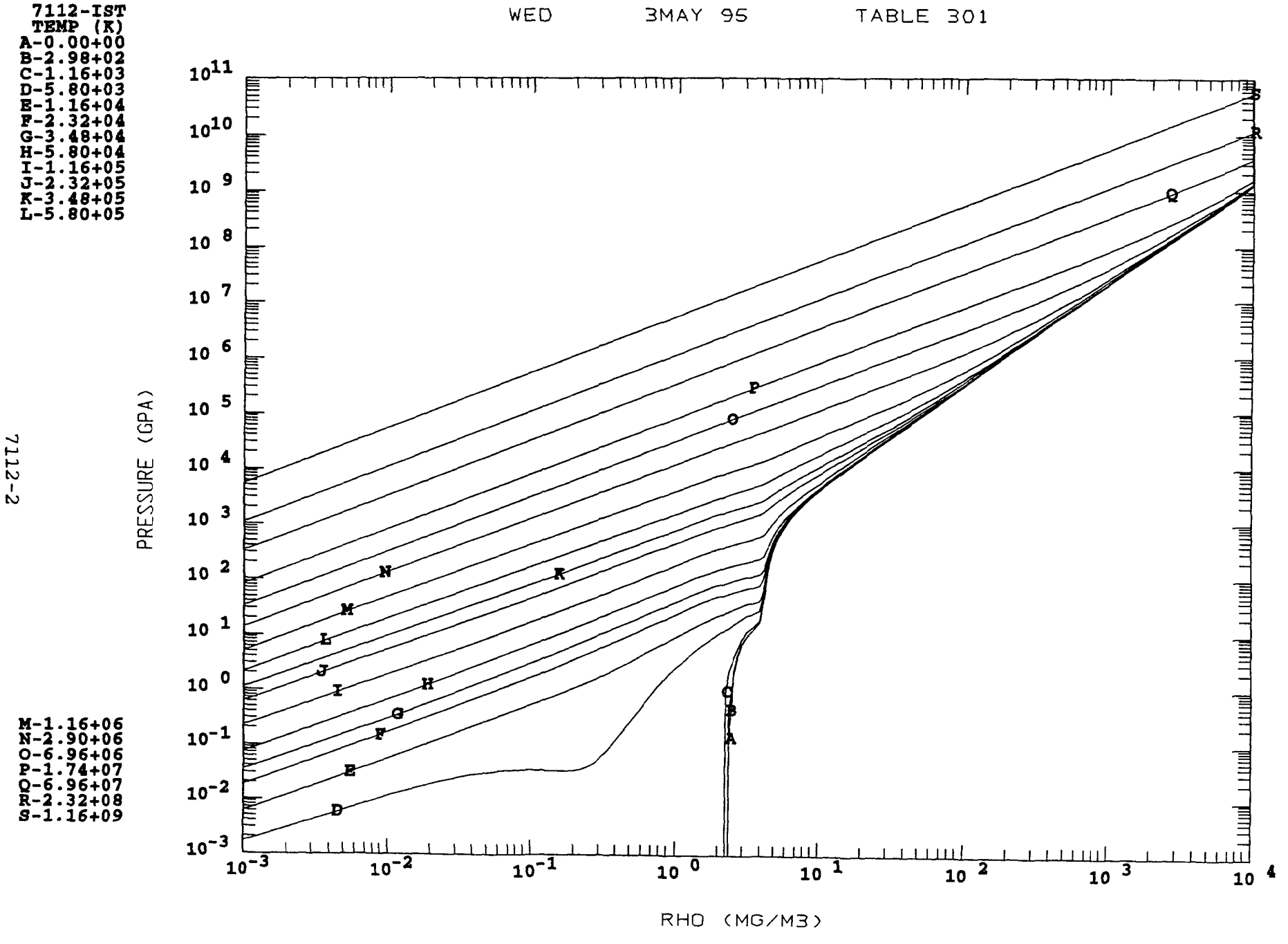
TABLE SUMMARY.

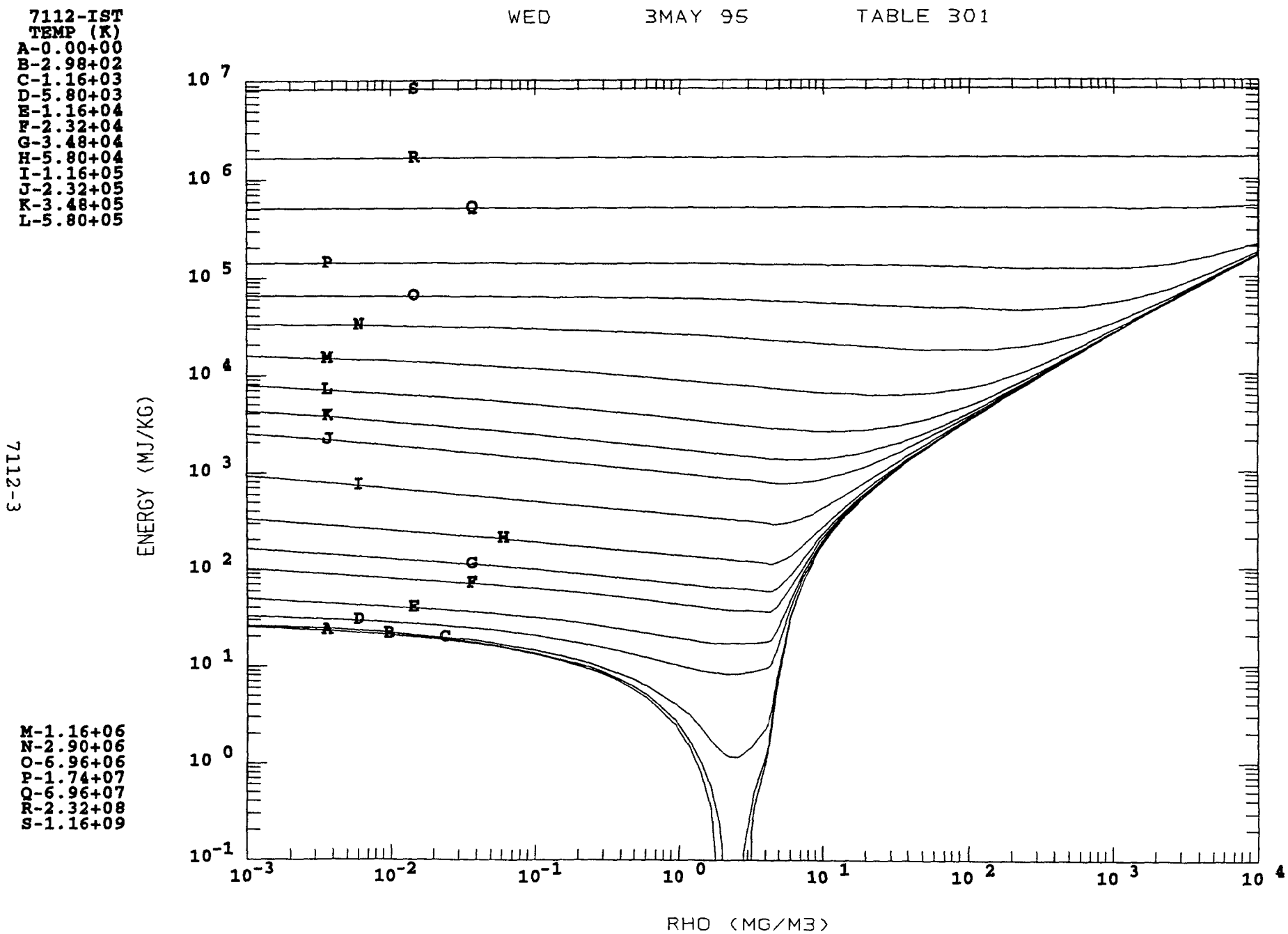
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	24					
102	80					
201	5					
301	8103	72	37	0.0000E+00	2.3500E-06	4.7000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7431	66	37	2.3500E-06	4.7000E-06	4.7000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7991	71	37	2.3500E-06	4.7000E-06	4.7000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	287	71	1	2.3500E-06	4.7000E-06	4.7000E+04
				0.0000E+00	-6.8172E-11	0.0000E+00
401	65					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. MAY 92
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 52092.
DATE OF LAST UPDATE. 52092.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. JDJNUC NUCLEAR MODEL WITH PIECEWISE LINEAR GAMMA IN COMPRESSION (IGRUN=8). GAMRHO=(2.35,0.66667), (4.0,0.3), (5.5,0.6), GAMEPS=(0.66667,1.0), DGAMMA=(0.0,-1.0). GAMREF=0.66667, TMELT=1800 KELVIN. COLD CURVE FROM SHOCK DATA. USUPKS=(0.0,3.0), (1.0,4.0), (1.8,4.0), (2.05,5.0), (6.5,14.0). ECOHKC=140, FACLJ=0.24, CMAT=1.818. THE CRITICAL TEMPERATURE IS 5845 KELVIN. THE 301 TABLE HAS VAN DER WAALS LOOPS. MELT (411,412) TABLES ARE AVAILABLE.

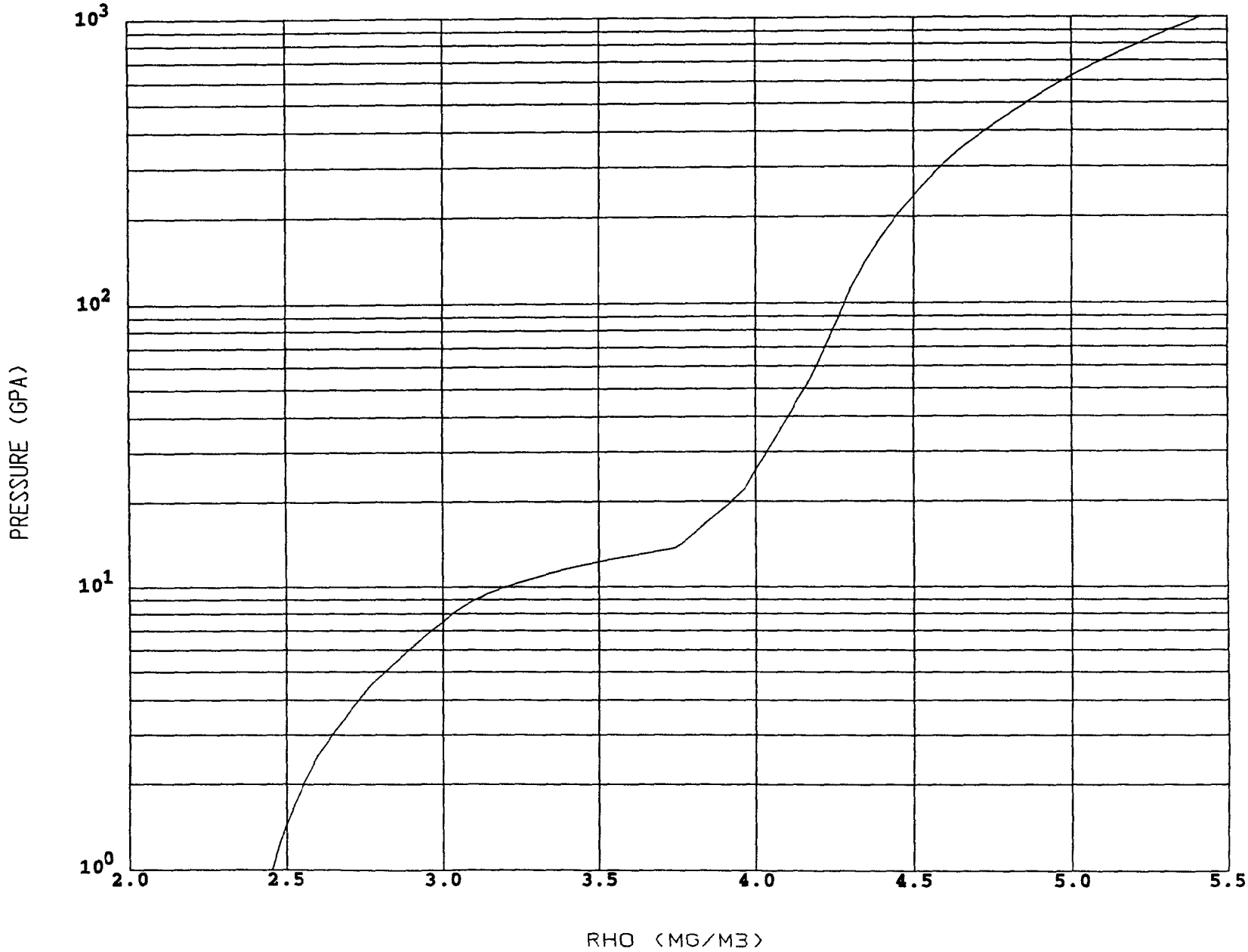

7112-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA1



T1 SES2D CRAY 02

7112-HU1
E0 MJ/KG
0.00+00

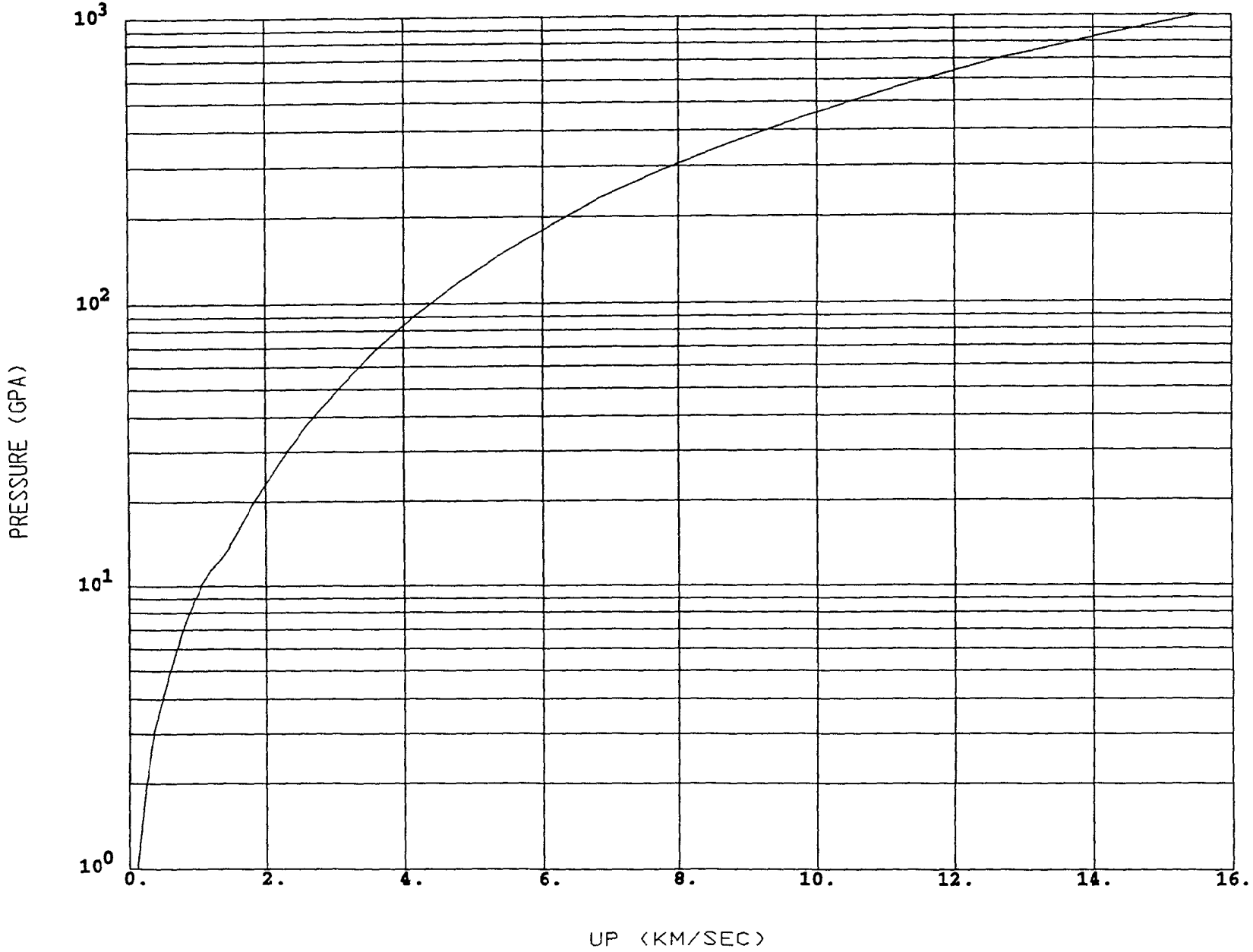
WED 3MAY 95 TABLE 301



T1 SES2D CRA\

7112-HU1
E0 MJ/KG
0.00+00

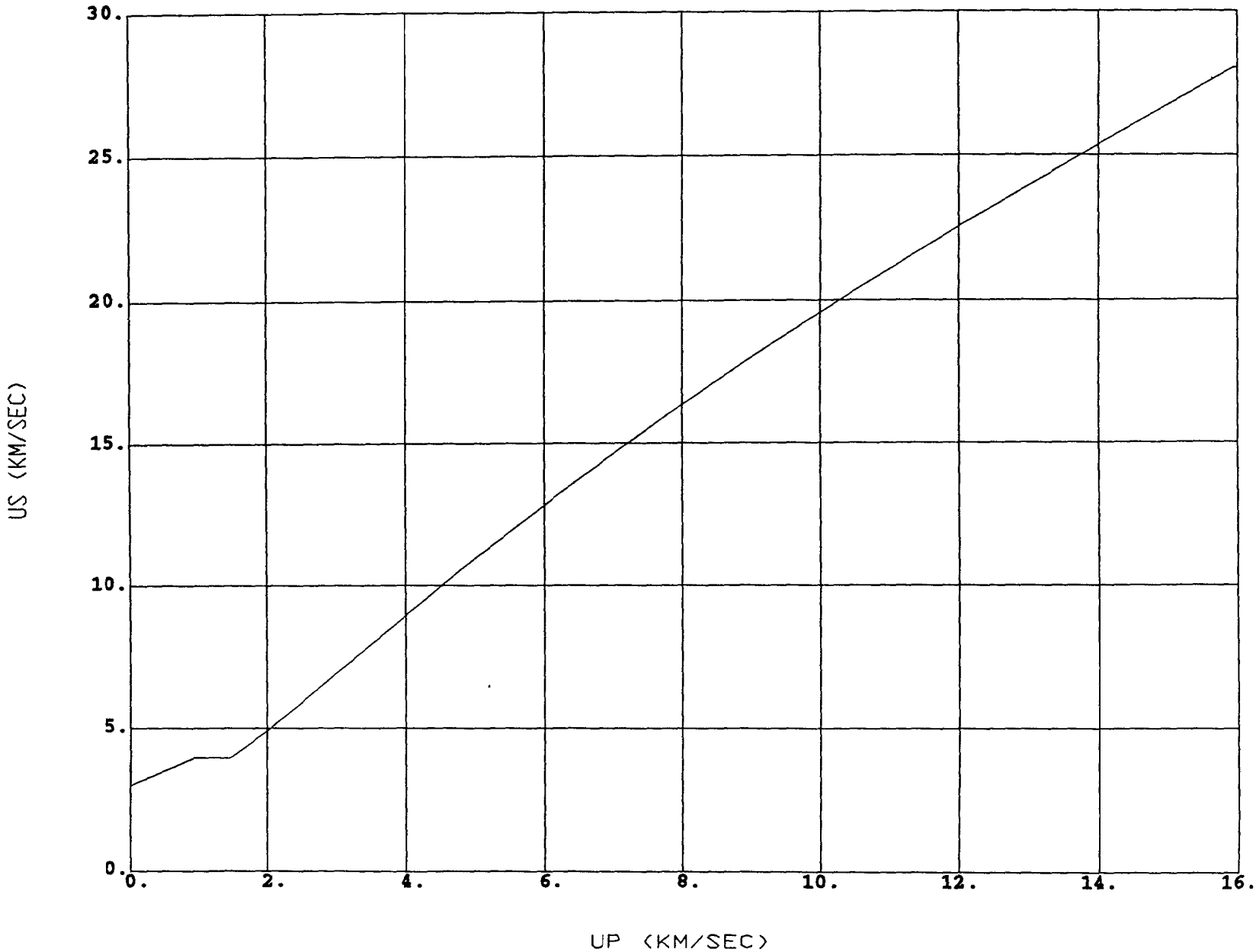
WED 3MAY 95 TABLE 301



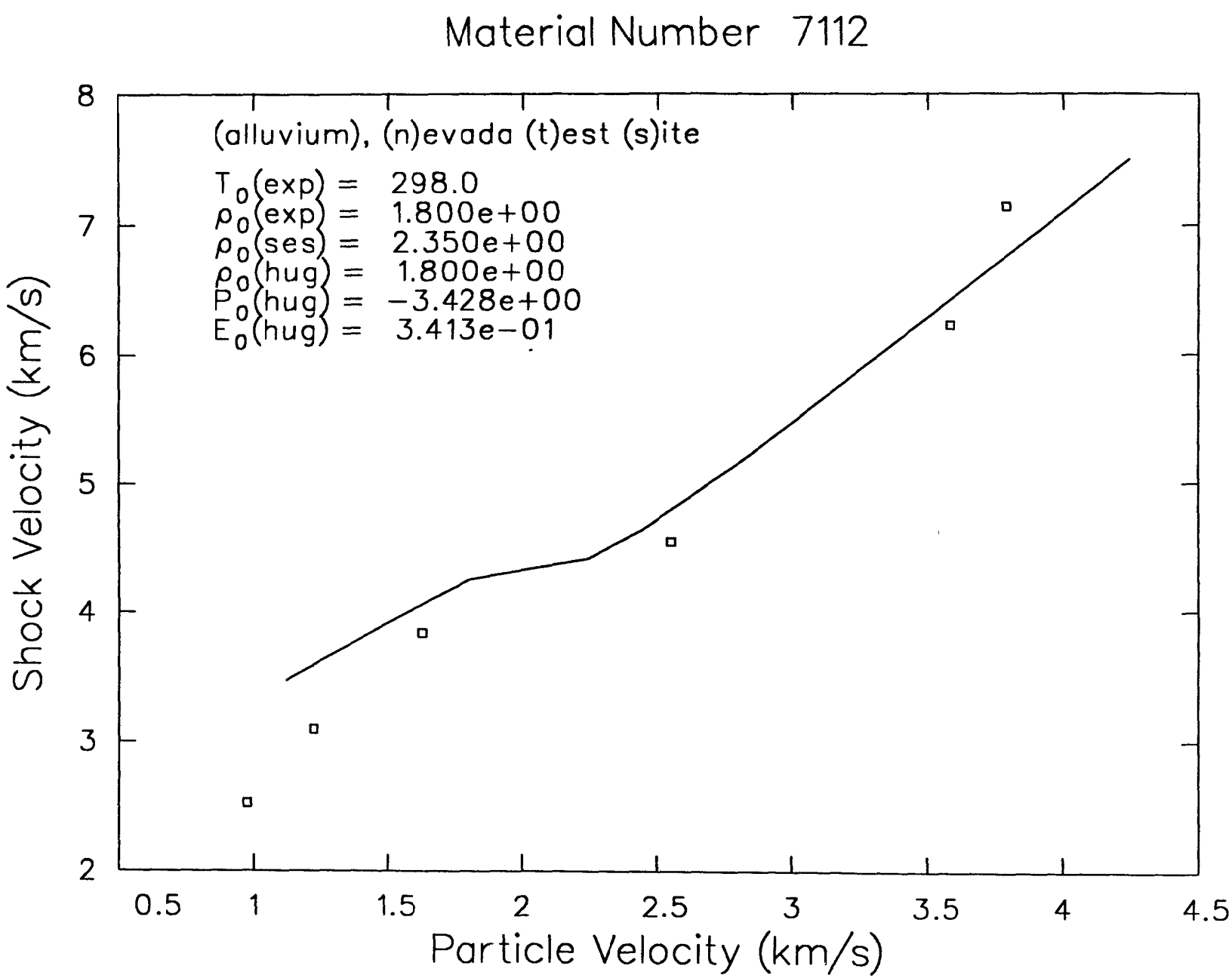
T1 SES2D CRAY 02

7112-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRA


Material Number 7112
(alluvium), (n)evada (t)est (s)ite
T_0(exp) = 298.0
ρ_0(exp) = 1.800e+00
ρ_0(ses) = 2.350e+00
ρ_0(hug) = 1.800e+00
P_0(hug) = −3.428e+00
E_0(hug) = 3.413e−01
Shock Velocity (km/s)
Particle Velocity (km/s)
8
7
6
5
4
3
2
0.5
1
1.5
2
2.5
3
3.5
4
4.5

MATERIAL NUMBER | SUMMARY

7120 MATERIAL. SATURATED TUFF

COMP. 63.5% SIO2, 21.3% H2O, 15.2% AL2O3 BY WEIGHT
ATOMIC NUMBER. 6.8300E+00
ATOMIC MASS. 1.3400E+01
NORMAL DENSITY. 1.9500E+00

GAMMA(COMPUTED). 1.2591

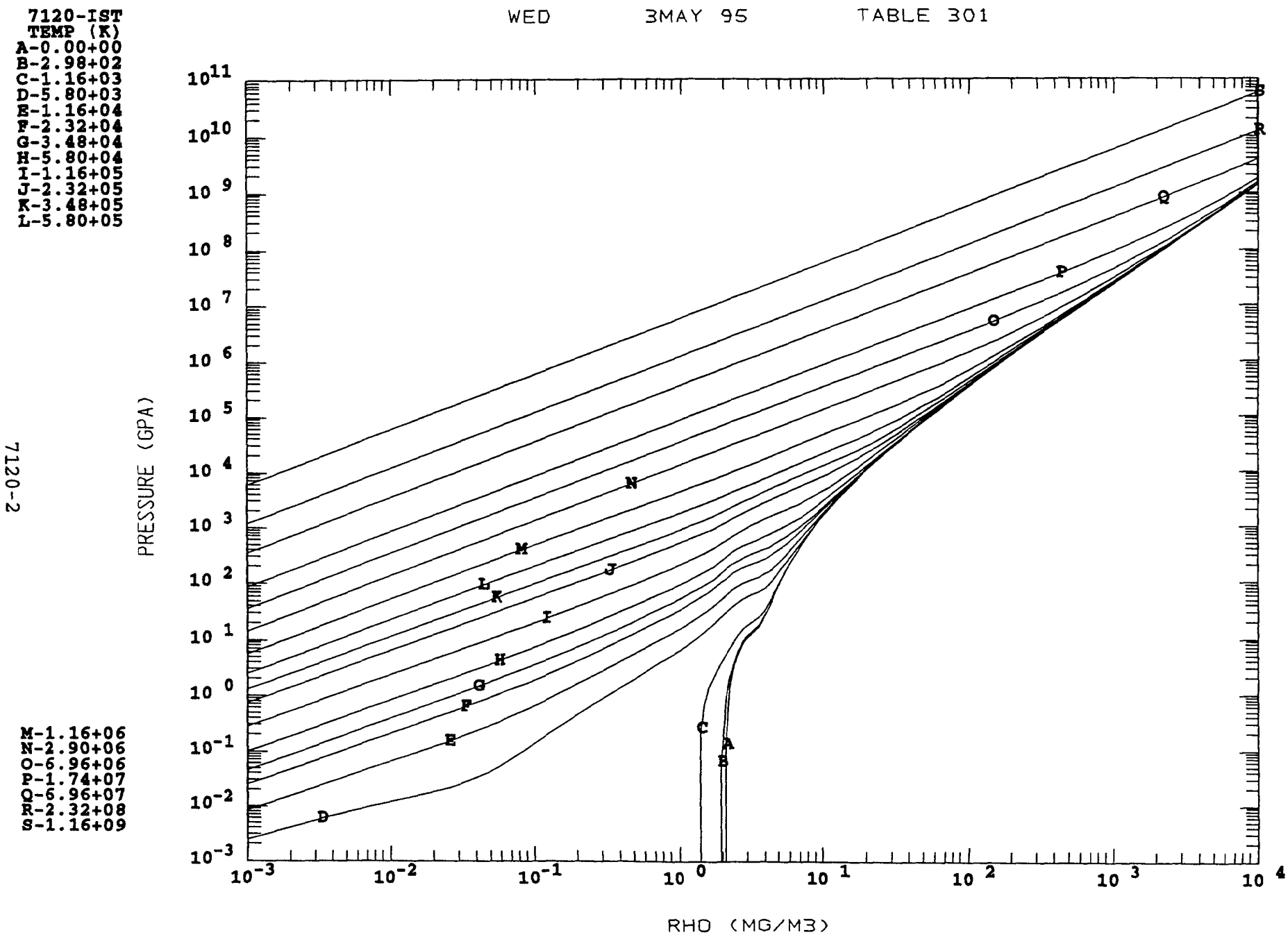
TABLE SUMMARY.

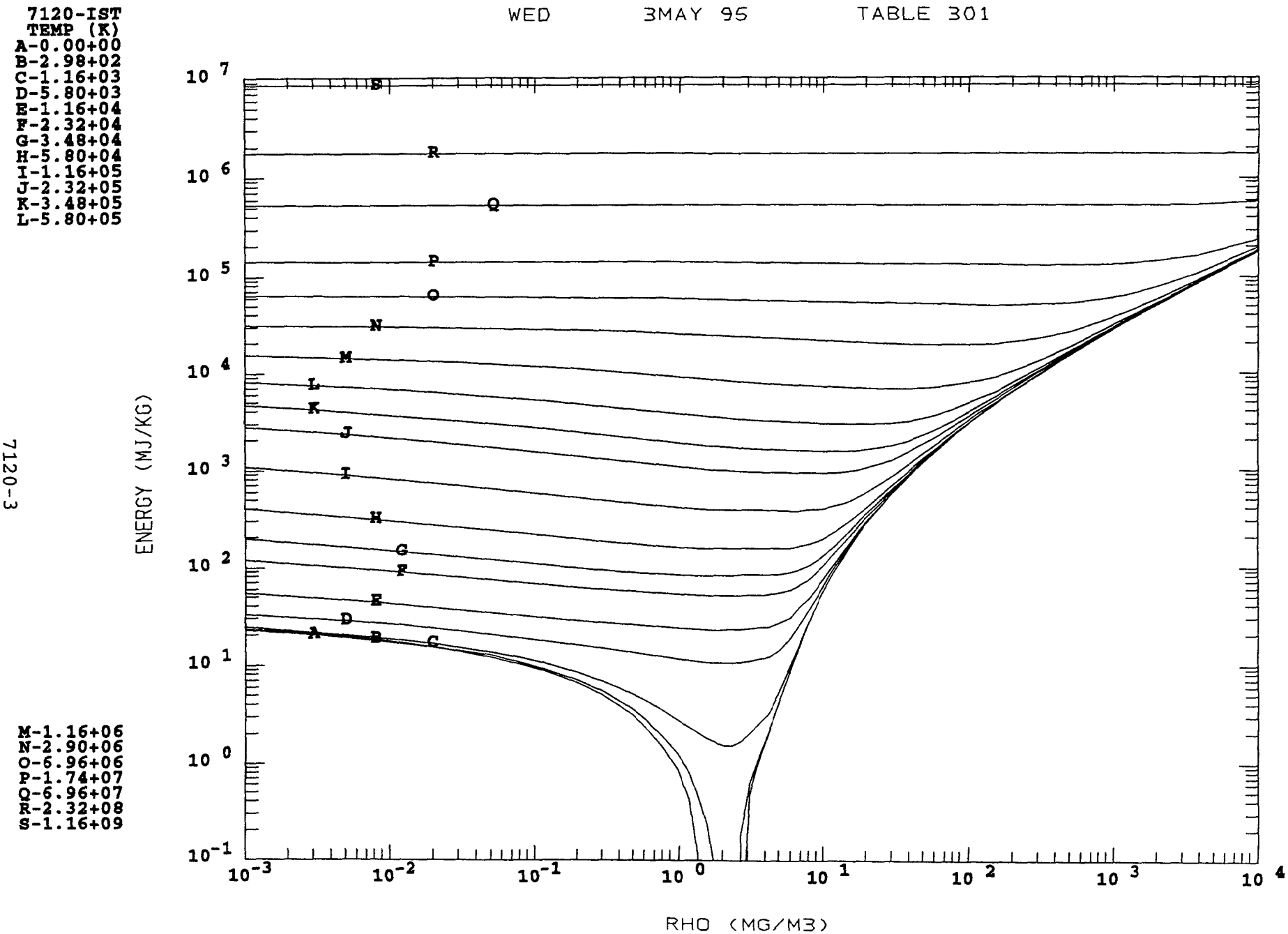
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	20					
102	98					
201	5					
301	8439	75	37	0.0000E+00	1.9500E-06	3.9000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	1.9500E-06	3.9000E-06	3.9000E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	8327	74	37	1.9500E-06	3.9000E-06	3.9000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	291	72	1	1.9500E-06	3.9000E-06	3.9000E+04
				0.0000E+00	-7.6417E-11	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. MAY 85
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 42985.
DATE OF LAST UPDATE. 43085.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

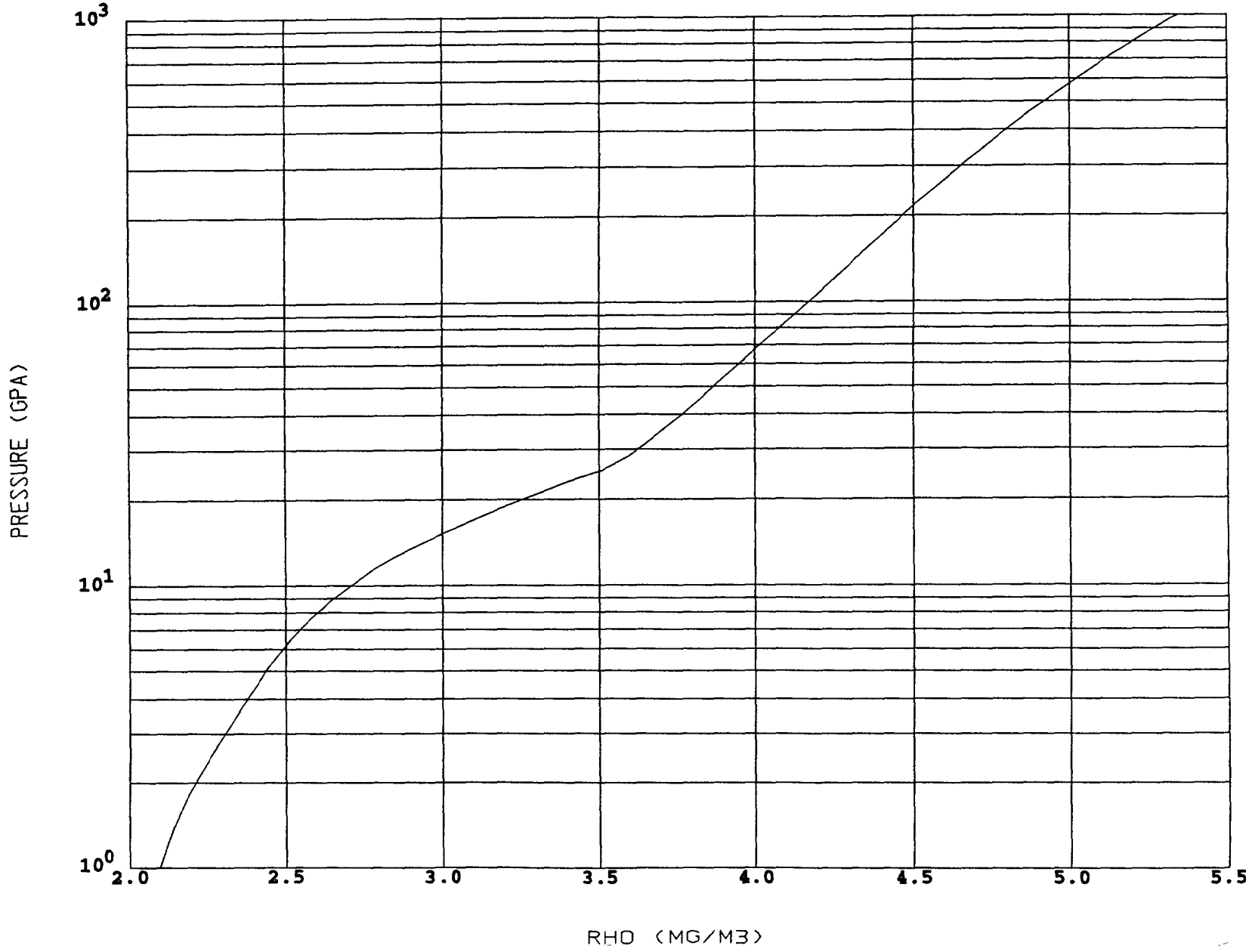
COMMENTS. THIS EOS IS FOR TUFF WITH ALL VOIDS FILLED WITH WATER. THE VOID VOLUME IS 30% OF THE TOTAL VOLUME. NOTE THAT EVEN DRY TUFF HAS SOME WATER CONTENT. AVERAGE ATOM MODELING THROUGHOUT. TFD AS CALCULATED BY GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. COLD CURVE FROM SHOCK DATA AND SOUND VELOCITY. US-UP COMPOSED OF THREE STRAIGHT LINES (UP = 0.0, 1.2, 2.53, 6.6 AND US = 2.4, 4.3, 5.55, 12.13). DATA FROM EILERS (PRIVATE COMMUNICATION) FOR UP = 0.0 AND ISBELL AND ROSENBERG ET AL FOR THE REMAINING SHOCK DATA. TFD MATCH MADE AT COMPRESSION OF 2.16. ECOH = 100 KCAL PER MOLE AND FACLJ = 0.23. SPECIAL GAMMA (IGRUN = 7) WITH GAMREF = 1.27, GAMEPS = 0.5, 1.0 AND DGAMMA = 1.377, 1.377. THIS GAMREF WAS PICKED BETWEEN 2S-1 AND THE GAMREF OF GLASS. DEBYEREF = 500 KELVIN (A GUESS).


7120-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA


7120-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
10 7
10 6
10 5
10 4
10 3
10 2
10 1
10 0
10-1
10-3
10-2
10-1
10 0
10 1
10 2
10 3
10 4
T1 SES2D CRAY 02

7120-HU1
E0 MJ/KG
0.00+00

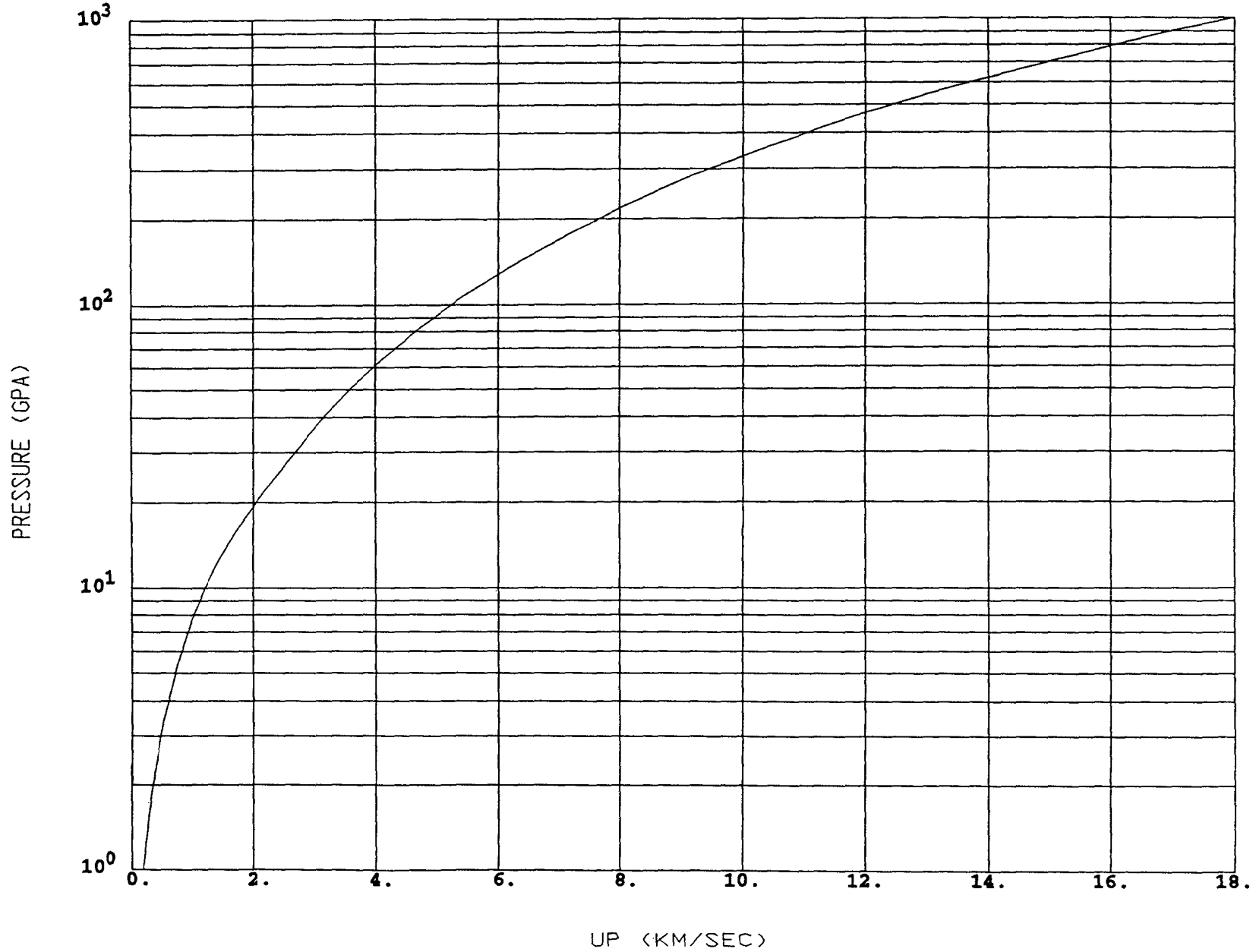
TUESDAY 11JUL 95 TABLE 301



T1 SFS2D CRAY

7120-HU1
E0 MJ/KG
0.00+00

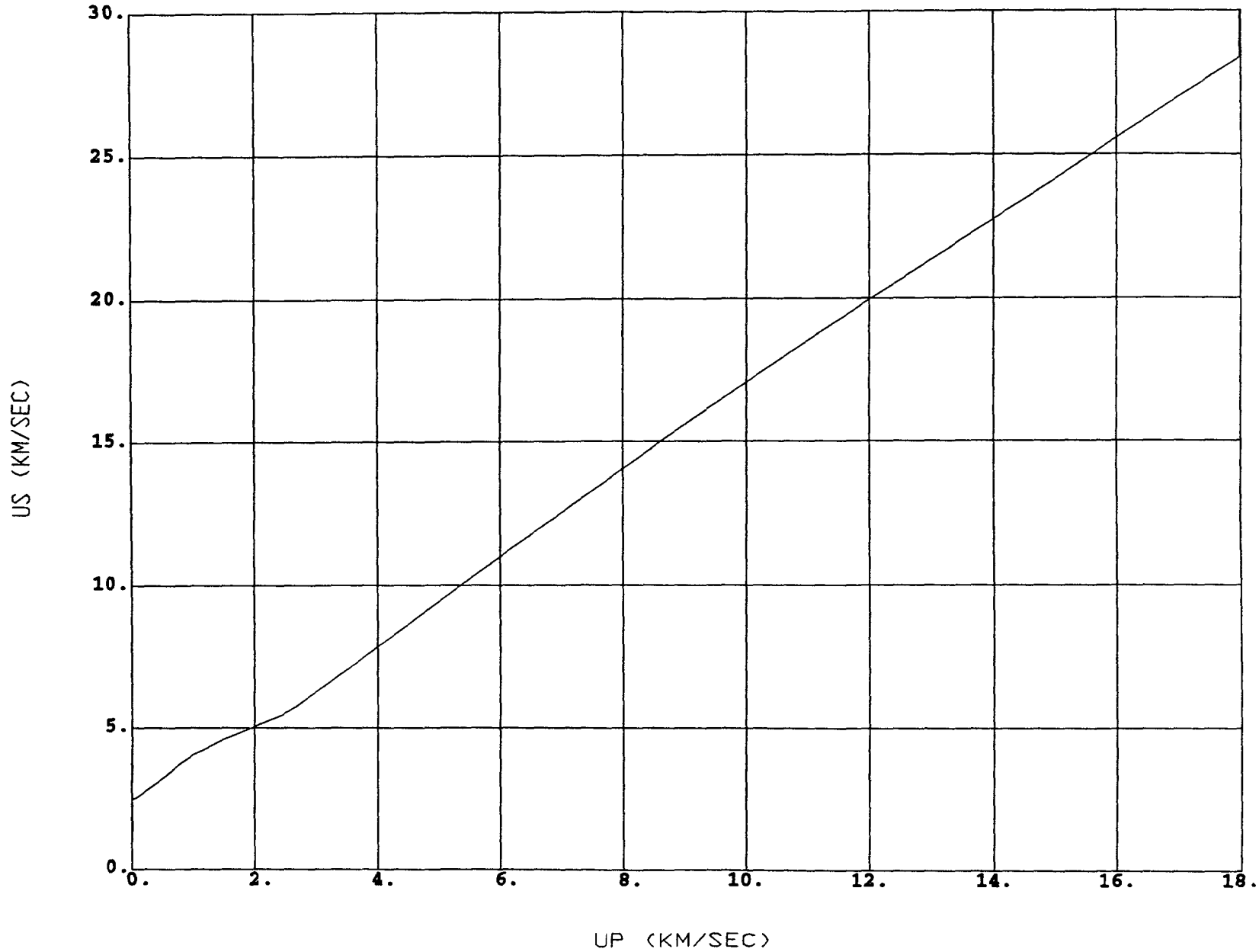
WED 3MAY 95 TABLE 301



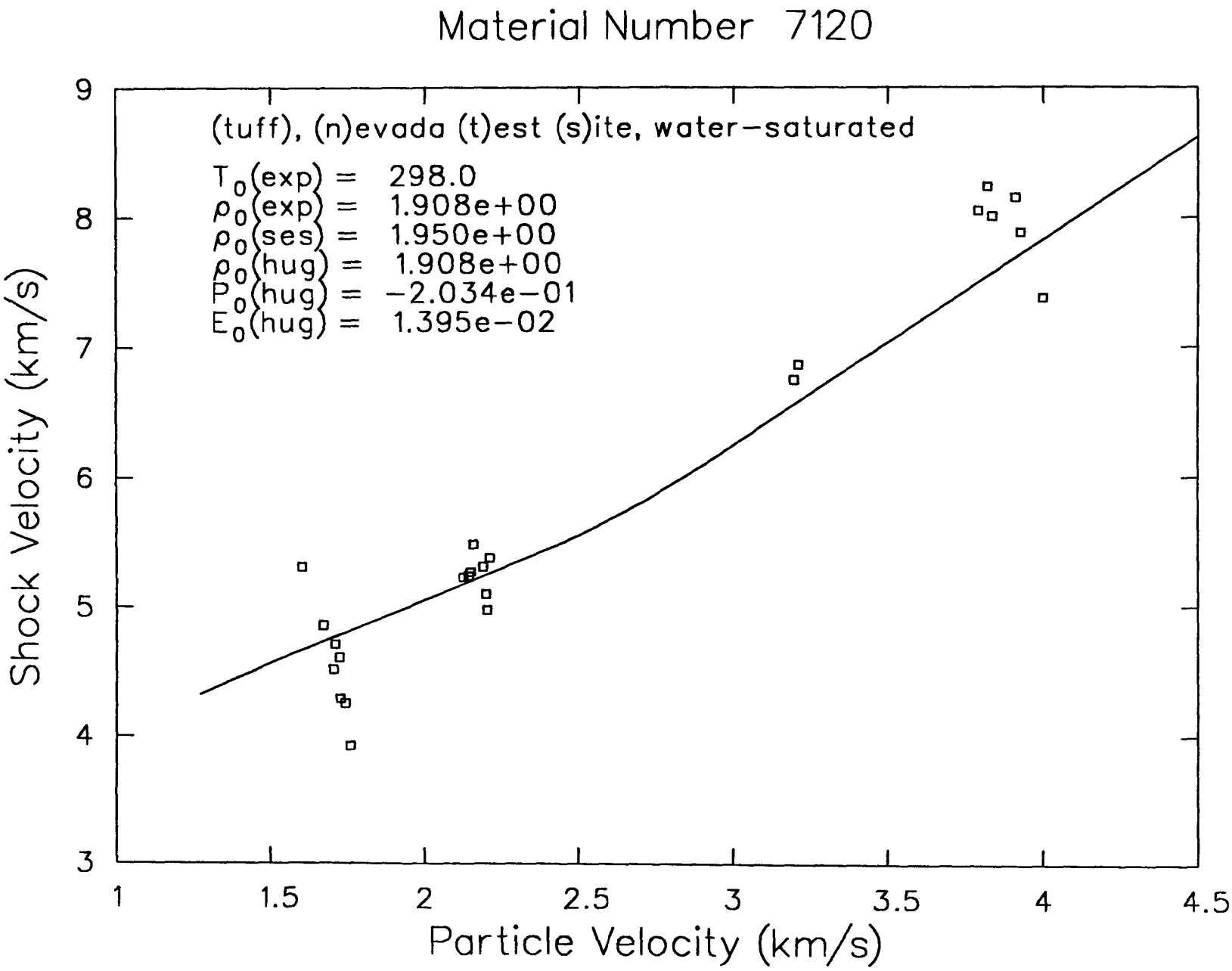
T1 SES2D CRAY 02

7120-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRA


Material Number 7120
(tuff), (n)evada (t)est (s)ite, water-saturated
T_0(exp) = 298.0
ρ_0(exp) = 1.908e+00
ρ_0(ses) = 1.950e+00
ρ_0(hug) = 1.908e+00
P_0(hug) = -2.034e-01
E_0(hug) = 1.395e-02
Shock Velocity (km/s)
Particle Velocity (km/s)
9
8
7
6
5
4
3
1
1.5
2
2.5
3
3.5
4
4.5

MATERIAL NUMBER	SUMMARY
7121	MATERIAL. SATURATED TUFF

COMP. 63.5% SIO2, 21.3% H2O, 15.2% AL2O3 BY WEIGHT
ATOMIC NUMBER. 6.8300E+00
ATOMIC MASS. 1.3400E+01
NORMAL DENSITY. 1.9500E+00

GAMMA(COMPUTED). 0.8953

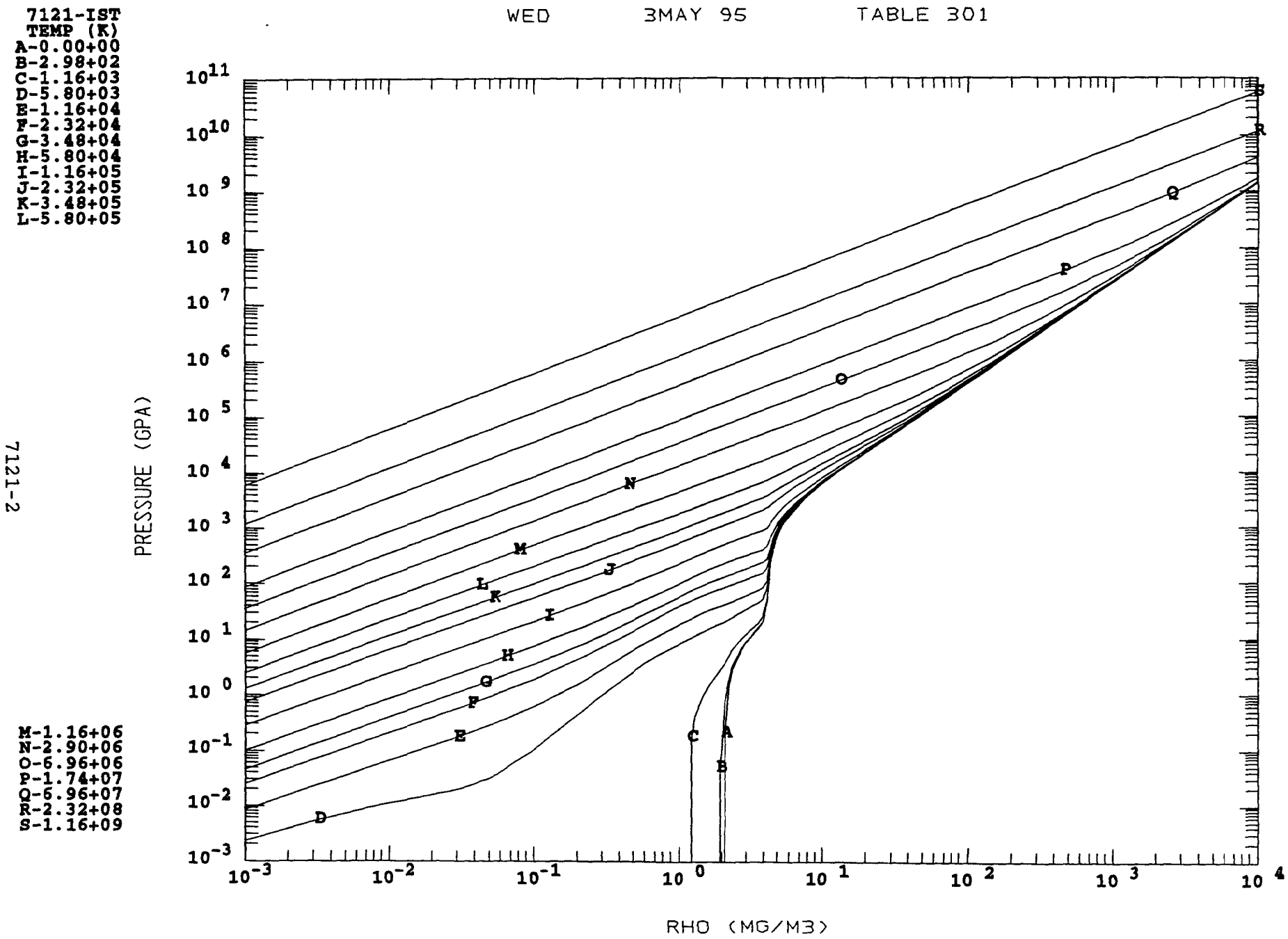
TABLE SUMMARY.

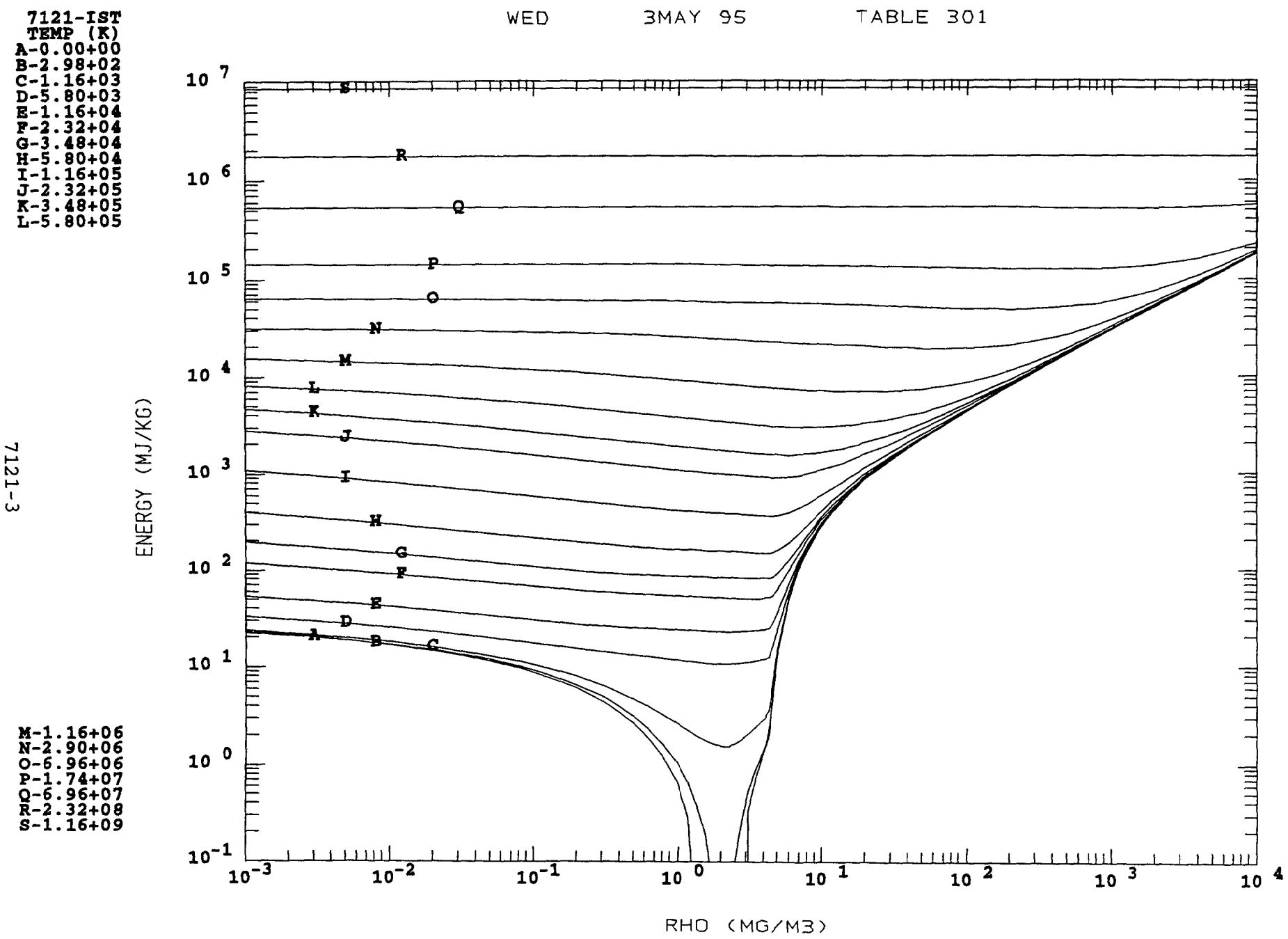
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	20					
102	25					
201	5					
301	8887	79	37	0.0000E+00	1.9500E-06	3.9000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	1.9500E-06	3.9000E-06	3.9000E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	8775	78	37	1.9500E-06	3.9000E-06	3.9000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	291	72	1	1.9500E-06	3.9000E-06	3.9000E+04
				0.0000E+00	-8.2276E-11	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. MAY 85
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 90485.
DATE OF LAST UPDATE. 61587.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. THIS IS THE SAME AS 7120 WITH THE FOLLOWING CHANGES:
GAMREF = 0.9, DGAMMA = (-0.3,-0.3), CMAT = 2.19, (UP,US) =
(0.0,1.99), (0.4,2.81), (0.7,3.20), (1.5,3.96), (2.15, 4.50),
(4.0,7.56), (6.6,12.15).

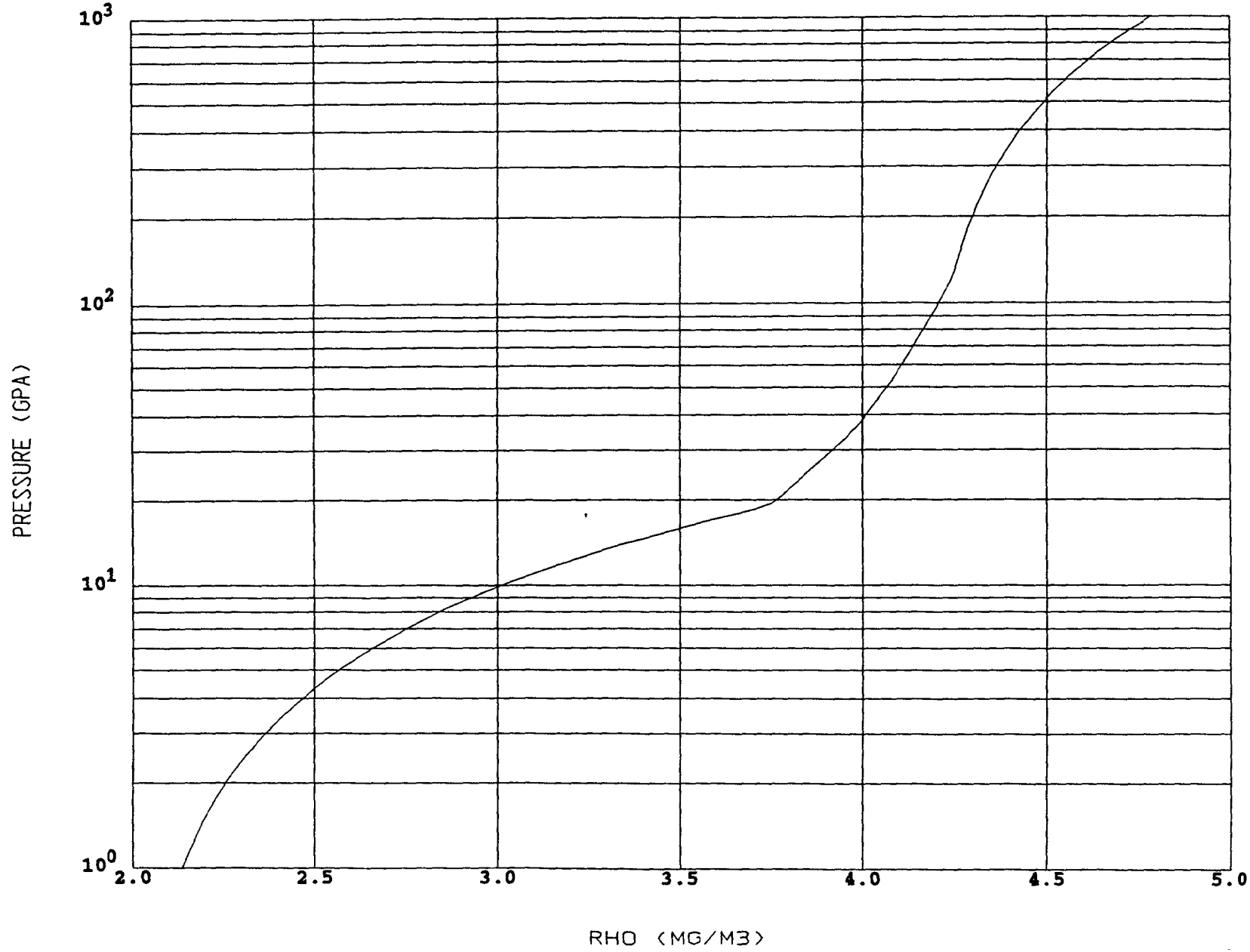

7121-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY



T1 SES2D CRAY 02

7121-HU1
E0 MJ/KG
0.00+00

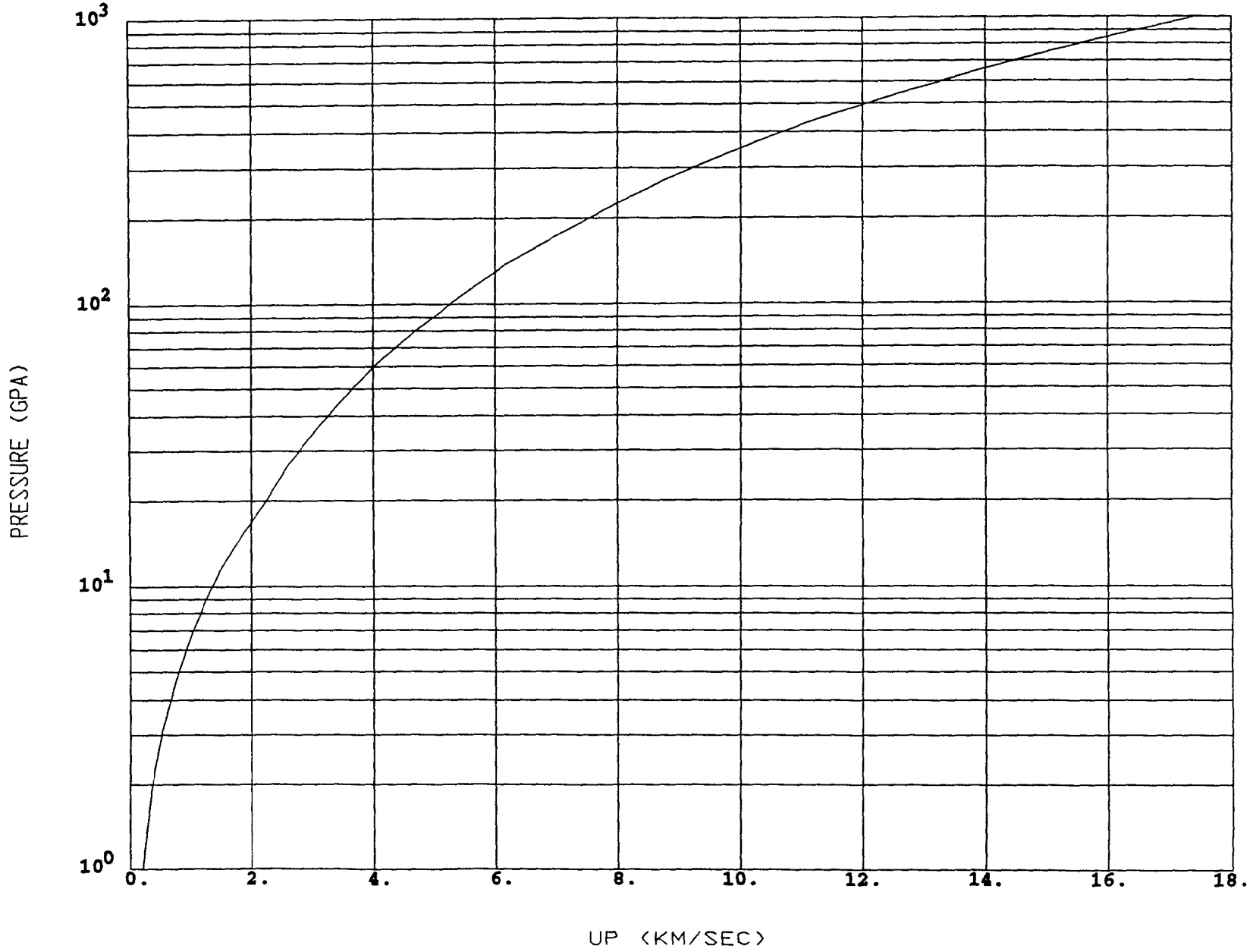
TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRAY

7121-HU1
E0 MJ/KG
0.00+00

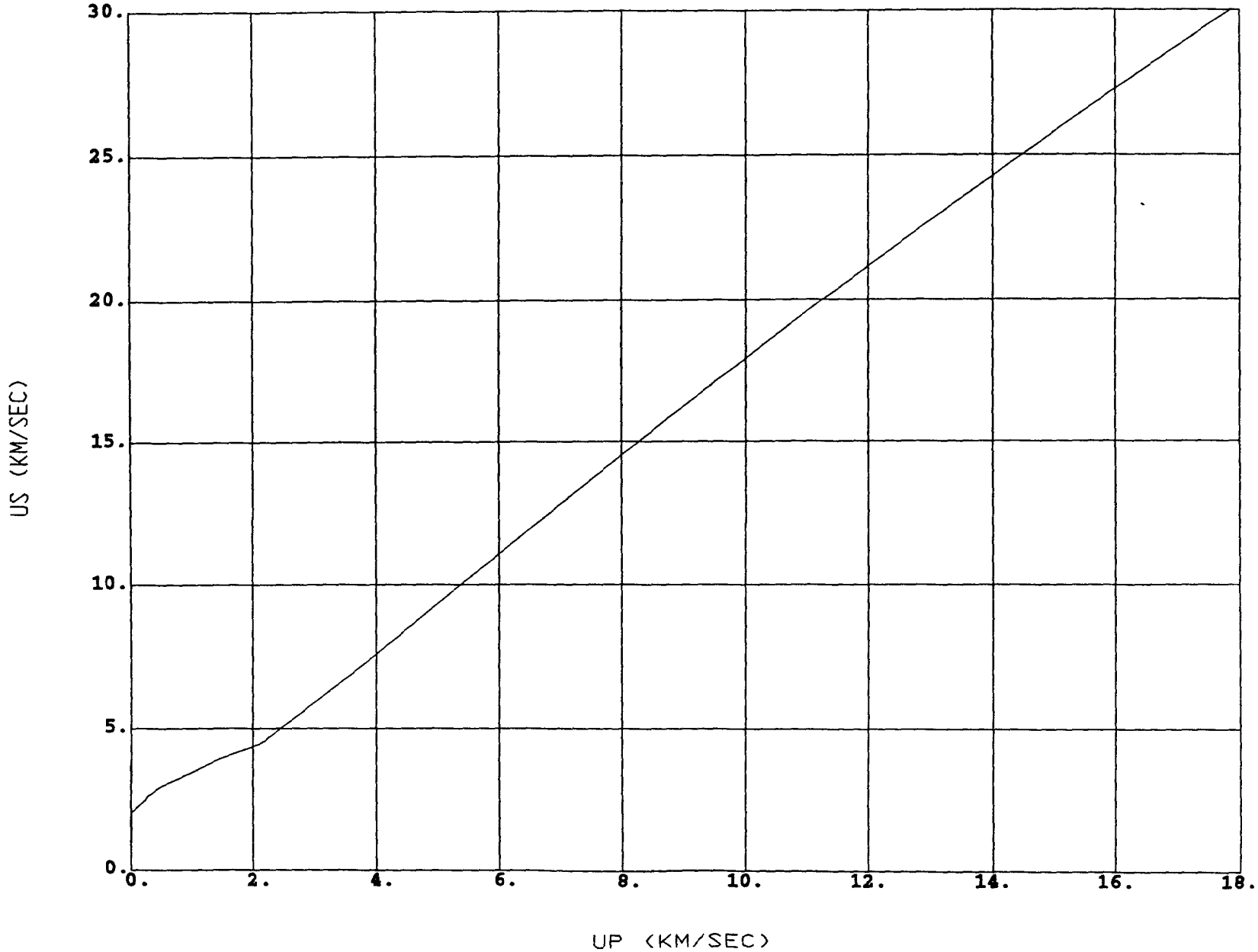
WED 3MAY 95 TABLE 301



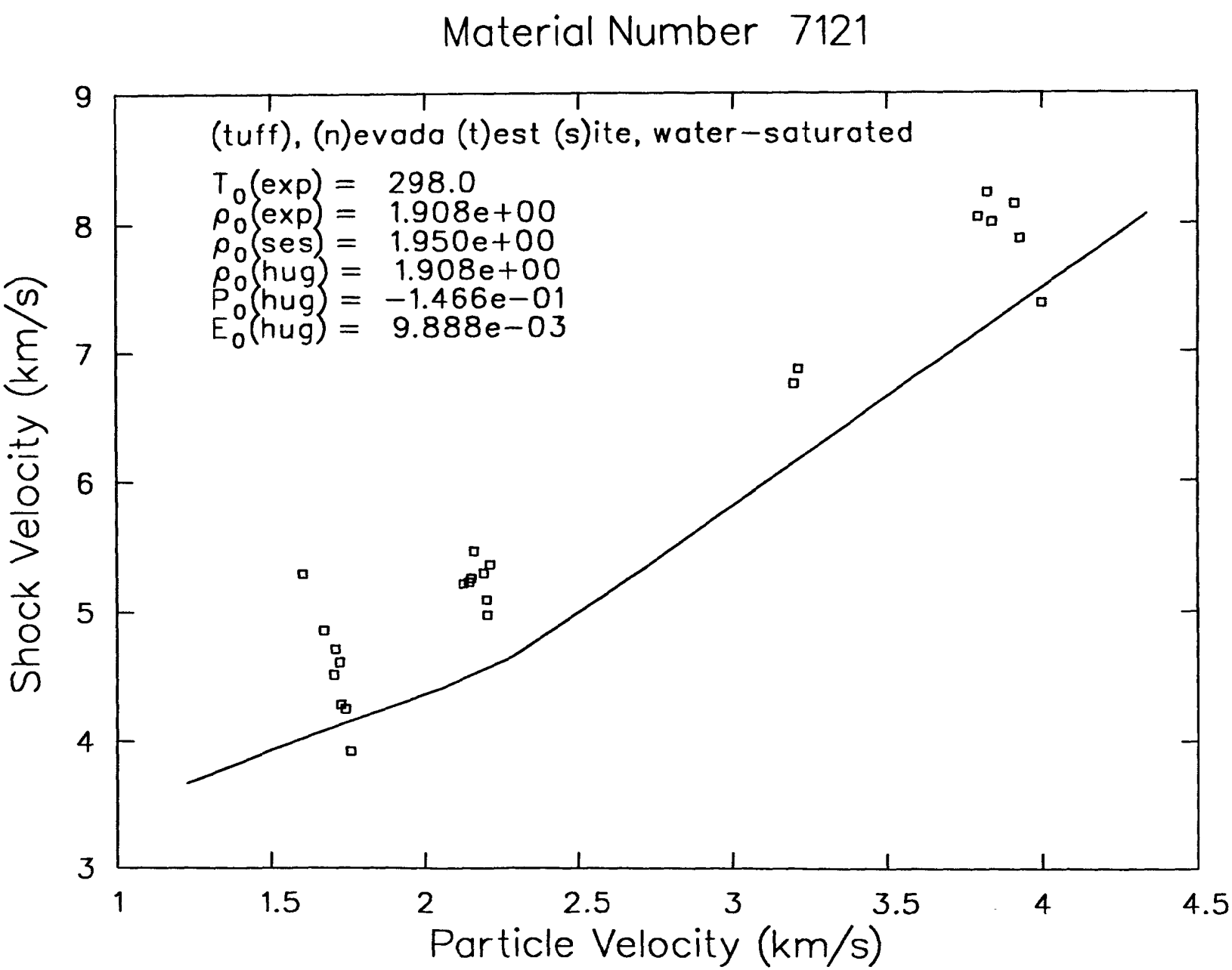
T1 SES2D CRAY 02

7121-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7121
(tuff), (n)evada (t)est (s)ite, water-saturated
T_0(exp) = 298.0
ρ_0(exp) = 1.908e+00
ρ_0(ses) = 1.950e+00
ρ_0(hug) = 1.908e+00
P_0(hug) = -1.466e-01
E_0(hug) = 9.888e-03
Shock Velocity (km/s)
Particle Velocity (km/s)
9
8
7
6
5
4
3
1
1.5
2
2.5
3
3.5
4
4.5

MATERIAL NUMBER | SUMMARY

7122 MATERIAL. SATURATED TUFF

COMP. 62.0% SIO2, 13.5% AL2O3, 24.5% H2O BY WEIGHT
ATOMIC NUMBER. 6.5302E+00
ATOMIC MASS. 1.2760E+01
NORMAL DENSITY. 1.9500E+00

GAMMA(COMPUTED). 0.4015

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	22					
102	83					
201	5					
301	7431	66	37	0.0000E+00	1.9500E-06	9.7500E+03
				0.0000E+00	1.2500E-02	9.9999E+04
304	6535	65	33	1.9500E-06	3.9000E-06	3.9000E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	8103	72	37	1.9500E-06	3.9000E-06	3.9000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	263	65	1	1.9500E-06	3.9000E-06	9.7500E+03
				0.0000E+00	-4.4759E-12	0.0000E+00

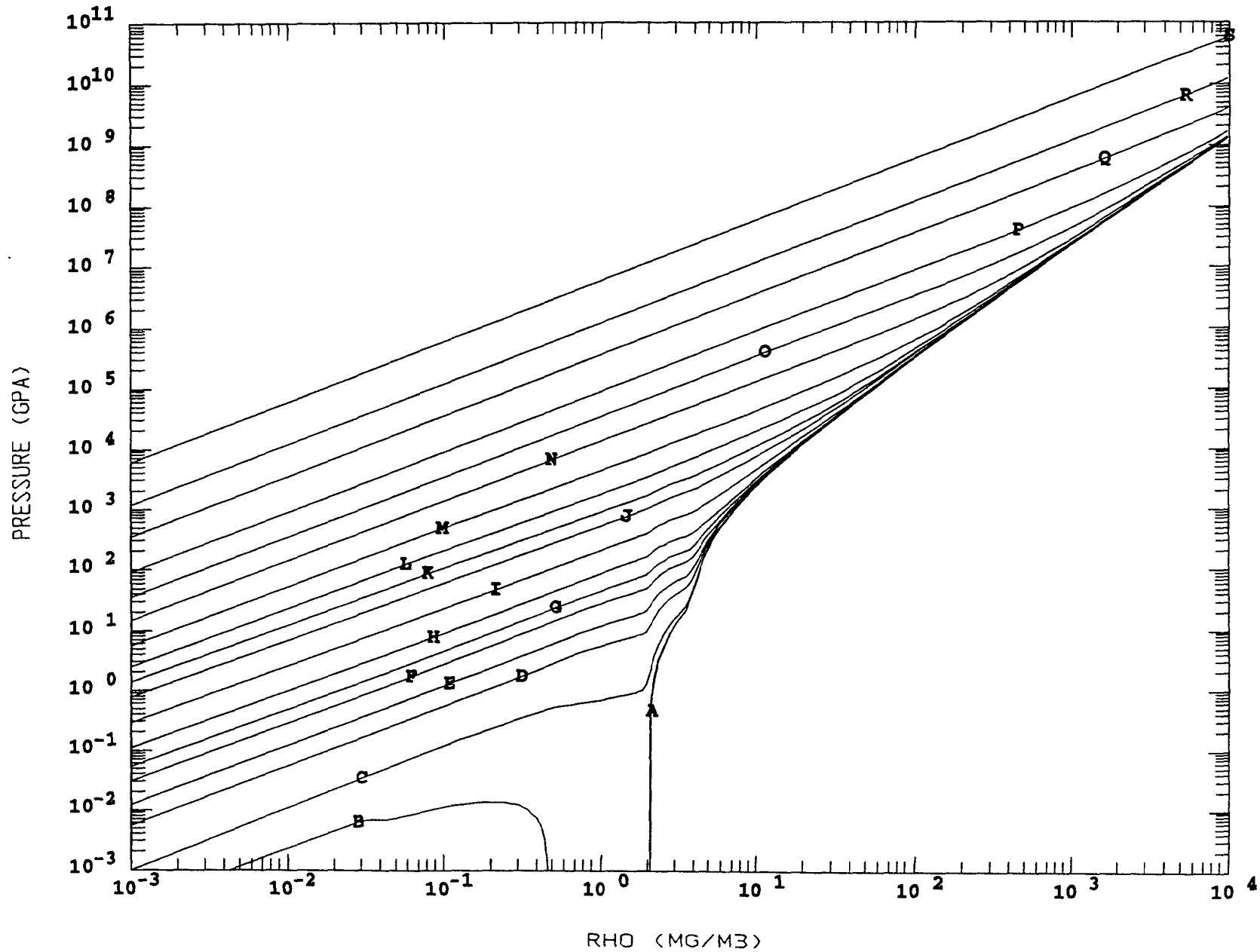
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. AUG 94
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 80494.
DATE OF LAST UPDATE. 90894.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. JDJNUC NUCLEAR MODEL WITH PIECEWISE LINEAR GAMMA (IGRUN=8). EXTENSIVE STUDY OF PIECEWISE LINEAR GAMMA TO ACCOMODATE HYDRODYNAMIC CONSTRAINTS AND BEST ESTIMATES OF GAMMA. GAMREF=0.40 AND TMELT=1300 KELVIN. DGAMMA=(0.0,0.0), GAMEPS=(0.66667,0.6), GAMRHO=(1.95,0.40), (2.5,0.8), (3.5,0.7). STANDARD COLD CURVE PROCEDURE EXCEPT HIGH DENSITY PORTION IS NOT AVERAGE ATOM MODELING BUT A MIXTURE OF CONSTITUENT ELEMENTS. (UP,US)= (0.0,2.15), (0.7,3.493), (2.5,5.5325), (6.0,11.178). ECOHKC=5.0, FACLJ=0.2, CMAT=2.159. CRITICAL TEMPERATURE IS 665 KELVIN. 301 TABLE HAS VAN DER WAAL LOOPS.

7122-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05

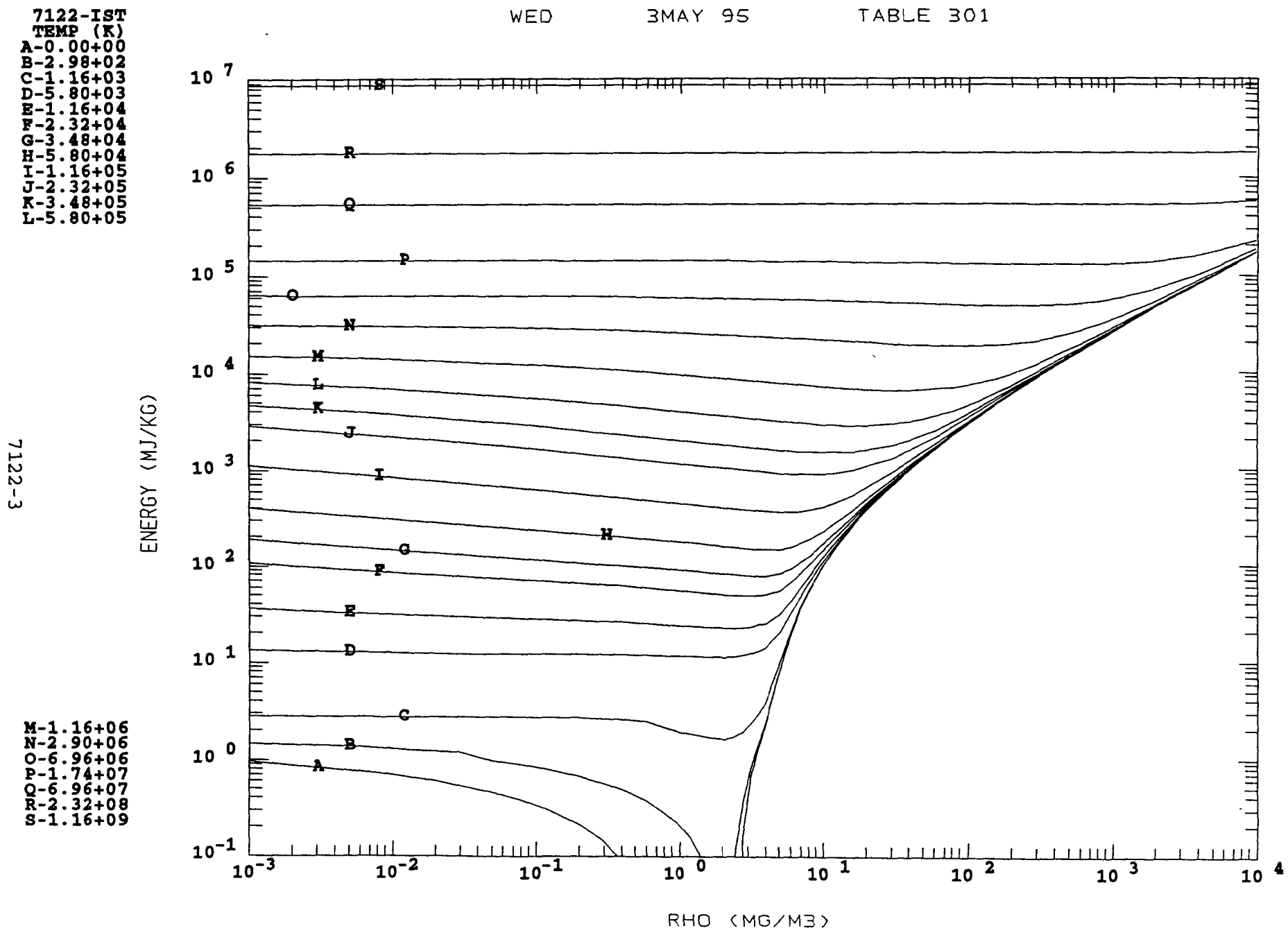
WED 3MAY 95 TABLE 301



M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09

7122-2

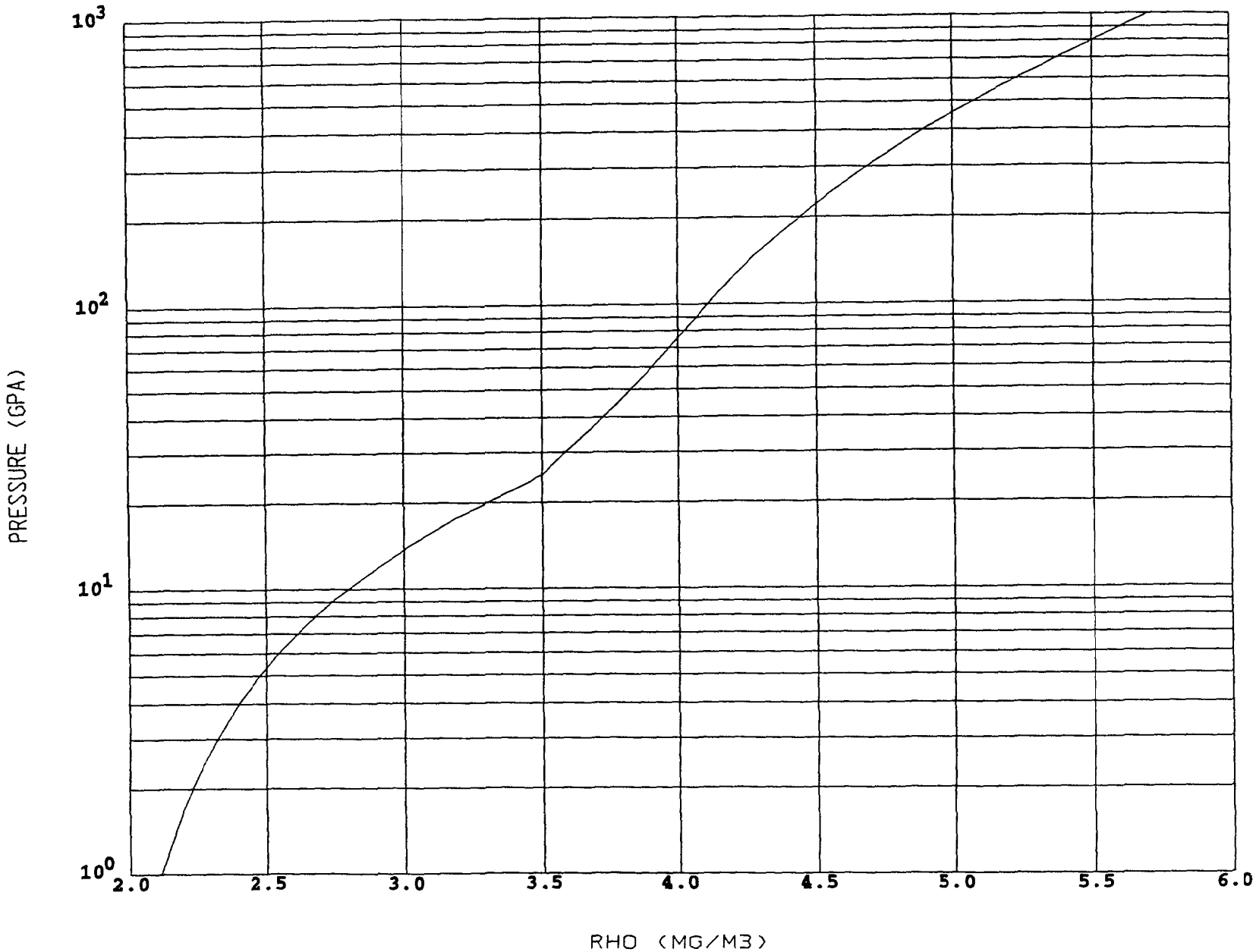
T1 SES2D CRA



T1 SES2D CRAY 02

7122-HU1
E0 MJ/KG
0.00+00

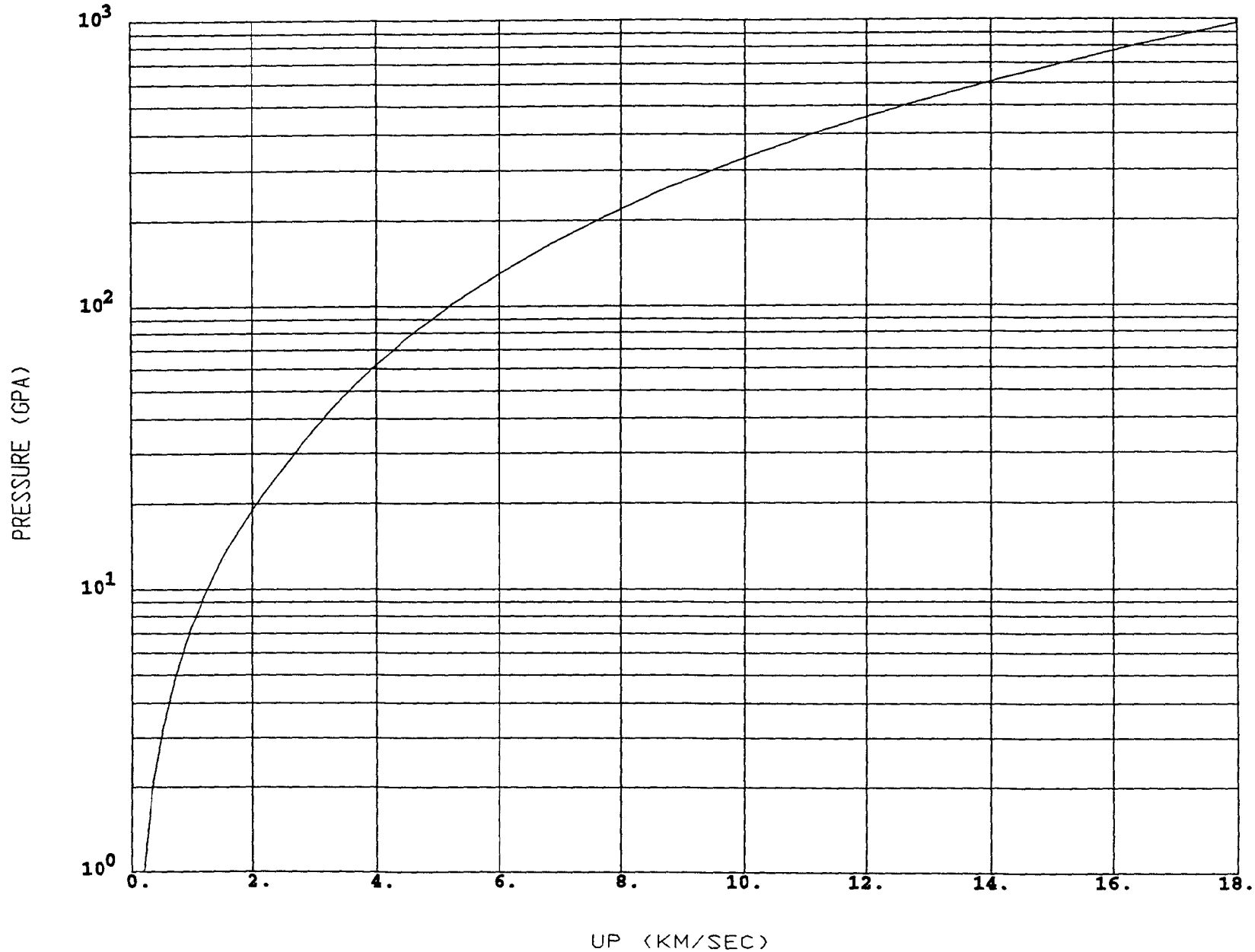
TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRA

7122-HU1
E0 MJ/KG
0.00+00

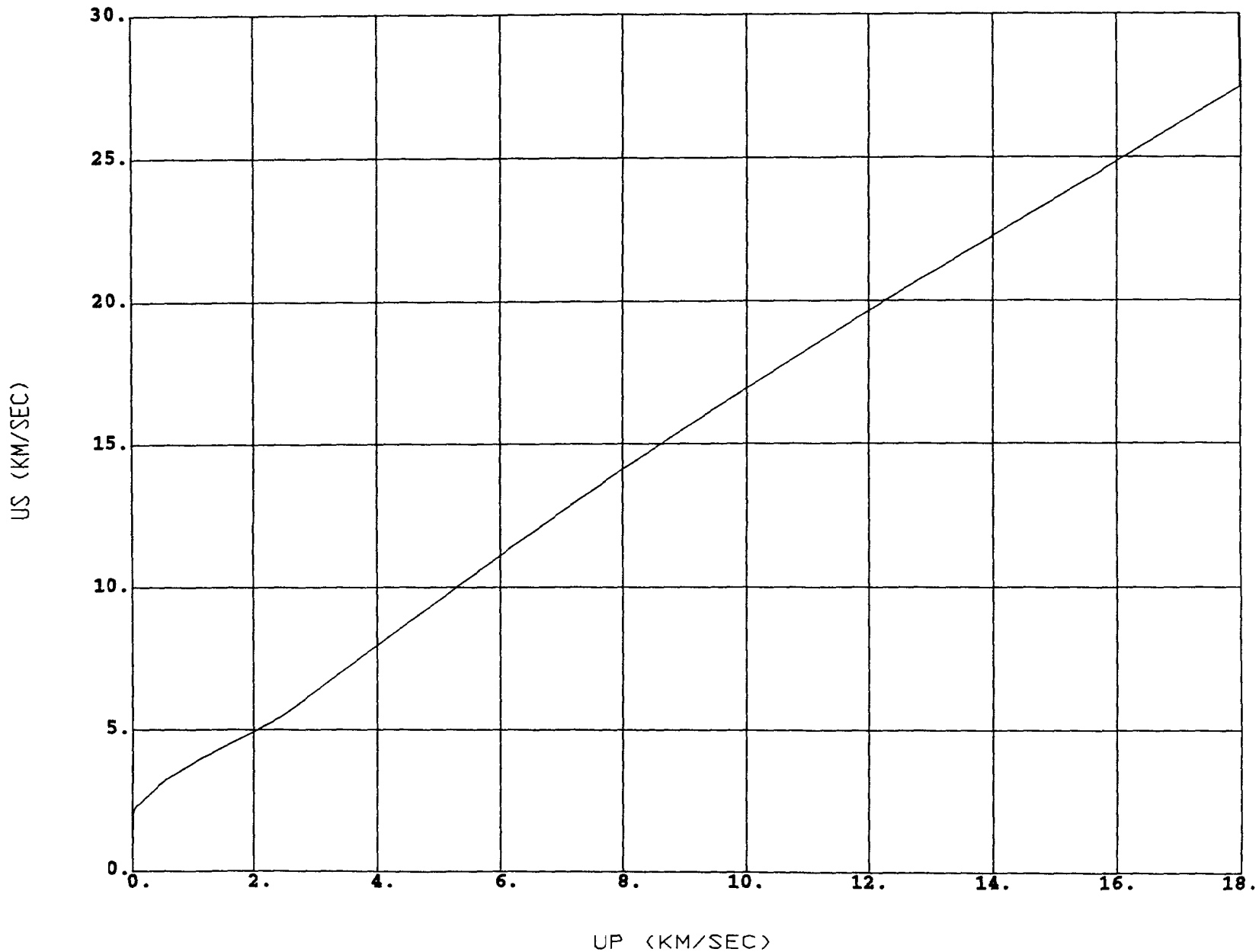
WED 3MAY 95 TABLE 301



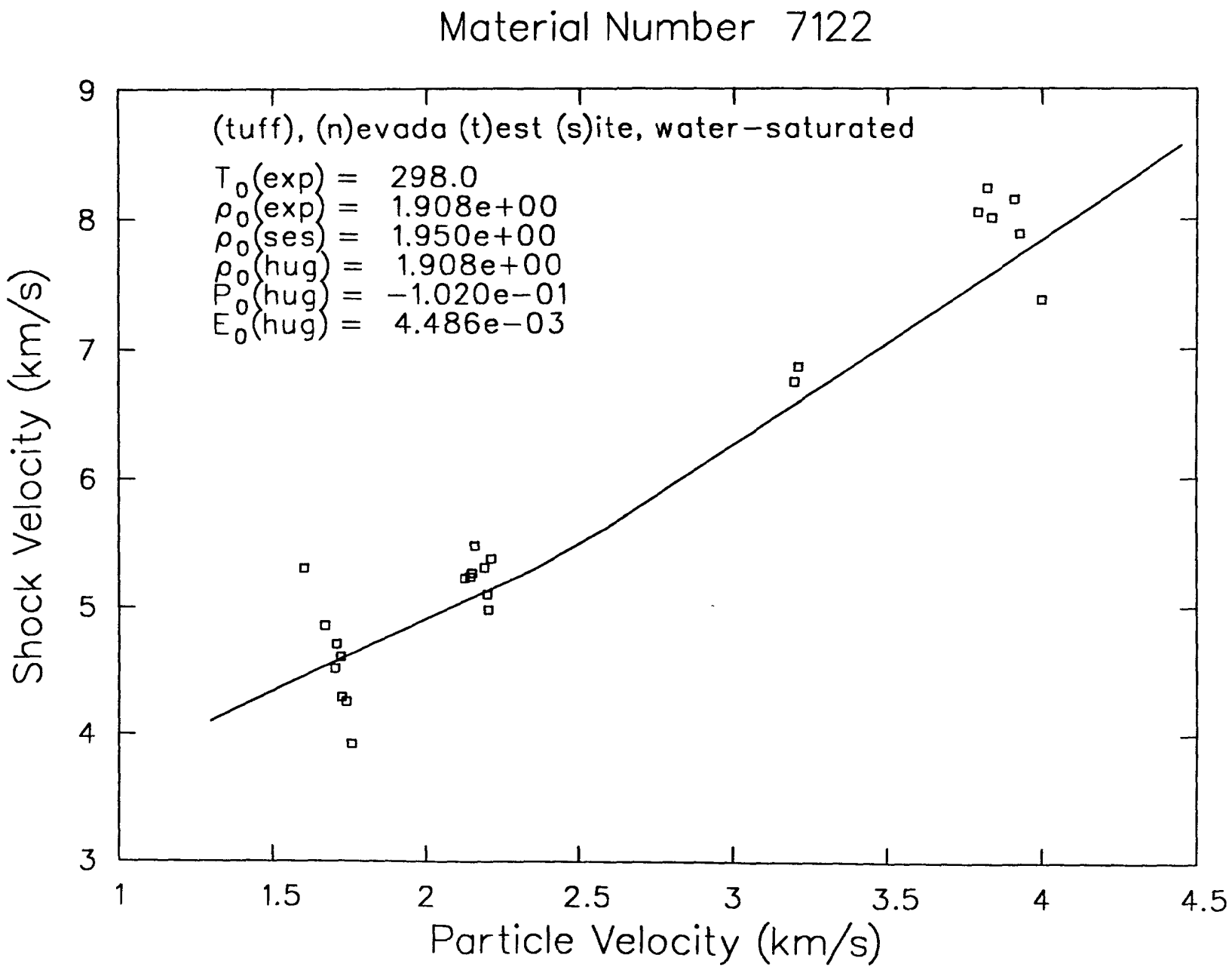
T1 SES2D CRAY 02

7122-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D GRA


Material Number 7122
(tuff), (n)evada (t)est (s)ite, water-saturated
T_0(exp) = 298.0
ρ_0(exp) = 1.908e+00
ρ_0(ses) = 1.950e+00
ρ_0(hug) = 1.908e+00
P_0(hug) = -1.020e-01
E_0(hug) = 4.486e-03
Shock Velocity (km/s)
Particle Velocity (km/s)
9
8
7
6
5
4
3
1
1.5
2
2.5
3
3.5
4
4.5

MATERIAL NUMBER	SUMMARY
7130	MATERIAL. LIMESTONE

COMP. 67.5% CACO3, 23.6% SIO2, 7.0% AL2O3, 1.9% H2O BY WEIGHT
ATOMIC NUMBER. 9.5951E+00
ATOMIC MASS. 1.9194E+01
NORMAL DENSITY. 2.7410E+00

GAMMA(COMPUTED). 1.0075

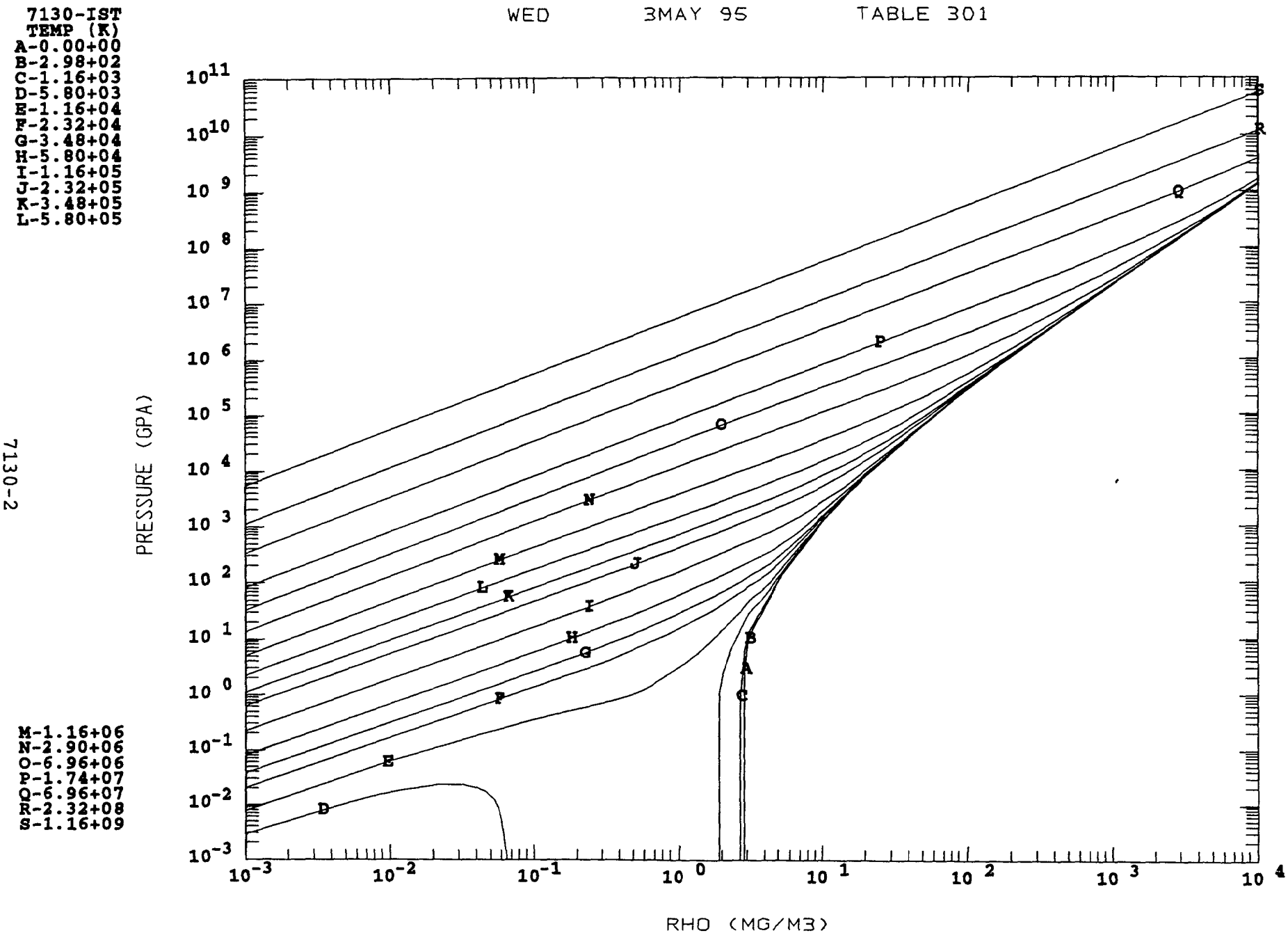
TABLE SUMMARY.

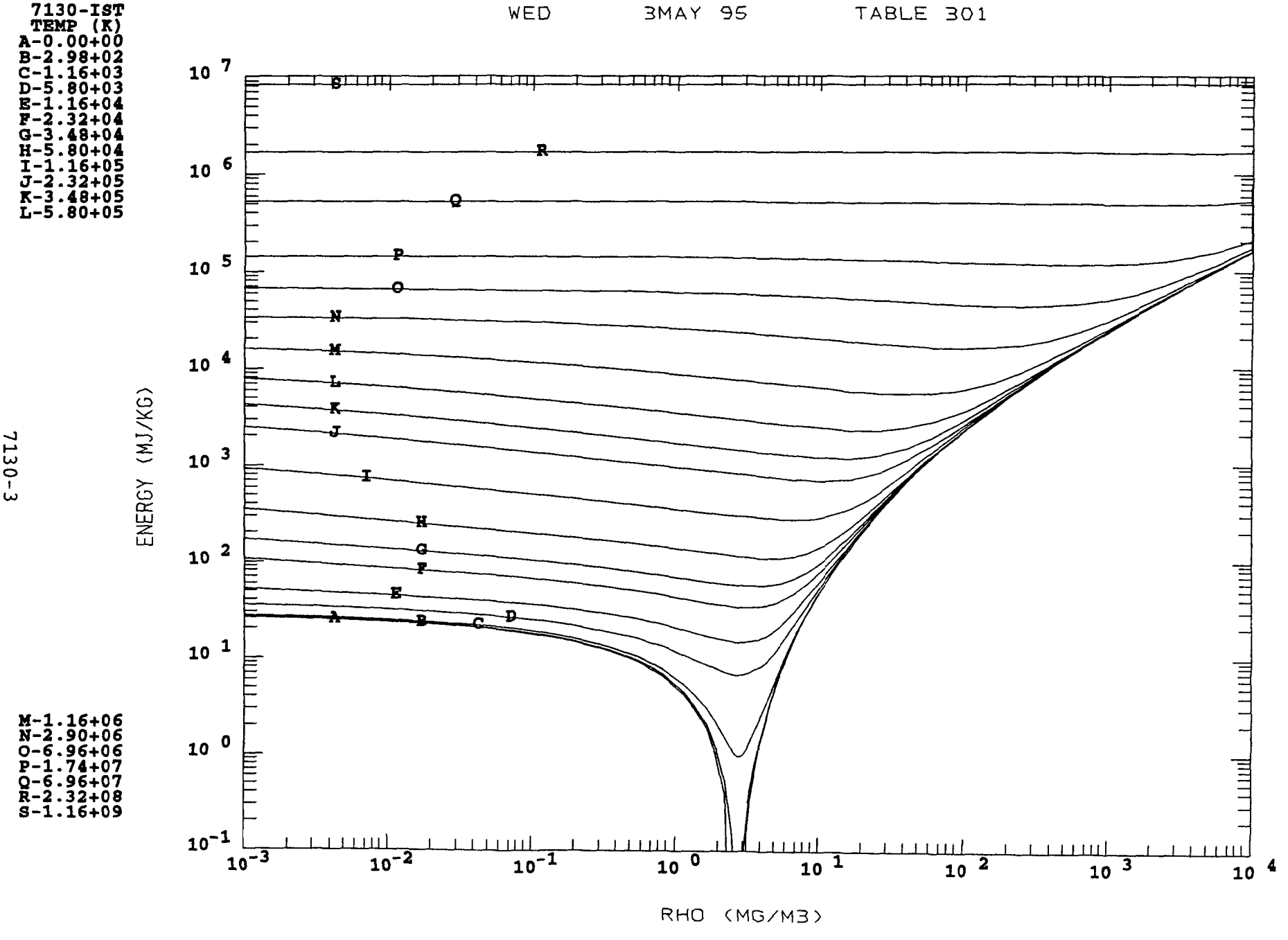
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	22					
102	36					
201	5					
301	8103	72	37	0.0000E+00	2.7410E-06	5.4820E+04
				0.0000E+00	1.2500E-02	9.9999E+04
401	73					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JAN 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 103087.
DATE OF LAST UPDATE. 20288.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. THIS TABLE WAS CONSTRUCTED USING IDEAL MIXING IN GRIZZLY. THE MIXTURE CONSISTS OF 67.5% CACO3 (7331), 23.6% SIO2 (7385), 7.0% AL2O3 (7411), 1.9% H2O (7153) BY WEIGHT. THE 301 TABLE WAS RESCALED TO A DENSITY OF 2.741 AND HAS VAN DER WAALS LOOPS. THE CRITICAL TEMPERATURE IS 9900 K.

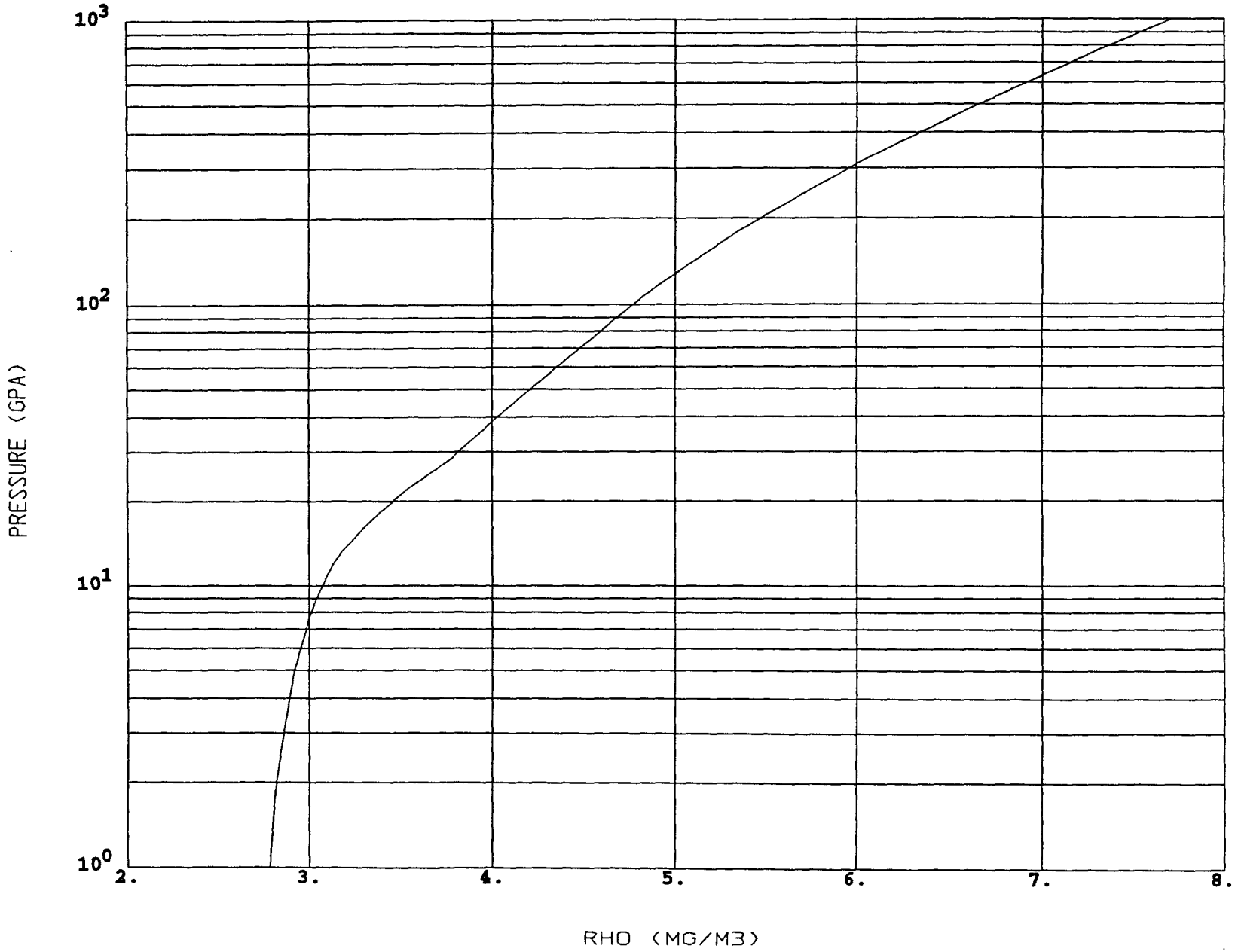

7130-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA



T1 SES2D CRAY 02

7130-HU1
E0 MJ/KG
0.00+00

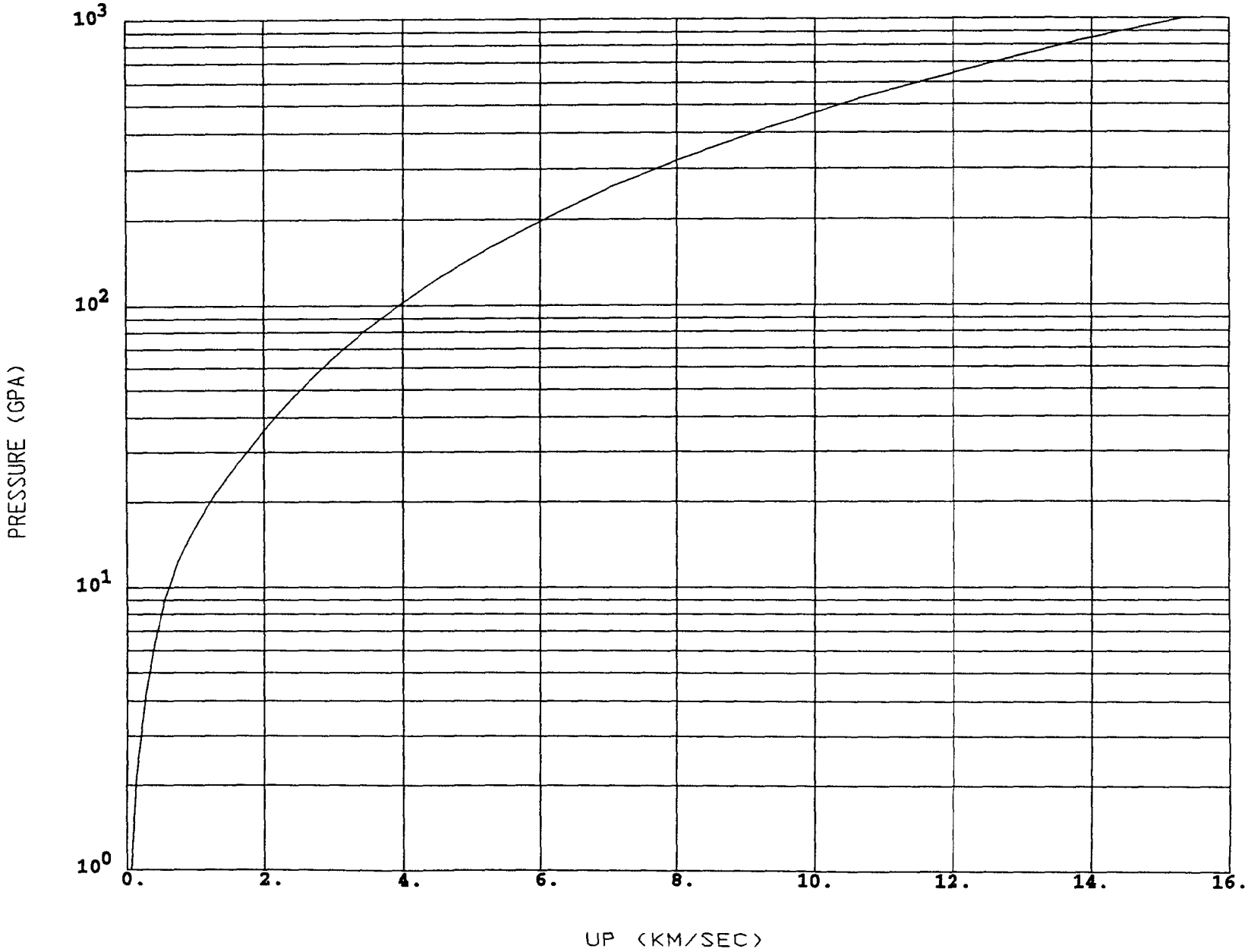
WED 3MAY 95 TABLE 301



T1 SRS2D CRAY

7130-HU1
E0 MJ/KG
0.00+00

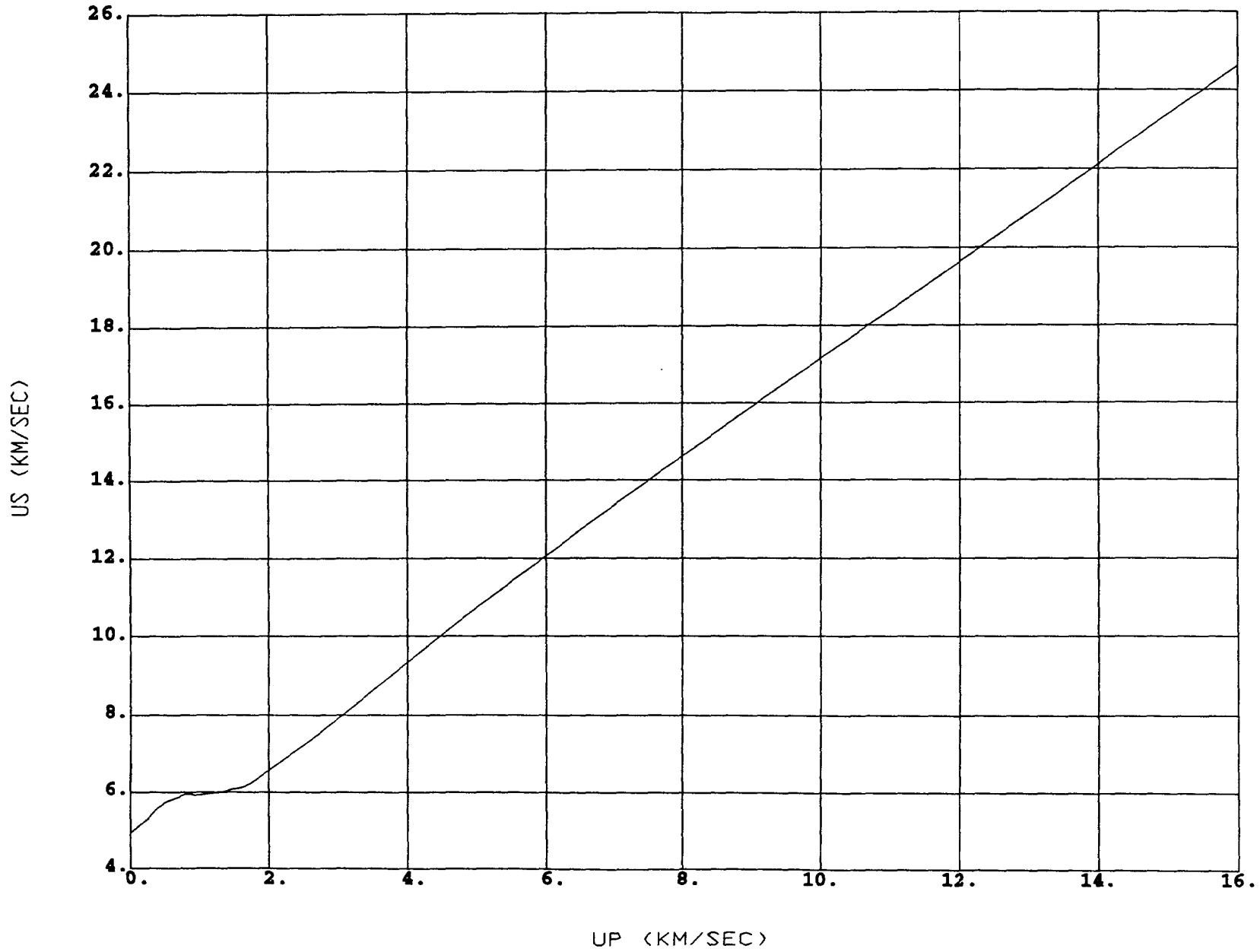
WED 3MAY 95 TABLE 301



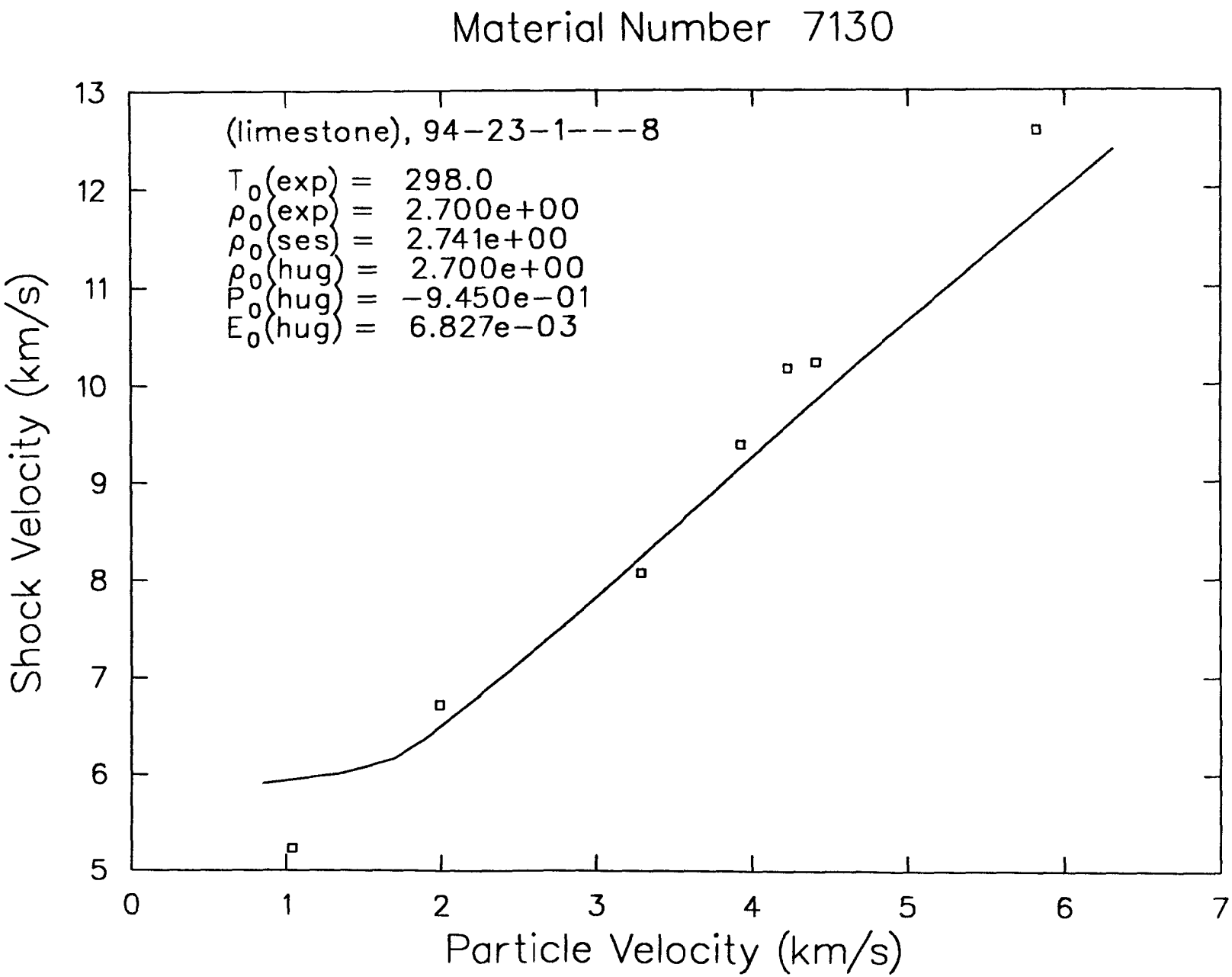
T1 SES2D CRAY 02

7130-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRAY

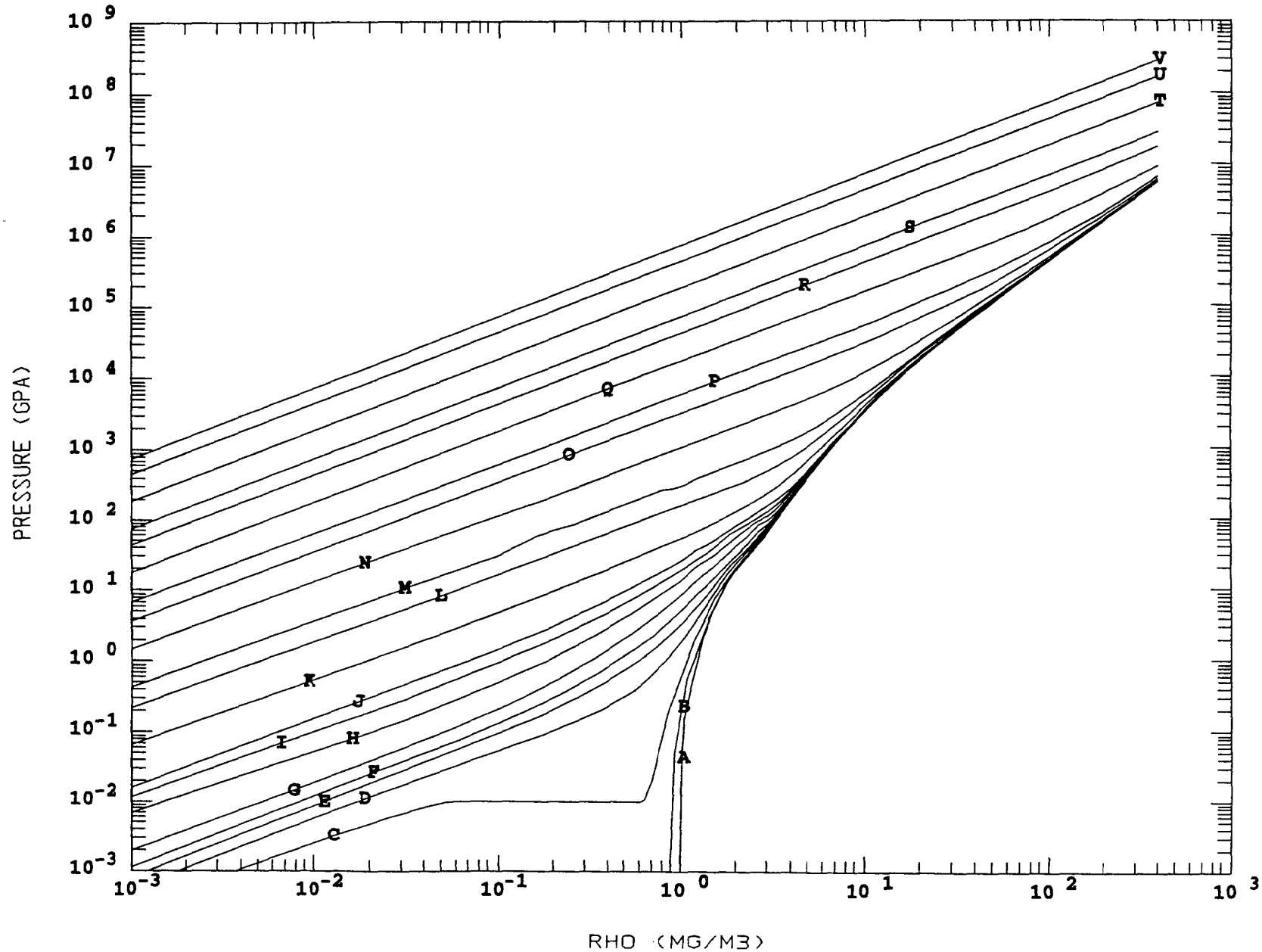

Material Number 7130
(limestone), 94-23-1---8
T_0(exp) = 298.0
ρ_0(exp) = 2.700e+00
ρ_0(ses) = 2.741e+00
ρ_0(hug) = 2.700e+00
P_0(hug) = -9.450e-01
E_0(hug) = 6.827e-03
Shock Velocity (km/s)
Particle Velocity (km/s)
13
12
11
10
9
8
7
6
5
0
1
2
3
4
5
6
7

MATERIAL NUMBER	SUMMARY
7150	MATERIAL. WATER

```
COMP. H2O
ATOMIC NUMBER.   3.3333E+00
ATOMIC MASS.     6.0053E+00
NORMAL DENSITY.  9.9820E-01

GAMMA(COMPUTED).     0.0094

TABLE SUMMARY.
TID    NW  NR  NT    R1/T1      R2/T2      RN/TN
101    19
201     5
301  7166  80  44 2.0000E-06 2.5000E-06 4.0000E+02
                  2.5000E-02 3.0000E-02 1.5000E+04
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 77, JAN 78
VERSION NUMBER.     4
DATE ADDED TO LIBRARY.    61777.
DATE OF LAST UPDATE.     113079.
SOURCE. F. H. REE (LIVERMORE)
REFS. UCRL-7118, UCRL-52190
CODES. SEE REFS
```

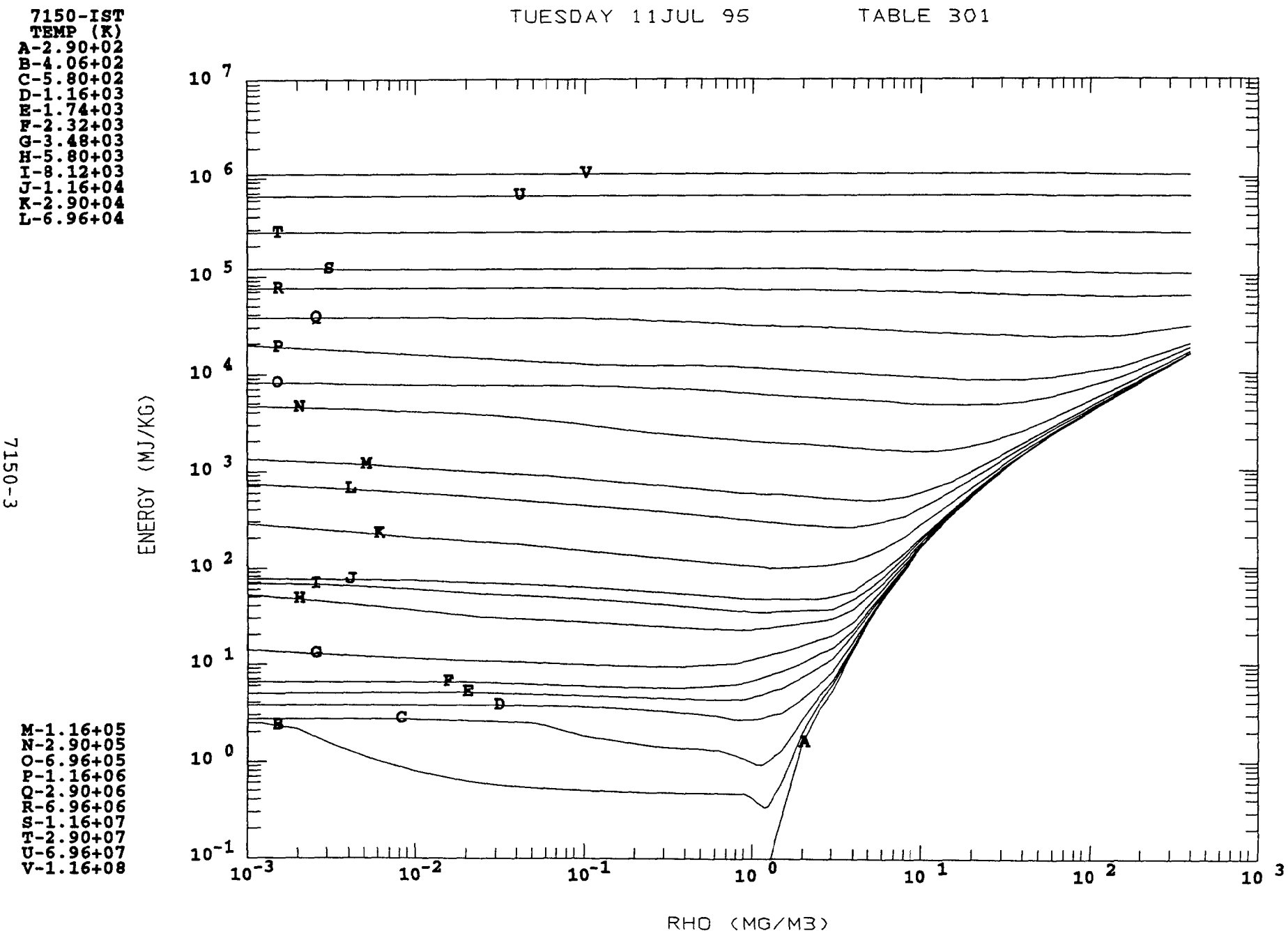
7150-IST
TEMP (K)
A-2.90+02
B-4.06+02
C-5.80+02
D-1.16+03
E-1.74+03
F-2.32+03
G-3.48+03
H-5.80+03
I-8.12+03
J-1.16+04
K-2.90+04
L-6.96+04

TUESDAY 11JUL 95 TABLE 301



M-1.16+05
N-2.90+05
O-6.96+05
P-1.16+06
Q-2.90+06
R-6.96+06
S-1.16+07
T-2.90+07
U-6.96+07
V-1.16+08

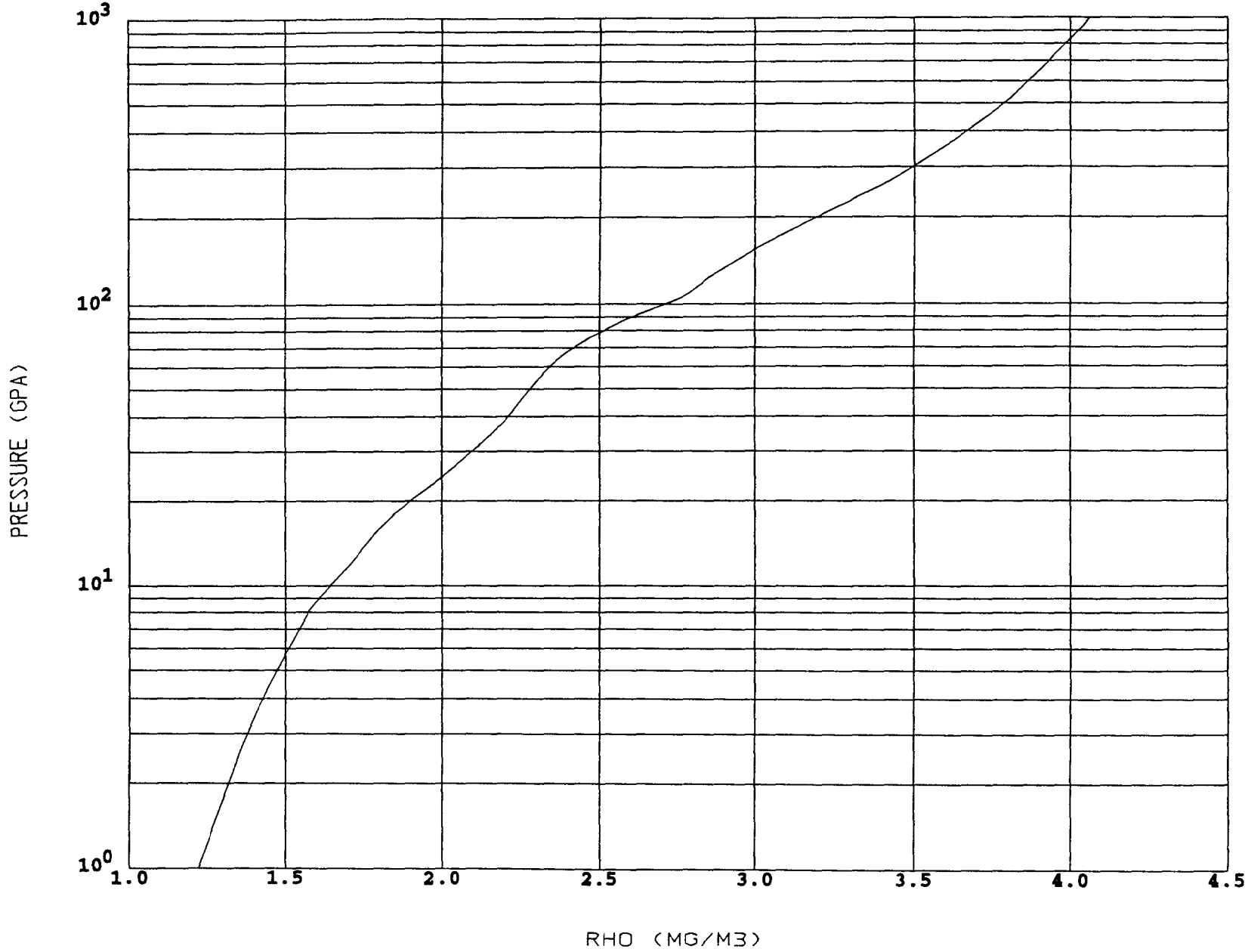
T1 SES2D CRAY



T1 SES2D CRAY 02

7150-HU1
E0 MJ/KG
0.00+00

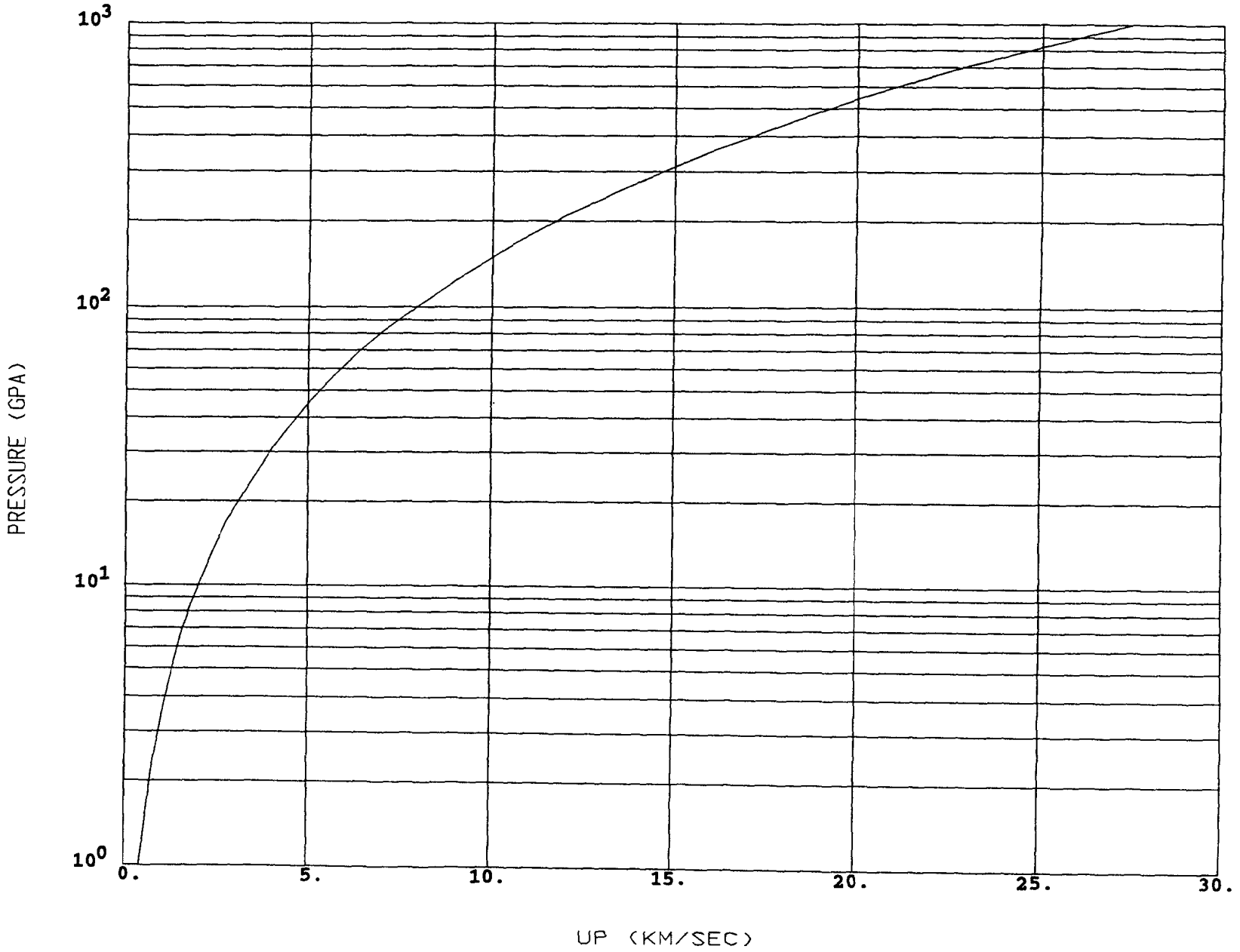
TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRA1

7150-HU1
E0 MJ/KG
0.00+00

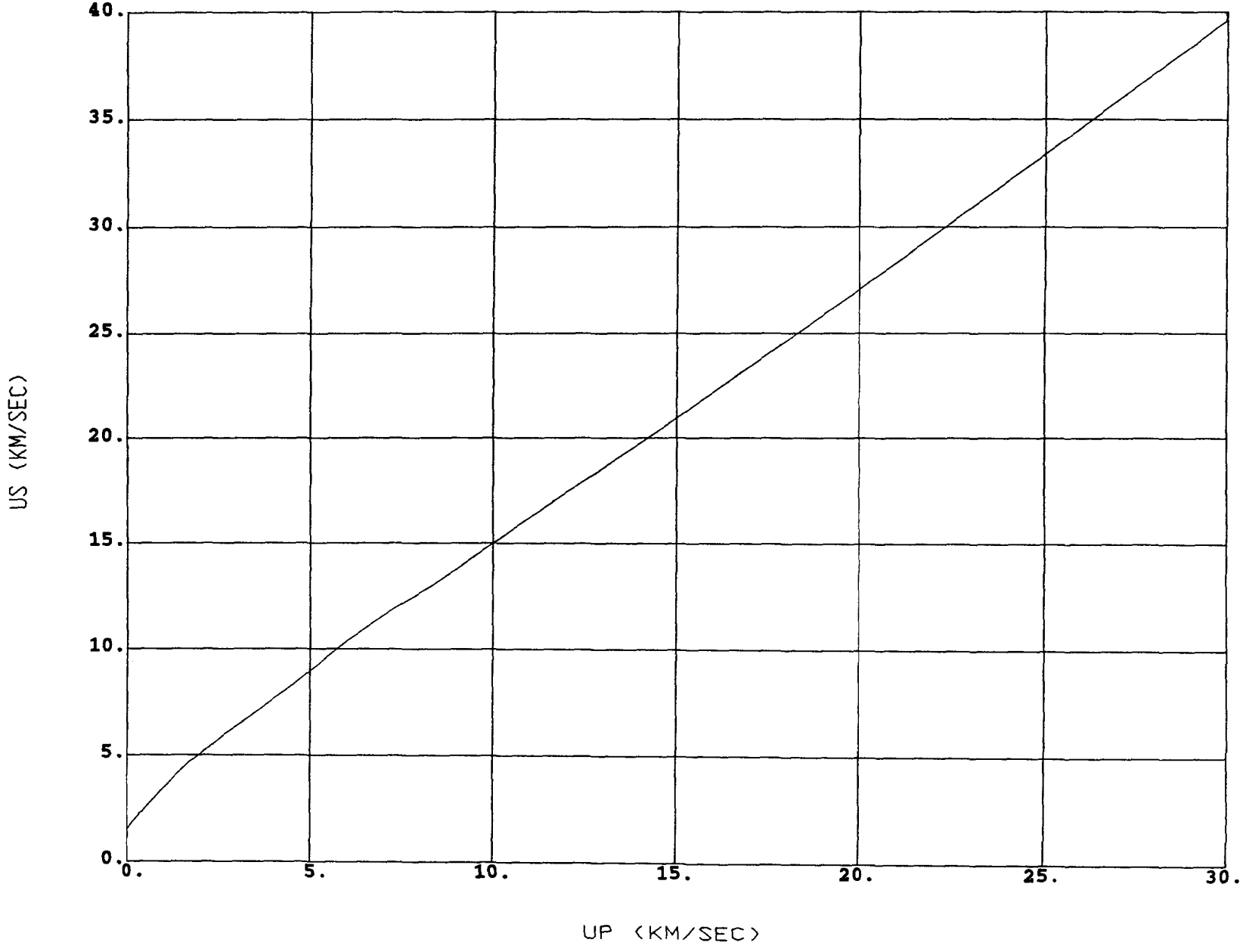
TUESDAY 11JUL 95 TABLE 301



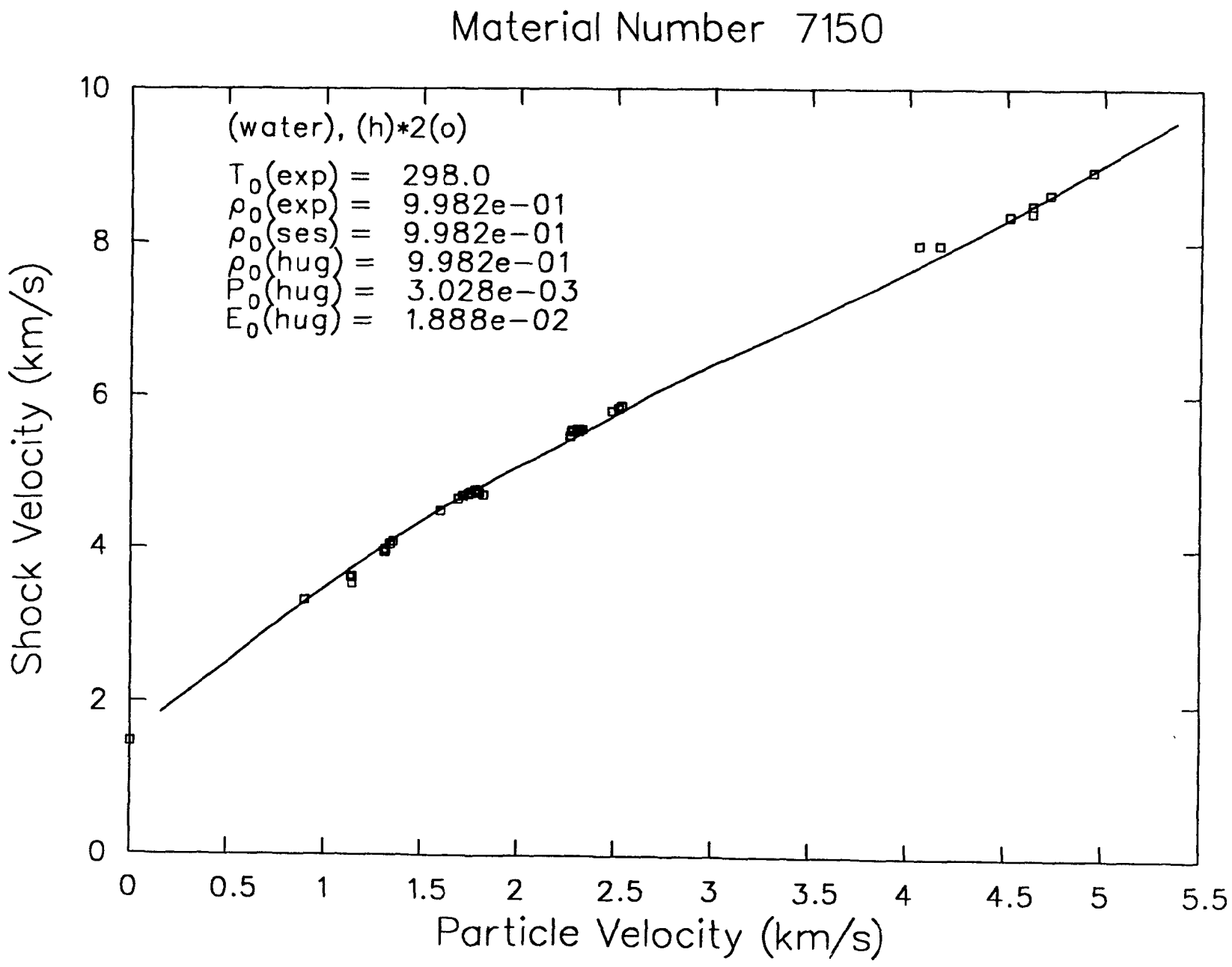
T1 SES2D CRAY 02

7150-HU1
E0 MJ/KG
0.00+00

TUESDAY 11JUL 95 TABLE 301

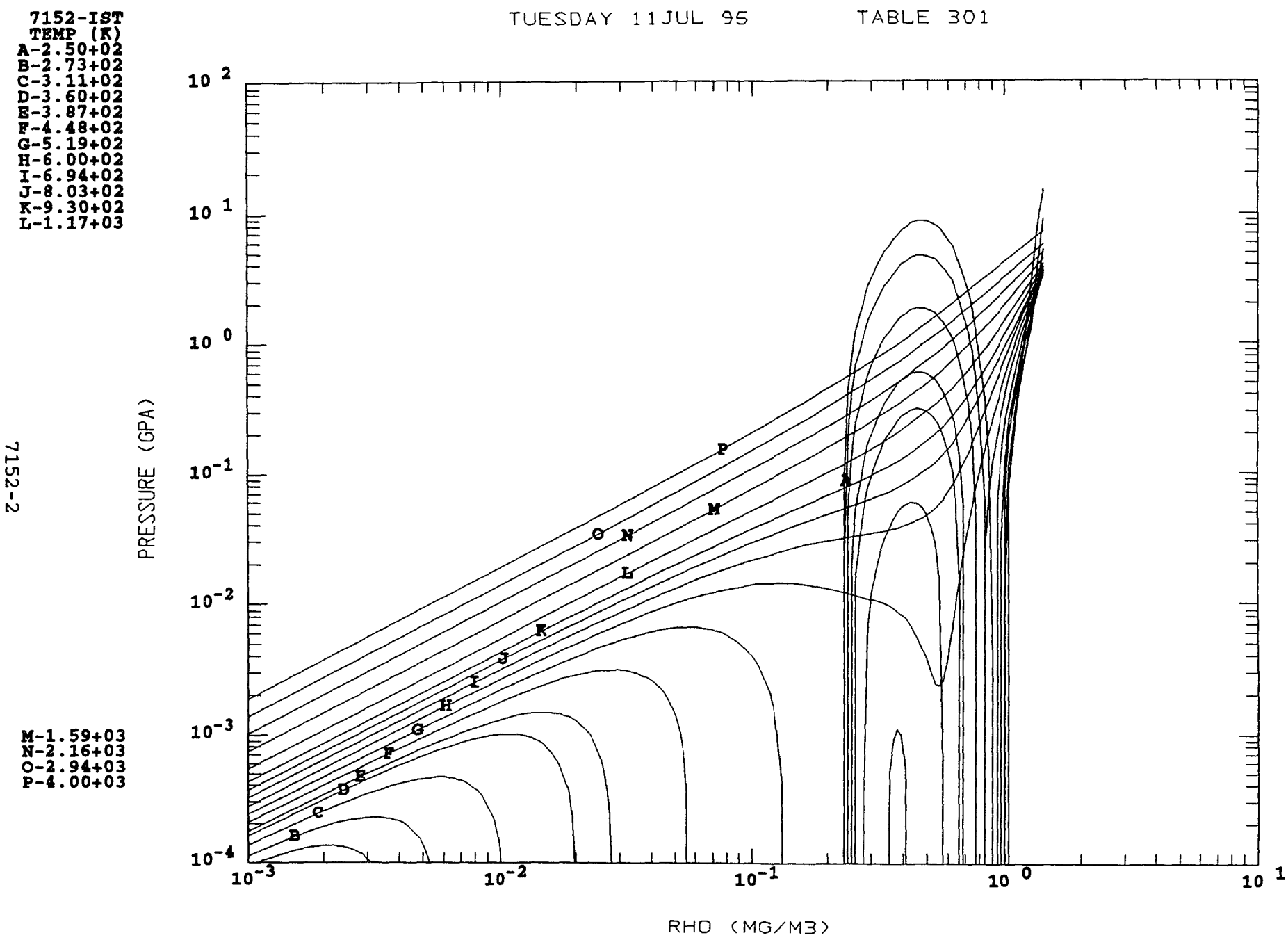


T1 SES2D CRA


Material Number 7150
(water), (h)*2(o)
T_0(exp) = 298.0
ρ_0(exp) = 9.982e−01
ρ_0(ses) = 9.982e−01
ρ_0(hug) = 9.982e−01
P_0(hug) = 3.028e−03
E_0(hug) = 1.888e−02
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5

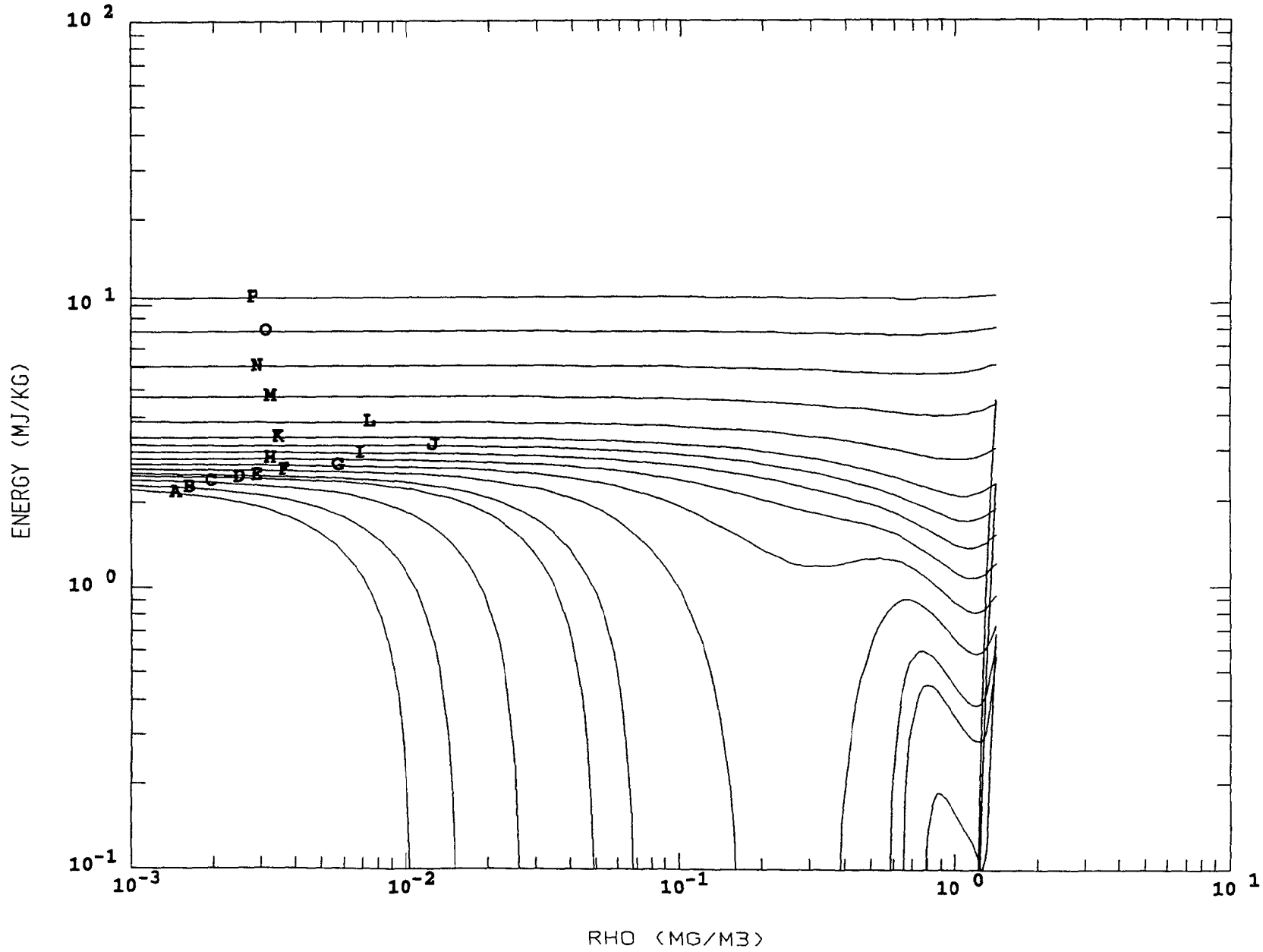
MATERIAL NUMBER	SUMMARY
7152	MATERIAL. WATER

```
COMP. H2O
ATOMIC NUMBER.   3.3333E+00
ATOMIC MASS.     6.0051E+00
NORMAL DENSITY.  9.9978E-01


TABLE SUMMARY.
TID    NW  NR  NT    R1/T1      R2/T2      RN/TN
101    24
201     5
301  6989  74  31 1.0000E-08 1.0000E-07 1.4000E+00
                  2.1542E-02 2.3173E-02 3.4468E-01
401    97
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 81
VERSION NUMBER.     2
DATE ADDED TO LIBRARY.    60981.
DATE OF LAST UPDATE.      61281.
SOURCE. NBS, MARYLAND (J.D. JOHNSON)
REFS. LANL MEMO T-4-1-EX (6-8-81), NBS REPORT WBSIR 81-2253
CODES. NBS STEAM CODE, PANDA
```


7152-IST
TEMP (K)
A-2.50+02
B-2.73+02
C-3.11+02
D-3.60+02
E-3.87+02
F-4.48+02
G-5.19+02
H-6.00+02
I-6.94+02
J-8.03+02
K-9.30+02
L-1.17+03
M-1.59+03
N-2.16+03
O-2.94+03
P-4.00+03
TUESDAY 11JUL 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
7152-2
T1 SES2D CRA

7152-IST
TEMP (K)
A-2.50+02
B-2.73+02
C-3.11+02
D-3.60+02
E-3.87+02
F-4.48+02
G-5.19+02
H-6.00+02
I-6.94+02
J-8.03+02
K-9.30+02
L-1.17+03

TUESDAY 11JUL 95 TABLE 301



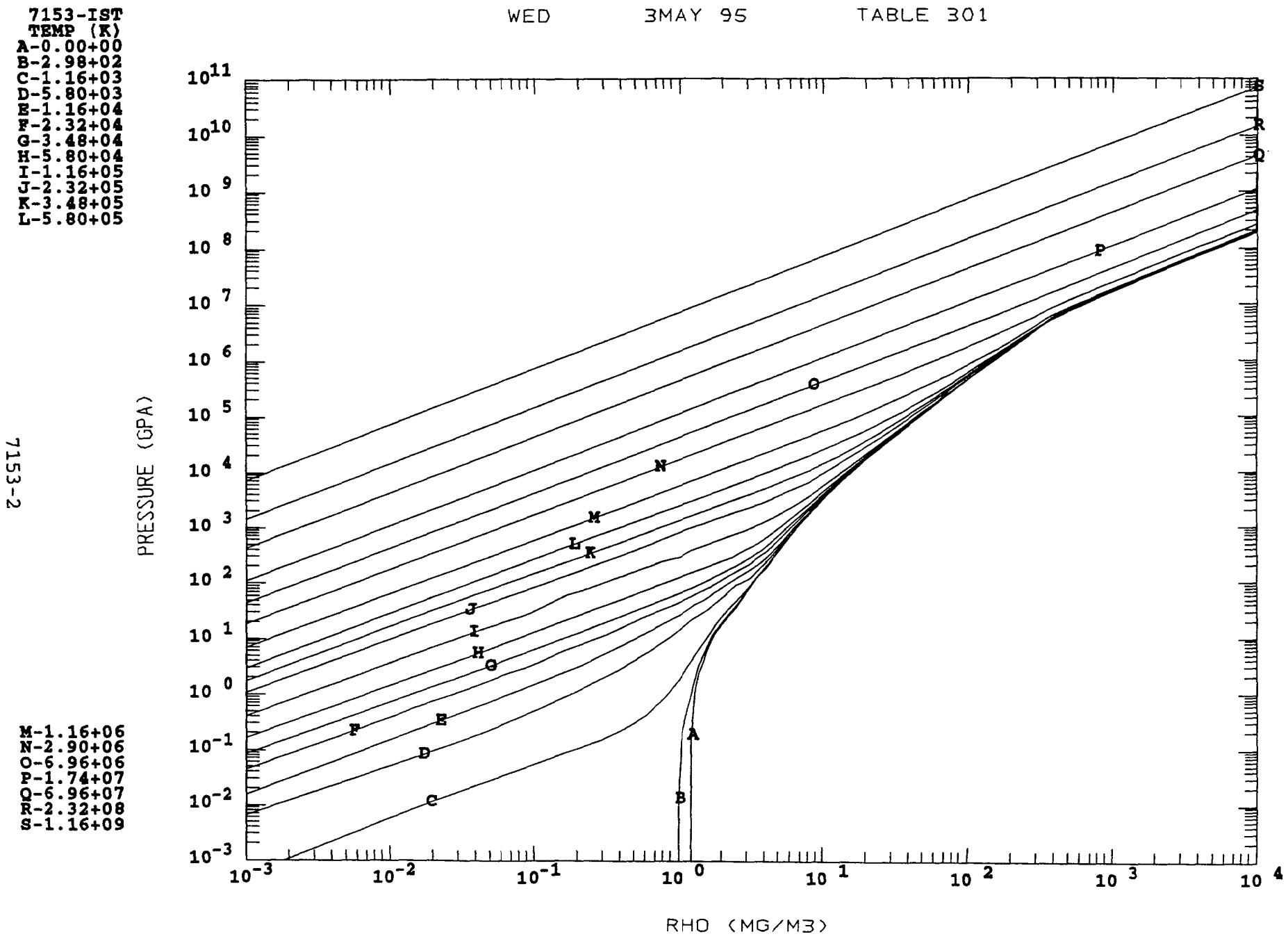
M-1.59+03
N-2.16+03
O-2.94+03
P-4.00+03

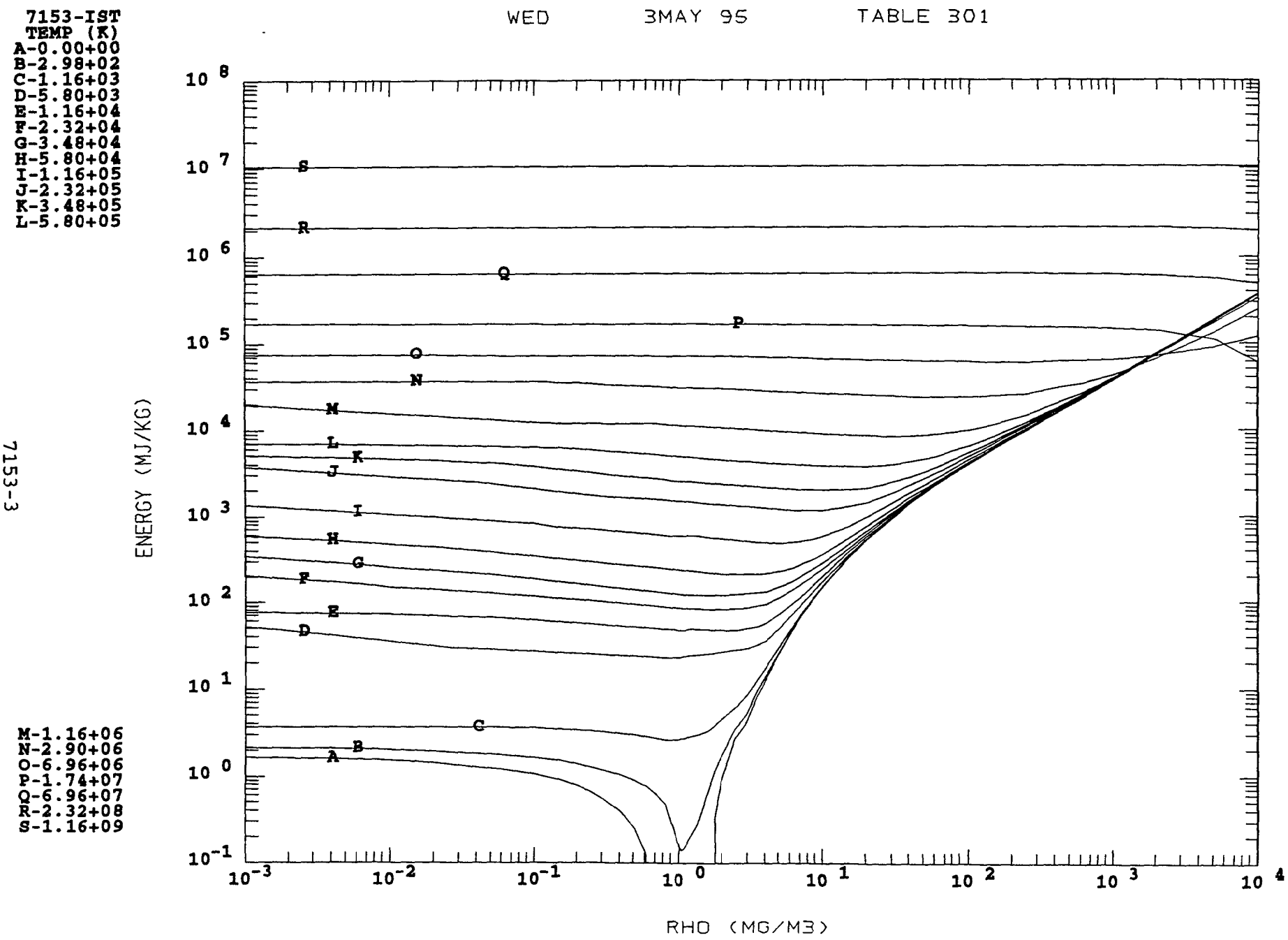
7152-3

T1 SES2D CRAY 02

MATERIAL NUMBER	SUMMARY
7153	MATERIAL. WATER

```
COMP. H2O
ATOMIC NUMBER.   3.3333E+00
ATOMIC MASS.     6.0053E+00
NORMAL DENSITY.  9.9820E-01

GAMMA(COMPUTED).     0.6791

TABLE SUMMARY.
TID    NW  NR  NT    R1/T1      R2/T2      RN/TN
101    18
102    12
201     5
301  7655  68  37 0.0000E+00 9.9820E-07 1.9964E+04
                  0.0000E+00 1.2500E-02 9.9999E+04
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 87
VERSION NUMBER.     1
DATE ADDED TO LIBRARY.    50787.
DATE OF LAST UPDATE.      61287.
SOURCE. J. BARNES, S. LYON
REFS. UCRL-7118, UCRL-52190
CODES. GRIZZLY

COMMENTS. THIS IS THE SAME AS 7150 EXCEPT THAT IT HAS BEEN
RE-TABULATED ON THE STANDARD GRIZZLY GRID.
```

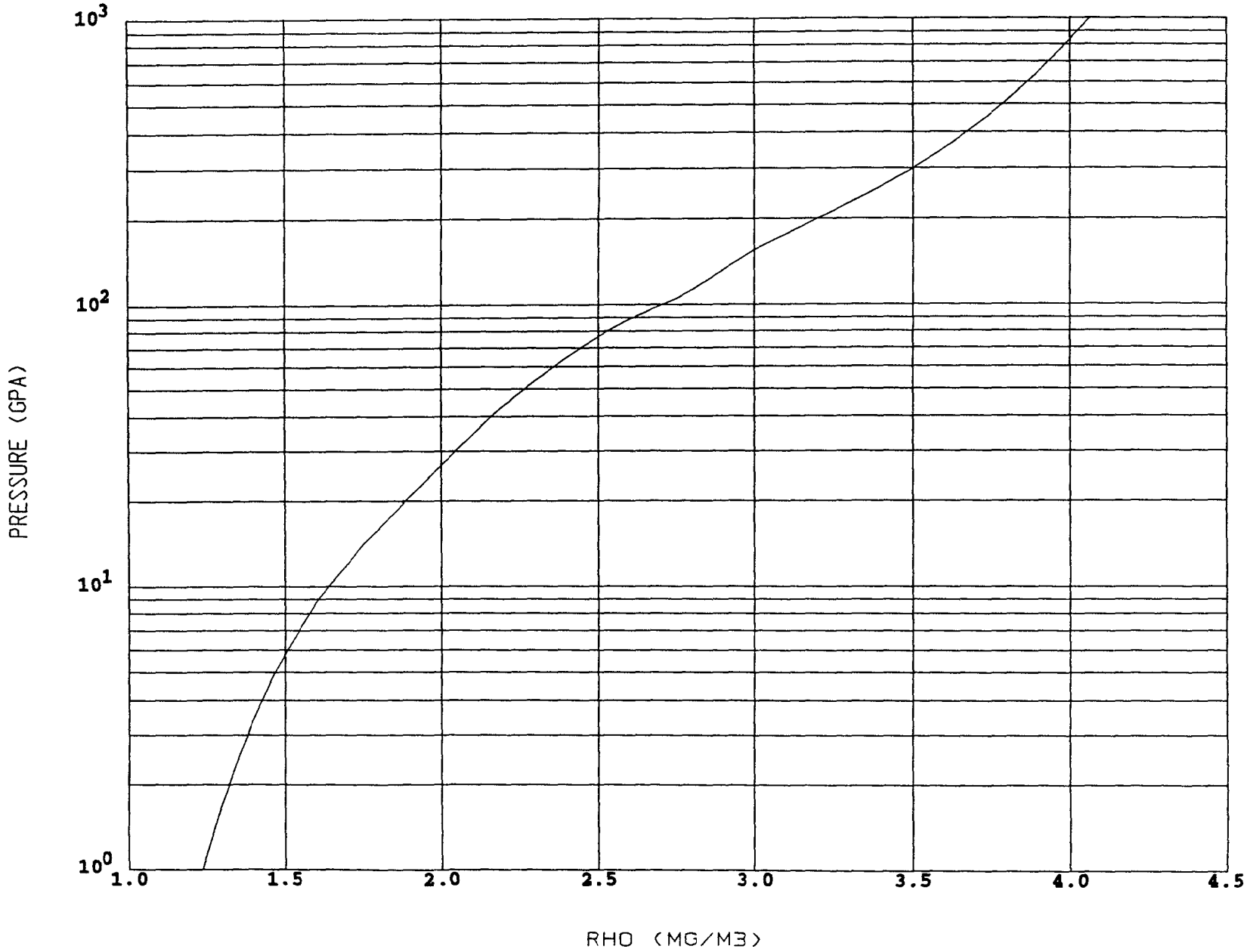

7153-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
7153-2



T1 SES2D CRAY 02

7153-HU1
E0 MJ/KG
0.00+00

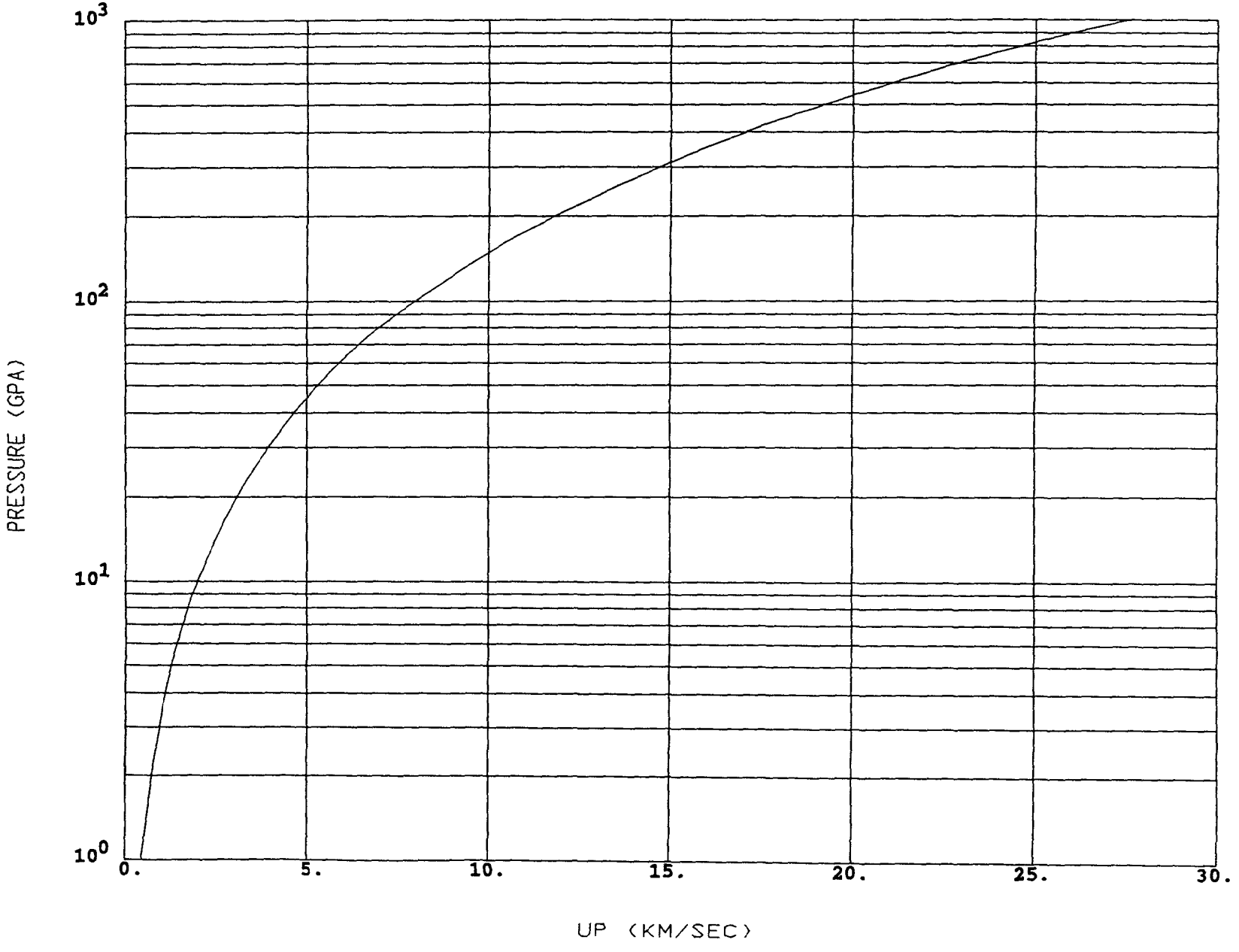
TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRAY

7153-HU1
E0 MJ/KG
0.00+00

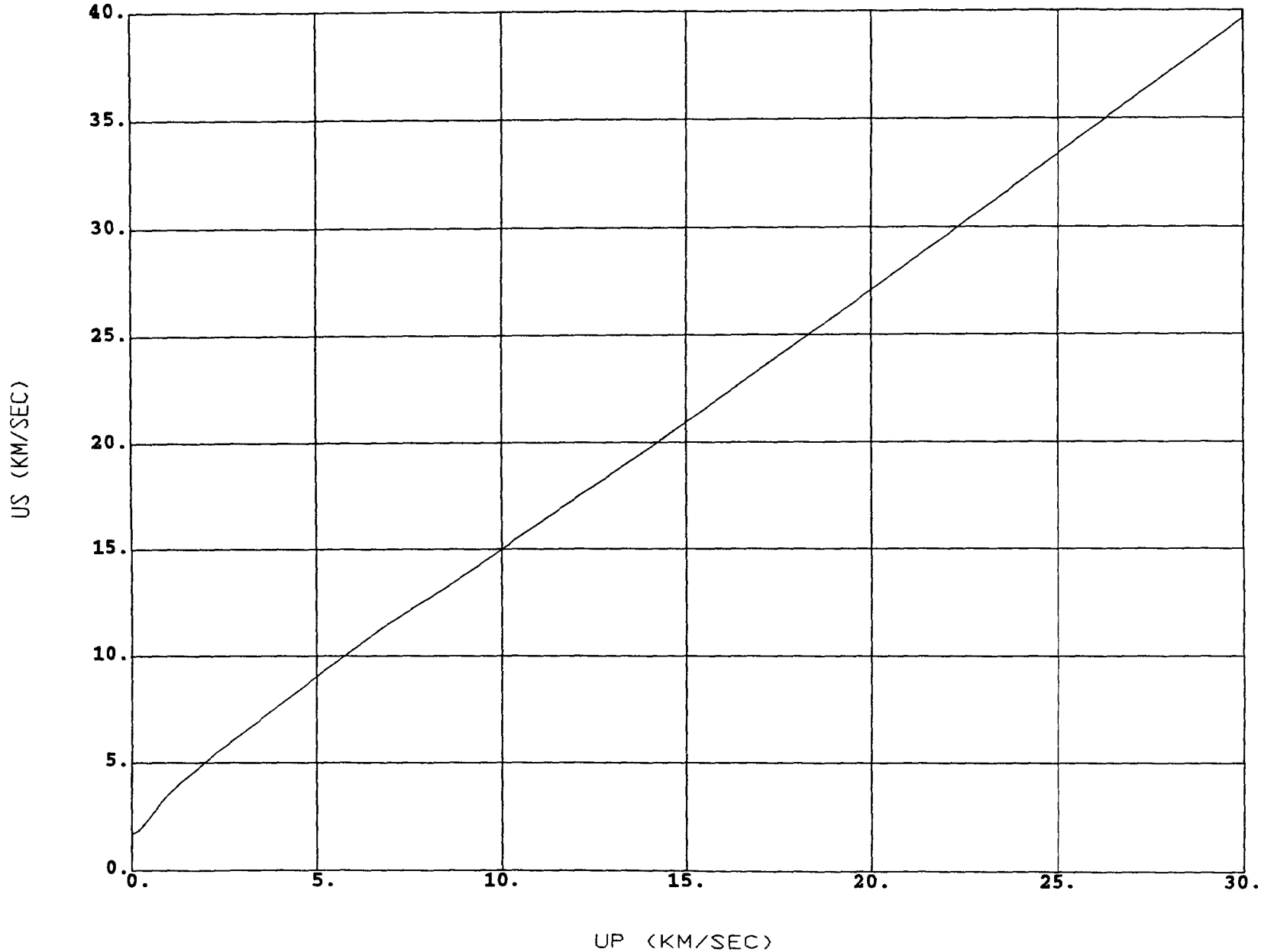
WED 3MAY 95 TABLE 301

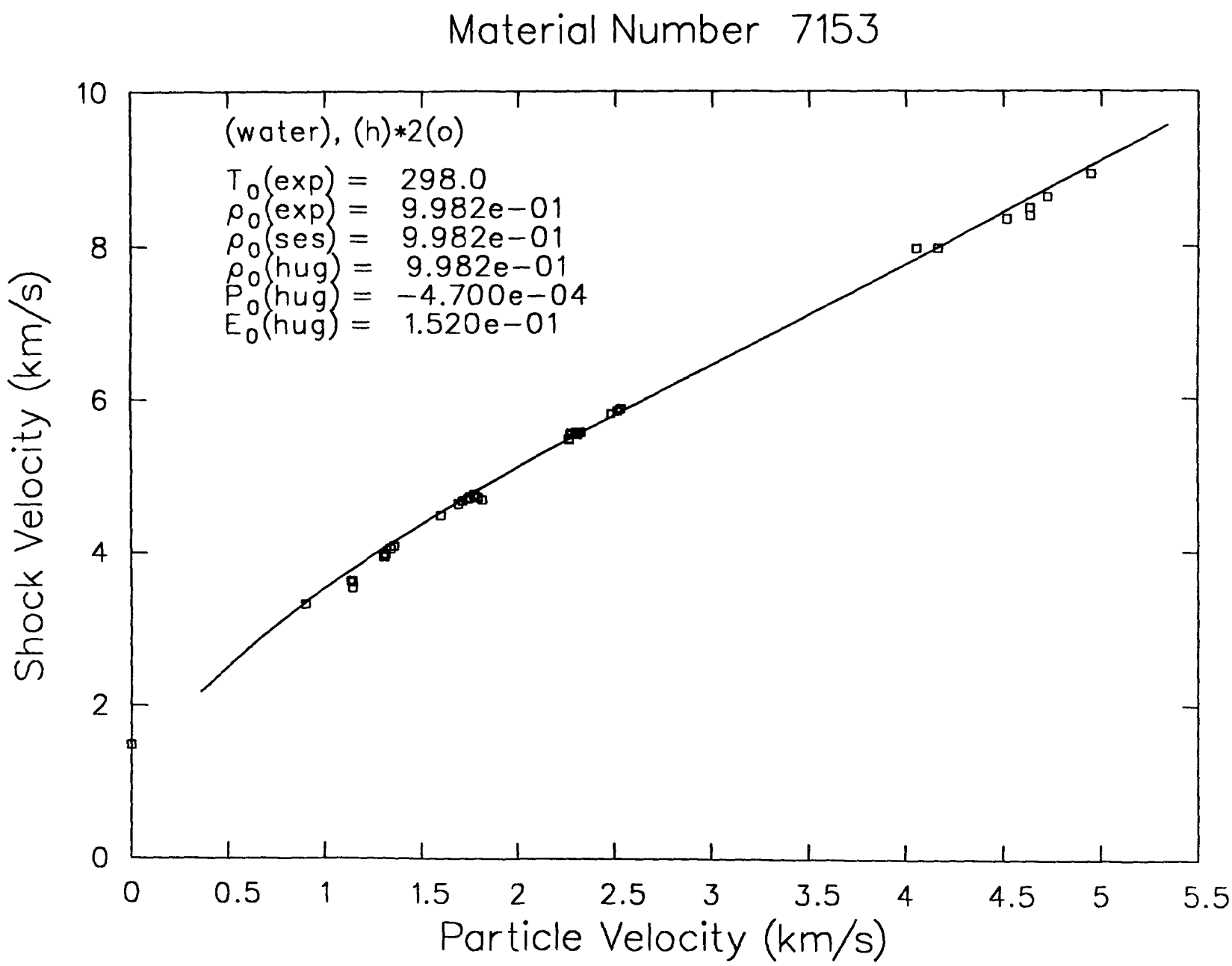


T1 SES2D CRAY 02

7153-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301




Material Number 7153
(water), (h)*2(o)
T_0(exp) = 298.0
ρ_0(exp) = 9.982e-01
ρ_0(ses) = 9.982e-01
ρ_0(hug) = 9.982e-01
P_0(hug) = -4.700e-04
E_0(hug) = 1.520e-01
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5

MATERIAL NUMBER SUMMARY

7154 MATERIAL. WATER

COMP. H2O
ATOMIC NUMBER. 3.3330E+00
ATOMIC MASS. 6.0050E+00
NORMAL DENSITY. 9.9800E-01

GAMMA(COMPUTED). 0.4481

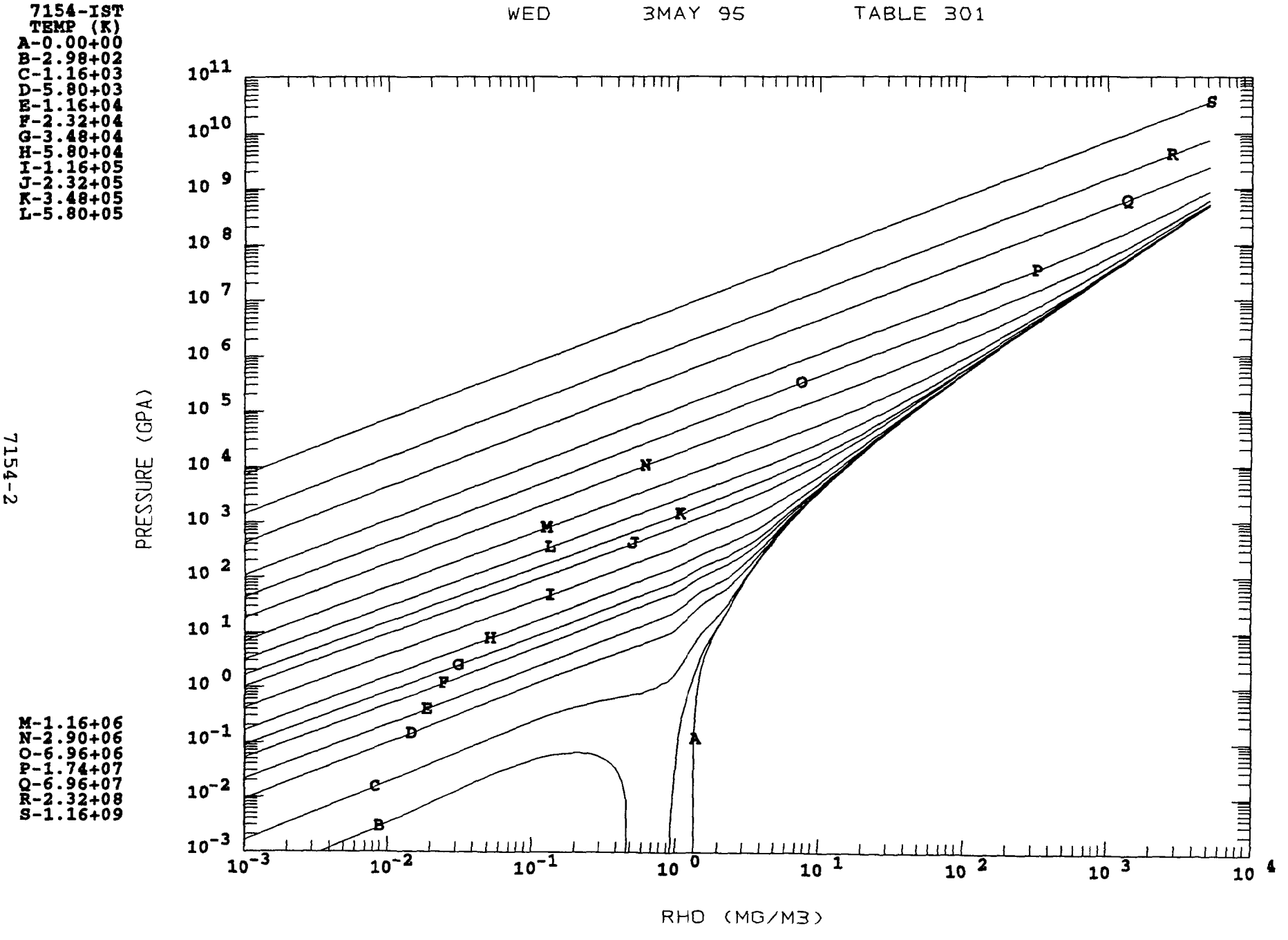
TABLE SUMMARY.

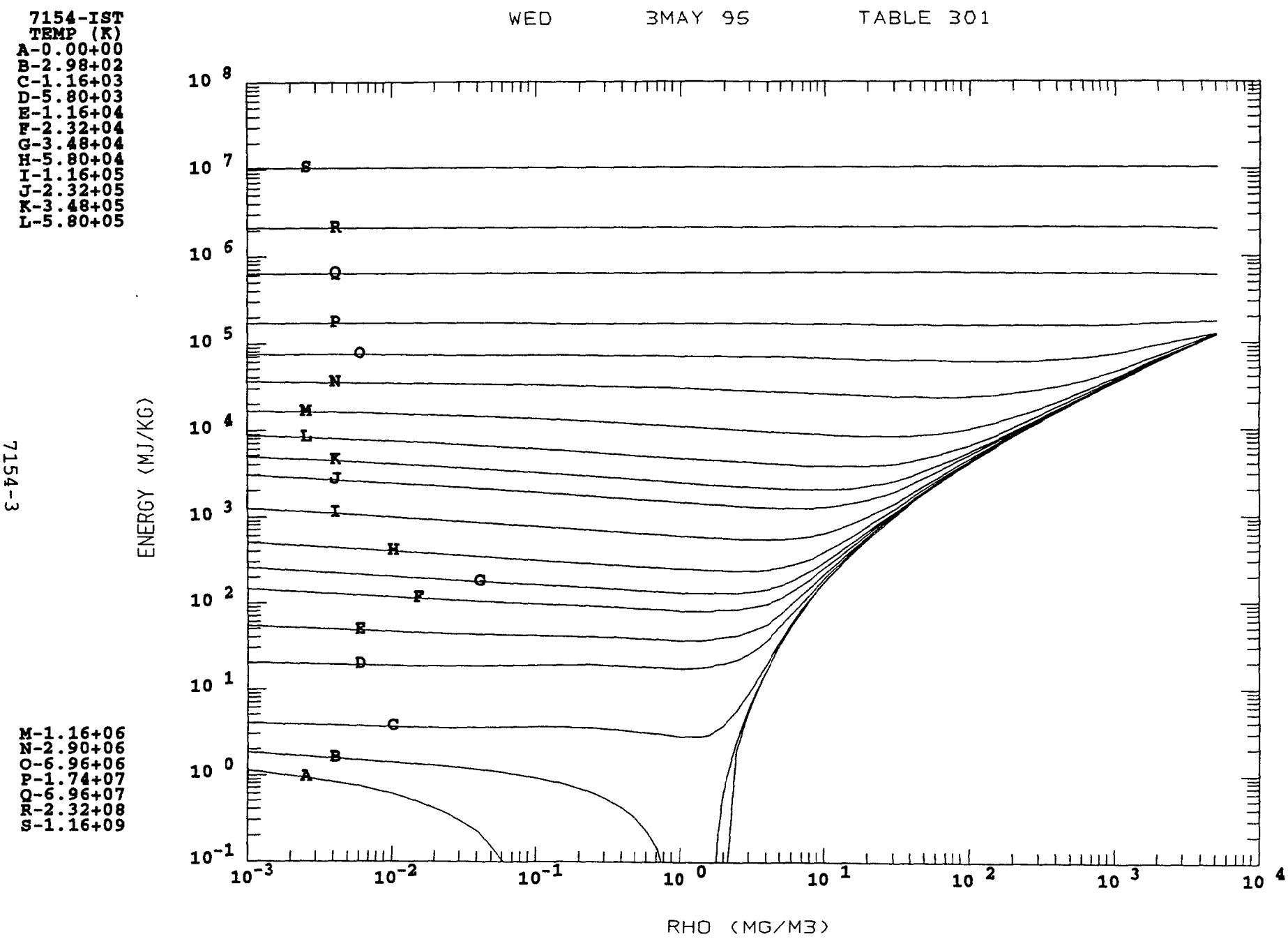
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	106					
201	5					
301	7431	66	37	0.0000E+00	9.9800E-07	4.9900E+03
				0.0000E+00	1.2500E-02	9.9999E+04
304	7207	64	37	0.0000E+00	1.3062E-06	1.3062E+03
				0.0000E+00	1.2500E-02	9.9999E+04
305	7319	65	37	9.9800E-07	1.9960E-06	4.9900E+03
				0.0000E+00	1.2500E-02	9.9999E+04
306	263	65	1	9.9800E-07	1.9960E-06	4.9900E+03
				0.0000E+00	-5.8764E-12	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. MAY 90
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 52290.
DATE OF LAST UPDATE. 80290.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

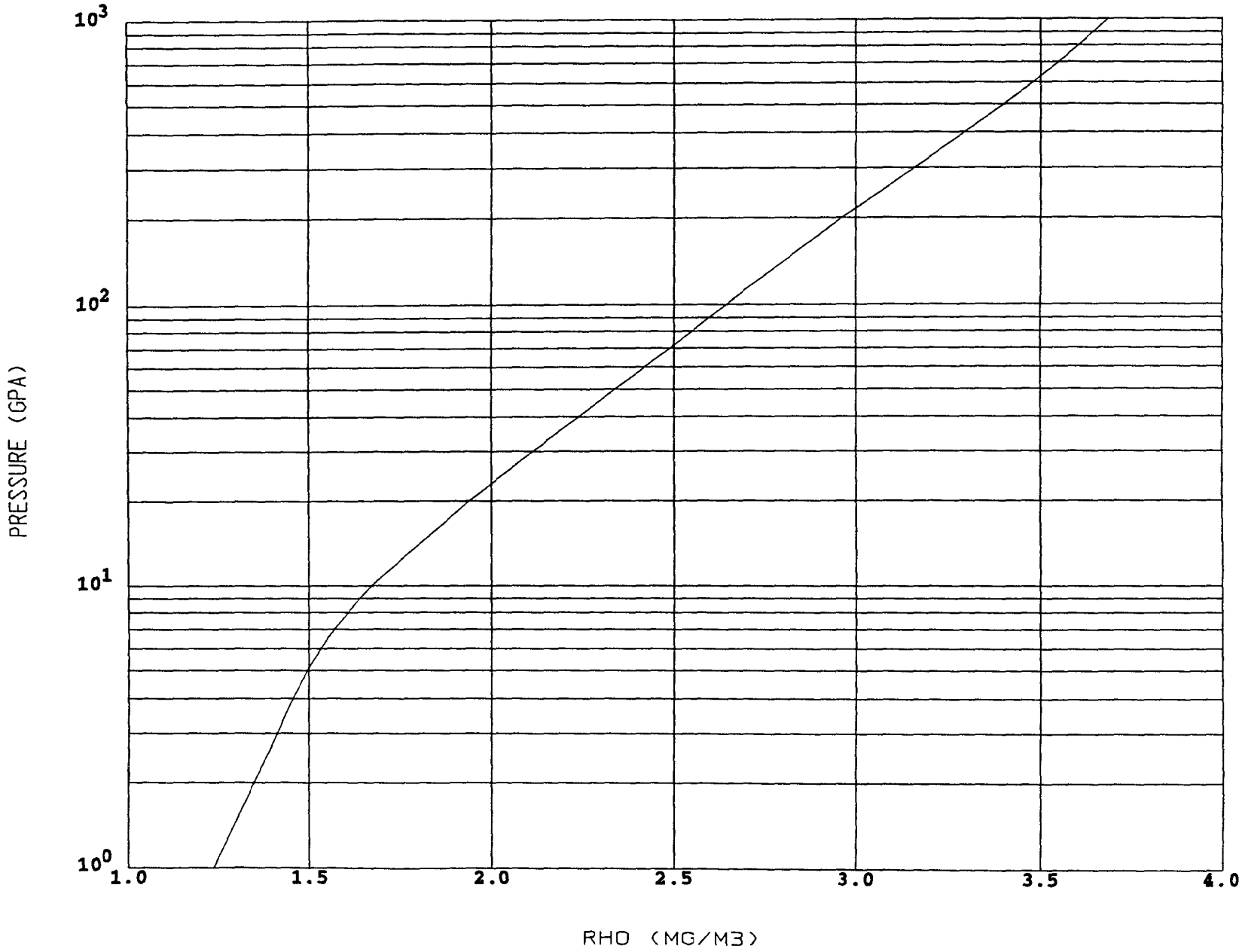
COMMENTS. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION(304). HYDROGEN AND OXYGEN WERE CALCULATED SEPARATELY AND MIXED WITH ADDITIVE VOLUME MIXING. AVERAGE ATOM MODELING WAS USED FOR THE NUCLEAR TABLE (305) EXCEPT FOR THE IDEAL GAS PORTION WHERE IDEAL MIXING WAS USED. CHARTJD NUCLEAR MODEL WITHGENERALIZED JD GAMMA (IGRUN=9). GAMREF = 0.5, GAMEPS = (0.66667,1.0), DGAMMA = (4.0,1.0), DEBKEL = 230.0, TMELT = 273.0. THE COLD CURVE BELOW RHO = 2.582 WAS OBTAINED USING AVERAGE ATOM MODELING AND SHOCK DATA. THE HIGH DENSITY COLD CURVE WAS CALCULATED USING ADDITIVE VOLUME MIXING (COLDMX). THE COMPLETE COLD CURVE (306) WAS OBTAINED BY MATCHING THE TWO. (UP,US) DATA (0.0,1.5), (1.708,4.67), (8.0,13.057). ECOHKC = 5.0, FACLJ = 0.15, CMAT = 2.582. THE 301 TABLE HAS VAN DER WAALS LOOPS. THE CRITICAL TEMPERATURE IS 610 K.


7154-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY


7154-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7154-HU1
E0 MJ/KG
0.00+00

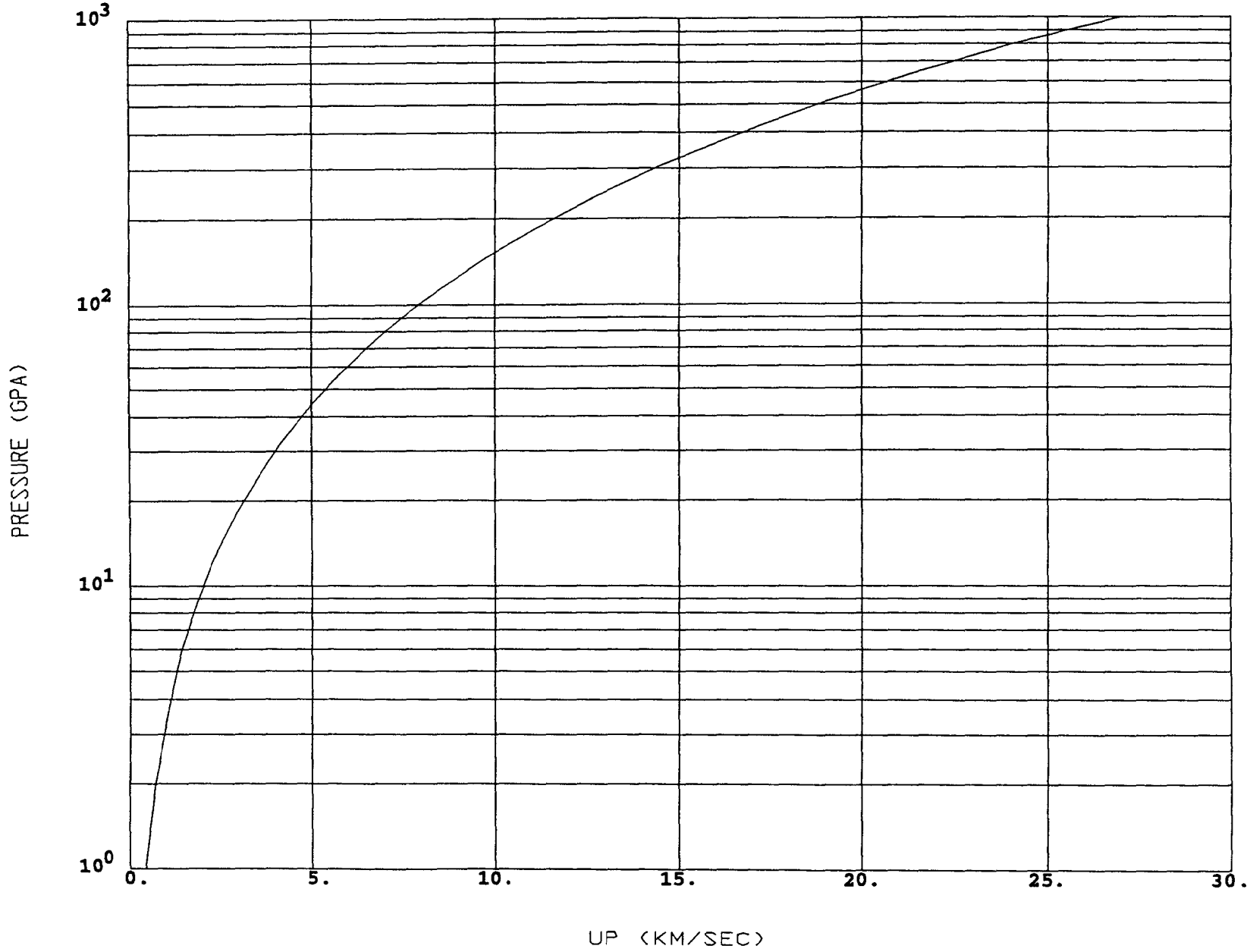
TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRAY

7154-HU1
E0 MJ/KG
0.00+00

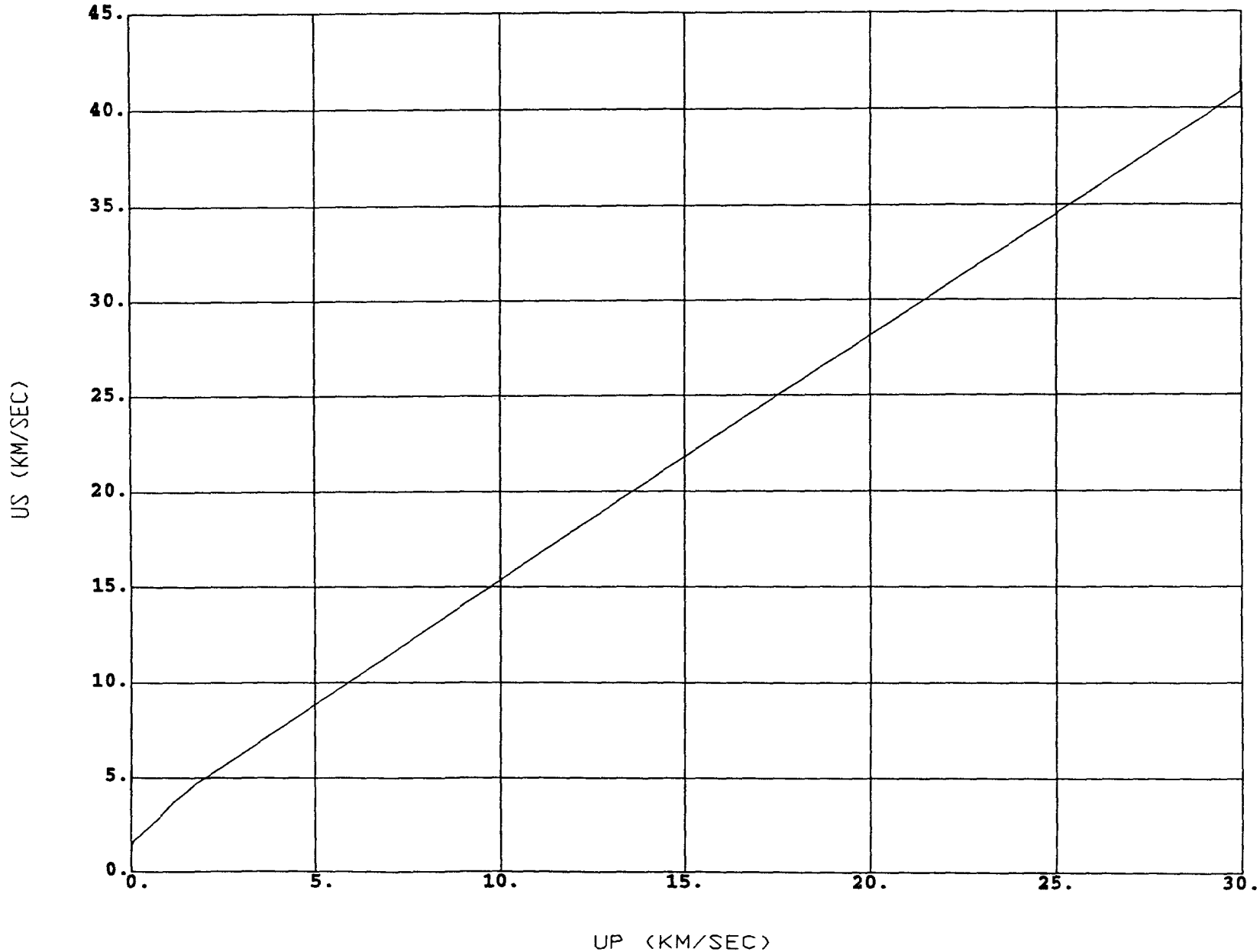
WED 3MAY 95 TABLE 301



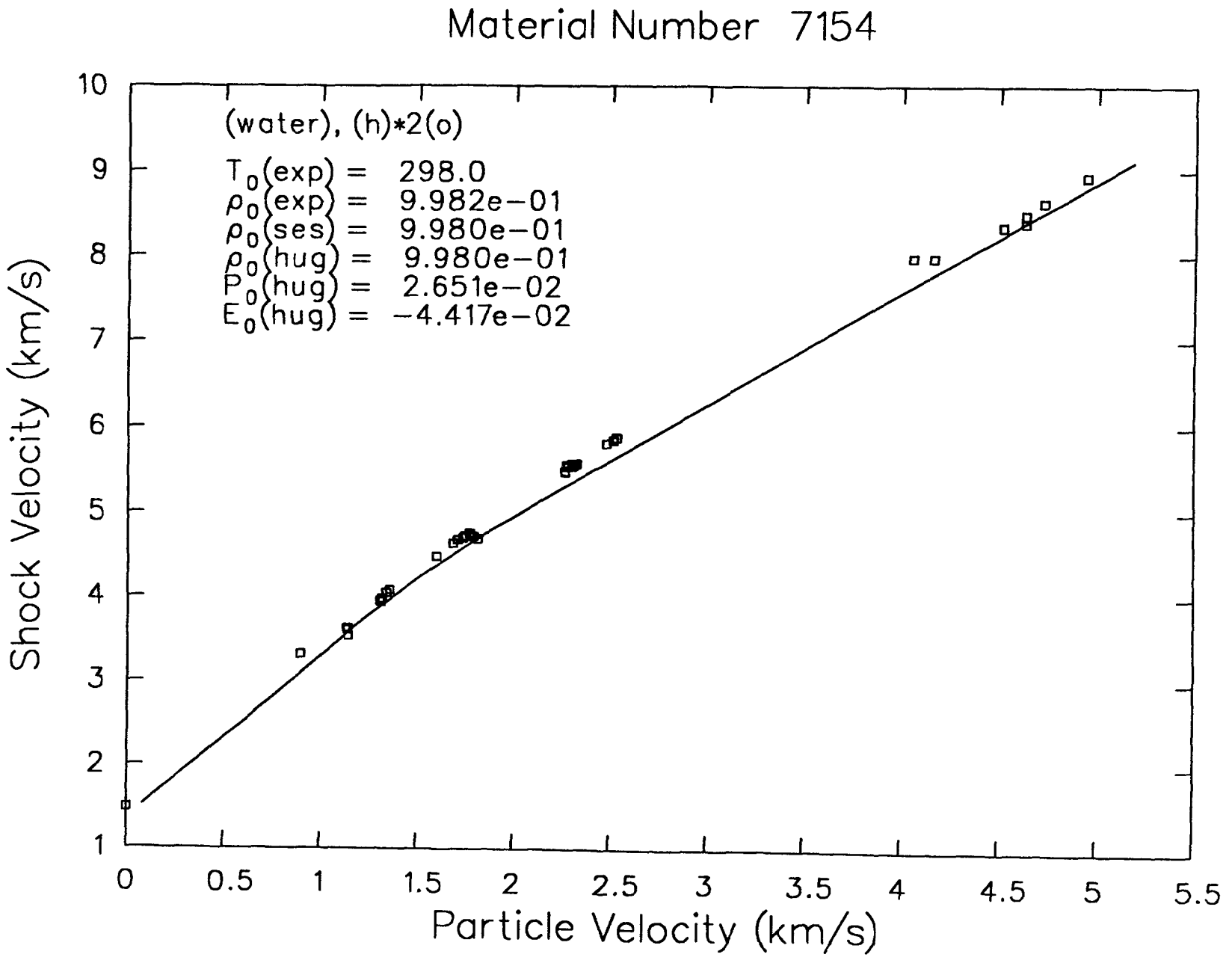
T1 SES2D CRAY 02

7154-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



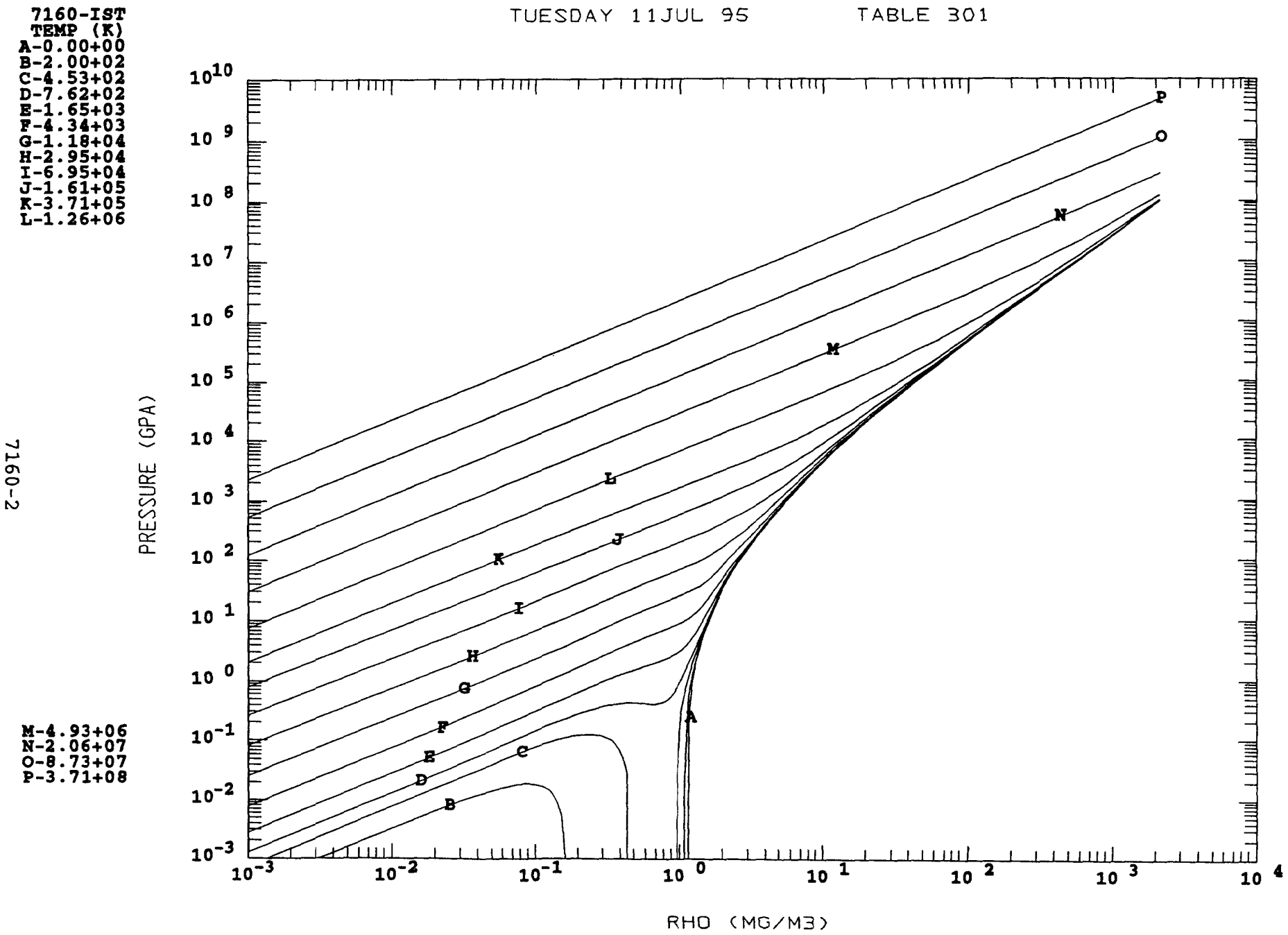
T1 SES2D CRAY


Material Number 7154
(water), (h)*2(o)
T0(exp) = 298.0
ρ0(exp) = 9.982e−01
ρ0(ses) = 9.980e−01
ρ0(hug) = 9.980e−01
P0(hug) = 2.651e−02
E0(hug) = −4.417e−02
Shock Velocity (km/s)
Particle Velocity (km/s)
1
2
3
4
5
6
7
8
9
10
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5

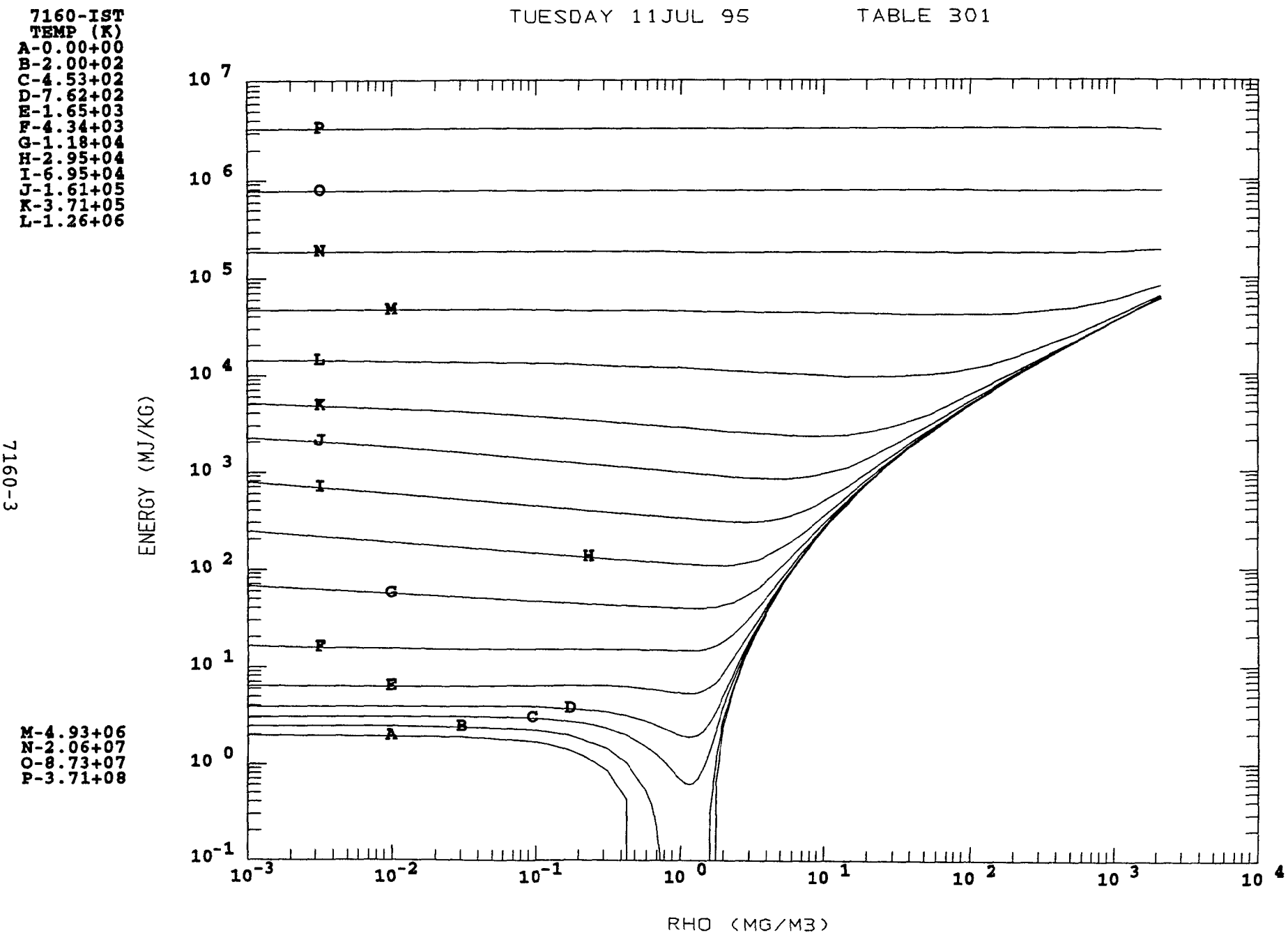
7154-8

MATERIAL NUMBER	SUMMARY
7160	MATERIAL. DEUTERO-POLYETHYLENE (BRANCHED, COMPLETELY DEUTERATED)

```
COMP. CD2
ATOMIC NUMBER.    2.6667E+00
ATOMIC MASS.      5.3468E+00
NORMAL DENSITY.   1.0475E+00

GAMMA(COMPUTED).      0.5684

TABLE SUMMARY.
TID    NW  NR  NT    R1/T1       R2/T2       RN/TN
101    23
102    20
201     5
301  6339  65  32 0.0000E+00 1.0475E-04 2.0949E+03
                  0.0000E+00 8.6170E-03 9.9996E+04
303  6339  65  32 0.0000E+00 1.0475E-04 2.0949E+03
                  0.0000E+00 8.6170E-03 9.9996E+04
304  6339  65  32 0.0000E+00 1.0475E-04 2.0949E+03
                  0.0000E+00 8.6170E-03 9.9996E+04
305  6339  65  32 0.0000E+00 1.0475E-04 2.0949E+03
                  0.0000E+00 8.6170E-03 9.9996E+04
306   263  65   1 0.0000E+00 1.0475E-04 2.0949E+03
                  0.0000E+00 0.0000E+00 0.0000E+00
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. SEP 82
VERSION NUMBER.     2
DATE ADDED TO LIBRARY.    90282.
DATE OF LAST UPDATE.      12583.
SOURCE. F. DOWELL
REFS. LA REPORT TO BE PUBLISHED
CODES. FIXTAB3

COMMENTS. THIS EOS WAS CREATED FROM 7171 BY ISOTOPIC SCALING.
WARNING - CONTRARY TO USUAL CONVENTION, THE ZERO POINT MOTION IS
IN THE 306 TABLE INSTEAD OF THE 305 TABLE.
```


7160-IST
TEMP (K)
A-0.00+00
B-2.00+02
C-4.53+02
D-7.62+02
E-1.65+03
F-4.34+03
G-1.18+04
H-2.95+04
I-6.95+04
J-1.61+05
K-3.71+05
L-1.26+06
M-4.93+06
N-2.06+07
O-8.73+07
P-3.71+08
TUESDAY 11JUL 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

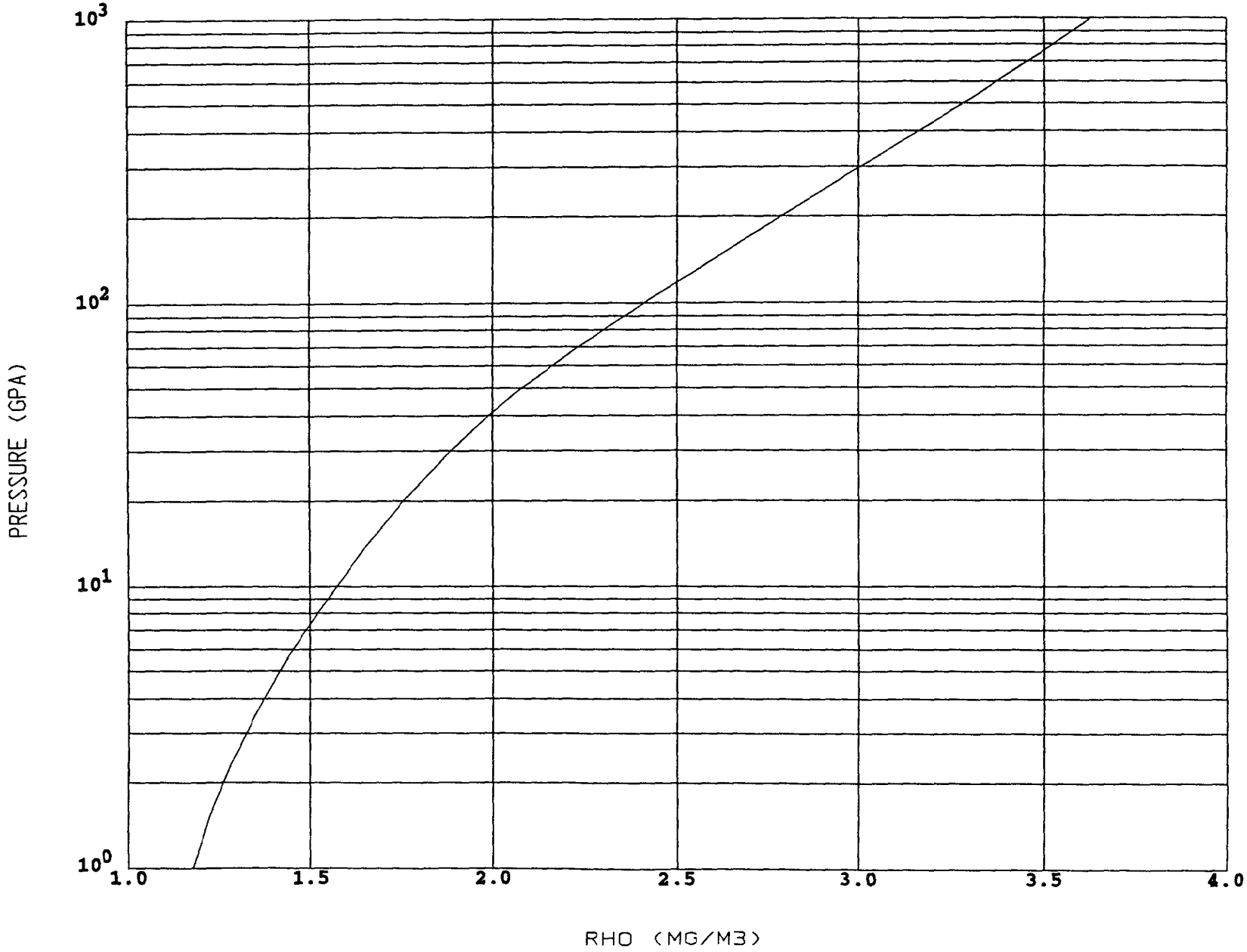
T1 SES2D CRA



T1 SES2D CRAY 02

7160-HU1
E0 MJ/KG
0.00+00

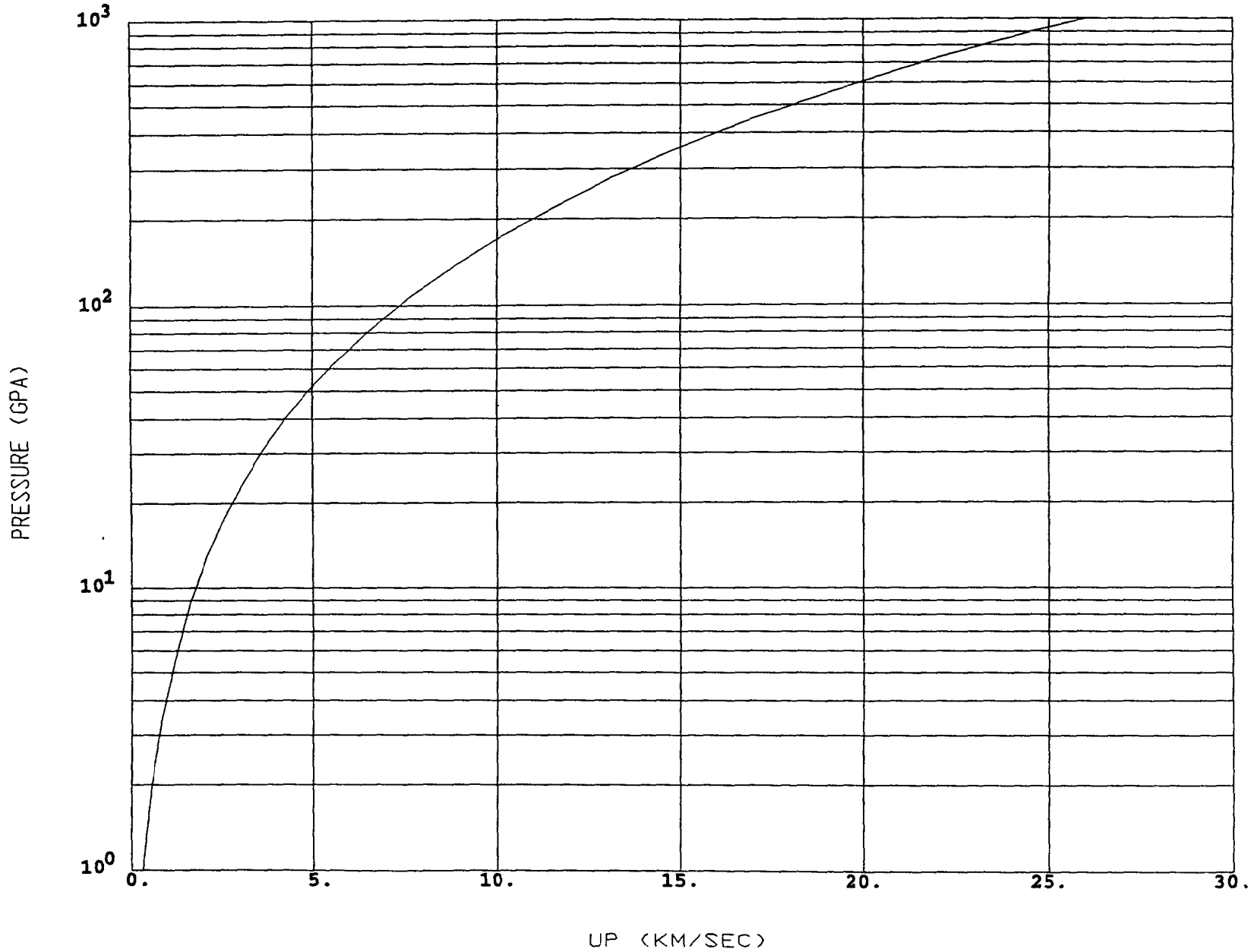
TUESDAY 11JUL 95 TABLE 301



T1 SRS2D CRAY

7160-HU1
E0 MJ/KG
0.00+00

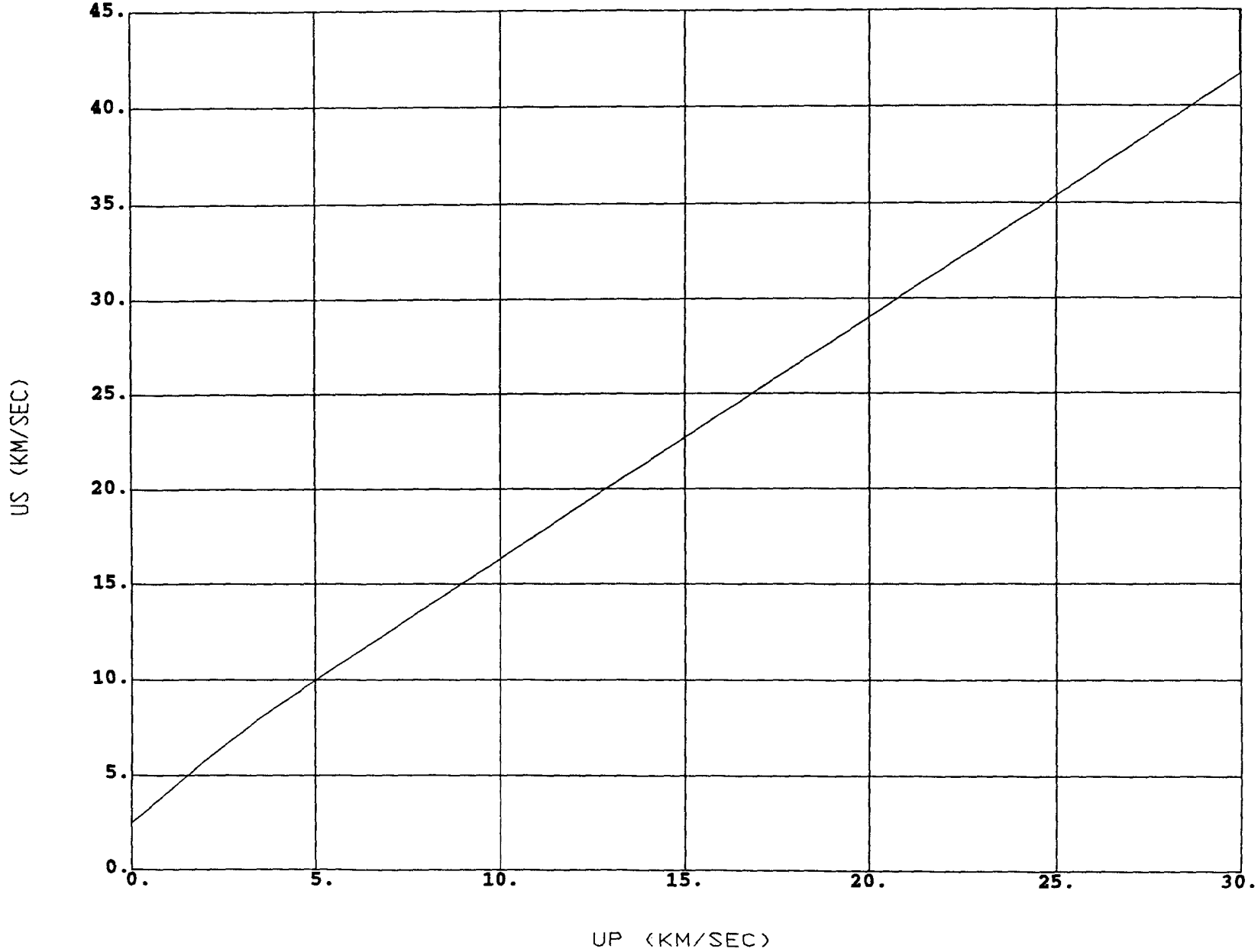
TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRAY 02

7160-HU1
E0 MJ/KG
0.00+00

TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRAY

MATERIAL NUMBER	SUMMARY
7171	MATERIAL. POLYETHYLENE (BRANCHED)

COMP. CH2
ATOMIC NUMBER. 2.6667E+00
ATOMIC MASS. 4.6757E+00
NORMAL DENSITY. 9.1598E-01

GAMMA(COMPUTED). 0.5684

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	18					
102	14					
201	5					
301	6339	65	32	0.0000E+00	9.1600E-05	1.8320E+03
				0.0000E+00	8.6170E-03	9.9996E+04
303	6339	65	32	0.0000E+00	9.1600E-05	1.8320E+03
				0.0000E+00	8.6170E-03	9.9996E+04
304	6339	65	32	0.0000E+00	9.1600E-05	1.8320E+03
				0.0000E+00	8.6170E-03	9.9996E+04
305	6339	65	32	0.0000E+00	9.1600E-05	1.8320E+03
				0.0000E+00	8.6170E-03	9.9996E+04
306	263	65	1	0.0000E+00	9.1600E-05	1.8320E+03
				0.0000E+00	0.0000E+00	0.0000E+00

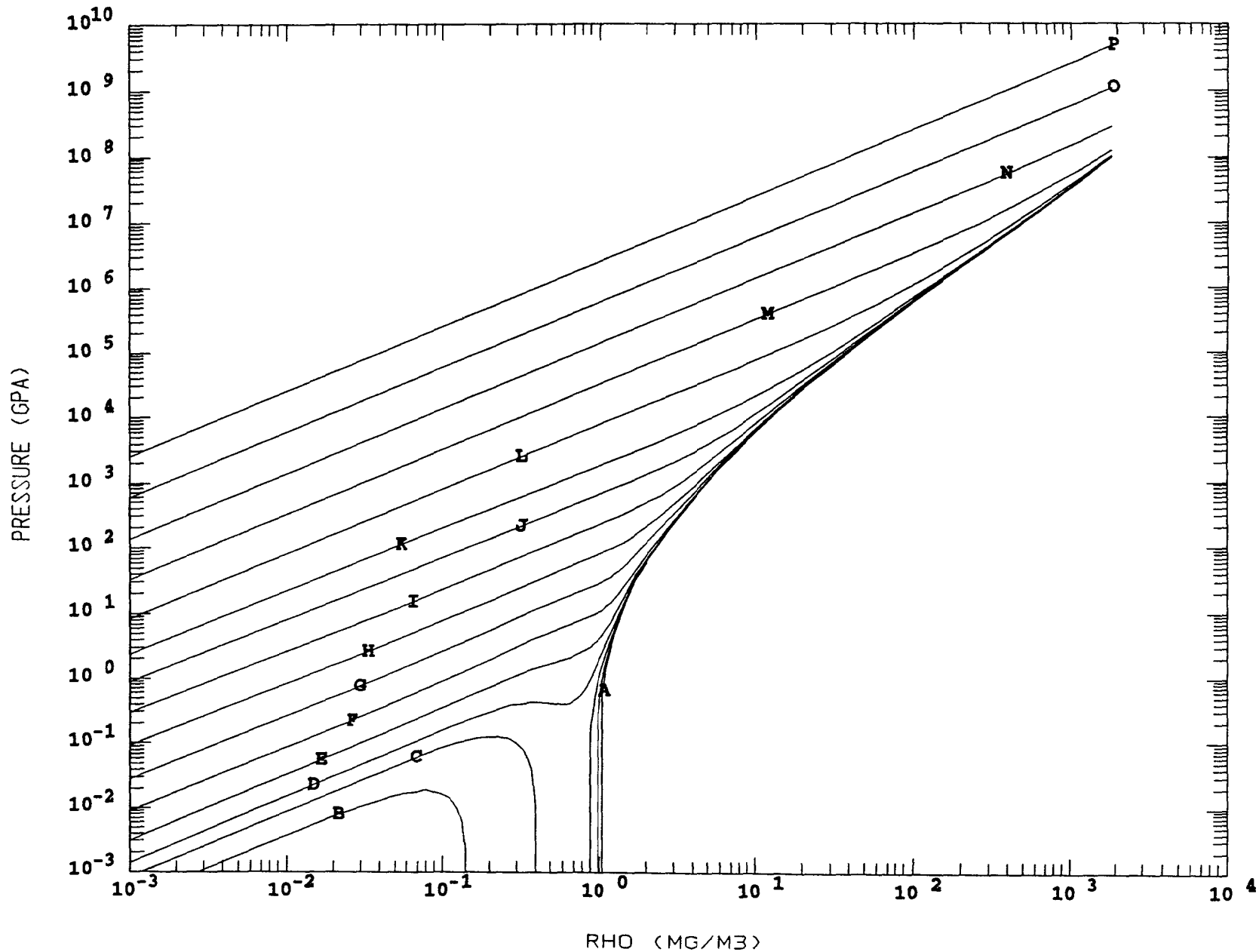
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. SEP 82
VERSION NUMBER. 3
DATE ADDED TO LIBRARY. 90282.
DATE OF LAST UPDATE. 12583.
SOURCE. F. DOWELL
REFS. LA-9559-MS
CODES. CANDIDE, PANDA

COMMENTS. WARNING - CONTRARY TO USUAL CONVENTION, THE ZERO POINT MOTION IS IN THE 306 TABLE INSTEAD OF THE 305 TABLE.

7171-IST
TEMP (K)
A-0.00+00
B-2.00+02
C-4.53+02
D-7.62+02
E-1.65+03
F-4.34+03
G-1.18+04
H-2.95+04
I-6.95+04
J-1.61+05
K-3.71+05
L-1.26+06

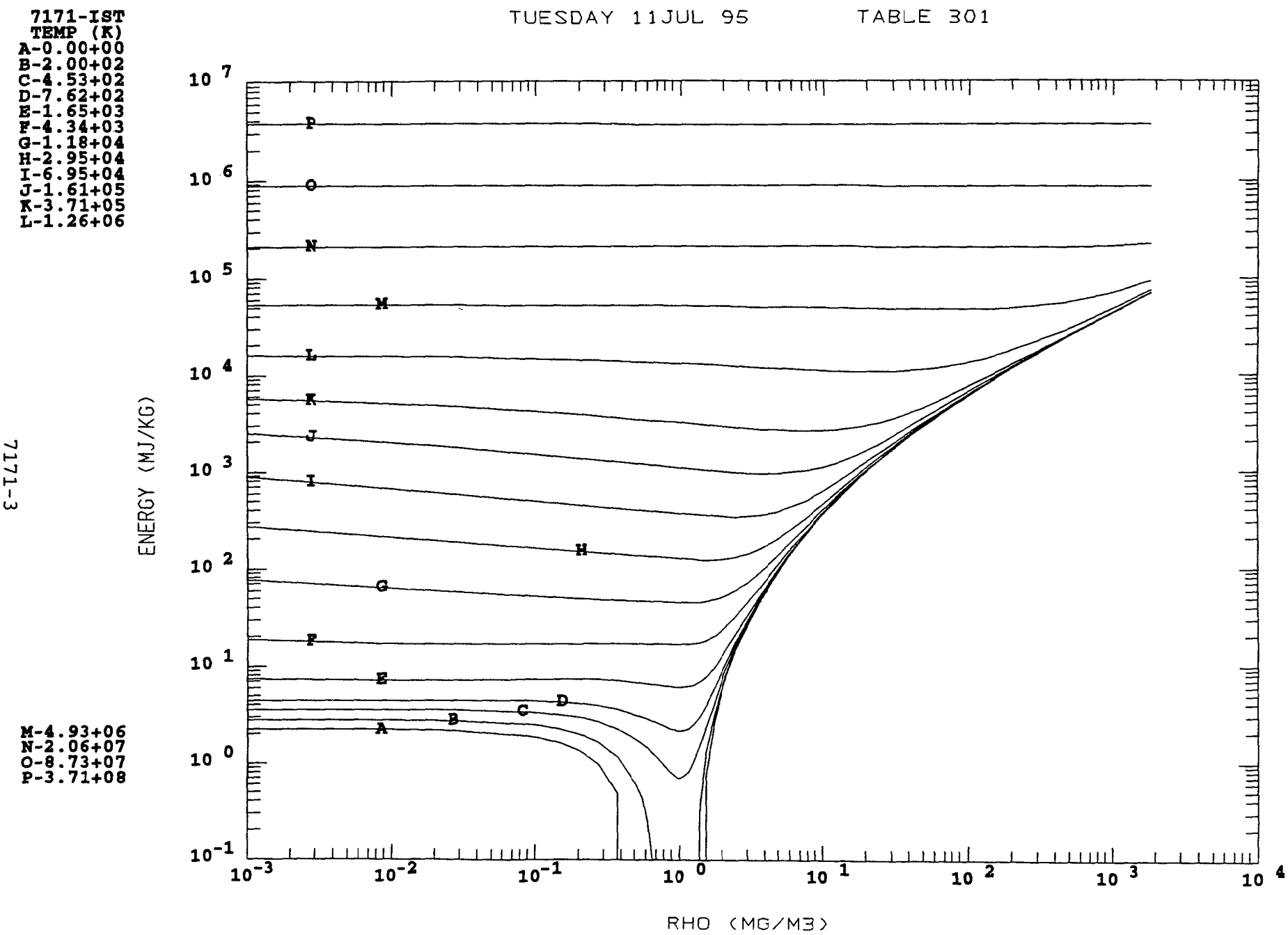
TUESDAY 11JUL 95 TABLE 301



M-4.93+06
N-2.06+07
O-8.73+07
P-3.71+08

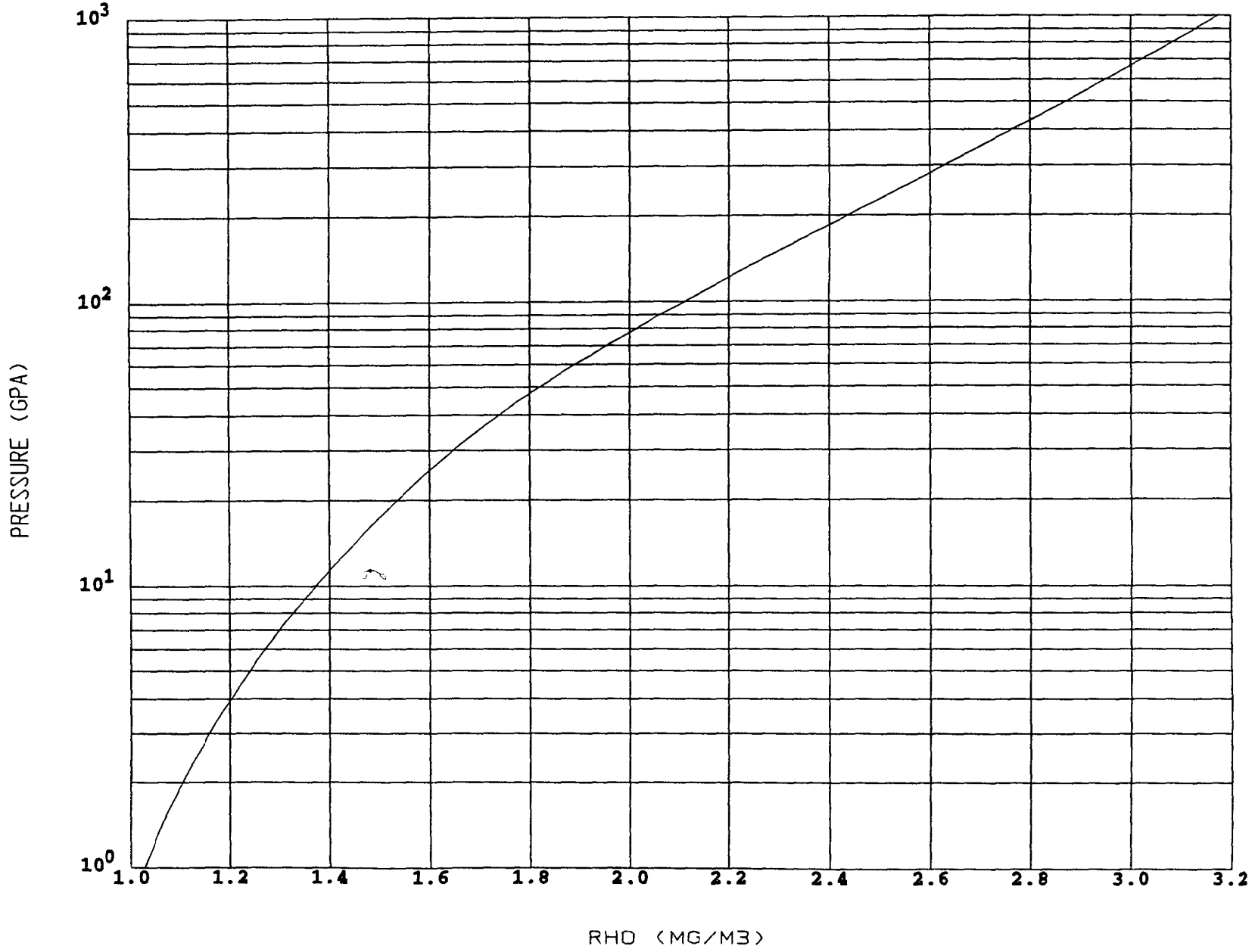
7171-2

T1 SES2D CRA


7171-IST
TEMP (K)
A-0.00+00
B-2.00+02
C-4.53+02
D-7.62+02
E-1.65+03
F-4.34+03
G-1.18+04
H-2.95+04
I-6.95+04
J-1.61+05
K-3.71+05
L-1.26+06
M-4.93+06
N-2.06+07
O-8.73+07
P-3.71+08
TUESDAY 11JUL 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
7171-3
T1 SES2D CRAY 02

7171-HU1
E0 MJ/KG
0.00+00

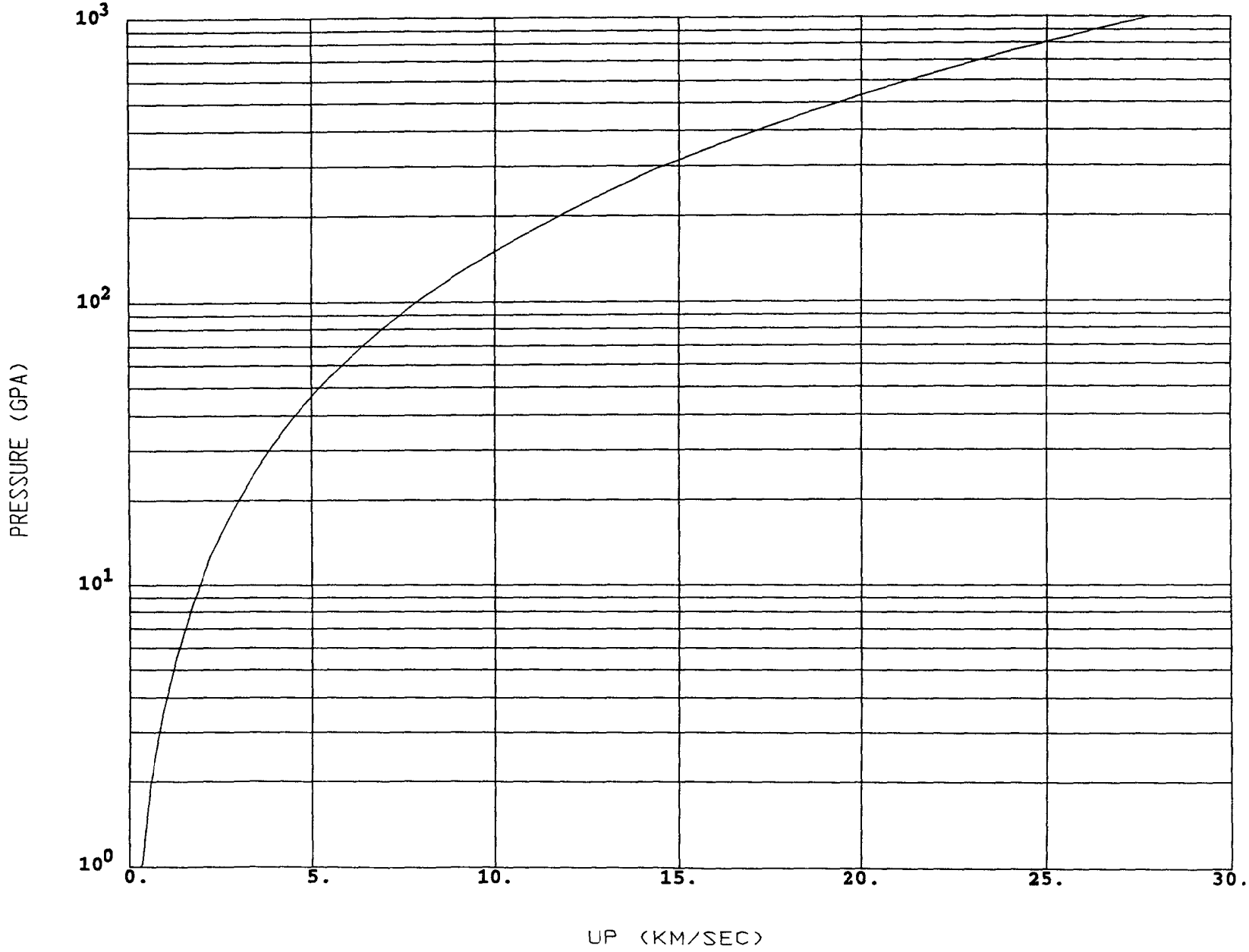
TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRA1

7171-HU1
E0 MJ/KG
0.00+00

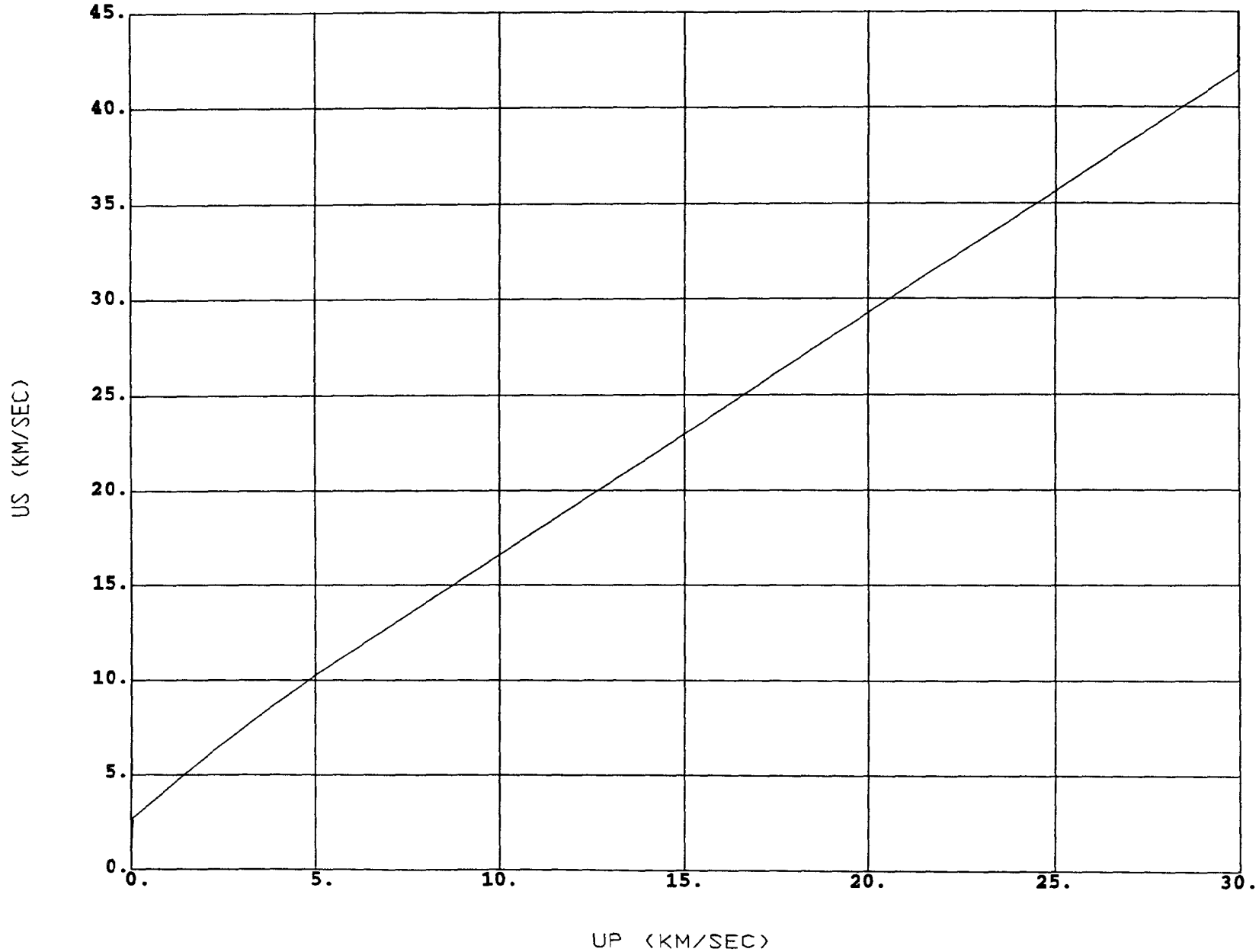
TUESDAY 11JUL 95 TABLE 301

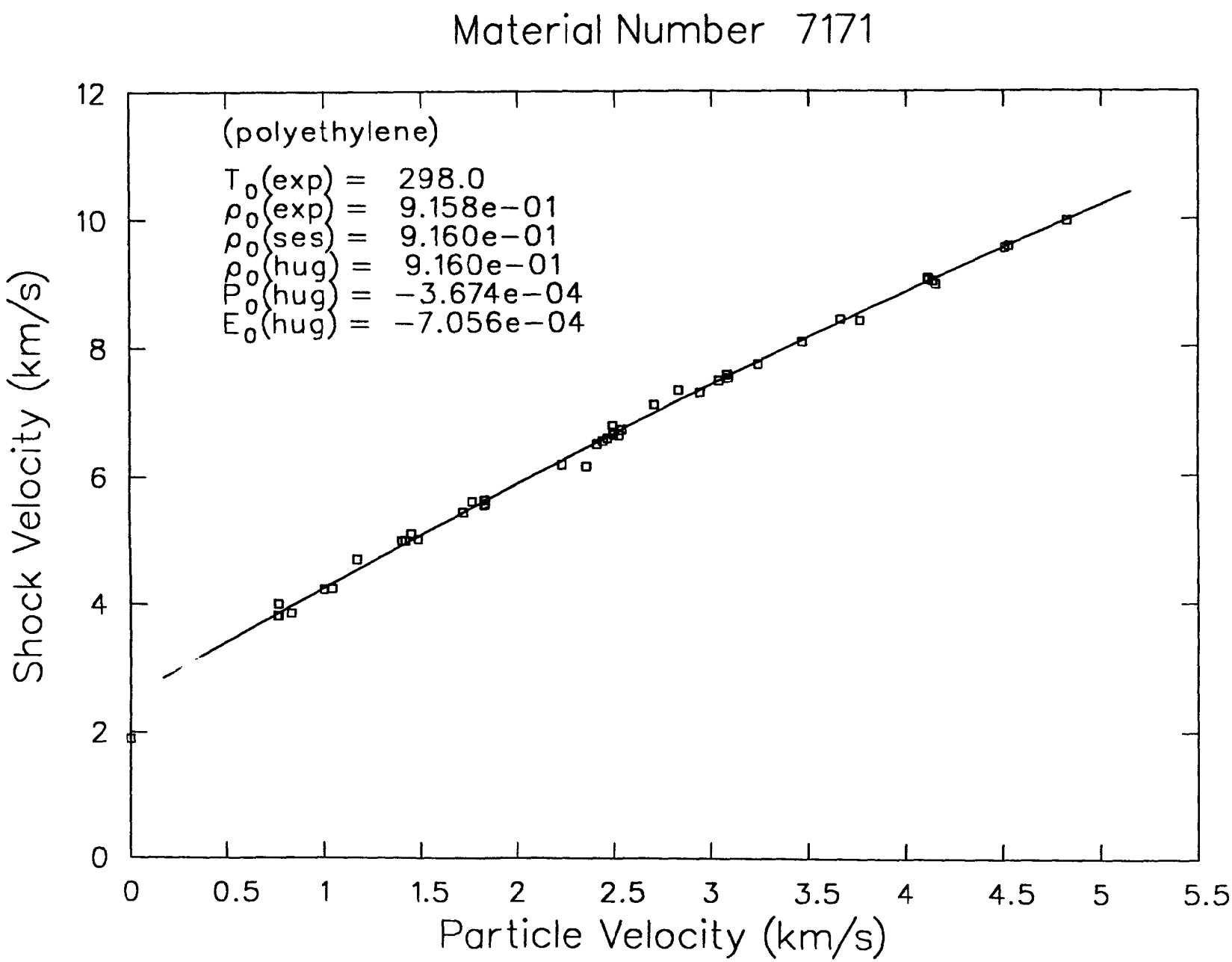


T1 SES2D CRAY 02

7171-HU1
E0 MJ/KG
0.00+00

TUESDAY 11JUL 95 TABLE 301




Material Number 7171
(polyethylene)
T_0(exp) = 298.0
ρ_0(exp) = 9.158e−01
ρ_0(ses) = 9.160e−01
ρ_0(hug) = 9.160e−01
P_0(hug) = −3.674e−04
E_0(hug) = −7.056e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
12
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5

MATERIAL NUMBER	SUMMARY
7180	MATERIAL. POLYETHYLENE (MARLEX)

COMP. CH2
ATOMIC NUMBER. 2.6667E+00
ATOMIC MASS. 4.6757E+00
NORMAL DENSITY. 9.5399E-01

GAMMA(COMPUTED). 0.7344

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	18					
102	14					
201	5					
301	6339	65	32	0.0000E+00	9.5400E-05	1.9080E+03
				0.0000E+00	8.6170E-03	9.9996E+04
303	6339	65	32	0.0000E+00	9.5400E-05	1.9080E+03
				0.0000E+00	8.6170E-03	9.9996E+04
304	6339	65	32	0.0000E+00	9.5400E-05	1.9080E+03
				0.0000E+00	8.6170E-03	9.9996E+04
305	6339	65	32	0.0000E+00	9.5400E-05	1.9080E+03
				0.0000E+00	8.6170E-03	9.9996E+04
306	263	65	1	0.0000E+00	9.5400E-05	1.9080E+03
				0.0000E+00	0.0000E+00	0.0000E+00

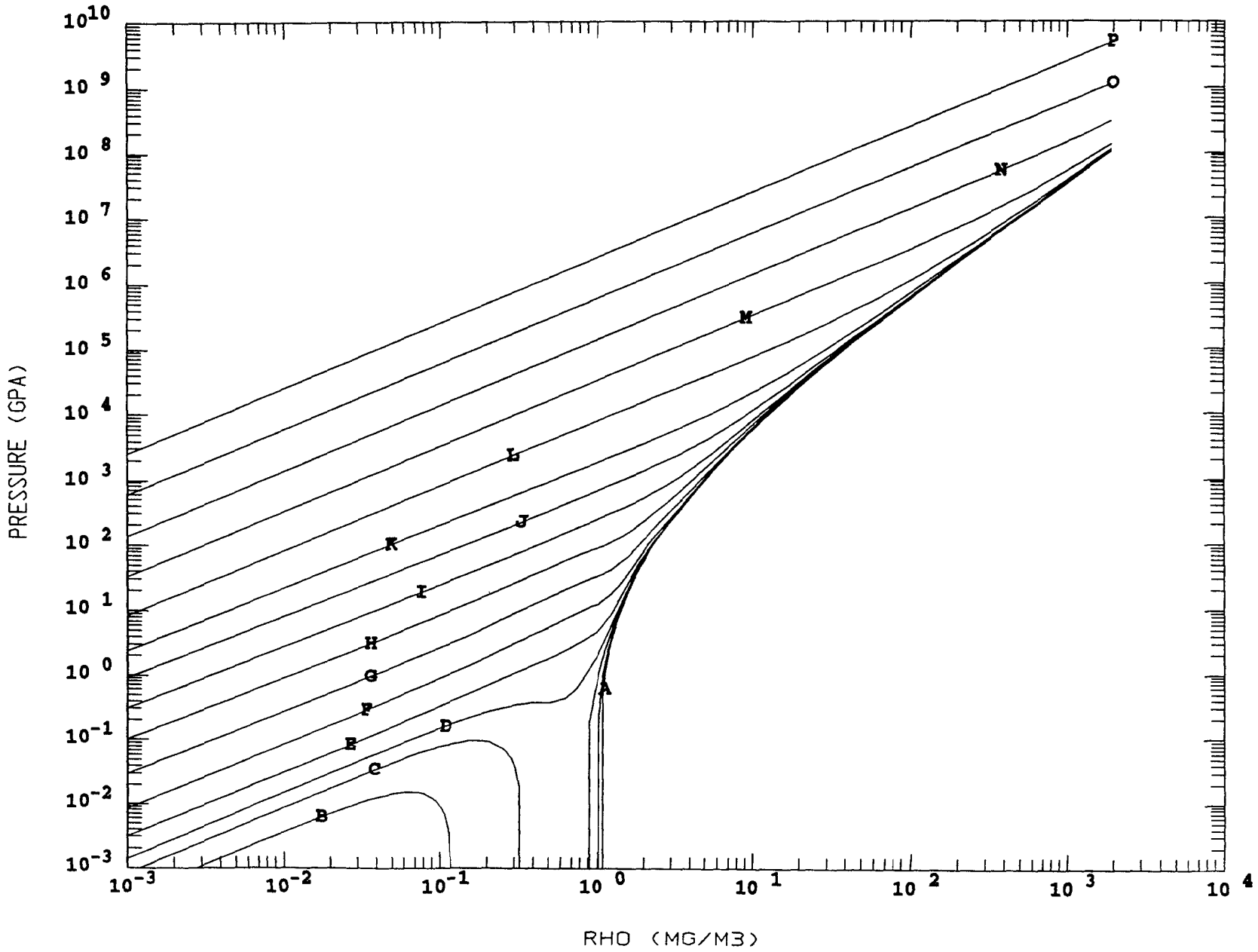
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. SEP 82
VERSION NUMBER. 3
DATE ADDED TO LIBRARY. 90282.
DATE OF LAST UPDATE. 12583.
SOURCE. F. DOWELL
REFS. LA-9564-MS
CODES. CANDIDE, PANDA

COMMENTS. WARNING - CONTRARY TO USUAL CONVENTION, THE ZERO POINT MOTION IS IN THE 306 TABLE INSTEAD OF THE 305 TABLE.

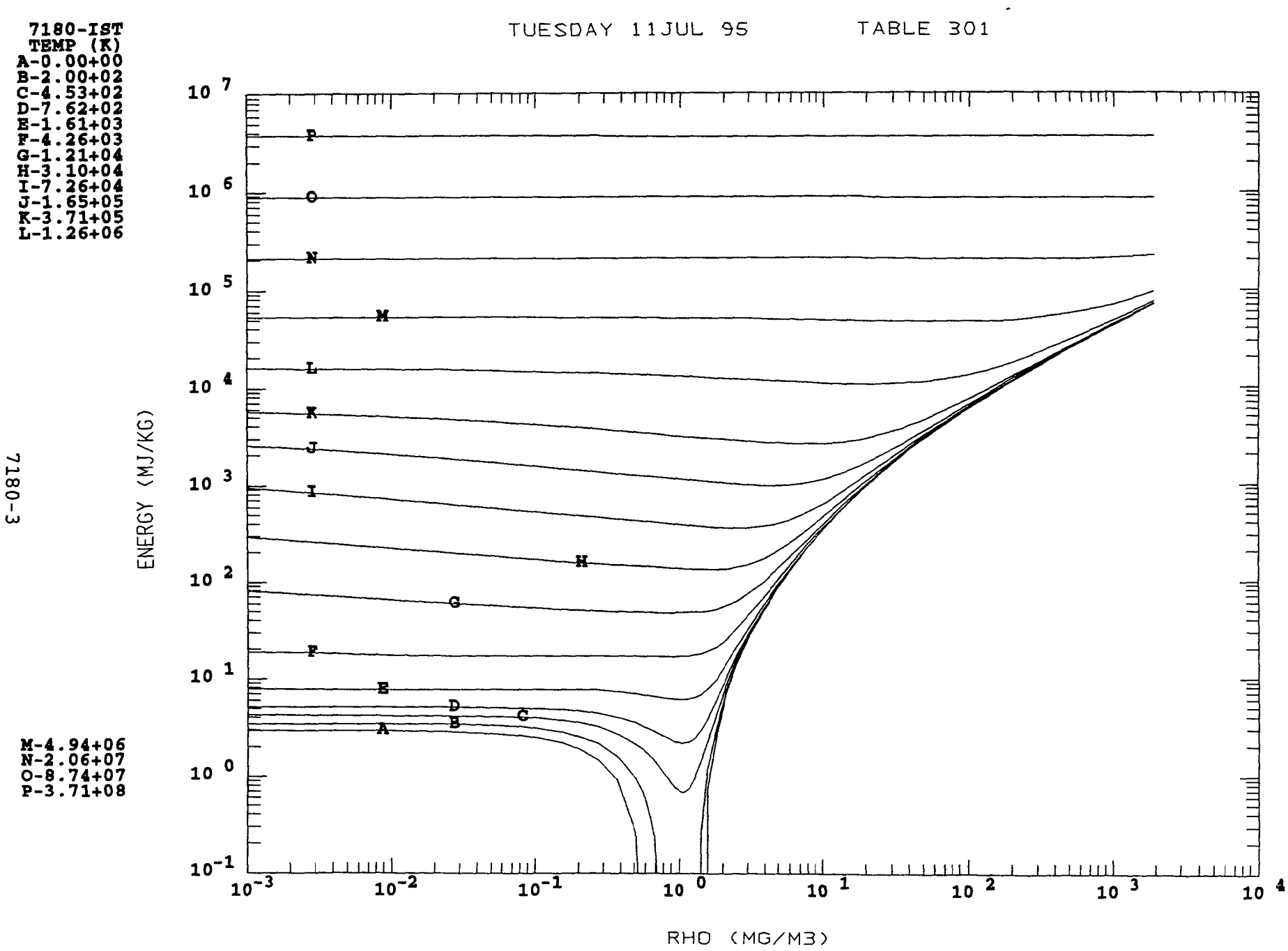
7180-IST
TEMP (K)
A-0.00+00
B-2.00+02
C-4.53+02
D-7.62+02
E-1.61+03
F-4.26+03
G-1.21+04
H-3.10+04
I-7.26+04
J-1.65+05
K-3.71+05
L-1.26+06

TUESDAY 11JUL 95 TABLE 301



M-4.94+06
N-2.06+07
O-8.74+07
P-3.71+08

T1 SES2D CRN

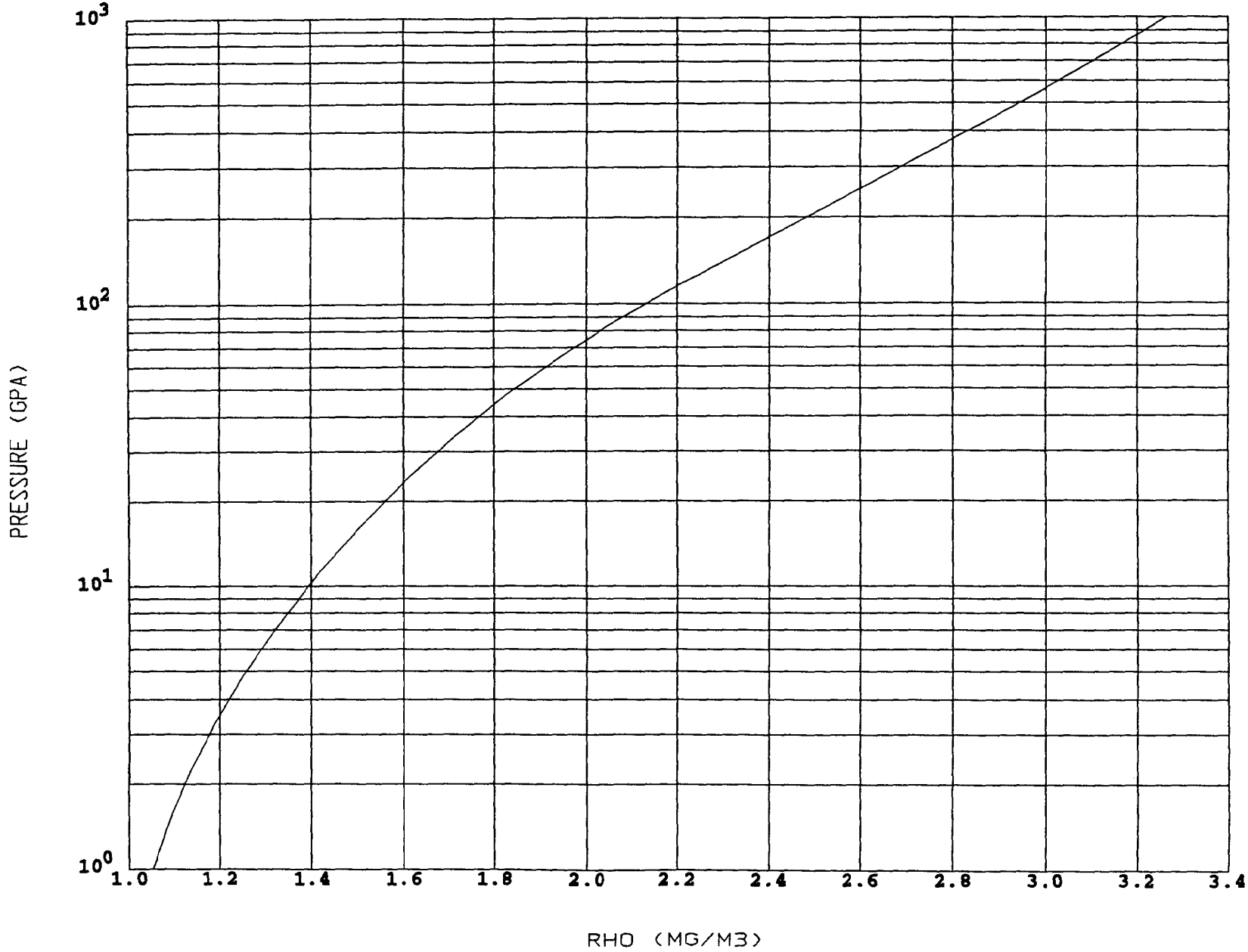


7180-3

T1 SES2D CRAY 02

7180-HU1
E0 MJ/KG
0.00+00

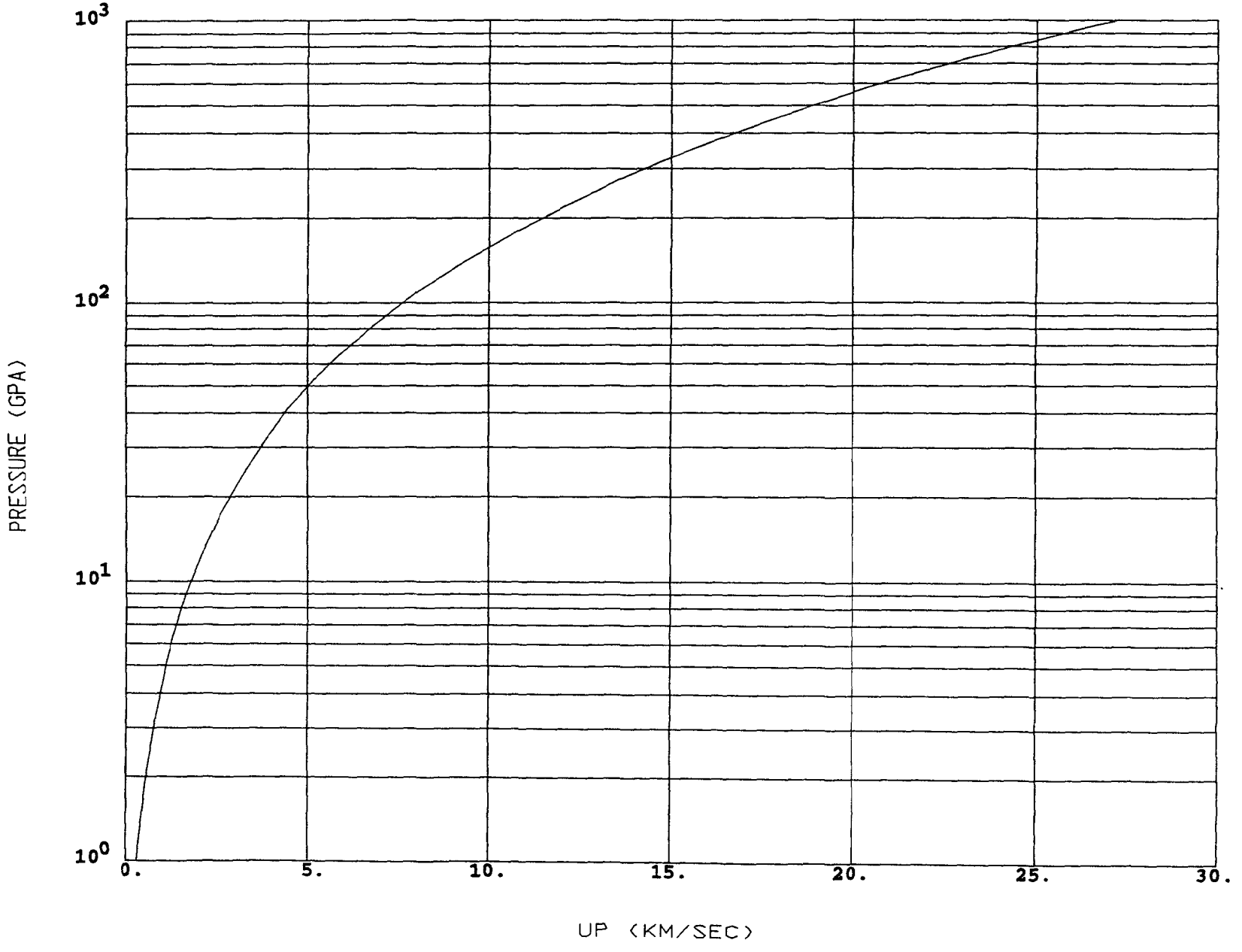
TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRAY

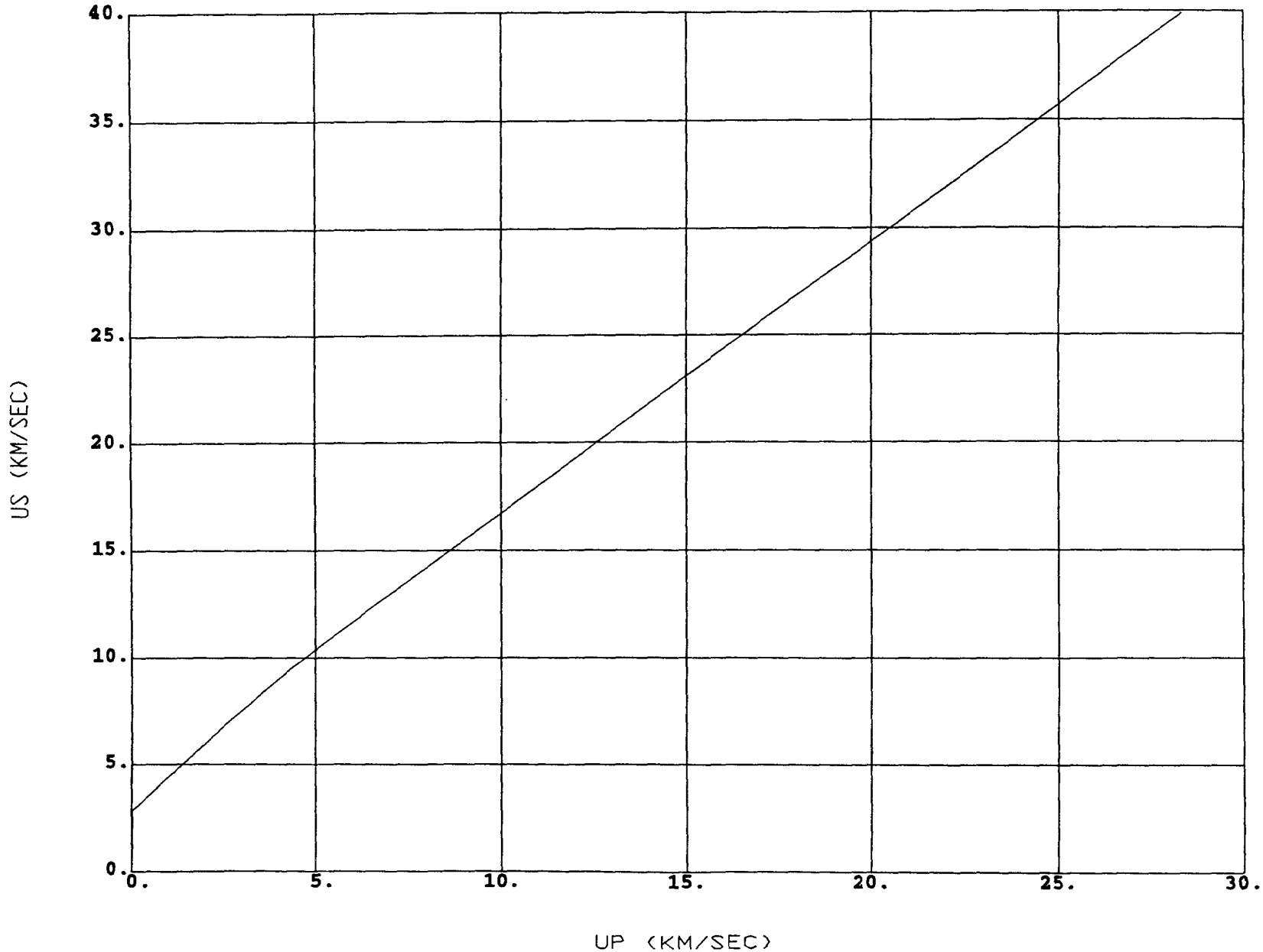
7180-HU1
E0 MJ/KG
0.00+00

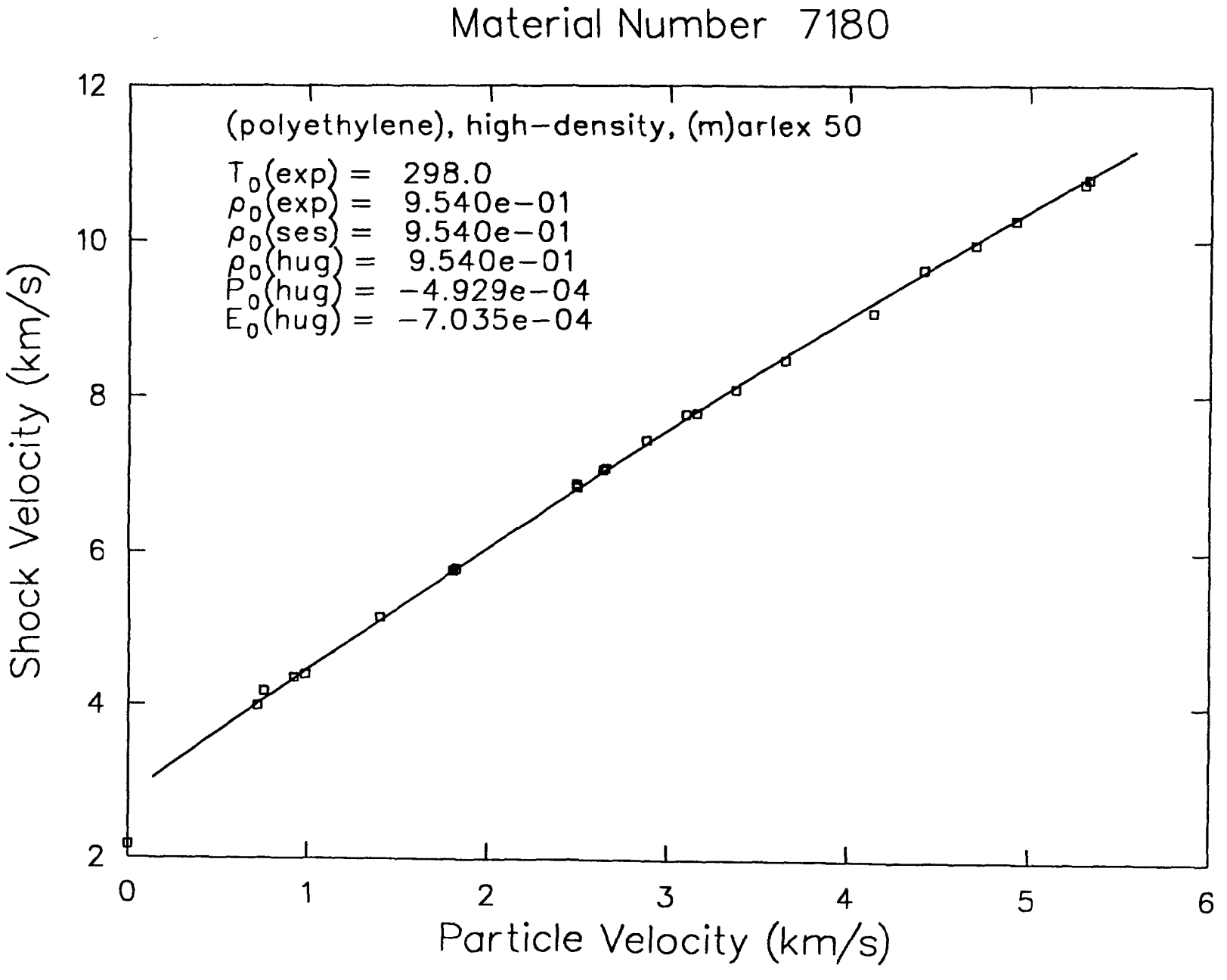
TUESDAY 11JUL 95 TABLE 301



7180-HU1
E0 MJ/KG
0.00+00

TUESDAY 11JUL 95 TABLE 301




Material Number 7180
(polyethylene), high-density, (m)arlex 50
T_0(exp) = 298.0
ρ_0(exp) = 9.540e-01
ρ_0(ses) = 9.540e-01
ρ_0(hug) = 9.540e-01
P_0(hug) = -4.929e-04
E_0(hug) = -7.035e-04
Shock Velocity (km/s)
Particle Velocity (km/s)
12
10
8
6
4
2
0
1
2
3
4
5
6

MATERIAL NUMBER	SUMMARY
7190	MATERIAL. TEFLON (POLYTETRAFLUOROETHYLENE)

COMP. CF2
ATOMIC NUMBER. 8.0000E+00
ATOMIC MASS. 1.6669E+01
NORMAL DENSITY. 2.1520E+00

GAMMA(COMPUTED). 0.4667

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	20					
102	14					
201	5					
301	6242	64	32	0.0000E+00	2.1520E-03	4.3040E+03
				0.0000E+00	8.6170E-03	9.9996E+04
303	6242	64	32	0.0000E+00	2.1520E-03	4.3040E+03
				0.0000E+00	8.6170E-03	9.9996E+04
304	6242	64	32	0.0000E+00	2.1520E-03	4.3040E+03
				0.0000E+00	8.6170E-03	9.9996E+04
305	6242	64	32	0.0000E+00	2.1520E-03	4.3040E+03
				0.0000E+00	8.6170E-03	9.9996E+04
306	259	64	1	0.0000E+00	2.1520E-03	4.3040E+03
				0.0000E+00	0.0000E+00	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

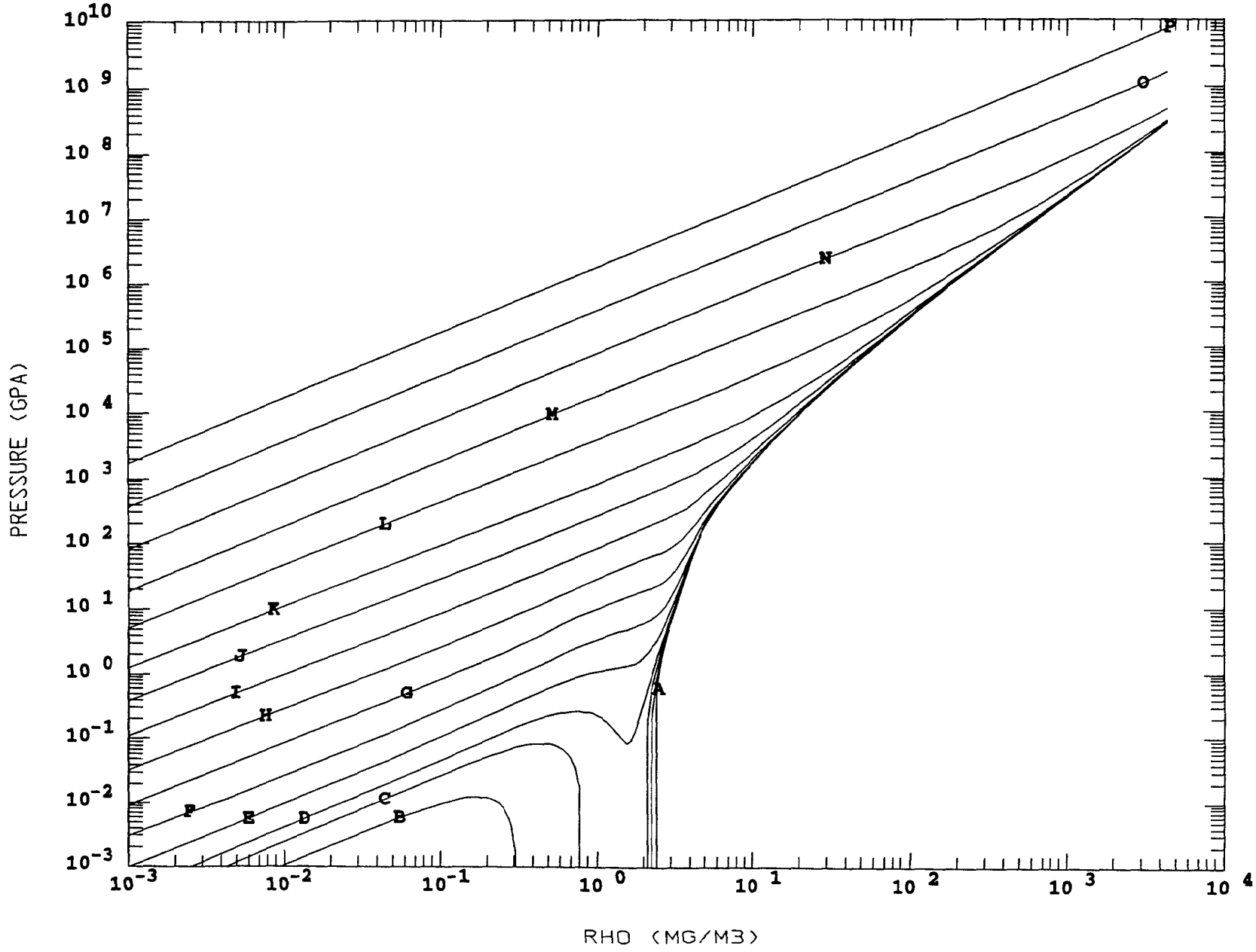
DATE. AUG 82
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 51882.
DATE OF LAST UPDATE. 12583.
SOURCE. F. DOWELL, J.D. JOHNSON
REFS. LA-9439-MS
CODES. CANDIDE, PANDA

COMMENTS. WARNING - CONTRARY TO USUAL CONVENTION, THE ZERO POINT MOTION IS IN THE 306 TABLE INSTEAD OF THE 305 TABLE.

7190-IST
TEMP (K)
A-0.00+00
B-2.00+02
C-4.53+02
D-7.62+02
E-1.73+03
F-4.65+03
G-1.25+04
H-3.04+04
I-7.06+04
J-1.63+05
K-3.71+05
L-1.16+06

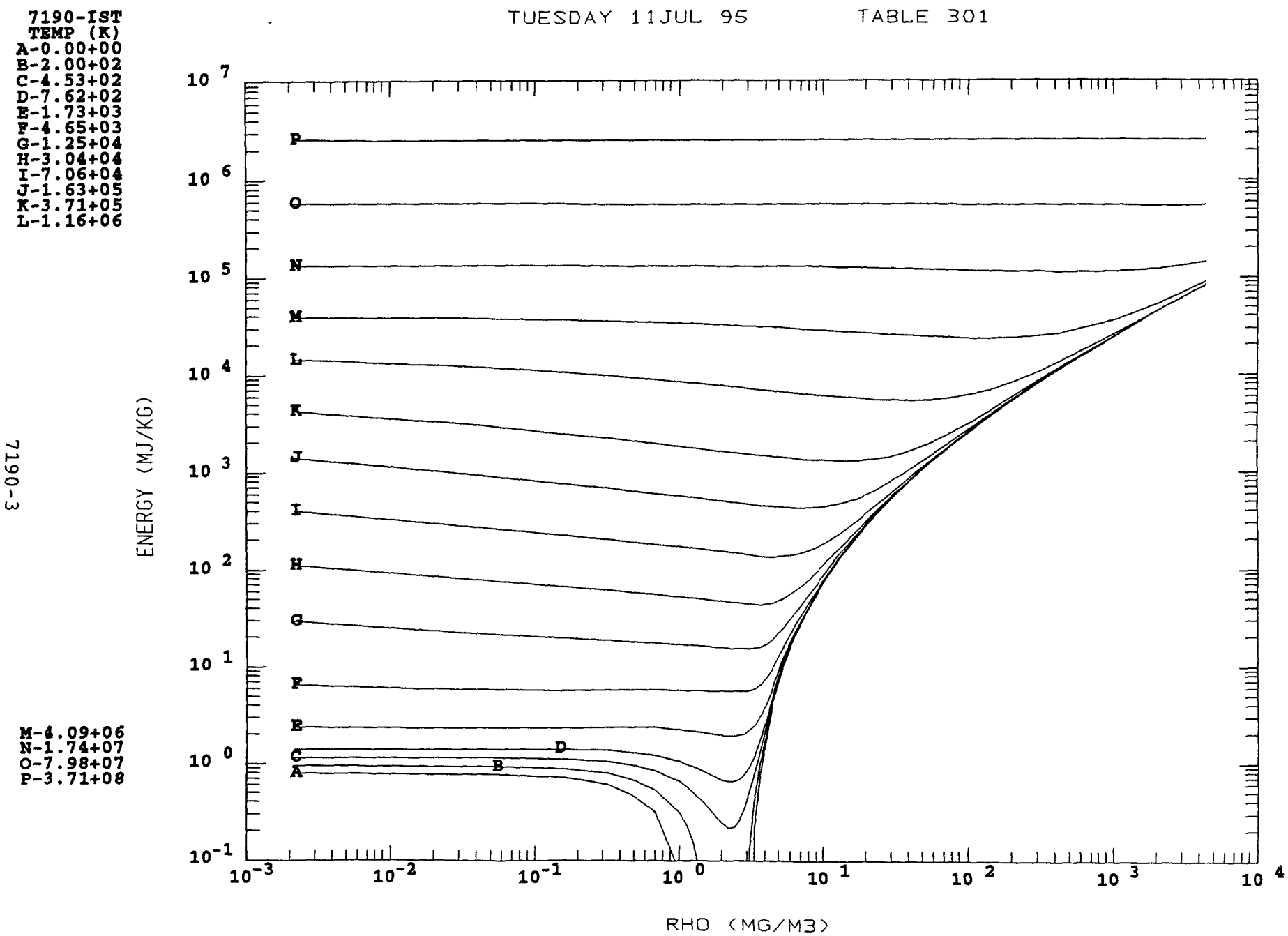
M-4.09+06
N-1.74+07
O-7.98+07
P-3.71+08

TUESDAY 11JUL 95 TABLE 301



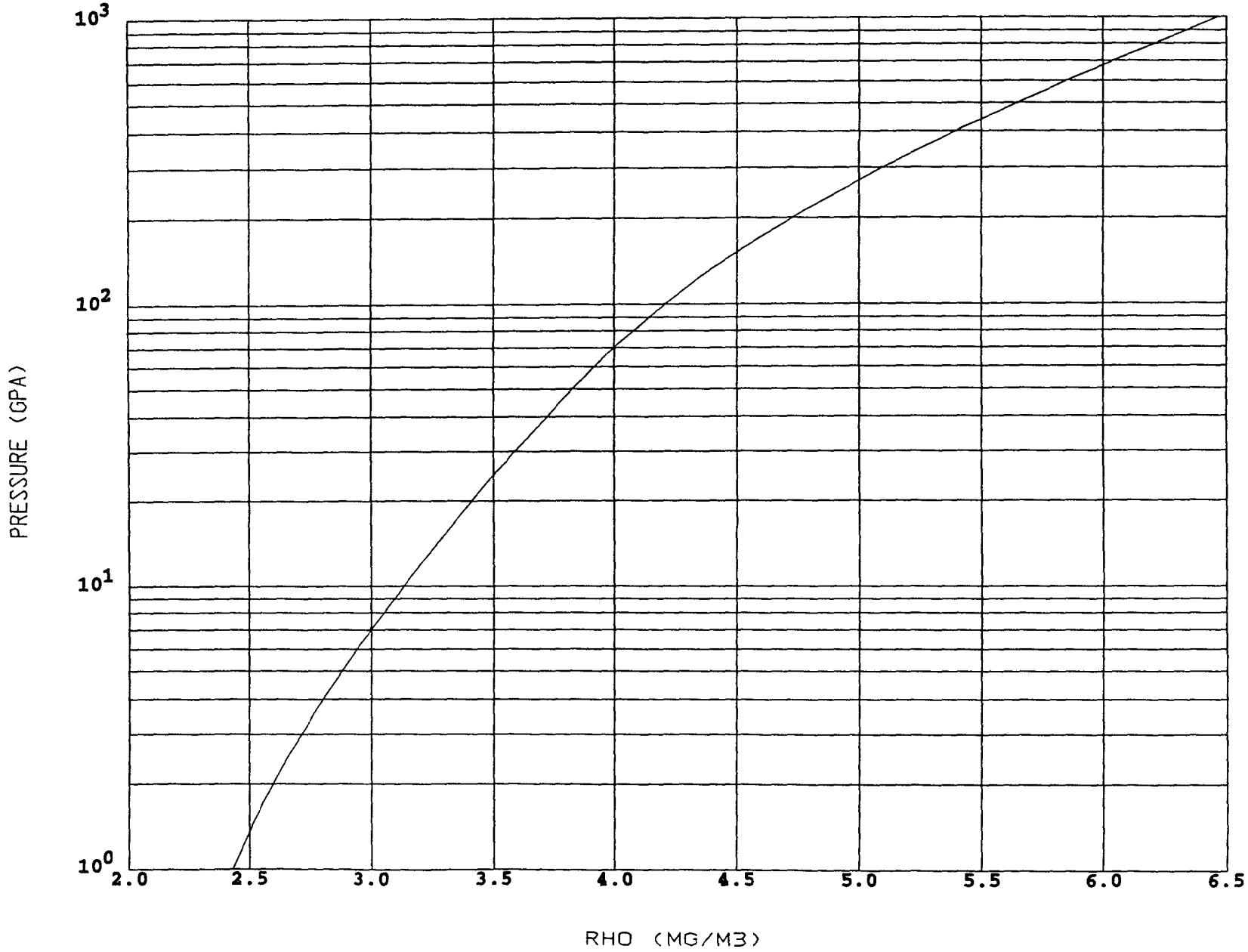
7190-2

T1 SES2D CRAY


7190-IST
TEMP (K)
A-0.00+00
B-2.00+02
C-4.53+02
D-7.62+02
E-1.73+03
F-4.65+03
G-1.25+04
H-3.04+04
I-7.06+04
J-1.63+05
K-3.71+05
L-1.16+06
M-4.09+06
N-1.74+07
O-7.98+07
P-3.71+08
TUESDAY 11JUL 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
7190-3

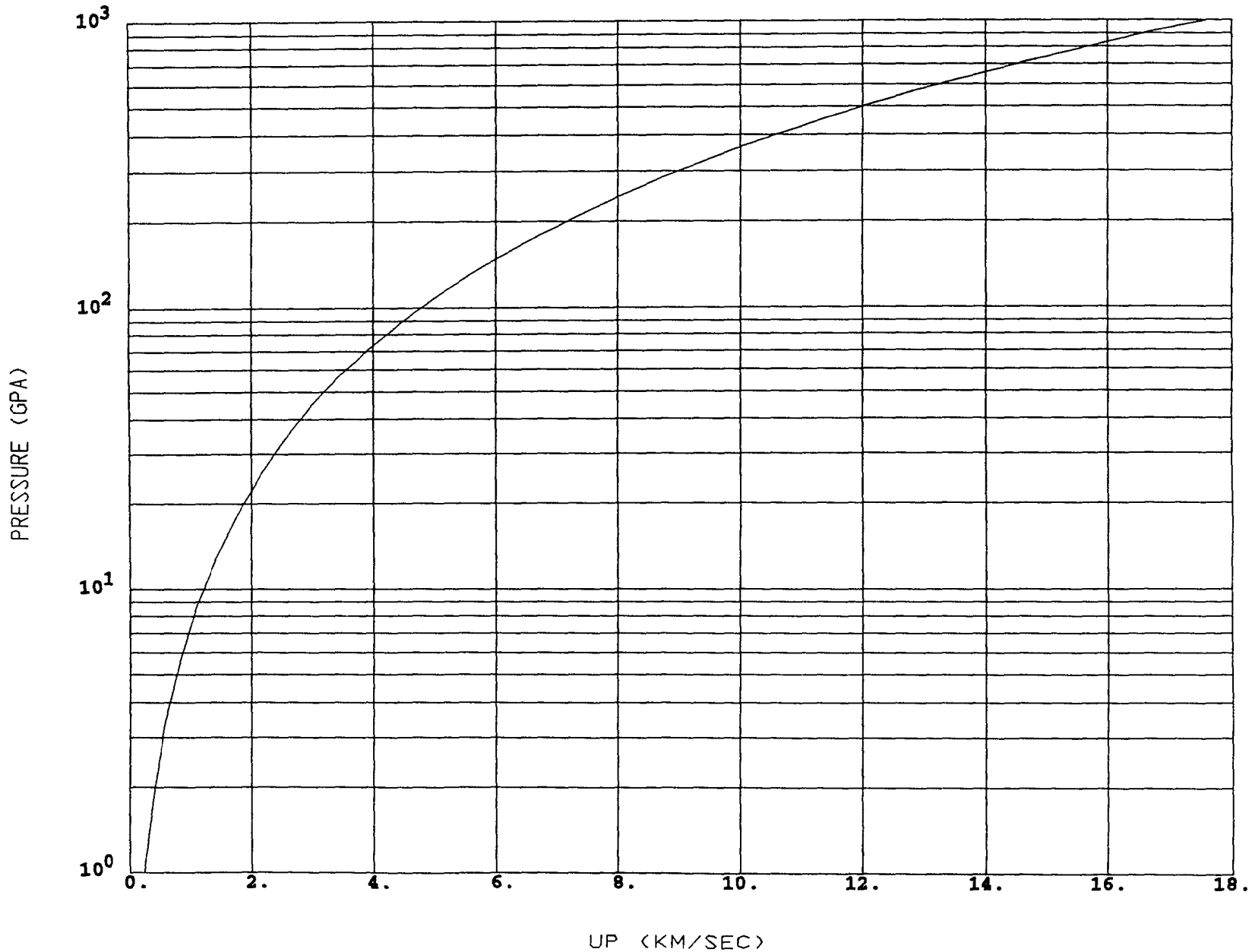
7190-HU1
E0 MJ/KG
0.00+00

TUESDAY 11JUL 95 TABLE 301



7190-HU1
E0 MJ/KG
0.00+00

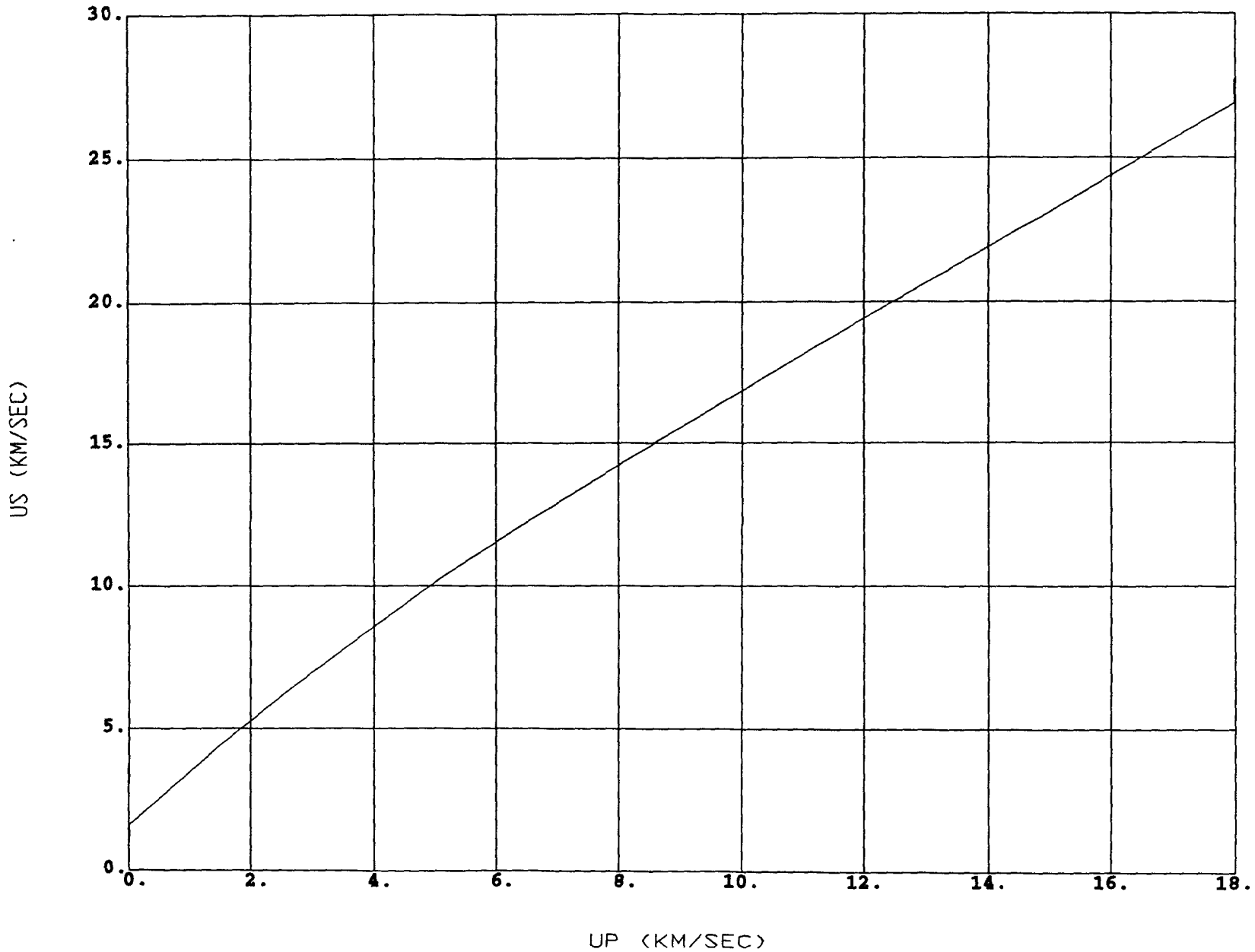
TUESDAY 11JUL 95 TABLE 301



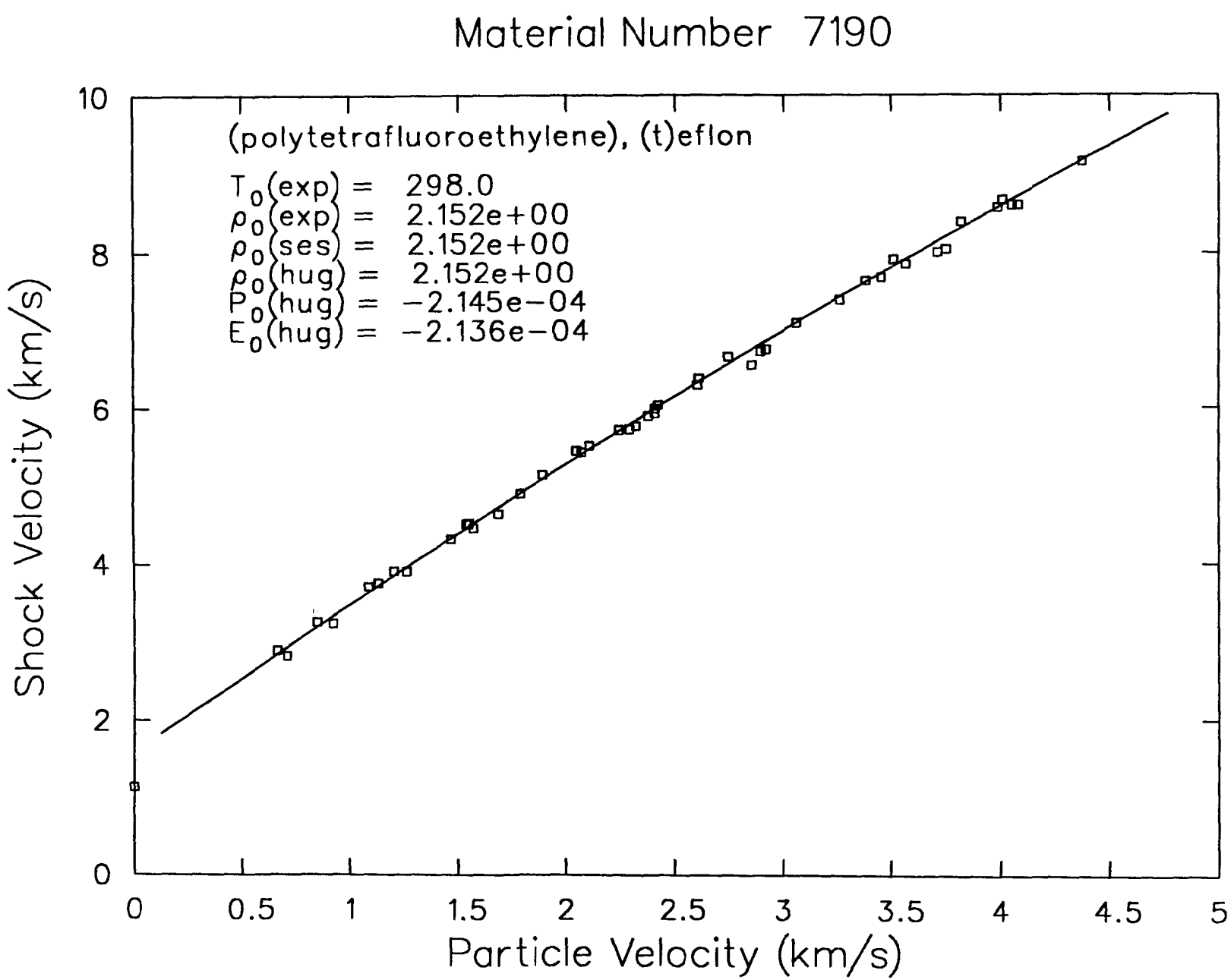
T1 SES2D CRAY 02

7190-HU1
E0 MJ/KG
0.00+00

TUESDAY 11JUL 95 TABLE 301



T1 SES2D CRAY


Material Number 7190
(polytetrafluoroethylene), (t)eflon
T_0(exp) = 298.0
ρ_0(exp) = 2.152e+00
ρ_0(ses) = 2.152e+00
ρ_0(hug) = 2.152e+00
P_0(hug) = −2.145e−04
E_0(hug) = −2.136e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

MATERIAL NUMBER	SUMMARY
7230	MATERIAL. POLYTETRADEUTEROETHYLENE (LINEAR)

COMP. CD2
ATOMIC NUMBER. 2.6667E+00
ATOMIC MASS. 5.3469E+00
NORMAL DENSITY. 1.0930E+00

GAMMA(COMPUTED). 0.4077

TABLE SUMMARY.

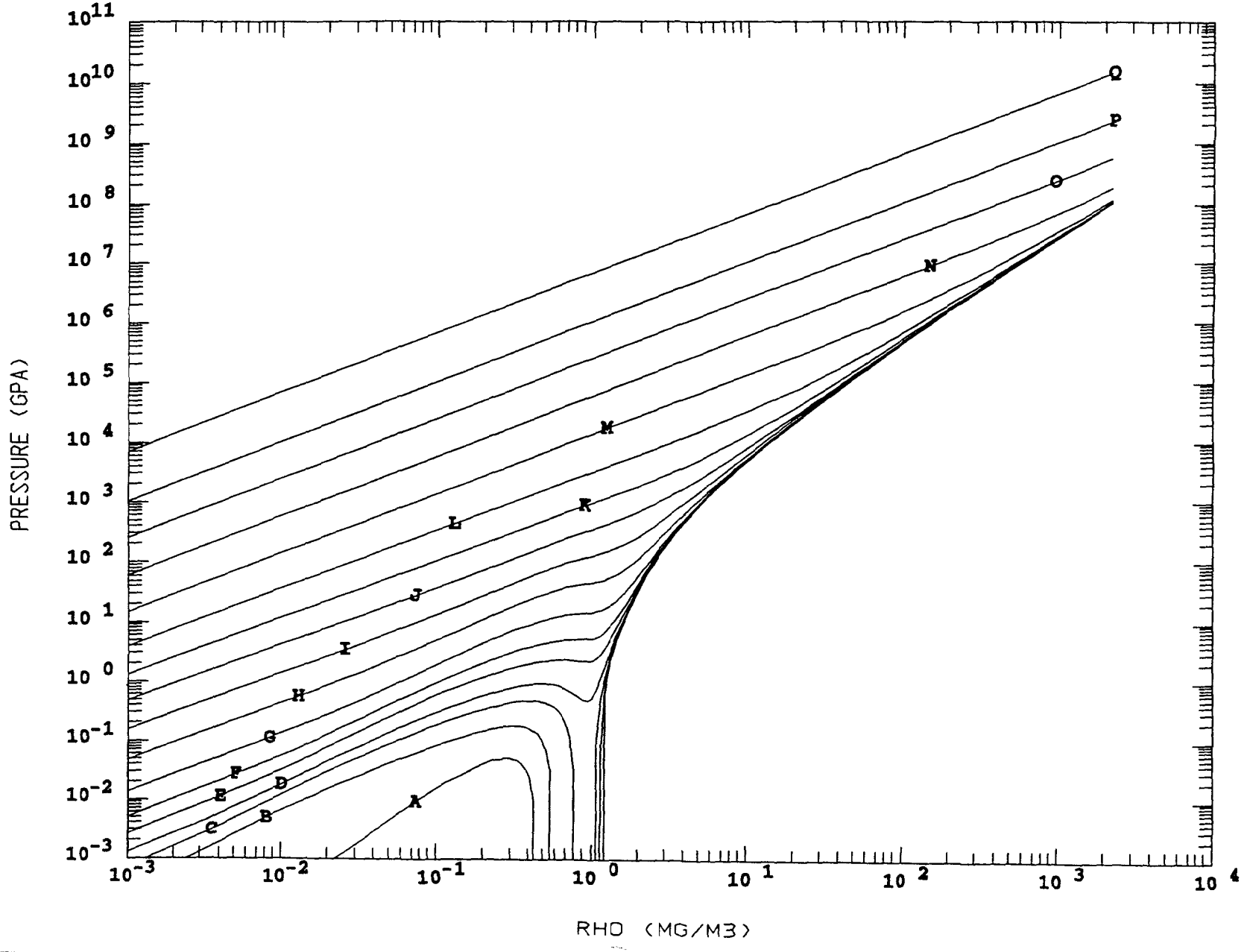
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	19					
201	5					
301	6935	69	33	0.0000E+00	1.0930E-06	2.1860E+03
				0.0000E+00	8.6170E-03	9.9996E+04
304	4990	68	24	1.0930E-06	1.0930E-05	2.1860E+03
				0.0000E+00	2.6000E-01	9.9996E+04
305	6835	68	33	1.0930E-06	1.0930E-05	2.1860E+03
				0.0000E+00	8.6170E-03	9.9996E+04
306	275	68	1	1.0930E-06	1.0930E-05	2.1860E+03
				0.0000E+00	-2.9688E-22	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. AUG 84
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 82284.
DATE OF LAST UPDATE. 82984.
SOURCE. F. DOWELL
REFS. LA-10241-MS
CODES. GRIZZLY, FIXTAB

7230-IST
TEMP (K)
A-0.00+00
B-2.00+02
C-4.53+02
D-7.62+02
E-1.61+03
F-3.02+03
G-7.23+03
H-1.97+04
I-4.77+04
J-1.09+05
K-2.47+05
L-6.75+05

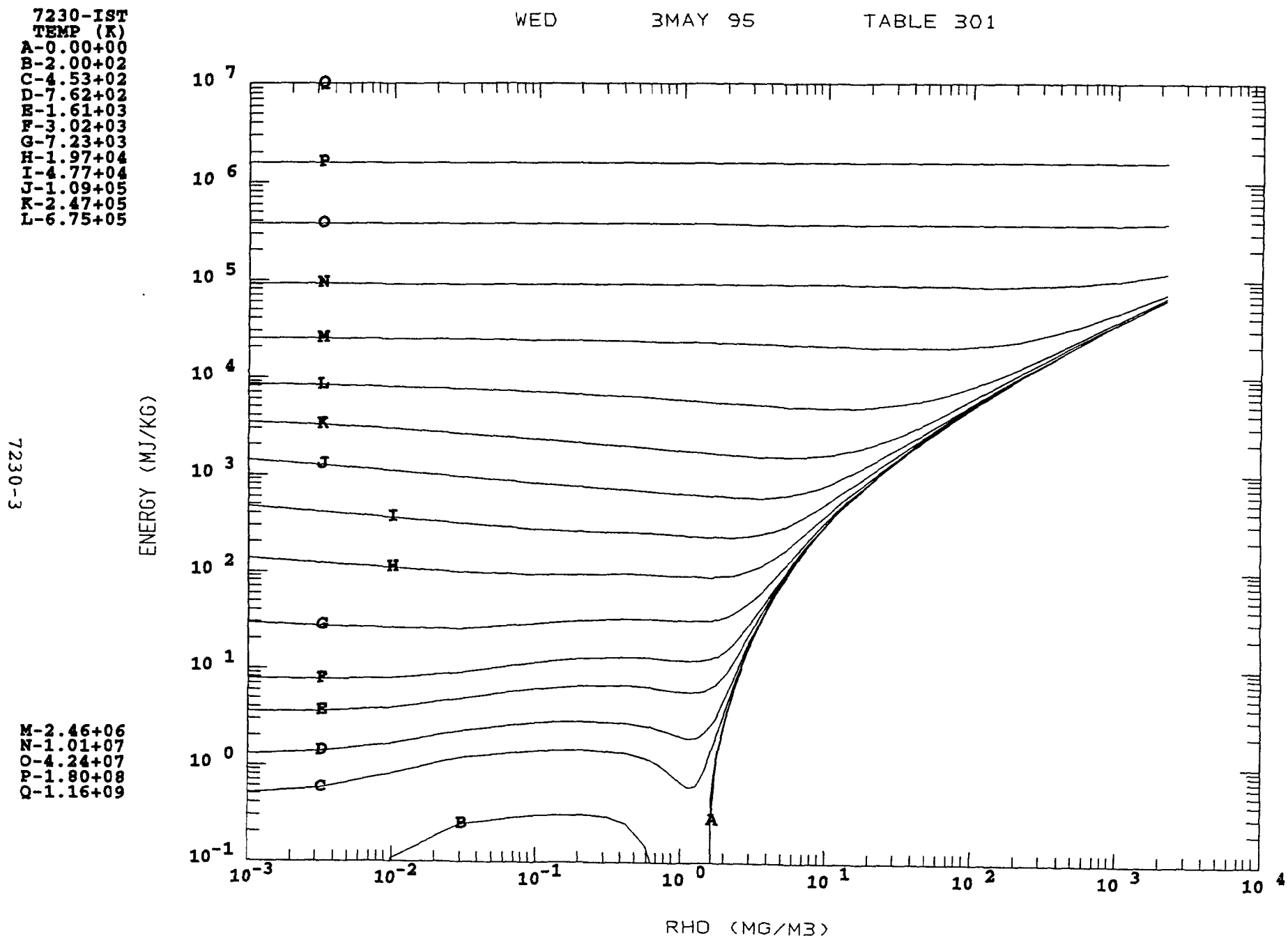
WED 3MAY 95 TABLE 301



M-2.46+06
N-1.01+07
O-4.24+07
P-1.80+08
Q-1.16+09

7230-2

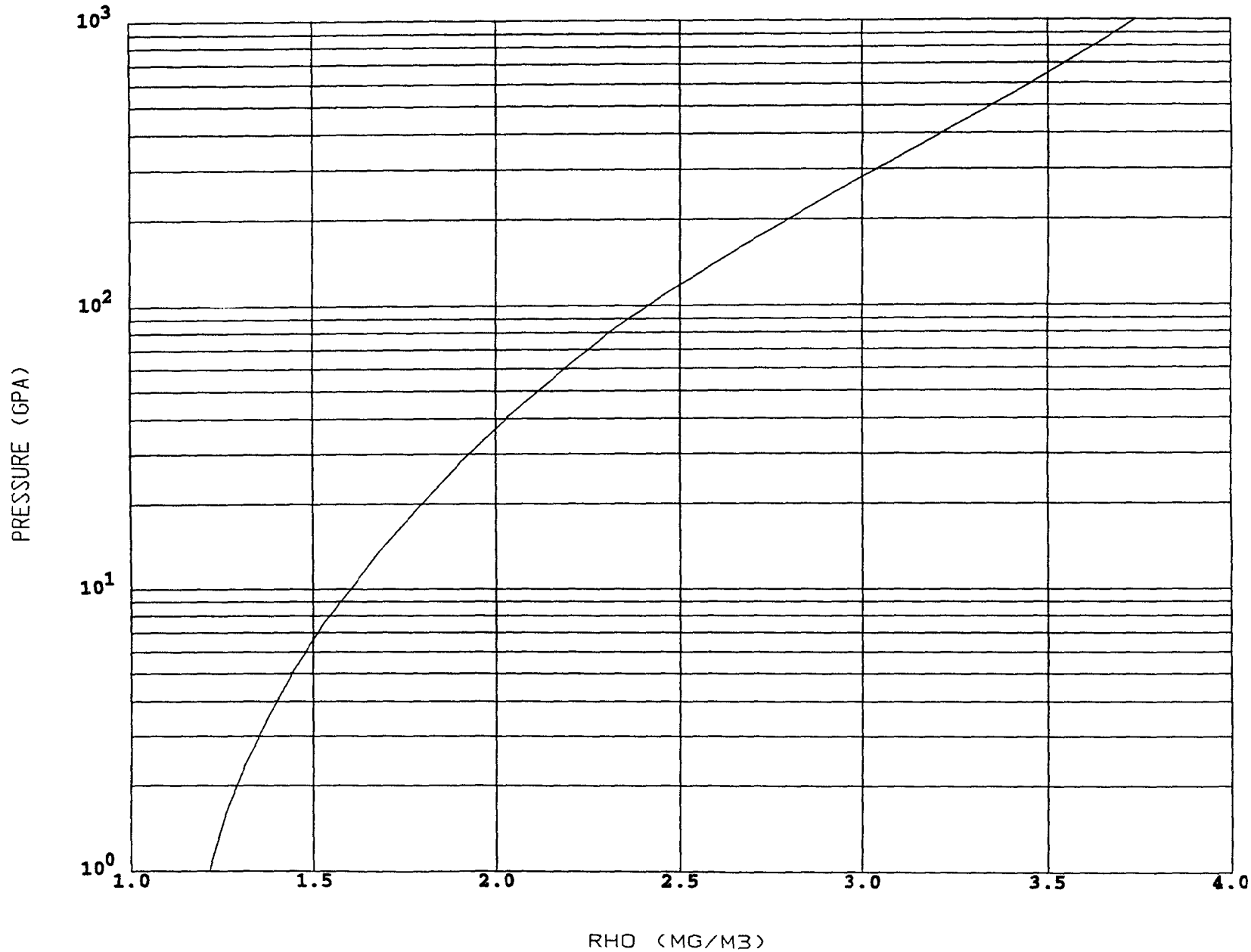
T1 SES2D CRAY



T1 SES2D CRAY 02

7230-HU1
E0 MJ/KG
0.00+00

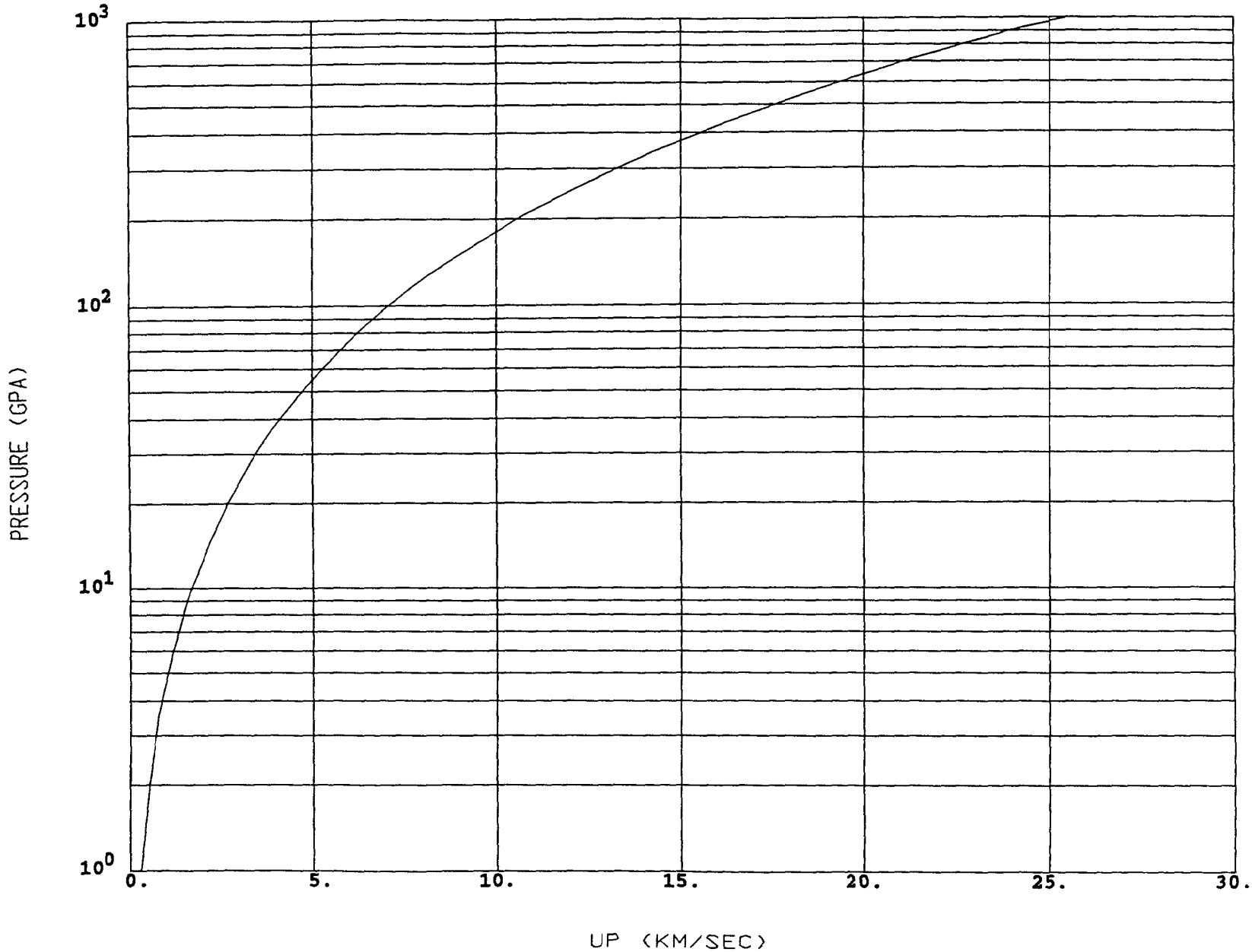
WED 3MAY 95 TABLE 301



T1 SES2D CRA

7230-HU1
E0 MJ/KG
0.00+00

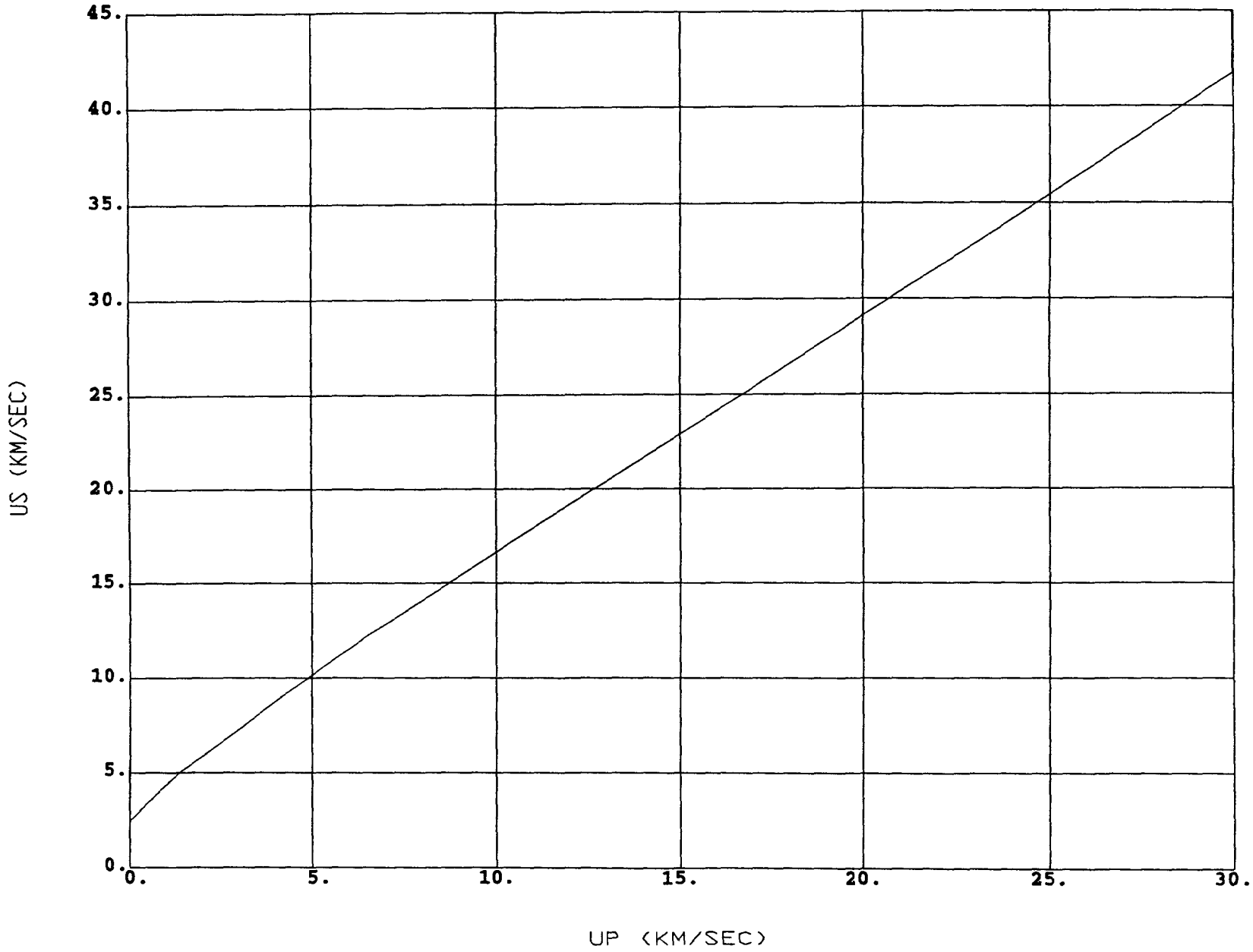
WED 3MAY 95 TABLE 301



T1 SES2D CRAY 02

7230-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



MATERIAL NUMBER	SUMMARY
7252	MATERIAL. LITHIA-BORIA GLASS

COMP. LI(0.6),AL(0.1),O(2.4),B(1.3)
ATOMIC NUMBER. 6.5455E+00
ATOMIC MASS. 1.3362E+01
NORMAL DENSITY. 2.2400E+00

GAMMA(COMPUTED). 1.2006

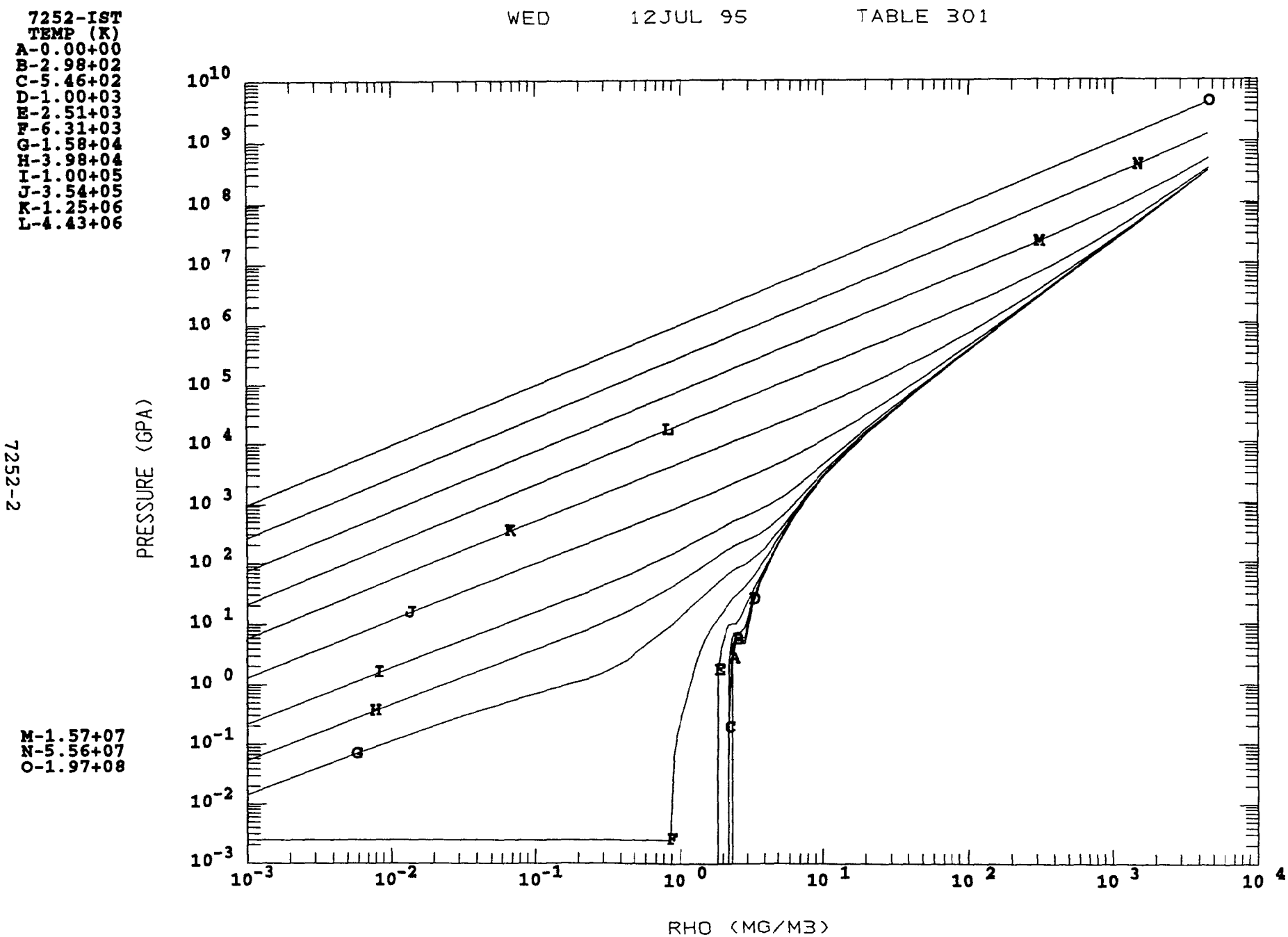
TABLE SUMMARY.

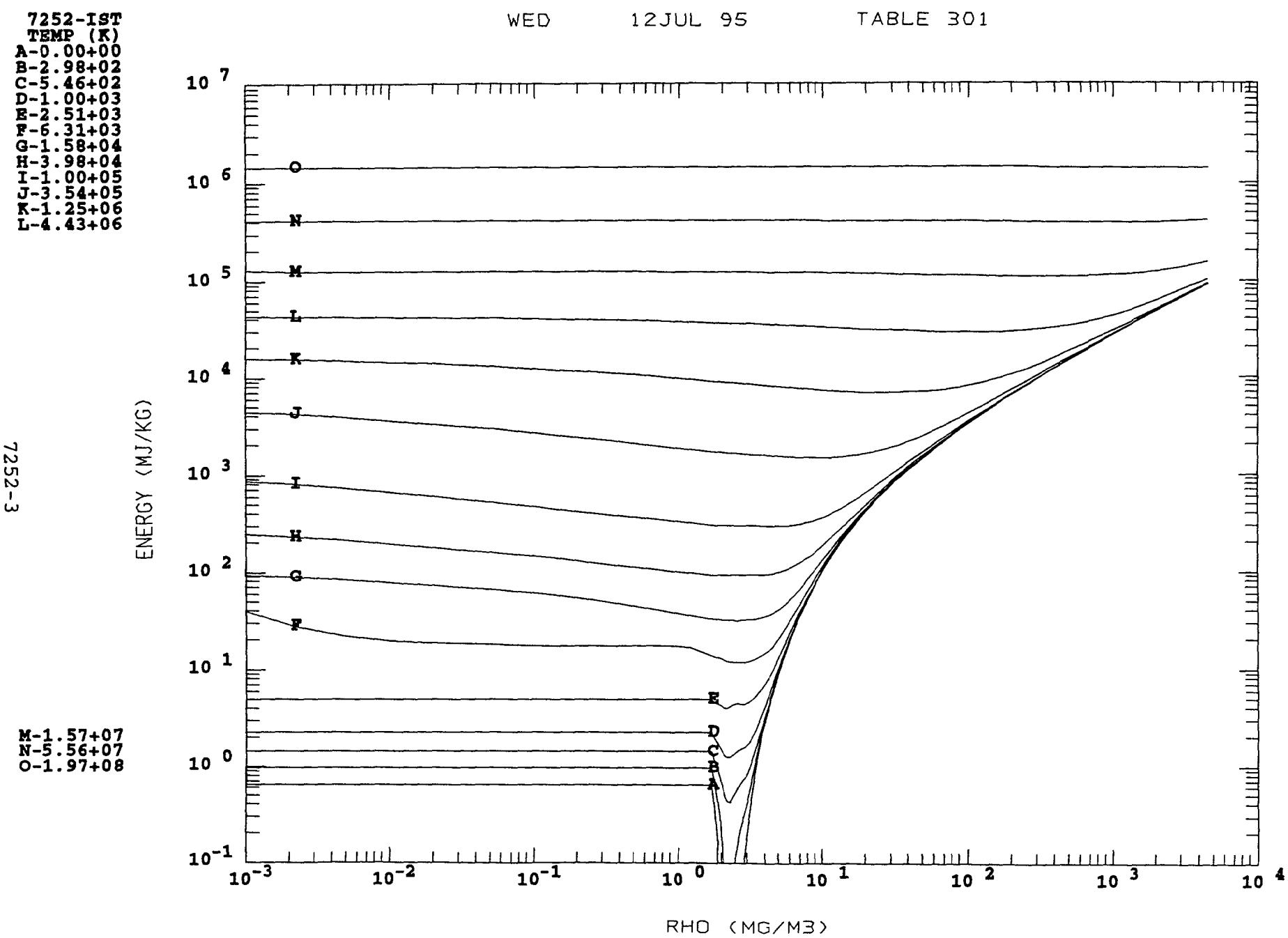
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	28					
102	15					
201	5					
301	6311	69	30	1.0000E-10	3.1623E-09	4.5000E+03
				0.0000E+00	1.2839E-02	3.1883E+04

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JANUARY 80
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 10383.
DATE OF LAST UPDATE. 91280.
SOURCE. G. KERLEY, J.D. JOHNSON
REFS. T-4-SL-5(DECEMBER 78), T-4 NOTEBOOK
CODES. CANDIDE, PANDA, TUTTI, MIXTFD

COMMENTS. SUPERCEDES EOS 7250 AND 7251. INCLUDES PHASE TRANSITION AT 5 GPA. AGREES WITH SHOCK DATA. 301 TABLE HAS FREE ENERGY.

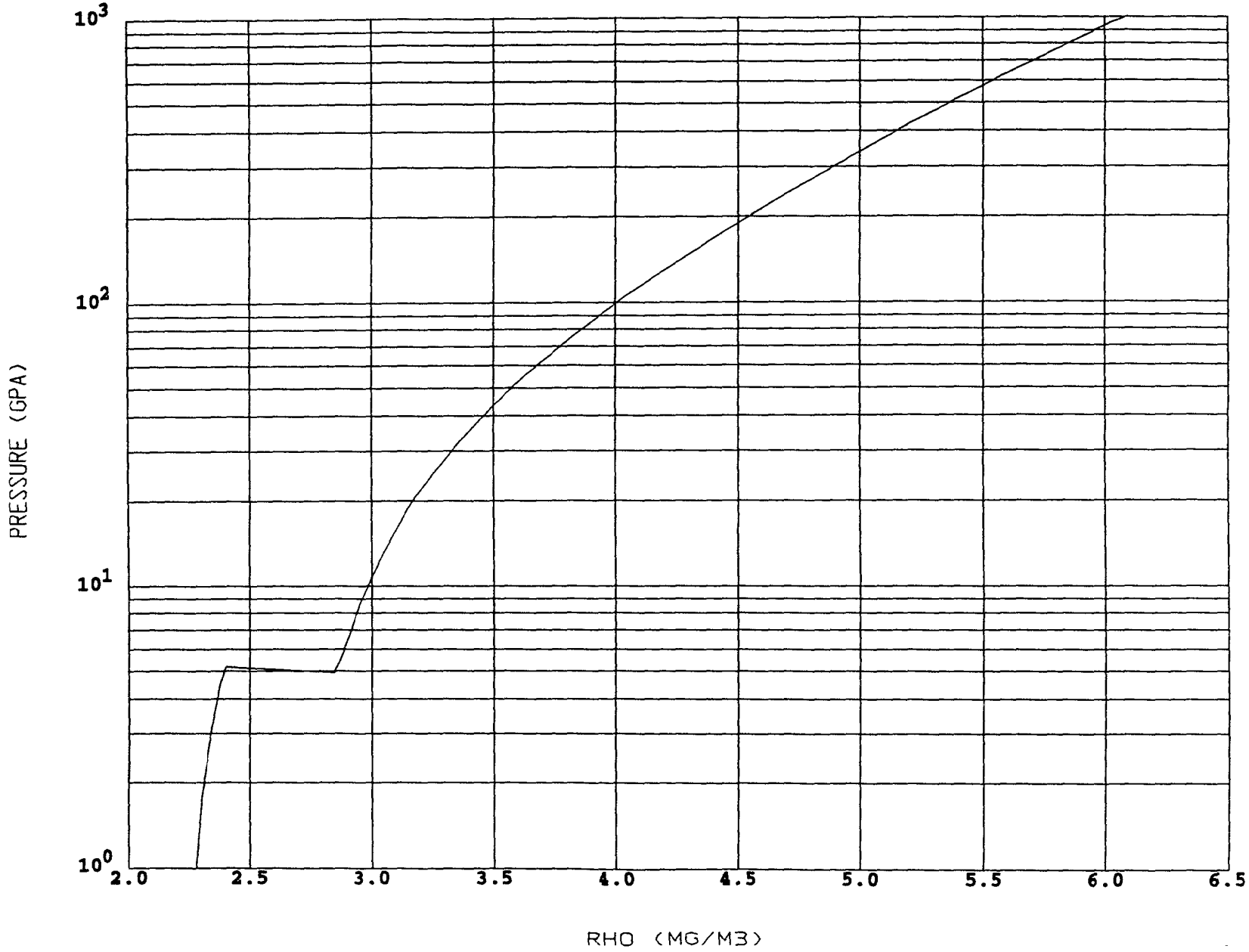

7252-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-5.46+02
D-1.00+03
E-2.51+03
F-6.31+03
G-1.58+04
H-3.98+04
I-1.00+05
J-3.54+05
K-1.25+06
L-4.43+06
M-1.57+07
N-5.56+07
O-1.97+08
WED 12JUL 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
7252-2
T1 SES2D CRA



T1 SES2D CRAY 02

7252-HU1
E0 MJ/KG
0.00+00

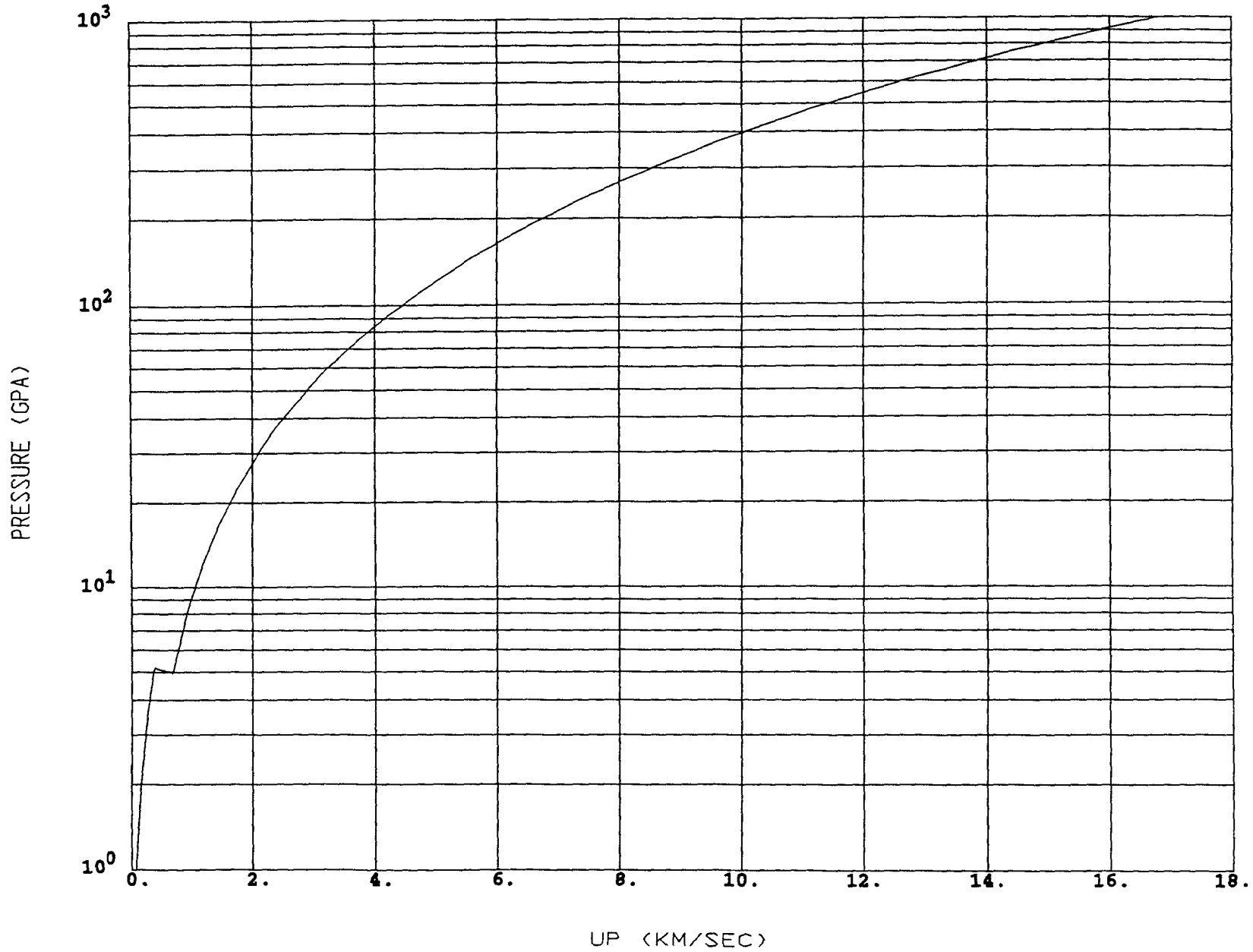
WED 12JUL 95 TABLE 301



T1 SESSD CRAY

7252-HU1
E0 MJ/KG
0.00+00

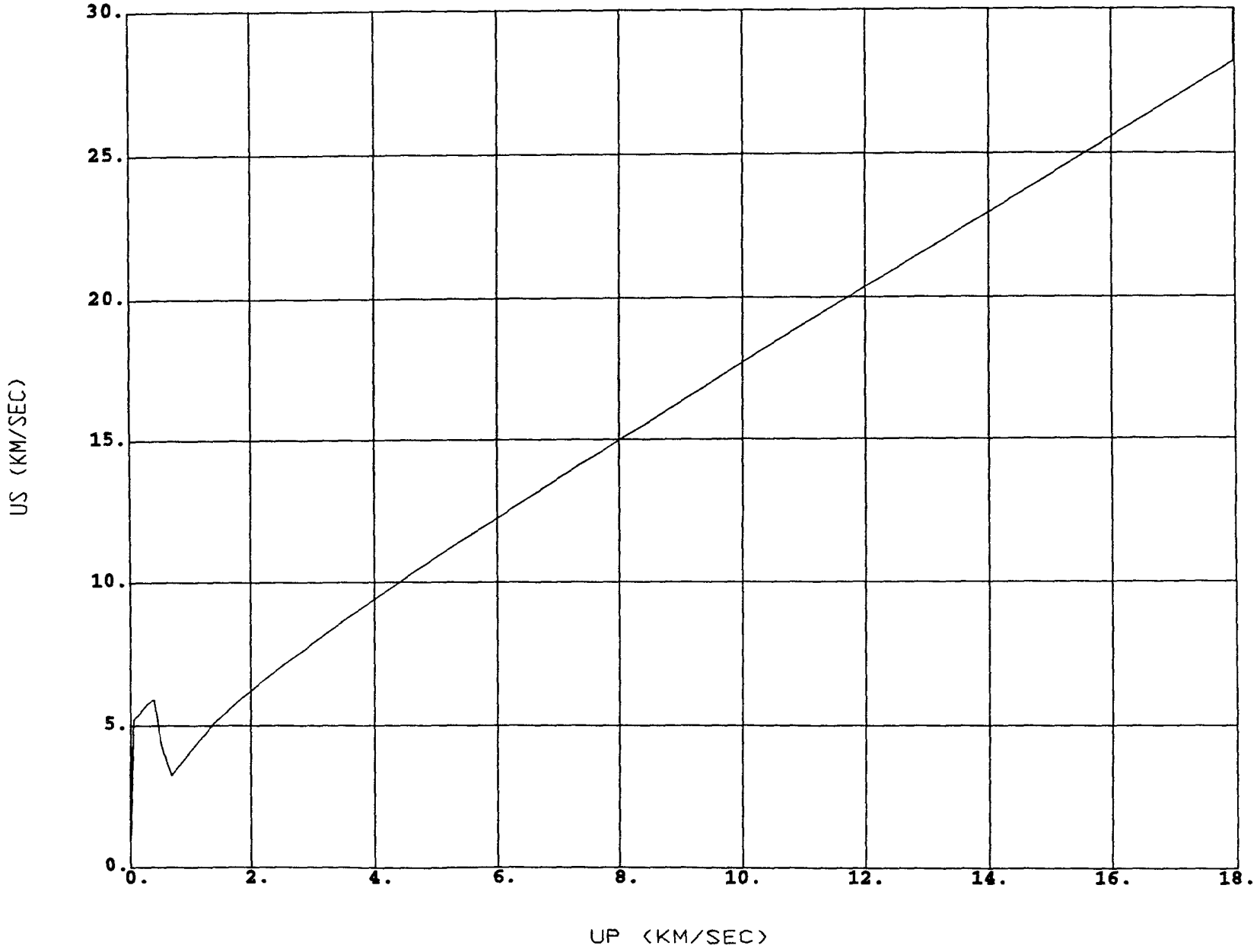
WED 12JUL 95 TABLE 301



T1 SES2D CRAY 02

7252-HU1
E0 MJ/KG
0.00+00

WED 12JUL 95 TABLE 301



MATERIAL NUMBER SUMMARY

7270 MATERIAL. LITHIUM FLUORIDE (SINGLE CRYSTAL)

COMP. LIF
ATOMIC NUMBER. 6.0000E+00
ATOMIC MASS. 1.2969E+01
NORMAL DENSITY. 2.6380E+00

GAMMA(COMPUTED). 1.9771

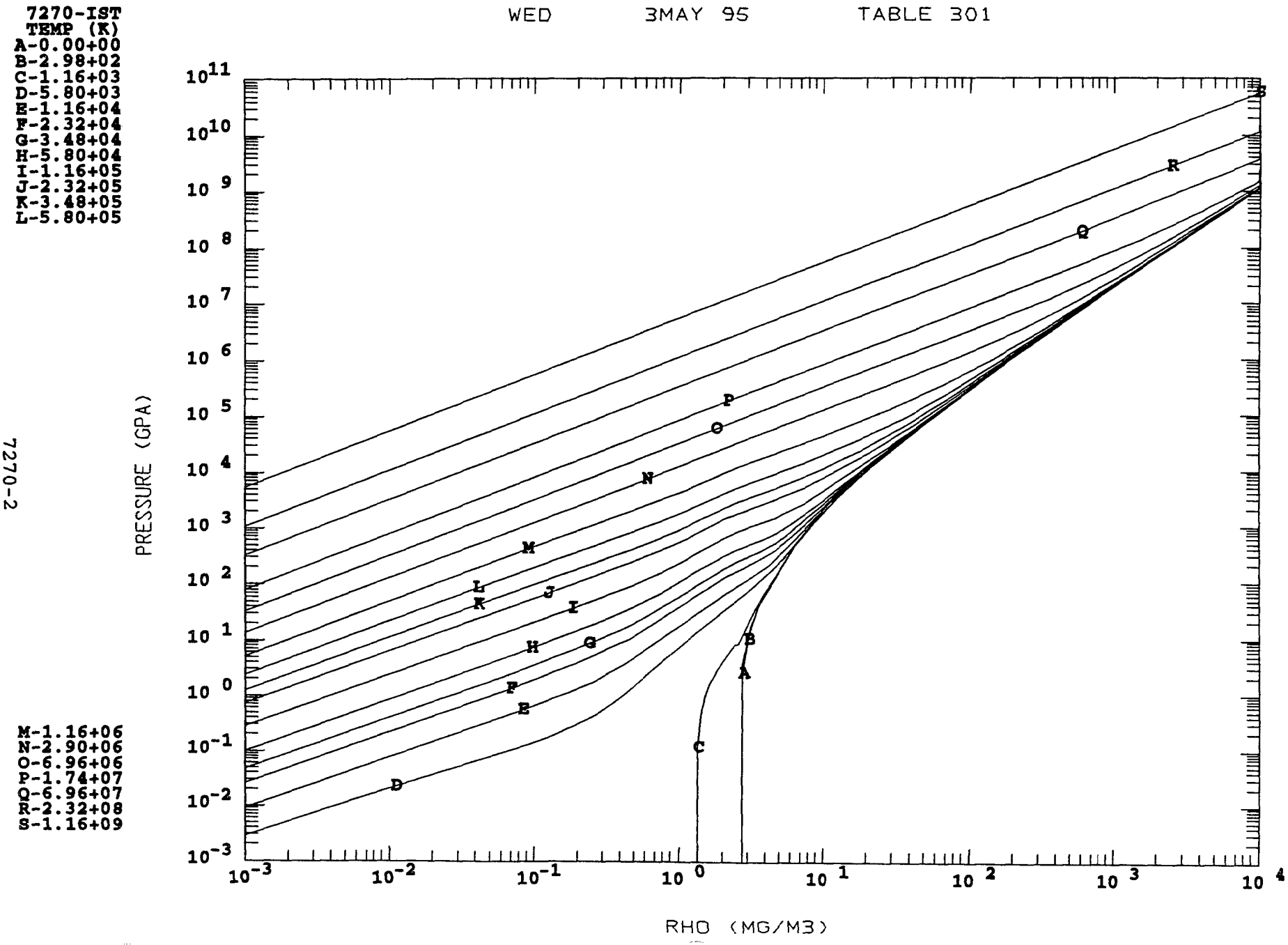
TABLE SUMMARY.

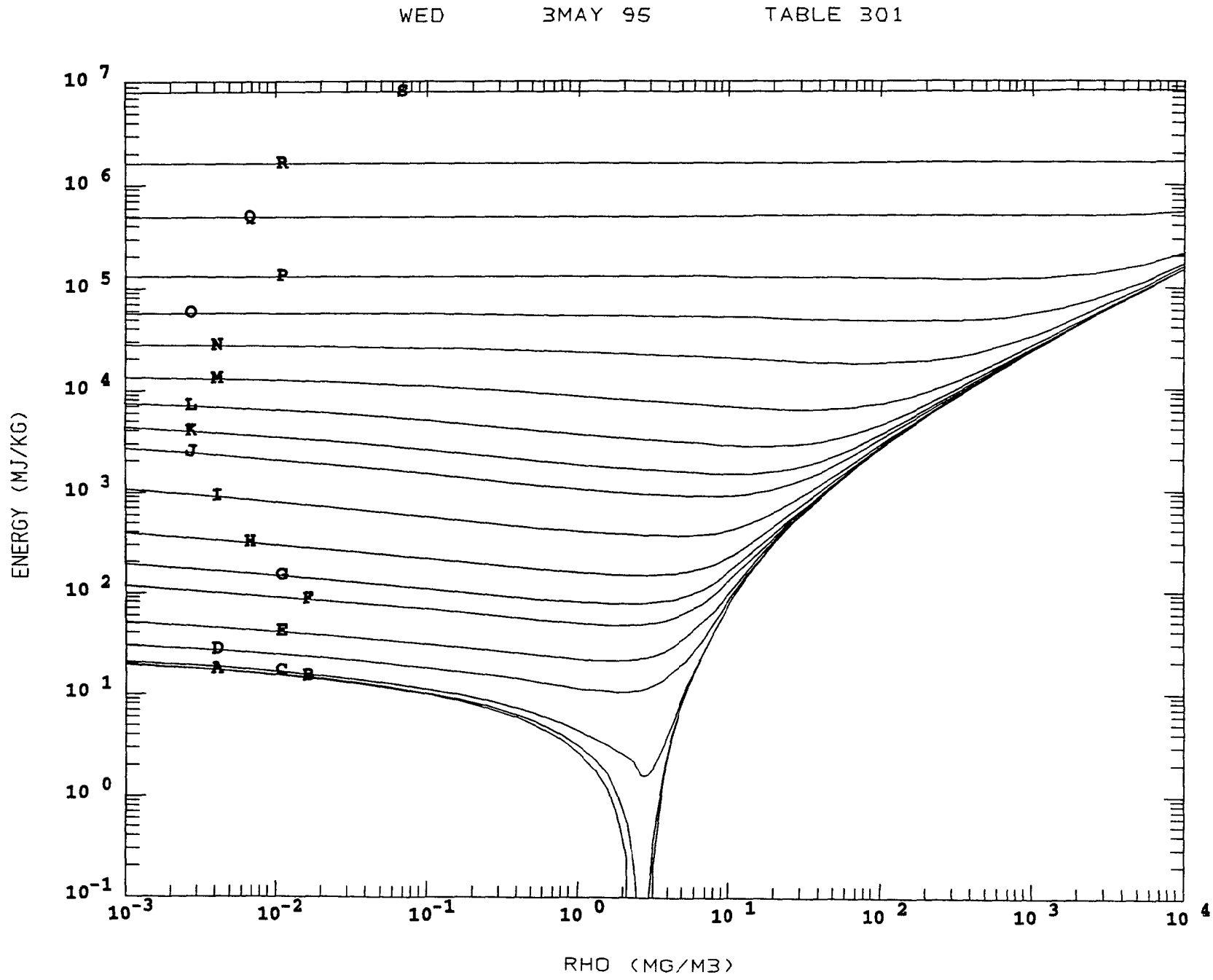
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	19					
102	71					
201	5					
301	7431	66	37	0.0000E+00	2.6380E-06	1.3190E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6535	65	33	2.6380E-06	5.2760E-06	5.2760E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	7543	67	37	2.6380E-06	5.2760E-06	5.2760E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	263	65	1	2.6380E-06	5.2760E-06	1.3190E+04
				0.0000E+00	-1.7139E-10	0.0000E+00
401	57					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. DEC 90
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 121890.
DATE OF LAST UPDATE. 11593.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED AND VERY HIGH DENSITY PORTION OF COLD CURVE WHERE TFD MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. JDJNUC NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN=1). GAMREF=1.99 AND TMELT= 1250. COLD CURVE FROM SHOCK DATA COMPOSED OF STRAIGHT LINE WITH C0=5.148 AND S1=1.353. ECOHKC=100, FACLJ=0.12, CMAT=1.776. CRITICAL TEMPERATURE IS 4035 KELVIN. 301 TABLE HAS VAN DER WAAL LOOPS. MELT (411,412) TABLES AVAILABLE.

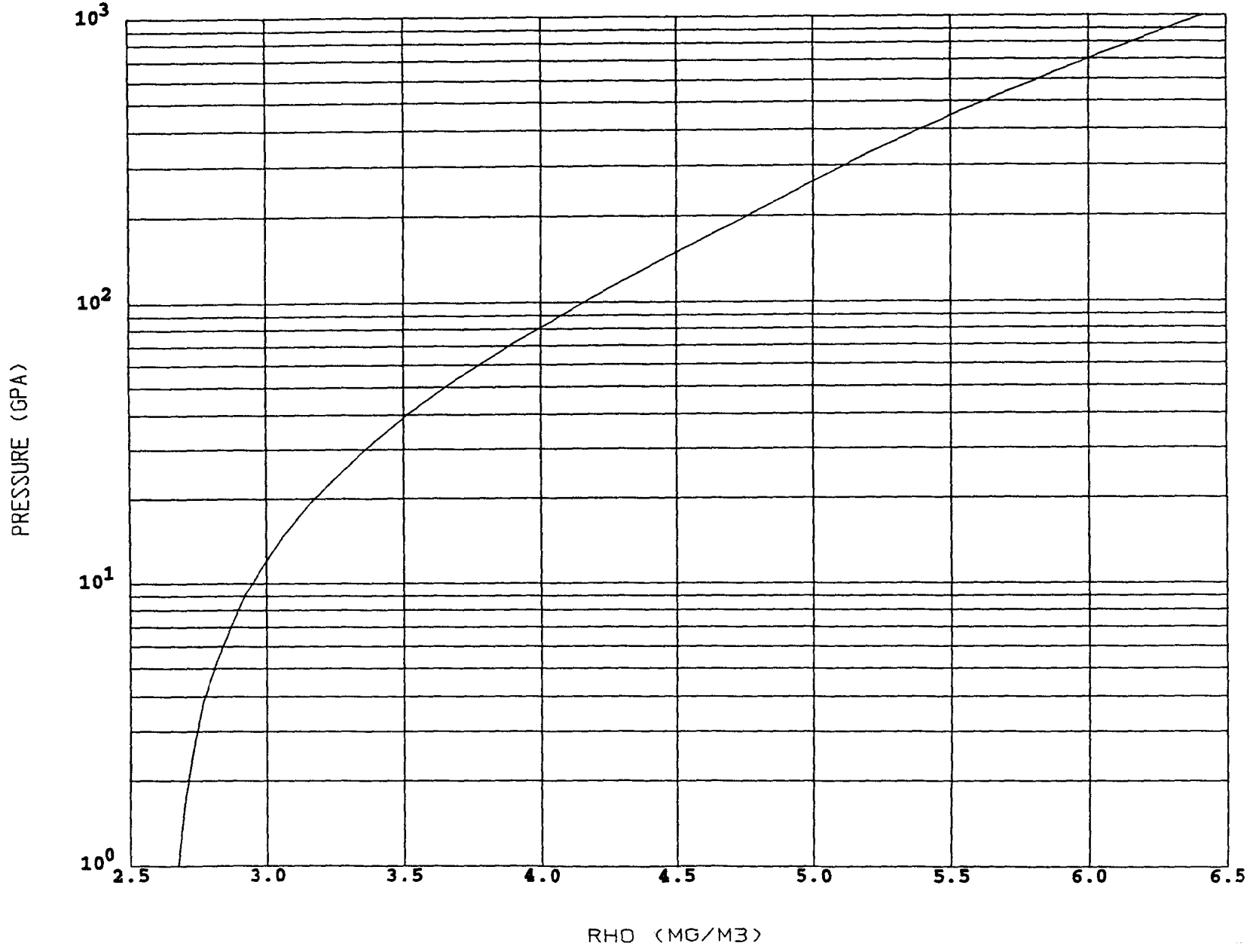

7270-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA1



T1 SES2D CRAY 02

7270-HU1
E0 MJ/KG
0.00+00

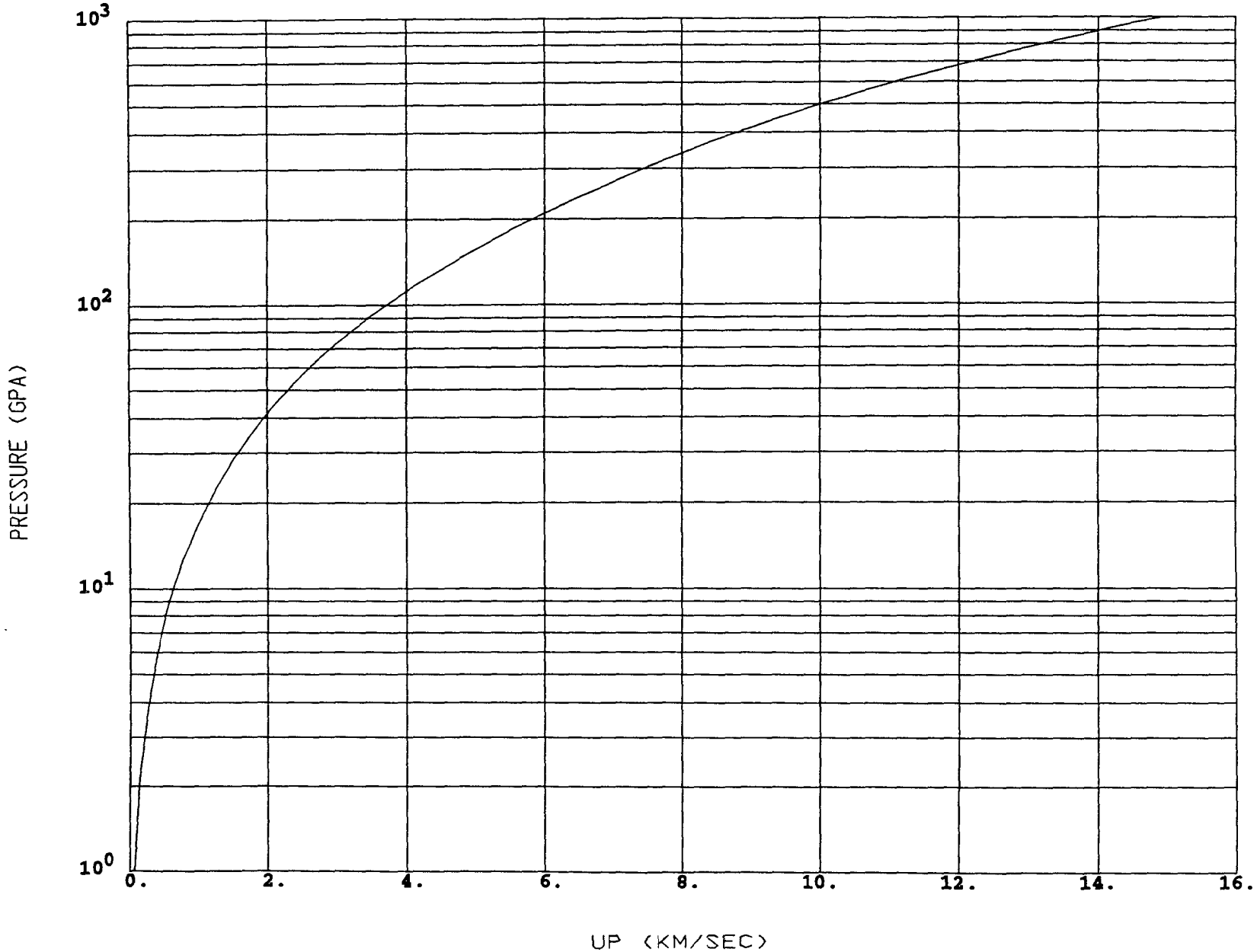
WED 3MAY 95 TABLE 301



T1 SES2D CRAY

7270-HU1
E0 MJ/KG
0.00+00

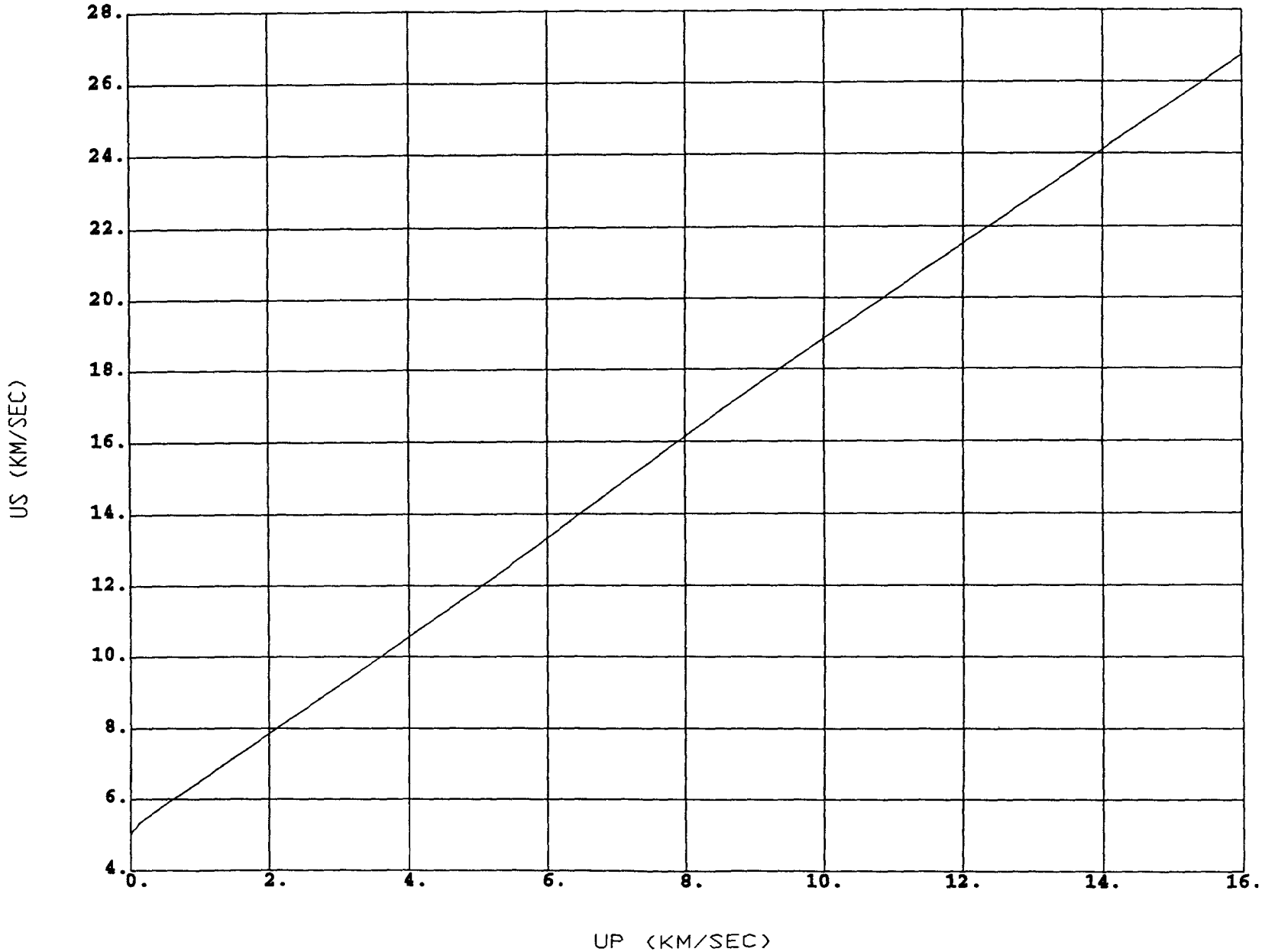
WED 3MAY 95 TABLE 301



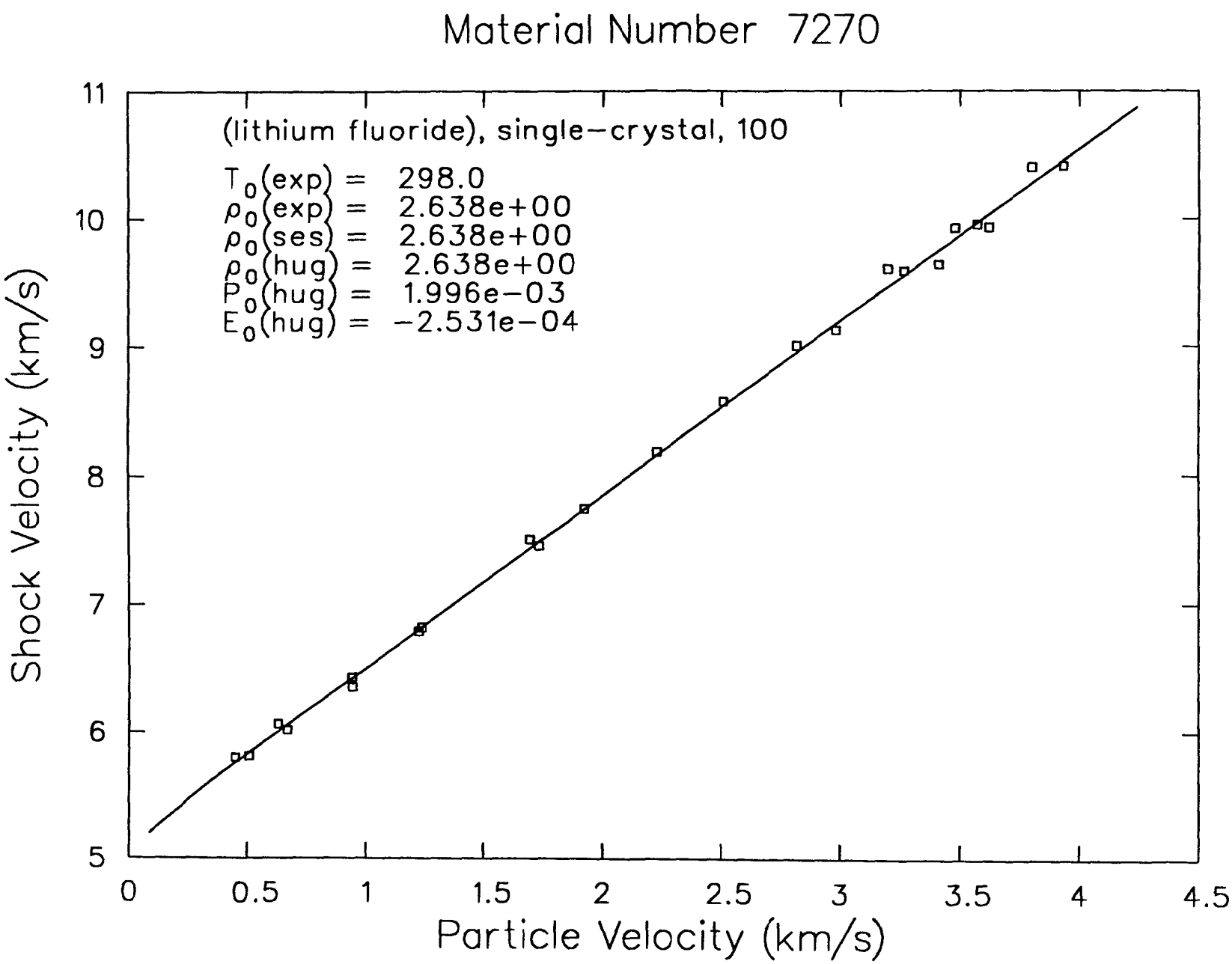
T1 SES2D CRAY 02

7270-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7270
(lithium fluoride), single-crystal, 100
T_0(exp) = 298.0
ρ_0(exp) = 2.638e+00
ρ_0(ses) = 2.638e+00
ρ_0(hug) = 2.638e+00
P_0(hug) = 1.996e-03
E_0(hug) = -2.531e-04
Shock Velocity (km/s)
Particle Velocity (km/s)
11
10
9
8
7
6
5
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

MATERIAL NUMBER	SUMMARY
7281	MATERIAL. SALT

COMP. NACL
ATOMIC NUMBER. 1.4000E+01
ATOMIC MASS. 2.9221E+01
NORMAL DENSITY. 2.1650E+00

GAMMA(COMPUTED). 0.6272

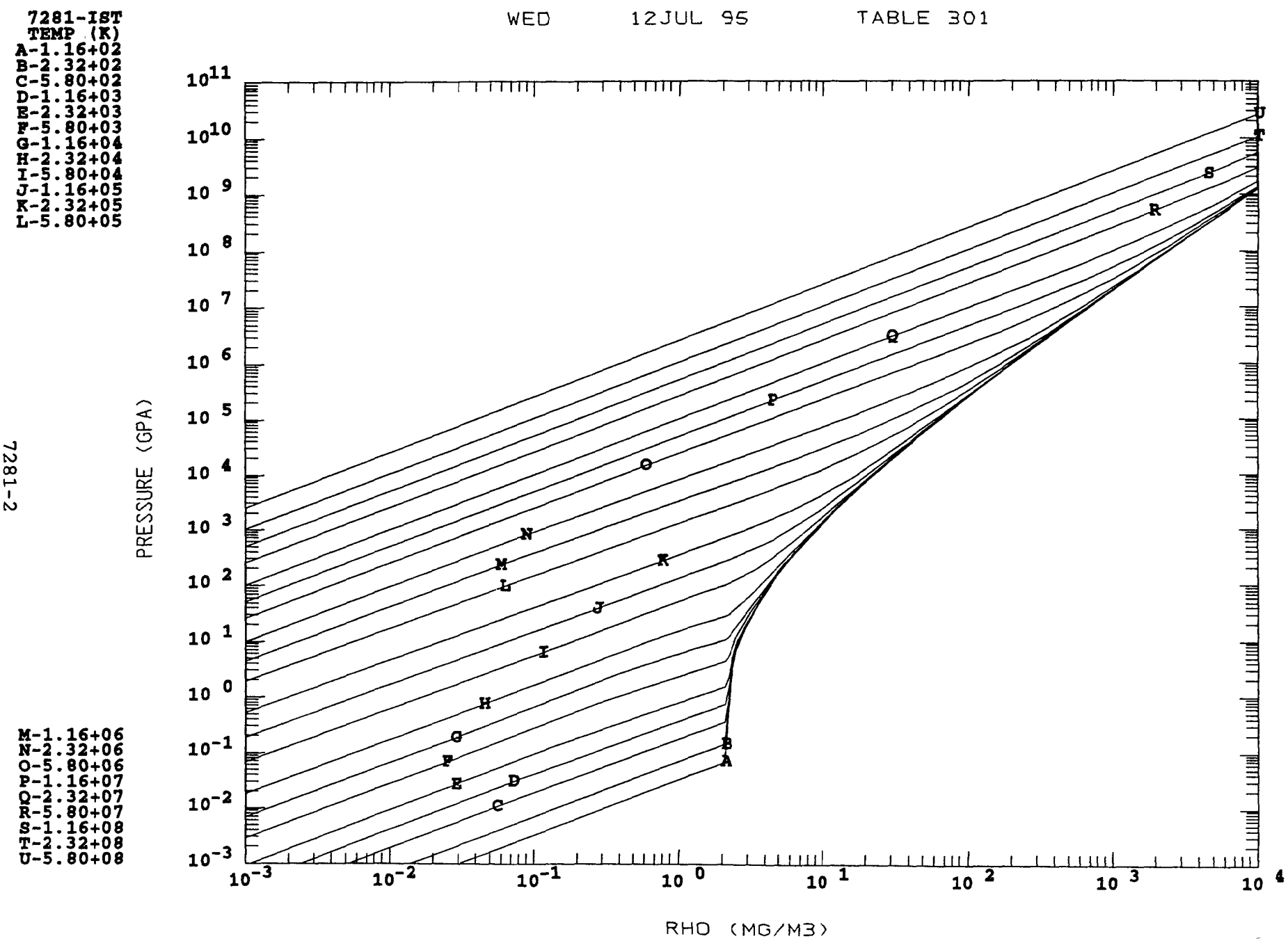
TABLE SUMMARY.

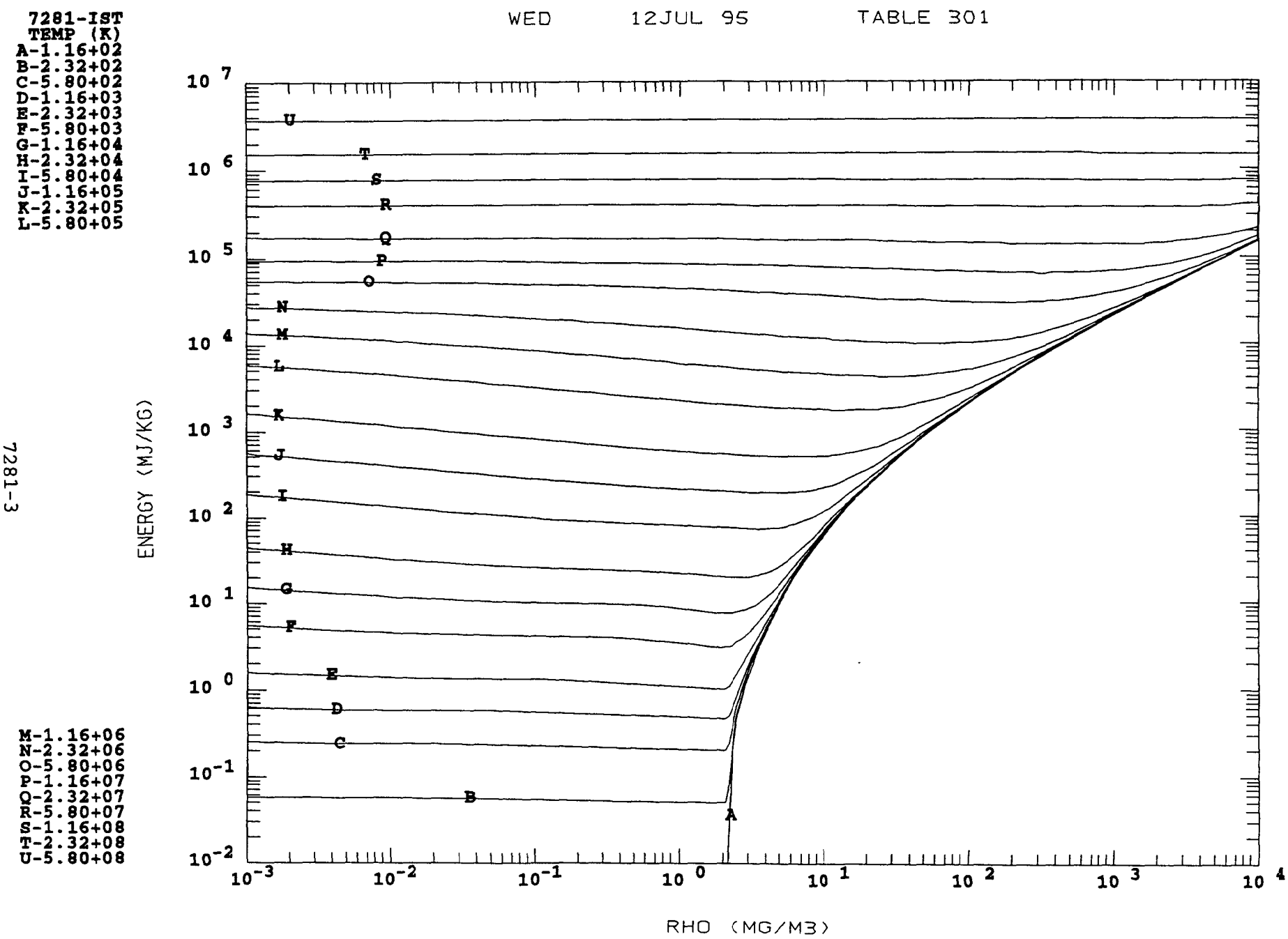
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	15					
102	27					
201	5					
301	1098	25	21	0.0000E+00	2.1600E-06	2.1600E+04
				1.0000E-02	2.0001E-02	5.0002E+04

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. NOV 81
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 111281.
DATE OF LAST UPDATE. 91082.
SOURCE. A. MERTS, N. MAGEE
REFS. LA-5068
CODES. EOS

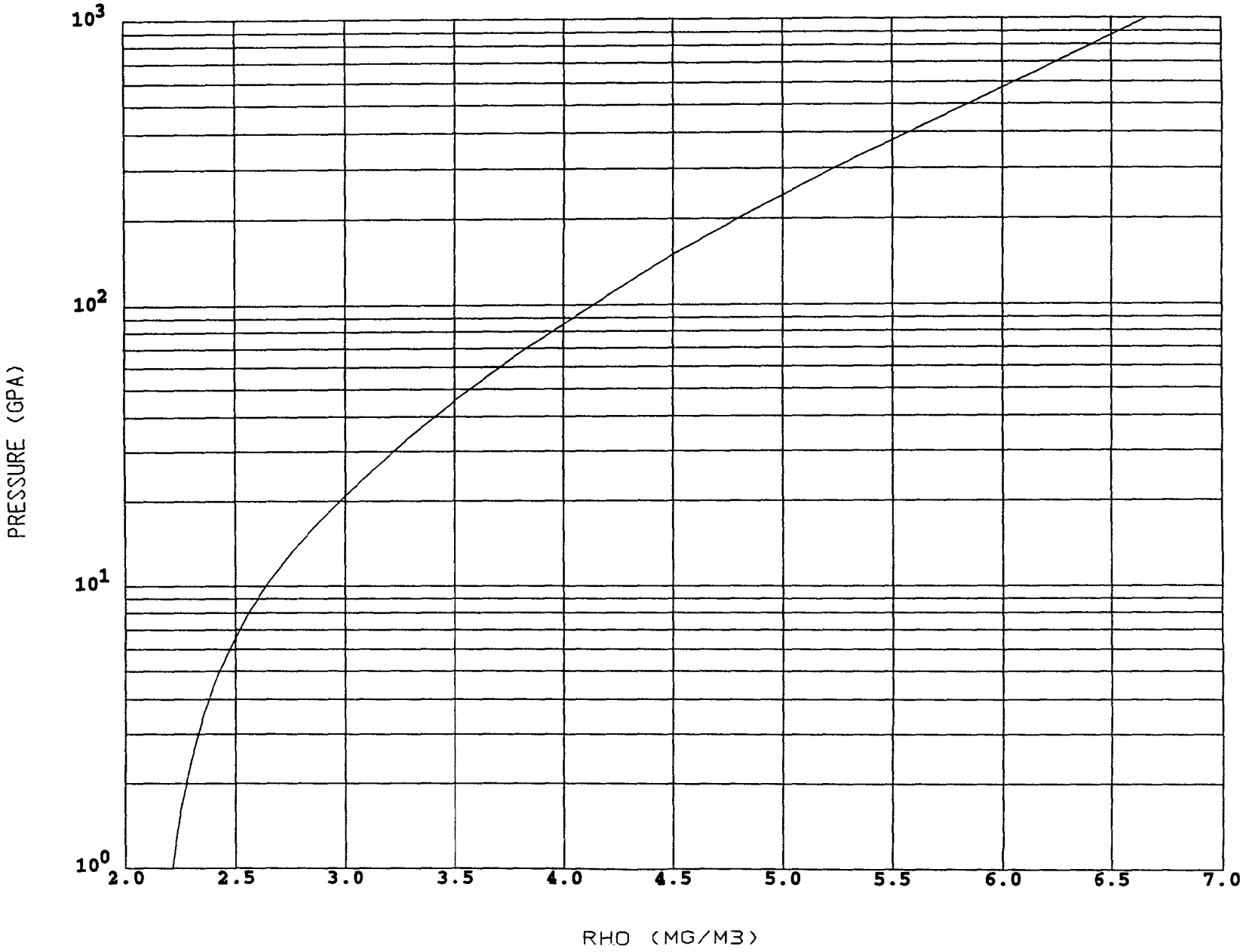
COMMENTS. A THOMAS-FERMI CODE FOR ELECTRON CONTRIBUTION AND A BARNES COLD CURVE CORRECTIONS. DOES NOT CONSIDER KNOWN PHASE CHANGES AT MODERATELY LOW PRESSURE. A QUICK ATTEMPT TO FILL A REQUEST FROM BOB DEUPREE (ESS-5).


7281-IST
TEMP (K)
A-1.16+02
B-2.32+02
C-5.80+02
D-1.16+03
E-2.32+03
F-5.80+03
G-1.16+04
H-2.32+04
I-5.80+04
J-1.16+05
K-2.32+05
L-5.80+05
M-1.16+06
N-2.32+06
O-5.80+06
P-1.16+07
Q-2.32+07
R-5.80+07
S-1.16+08
T-2.32+08
U-5.80+08
WED 12JUL 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY


7281-IST
TEMP (K)
A-1.16+02
B-2.32+02
C-5.80+02
D-1.16+03
E-2.32+03
F-5.80+03
G-1.16+04
H-2.32+04
I-5.80+04
J-1.16+05
K-2.32+05
L-5.80+05
M-1.16+06
N-2.32+06
O-5.80+06
P-1.16+07
Q-2.32+07
R-5.80+07
S-1.16+08
T-2.32+08
U-5.80+08
WED 12JUL 95 TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7281-HU1
E0 MJ/KG
0.00+00

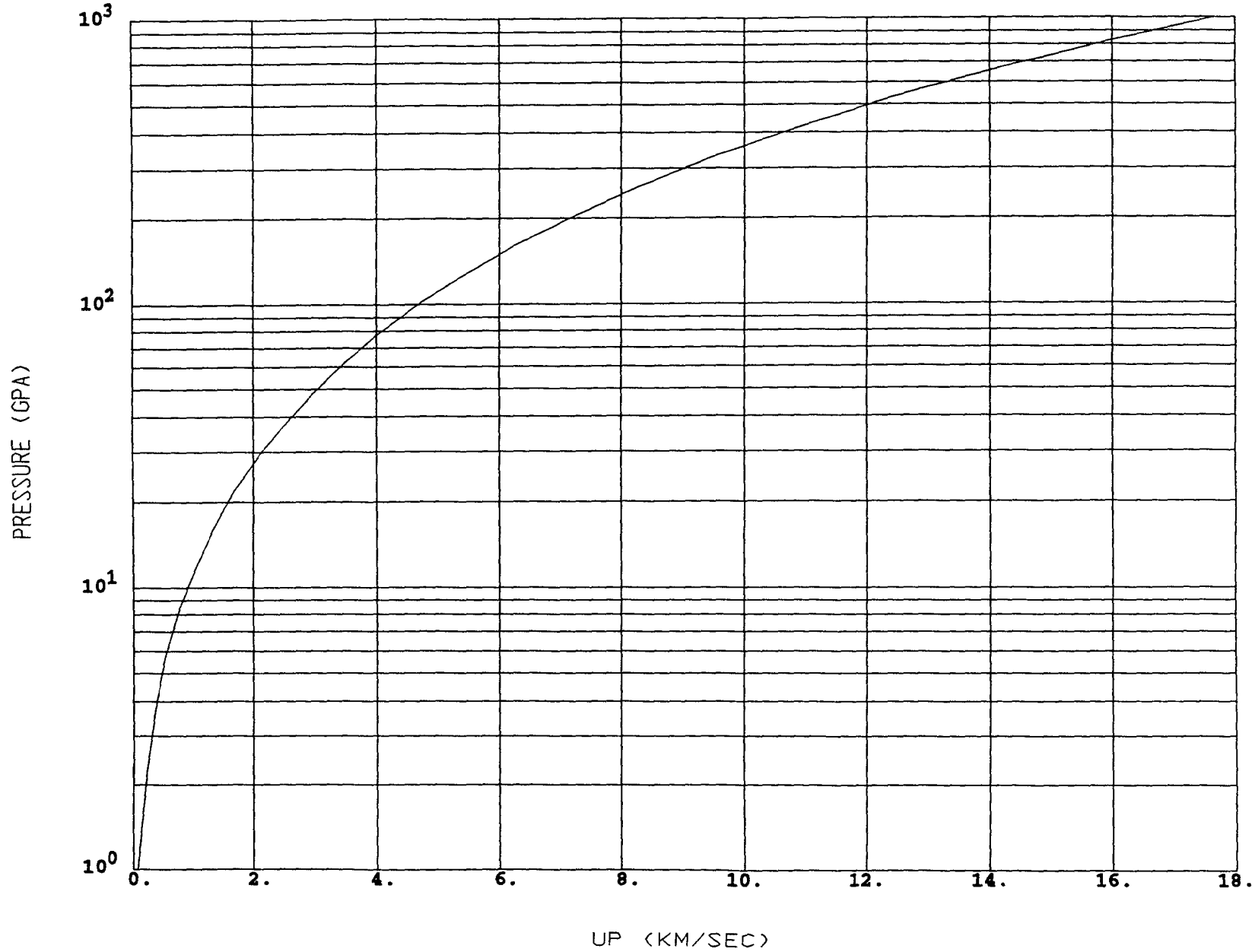
WED 12JUL 95 TABLE 301



T1 SESS2D CRAY

7281-HU1
E0 MJ/KG
0.00+00

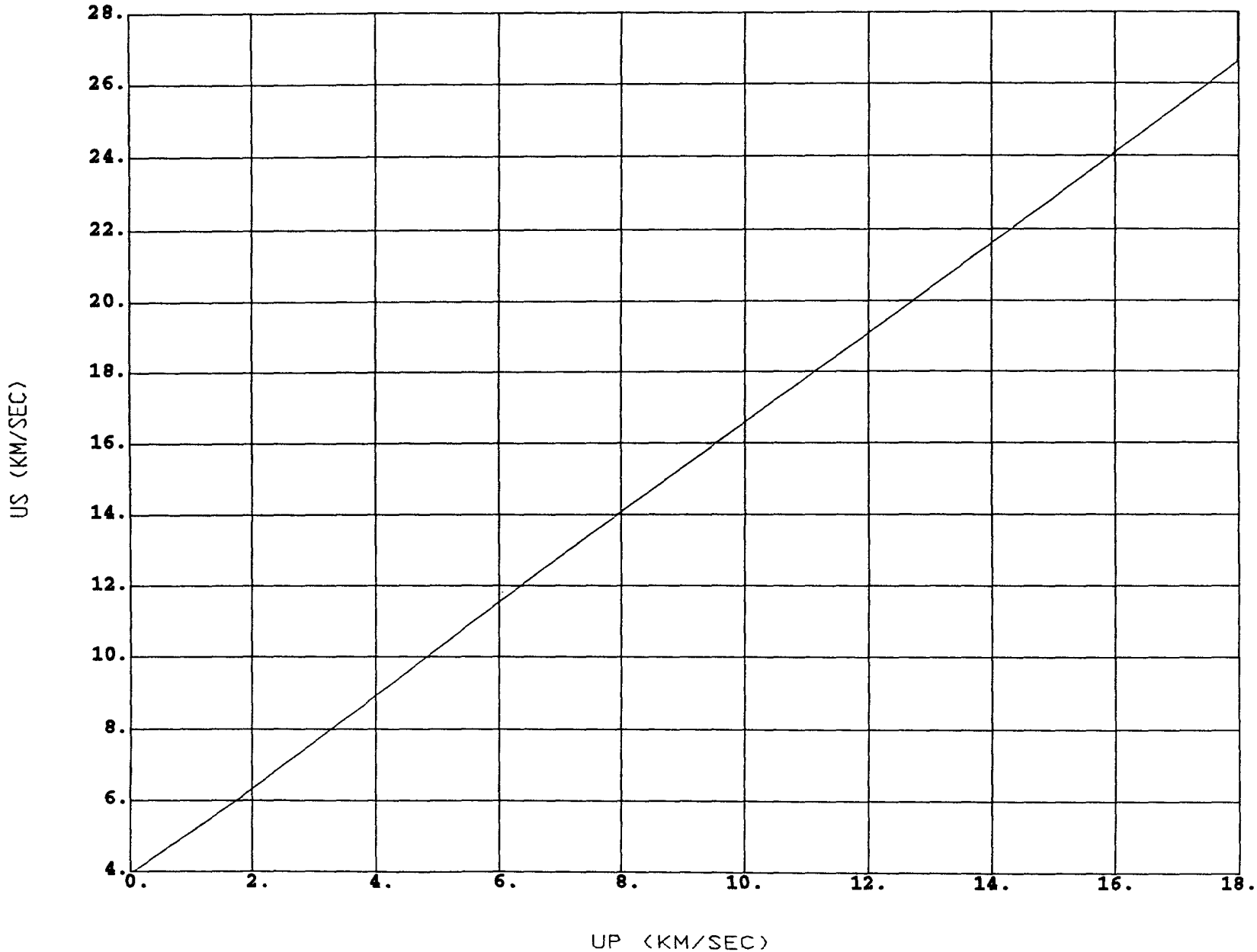
WED 12JUL 95 TABLE 301



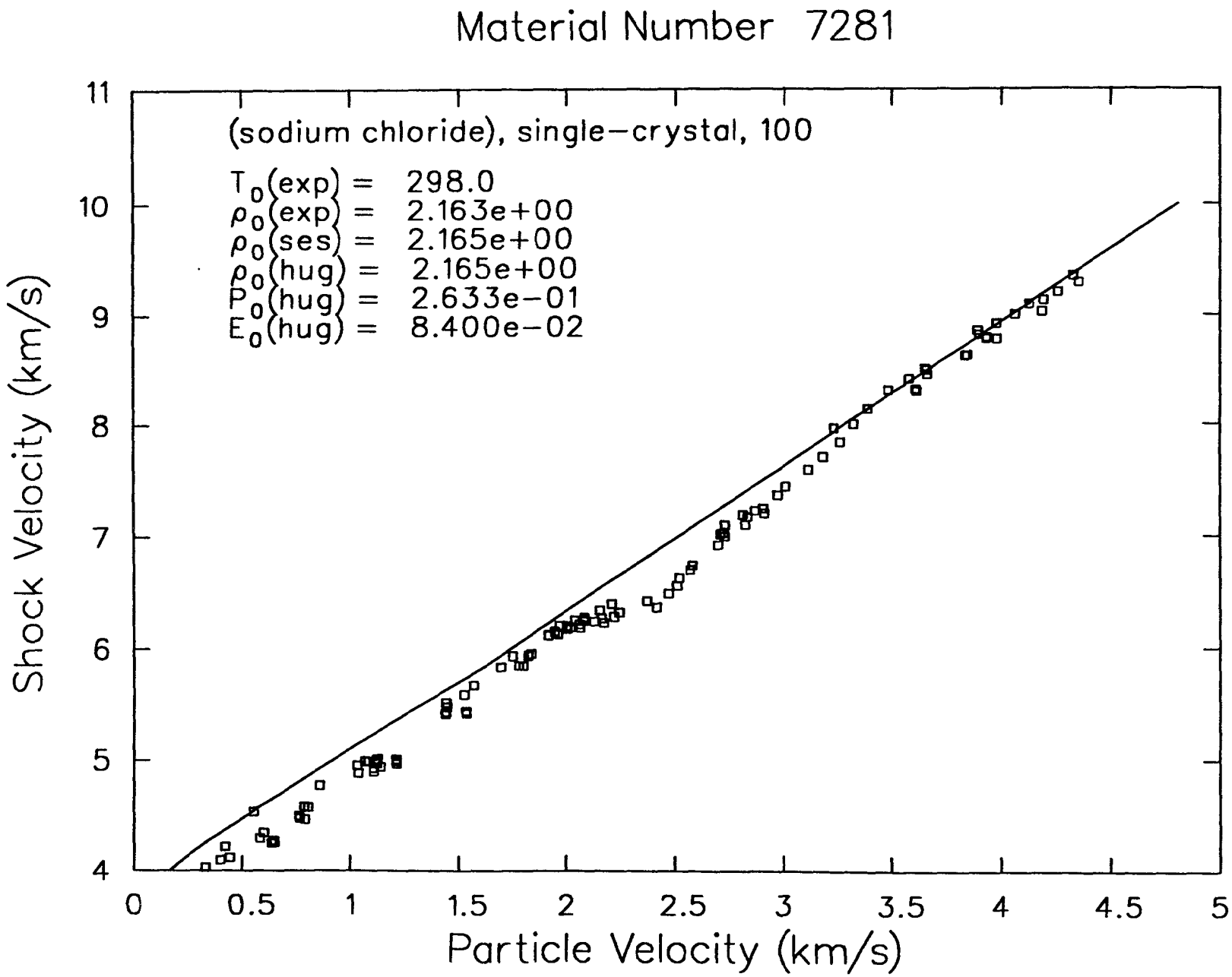
T1 SES2D CRAY 02

7281-HU1
E0 MJ/KG
0.00+00

WED 12JUL 95 TABLE 301



T1 SES2D CRA1


Material Number 7281
(sodium chloride), single-crystal, 100
T_0(exp) = 298.0
ρ_0(exp) = 2.163e+00
ρ_0(ses) = 2.165e+00
ρ_0(hug) = 2.165e+00
P_0(hug) = 2.633e-01
E_0(hug) = 8.400e-02
Shock Velocity (km/s)
Particle Velocity (km/s)
11
10
9
8
7
6
5
4
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

MATERIAL NUMBER SUMMARY

7282 MATERIAL. SALT

COMP. NACL
ATOMIC NUMBER. 1.4000E+01
ATOMIC MASS. 2.9221E+01
NORMAL DENSITY. 2.1370E+00

GAMMA(COMPUTED). 1.5631

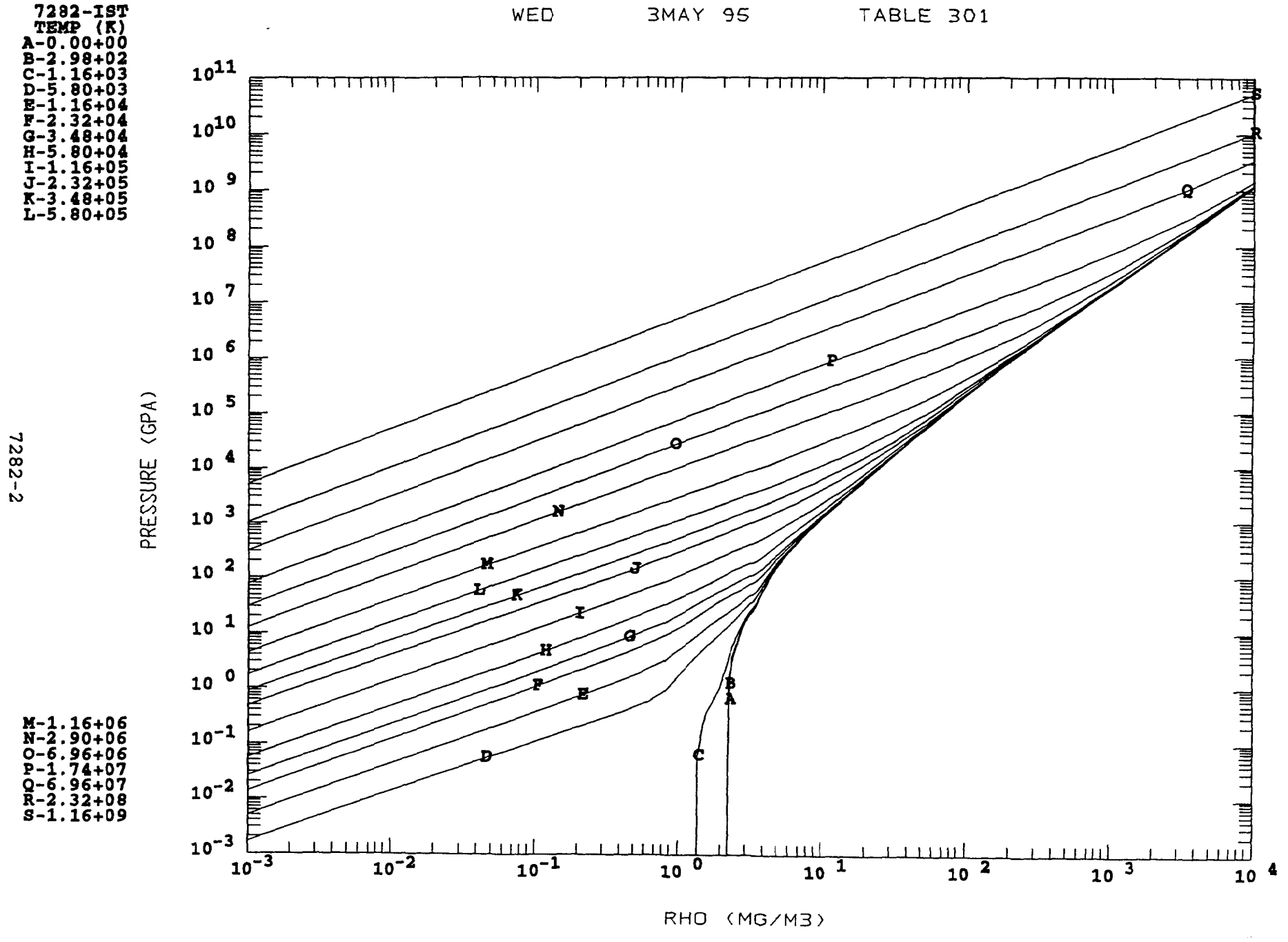
TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	15					
102	81					
201	5					
301	8215	73	37	0.0000E+00	2.1370E-06	4.2740E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7543	67	37	2.1370E-06	4.2740E-06	4.2740E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8103	72	37	2.1370E-06	4.2740E-06	4.2740E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	291	72	1	2.1370E-06	4.2740E-06	4.2740E+04
				0.0000E+00	-4.8132E-11	0.0000E+00
401	57					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

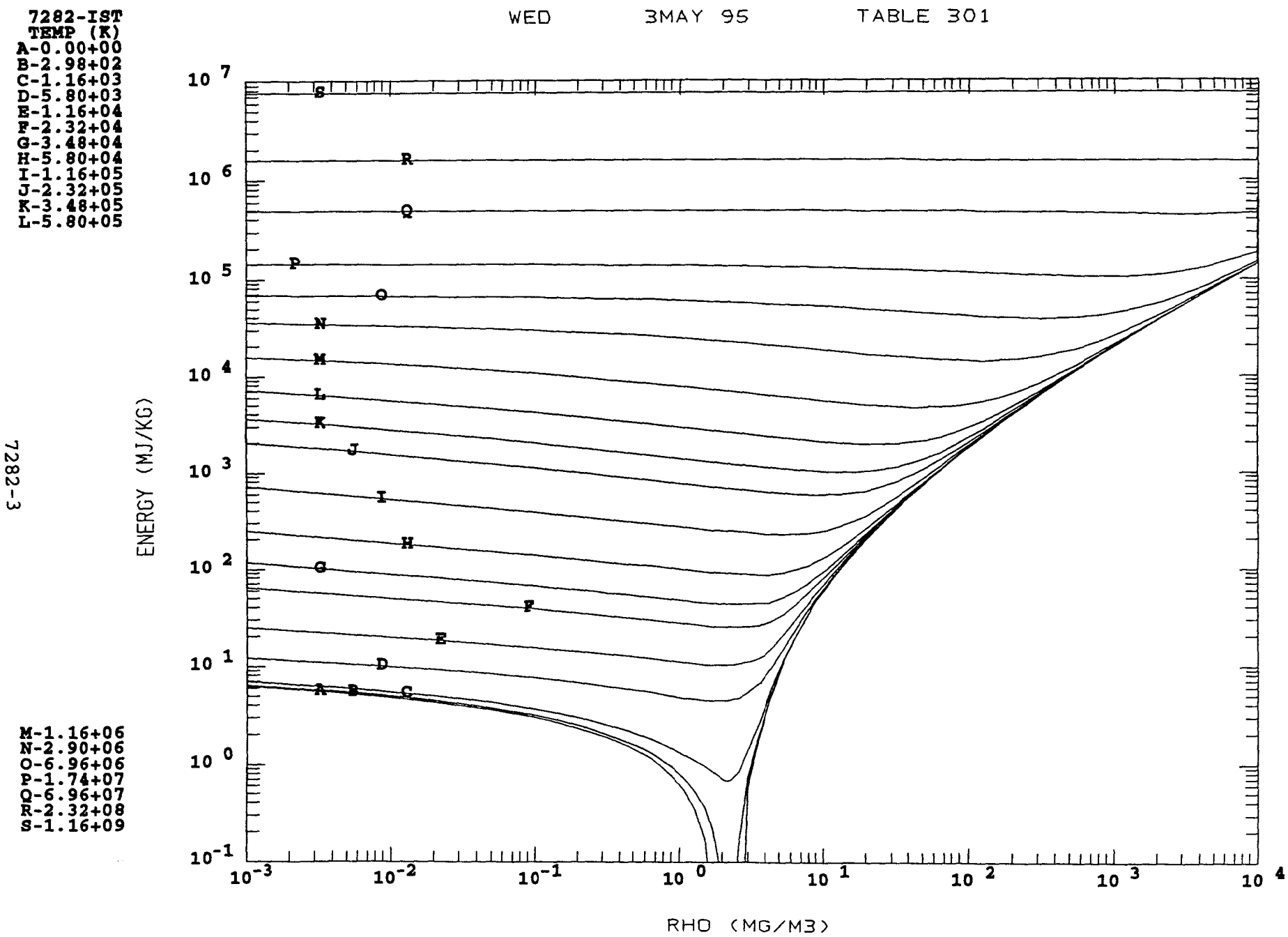
DATE. JAN 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 12788.
DATE OF LAST UPDATE. 20288.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH JD GAMMA (IGRUN = 7). GAMREF = 1.70, DEBKEL = 300, TMELT = 1074. DGAMMA = (-3.0,-3.0) WAS ADJUSTED TO FIT SHOCK DATA AT SHOCK DENSITY OF 0.868. COLD CURVE FROM SHOCK DATA AT SHOCK DENSITY OF 2.137. US-UP COMPOSED OF FOUR STRAIGHT LINES (UP,US) = (0.0,3.35), (1.71,5.66), (2.53,6.30), (3.18,7.64), (5.0,10.1). CMAT = 1.98, ECOHKC = 76.7, FACLJ = 0.115. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 3440 K.



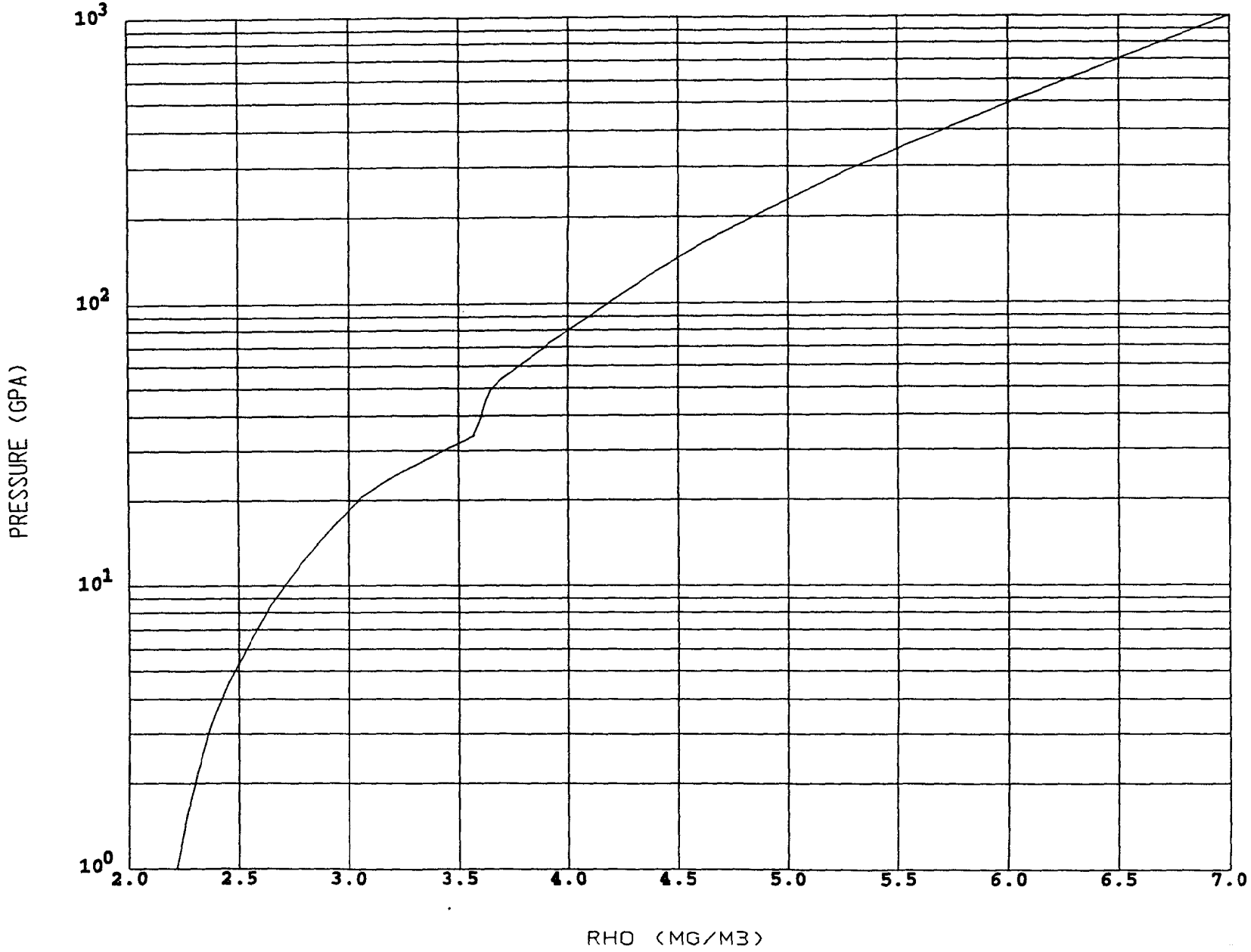
7282-2

T1 SES2D CRA


7282-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
10 7
10 6
10 5
10 4
10 3
10 2
10 1
10 0
10-1
10-3
10-2
10-1
10 0
10 1
10 2
10 3
10 4
T1 SES2D CRAY 02

7282-HU1
E0 MJ/KG
0.00+00

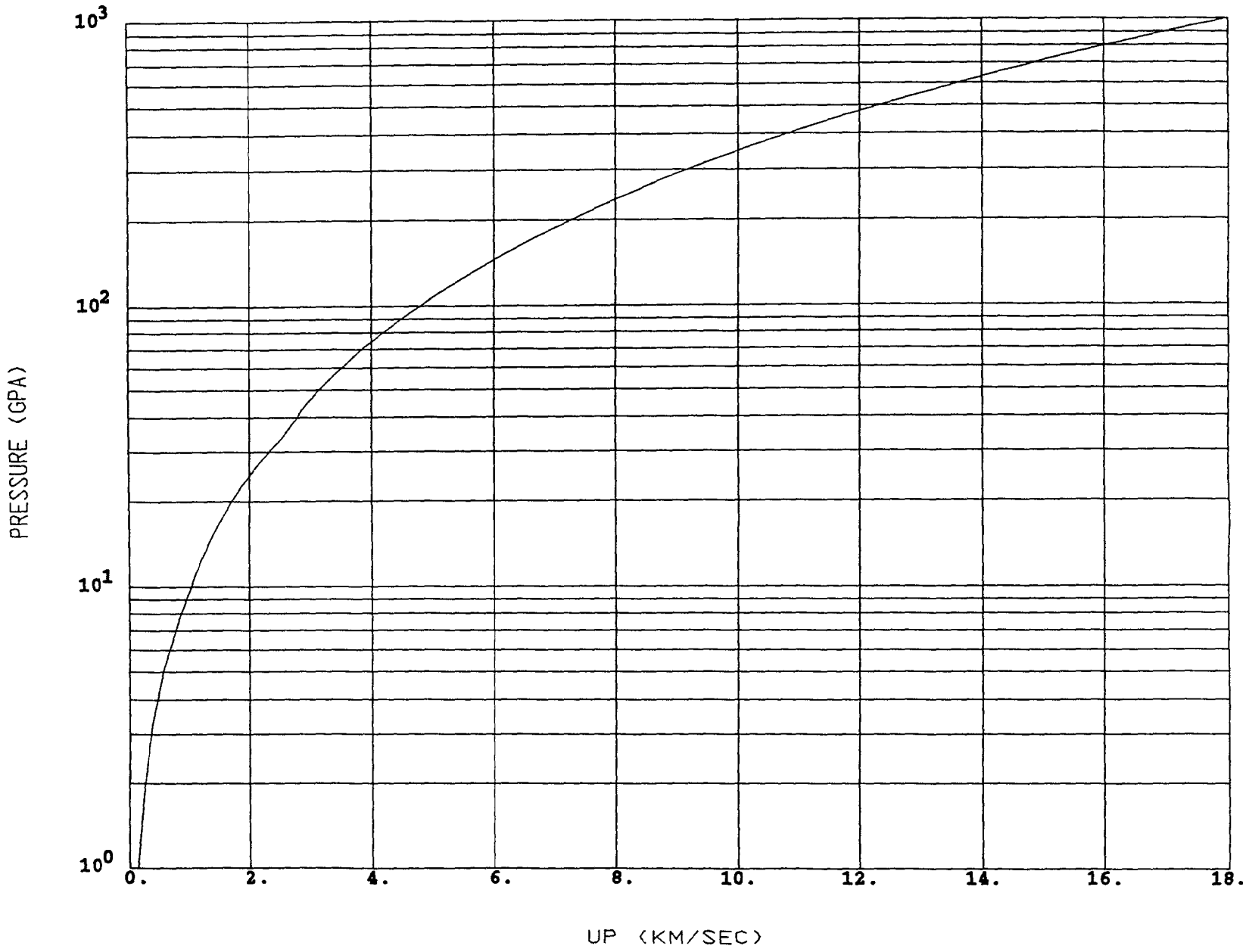
WED 3MAY 95 TABLE 301



T1 SES2D CRA

7282-HU1
E0 MJ/KG
0.00+00

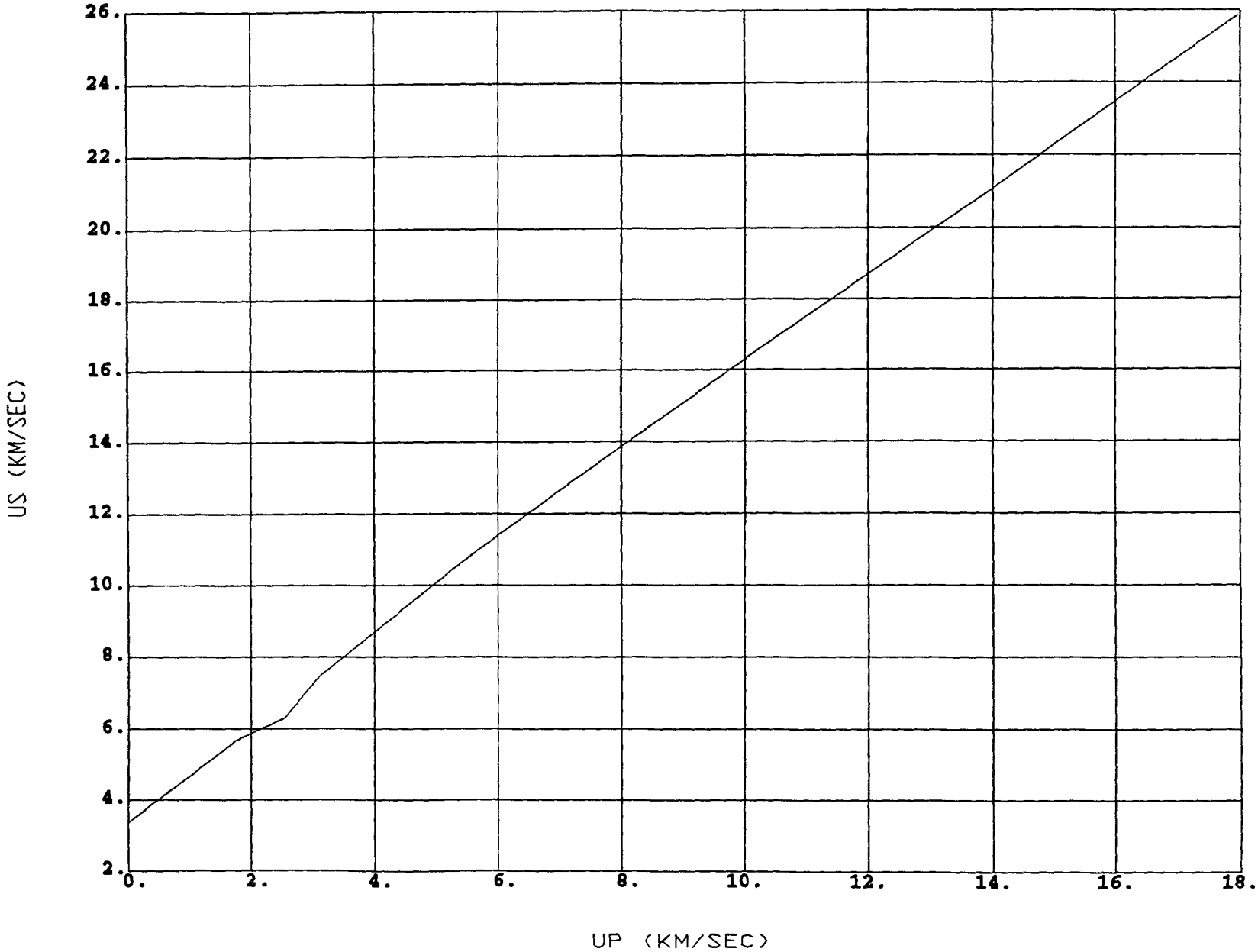
WED 3MAY 95 TABLE 301



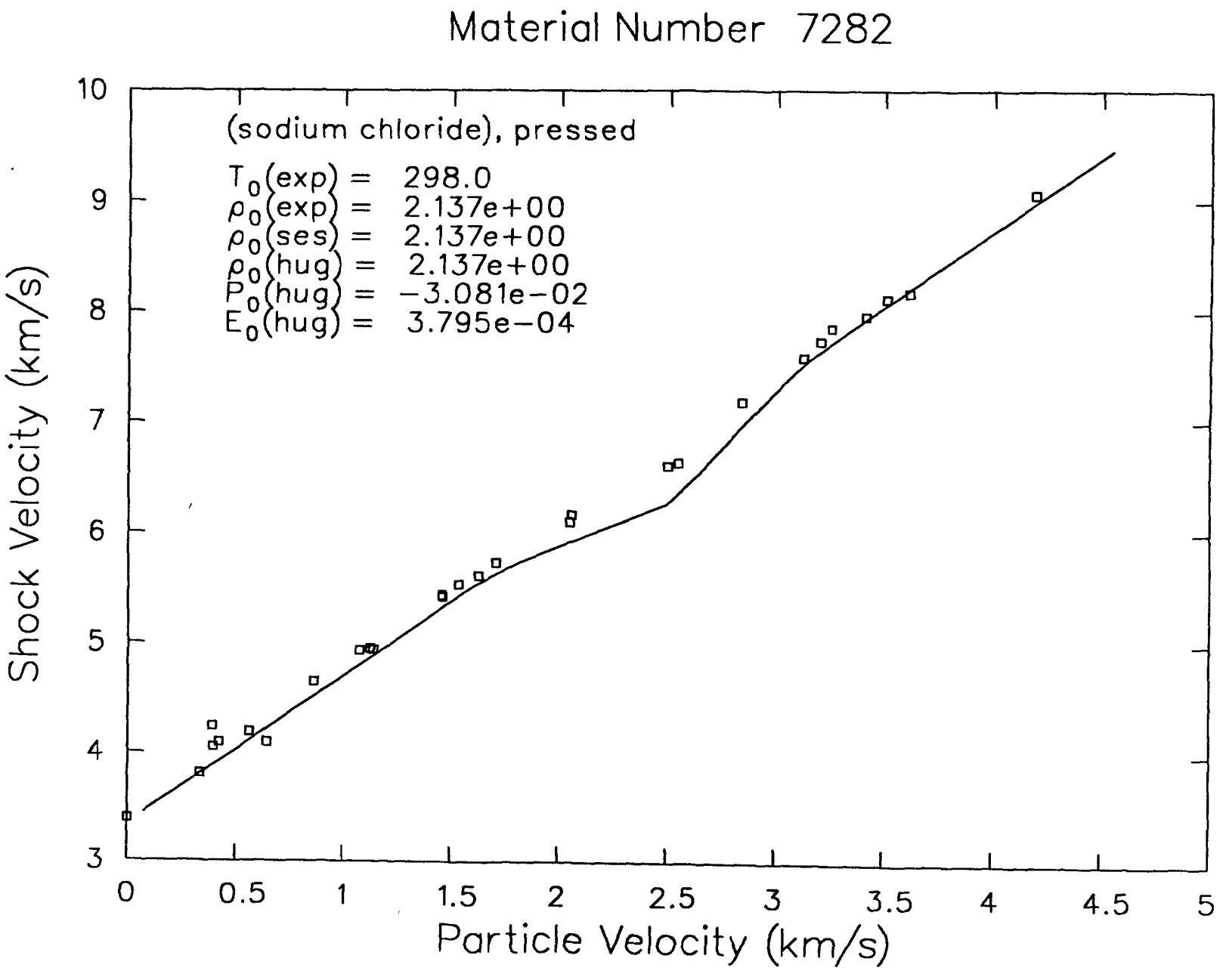
T1 SES2D CRAY 02

7282-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRA


Material Number 7282
(sodium chloride), pressed
T_0(exp) = 298.0
ρ_0(exp) = 2.137e+00
ρ_0(ses) = 2.137e+00
ρ_0(hug) = 2.137e+00
P_0(hug) = −3.081e−02
E_0(hug) = 3.795e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9
8
7
6
5
4
3
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

MATERIAL NUMBER SUMMARY

7283 MATERIAL. SALT

COMP. NACL(CASO4).0477
ATOMIC NUMBER. 1.3666E+01
ATOMIC MASS. 2.8404E+01
NORMAL DENSITY. 2.2400E+00

GAMMA(COMPUTED). 1.5637

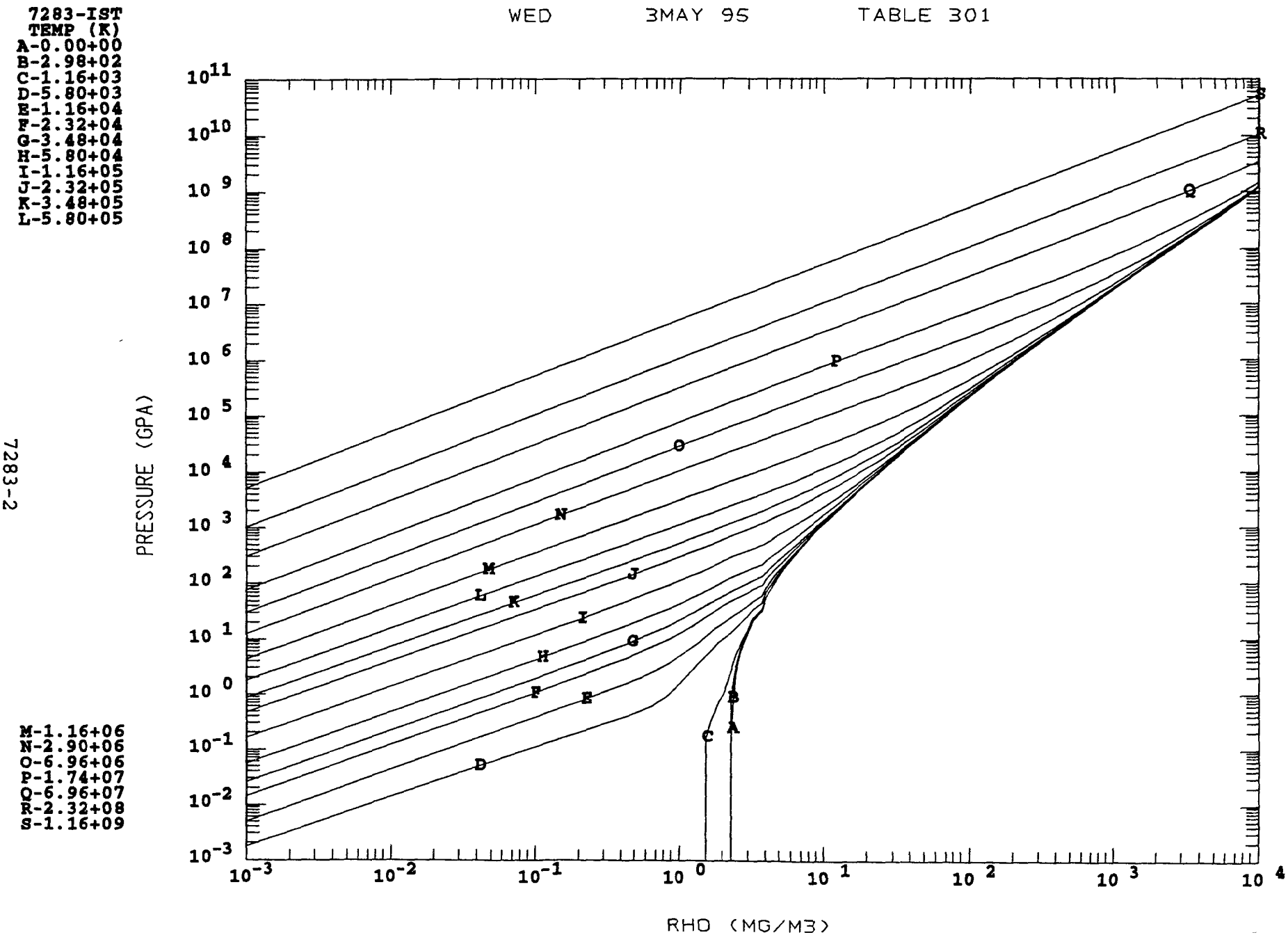
TABLE SUMMARY.

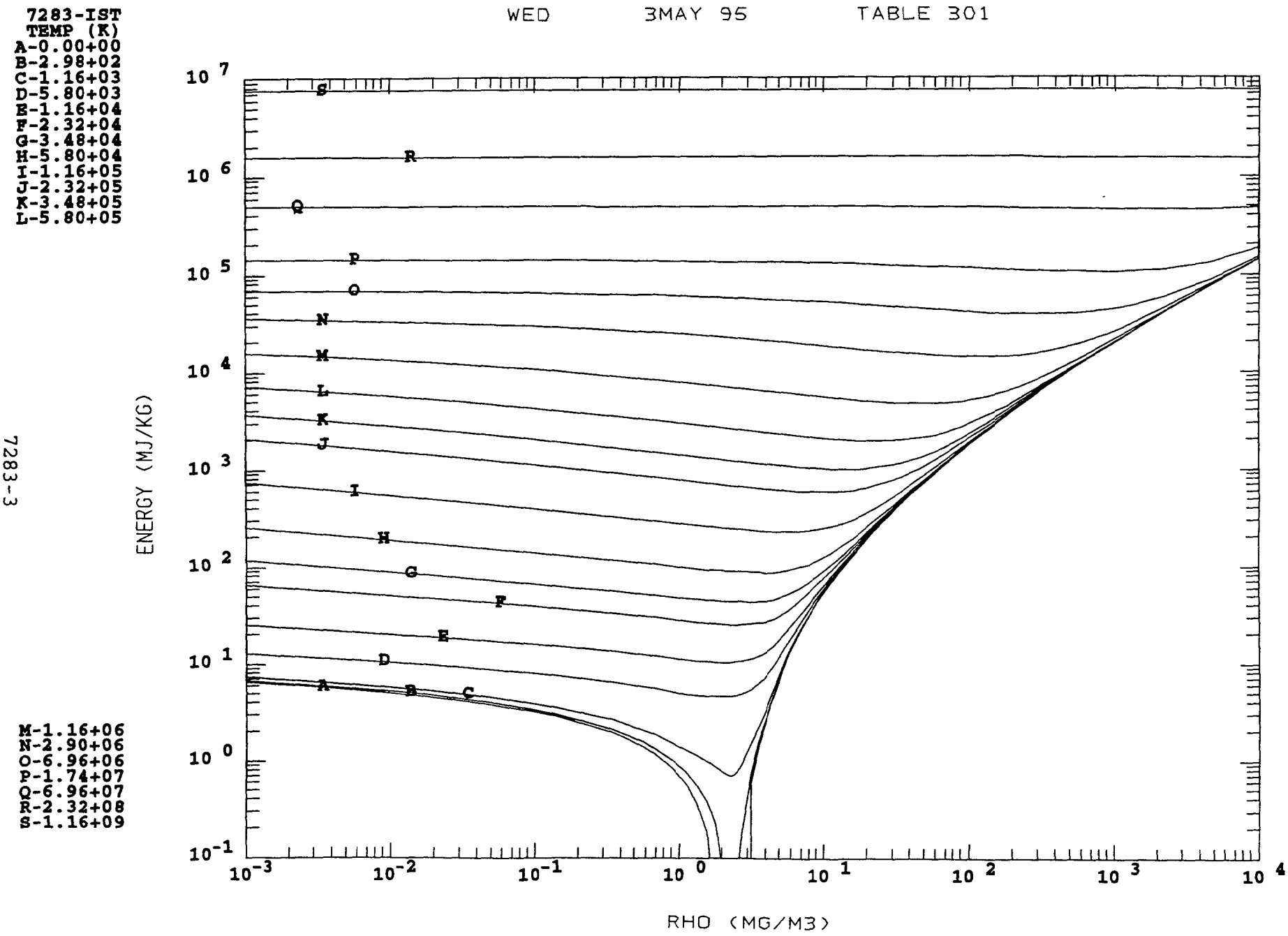
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	17					
102	19					
201	5					
301	8215	73	37	0.0000E+00	2.2400E-06	4.4800E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7543	67	37	2.2400E-06	4.4800E-06	4.4800E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8103	72	37	2.2400E-06	4.4800E-06	4.4800E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	291	72	1	2.2400E-06	4.4800E-06	4.4800E+04
				0.0000E+00	-5.2793E-11	0.0000E+00
401	57					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JAN 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 12688.
DATE OF LAST UPDATE. 20588.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. THIS IS THE SAME AS 7282 EXCEPT FOR THE FOLLOWING DIFFERENCES: ZBAR = 13.666, ABAR = 28.404, RHOREF = 2.24, TMELT = 1070, ECOHKC = 78, TCRIT = 3500 K.


7283-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
WED 3MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S

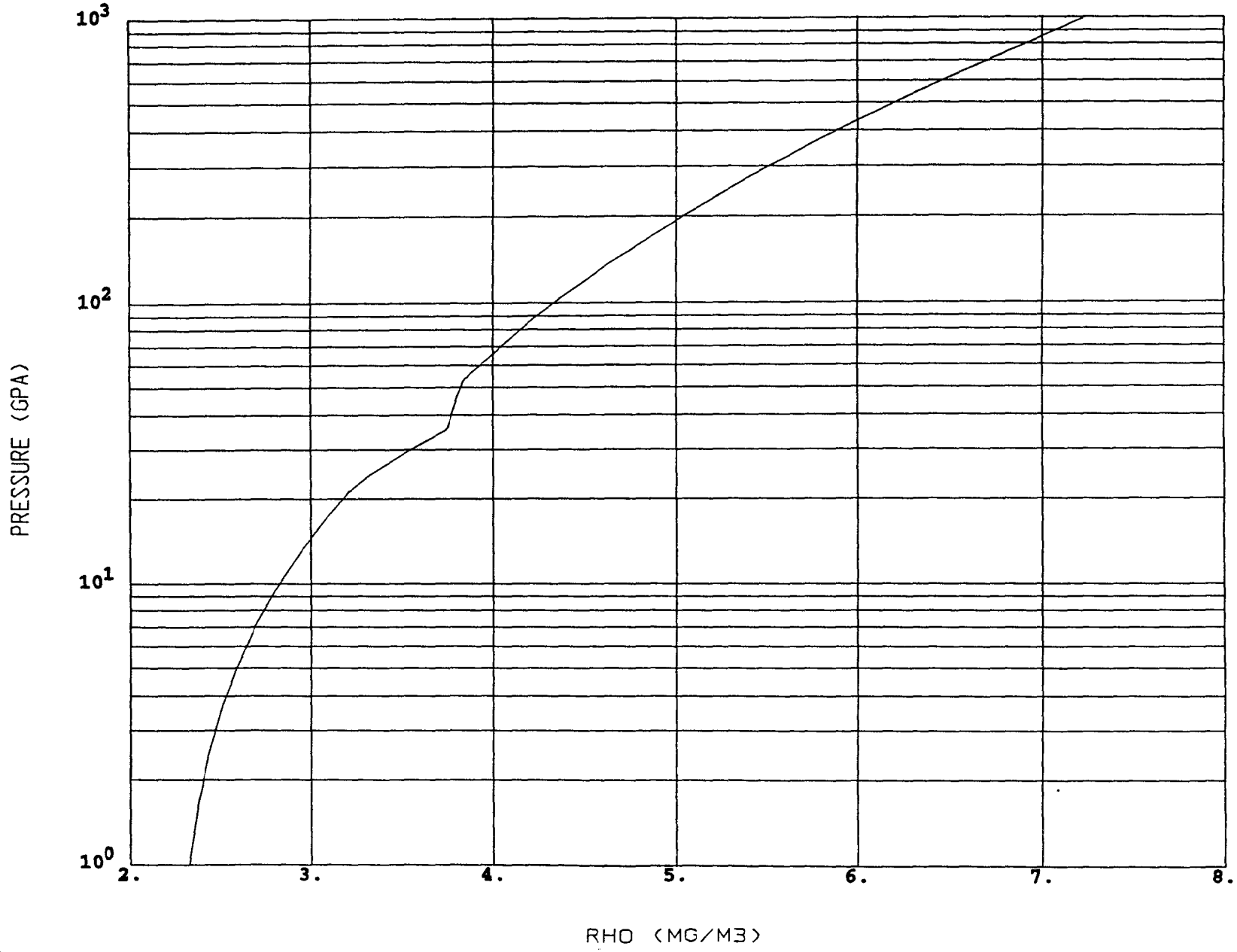


7283-3

T1 SES2D CRAY 02

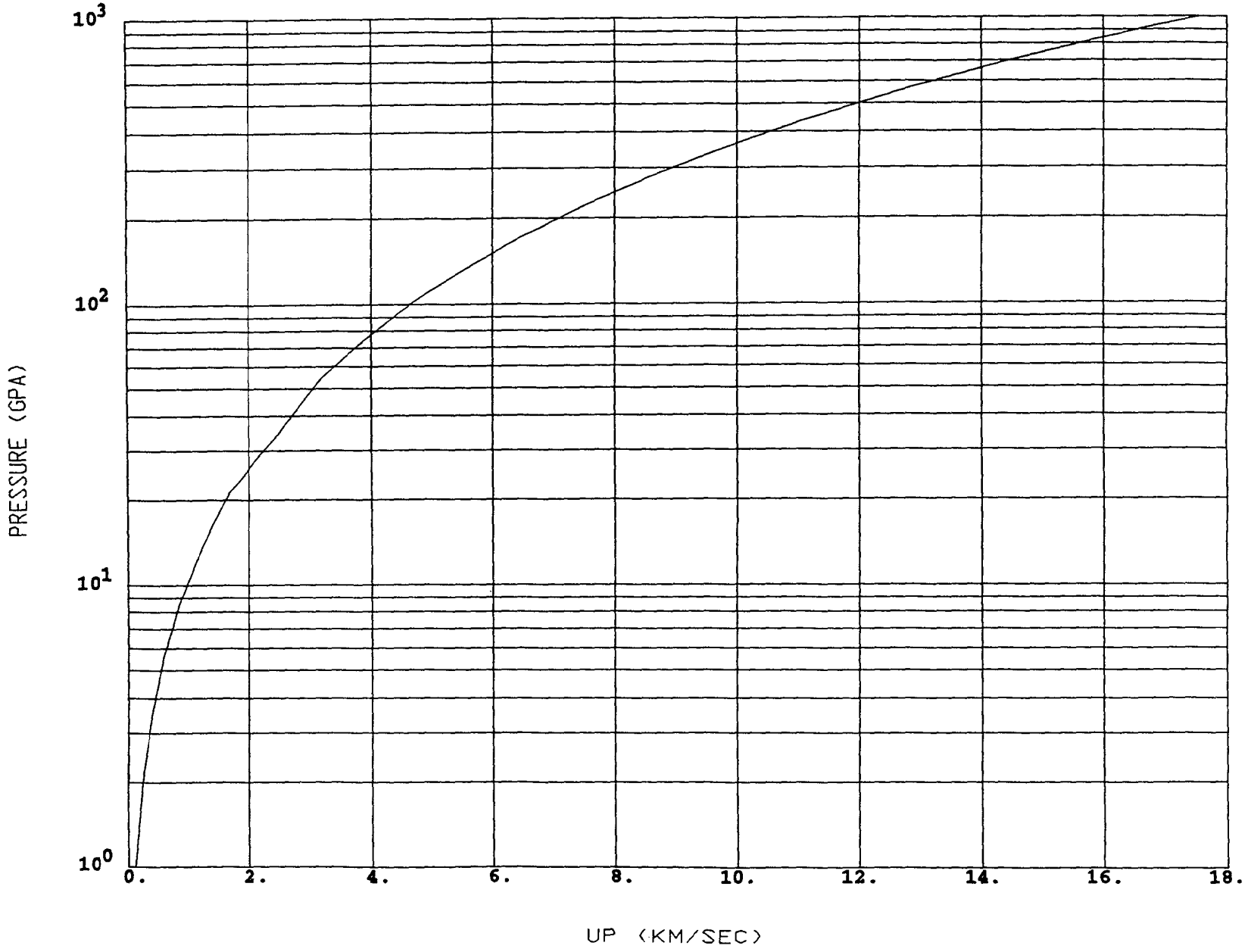
7283-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



7283-HU1
E0 MJ/KG
0.00+00

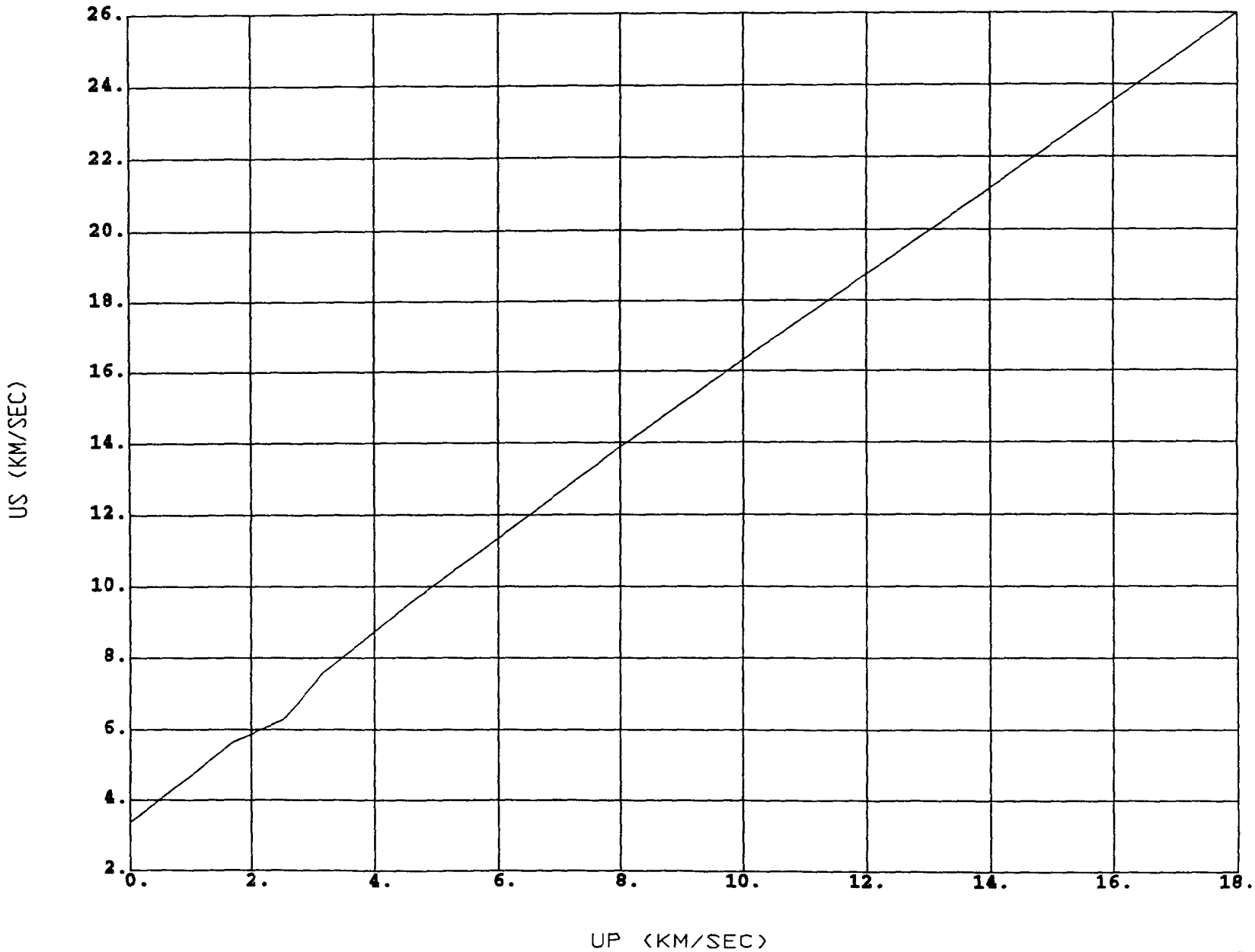
WED 3MAY 95 TABLE 301



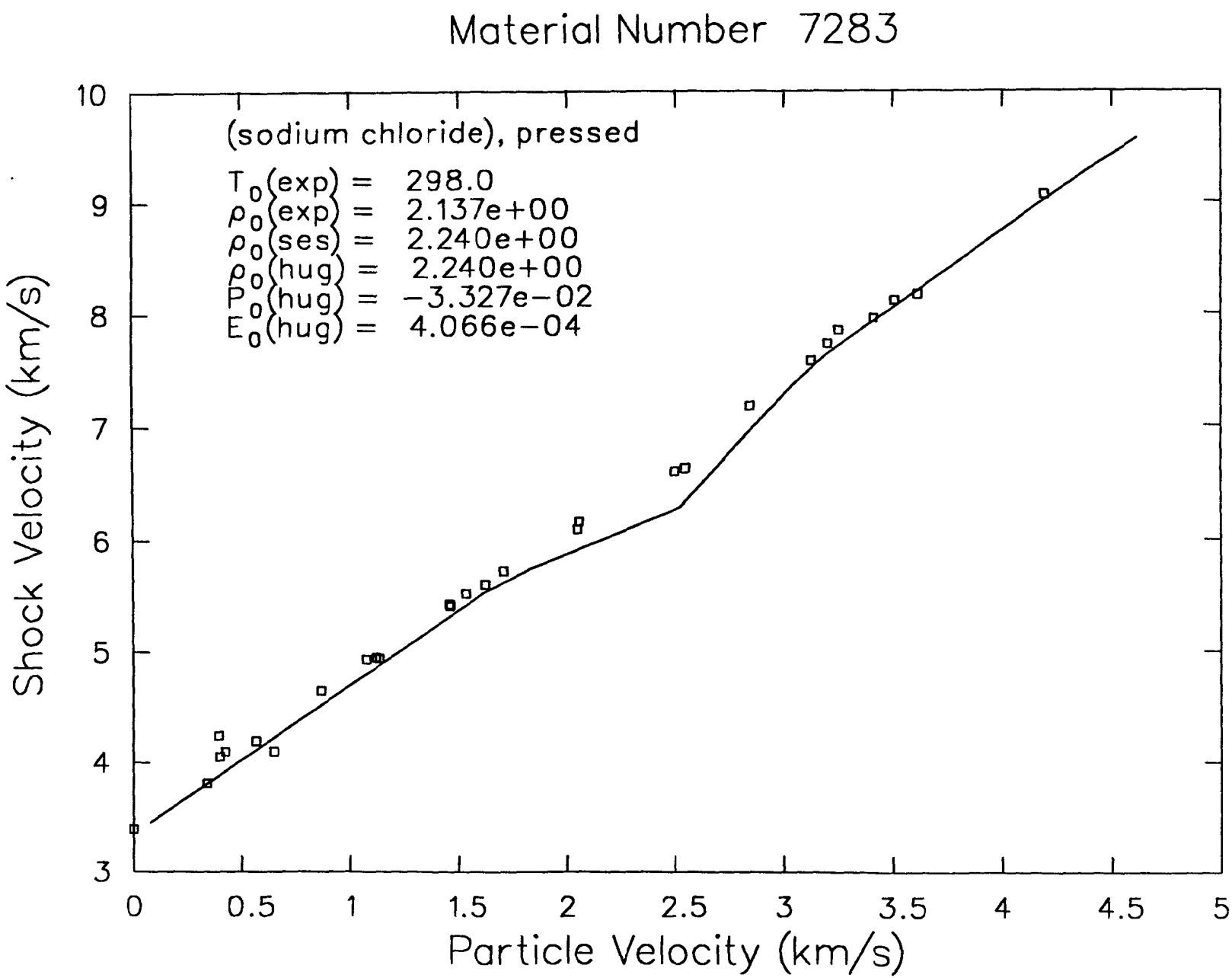
T1 SES2D CRAY 02

7283-HU1
E0 MJ/KG
0.00+00

WED 3MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7283
(sodium chloride), pressed
T_0(exp) = 298.0
ρ_0(exp) = 2.137e+00
ρ_0(ses) = 2.240e+00
ρ_0(hug) = 2.240e+00
P_0(hug) = −3.327e−02
E_0(hug) = 4.066e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9
8
7
6
5
4
3
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

MATERIAL NUMBER	SUMMARY
7330	MATERIAL. CALCIUM CARBONATE

COMP. CACO3
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0018E+01
NORMAL DENSITY. 2.7100E+00

GAMMA(COMPUTED). 0.0039

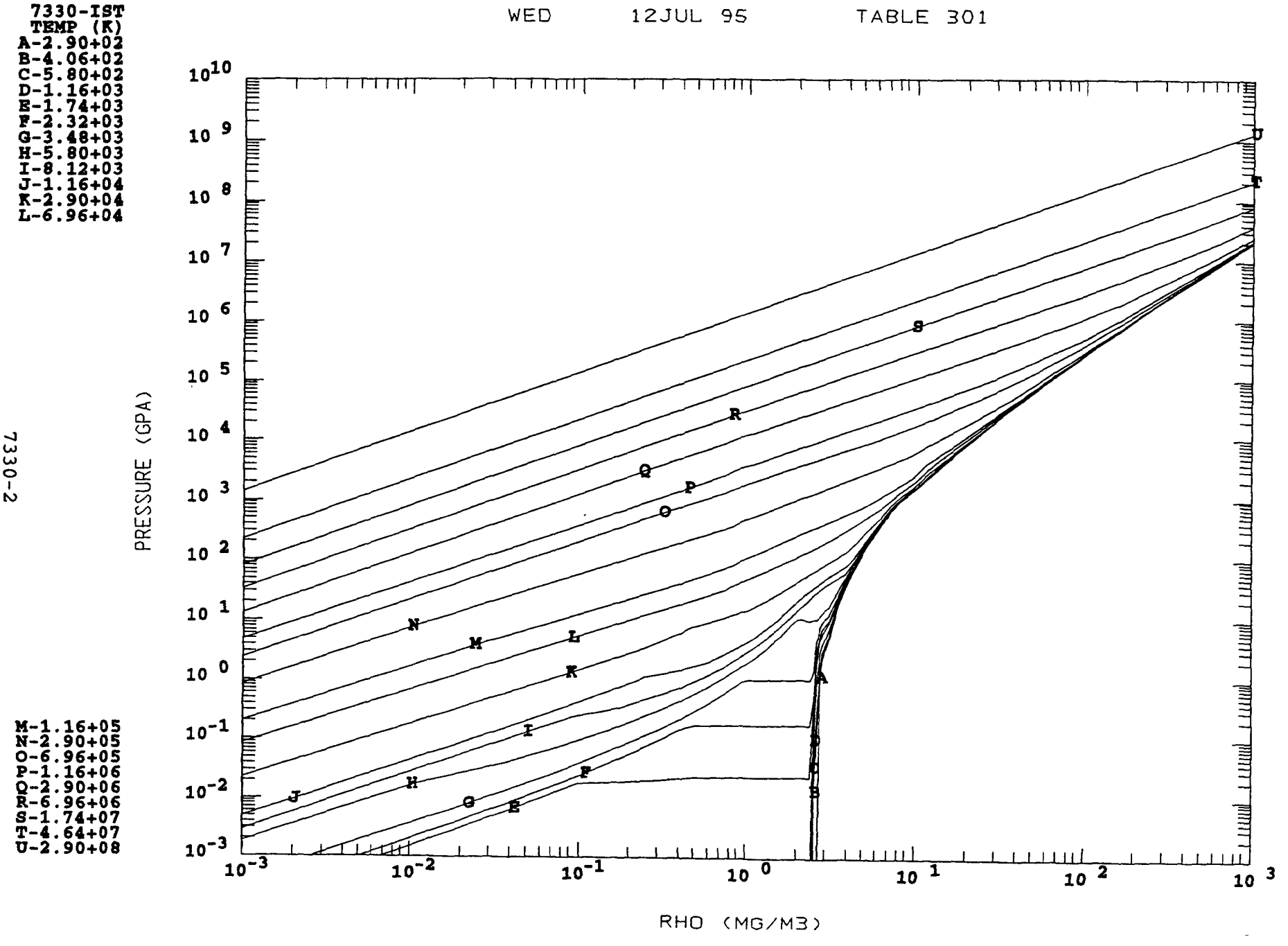
TABLE SUMMARY.

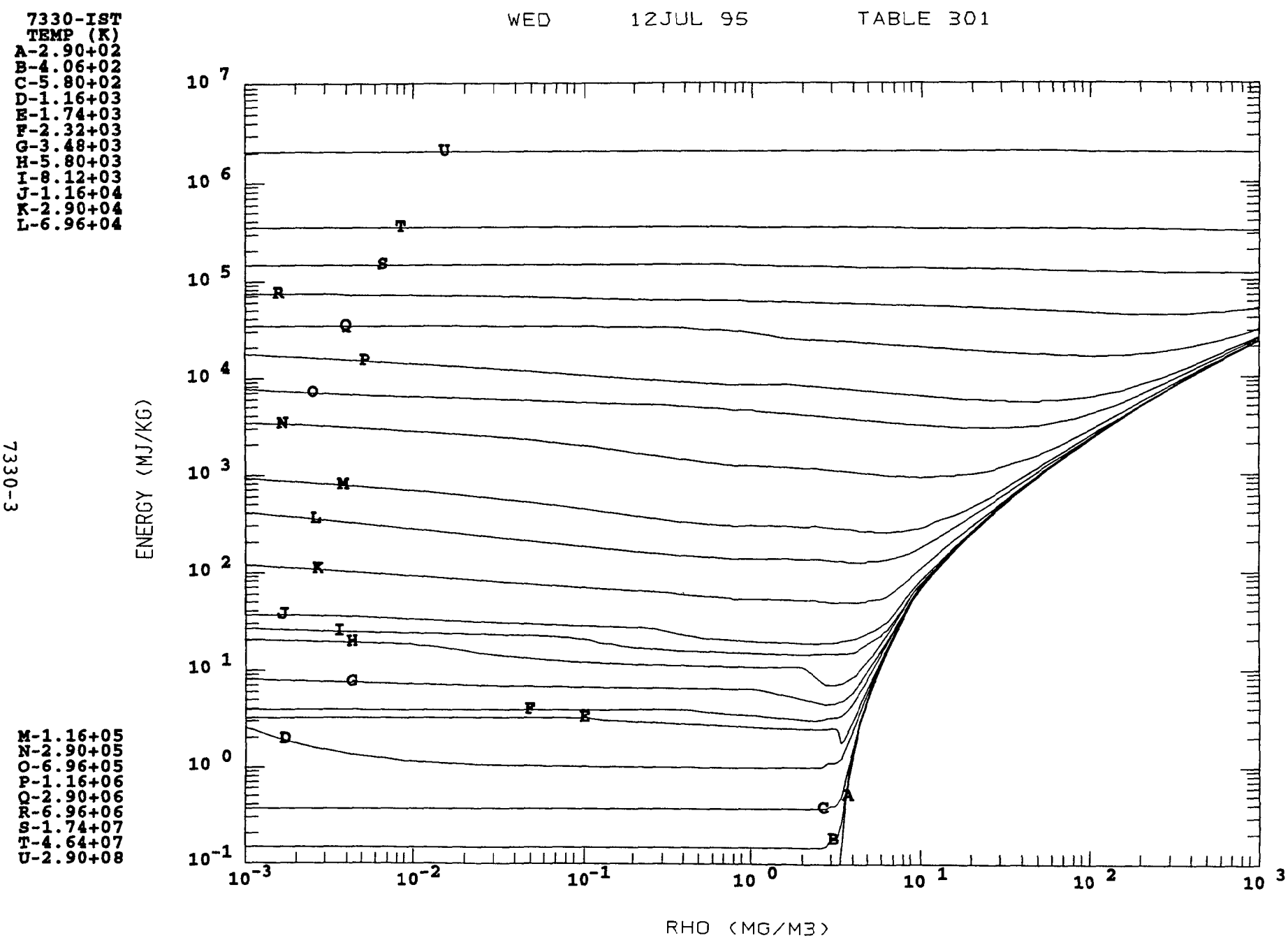
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	38					
102	210					
201	5					
301	7679	92	41	1.0000E-06	1.6000E-06	1.0000E+03
				2.4999E-02	2.9999E-02	2.4999E+04

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 83
VERSION NUMBER. 3
DATE ADDED TO LIBRARY. 42783.
DATE OF LAST UPDATE. 61583.
SOURCE. F.H. REE (LLNL, H-DIVISION)
REFS. F.H. REE, "EQUATIONS OF STATE OF CACO3 AND ITS MIXTURES WITH H2O", LAWRENCE LIVERMORE NATIONAL LABORATORY REPORT UCRL-53113 (1981).
CODES. GRAY, TIGER, CHEQ, OCCIPITAL, TFNUC

COMMENTS. THIS IS A WIDE-RANGE MULTIPHASE EQUATION OF STATE WHICH COVERS A DENSITY RANGE BETWEEN 1.0E-6 AND 1.0E+3 G PER CM3 AND A TEMPERATURANGE BETWEEN 0.025 AND 2.5E+4 EV. THE PHYSICAL MODELS WHICH WERE USED TO CALCULATE THE EOS ARE AS FOLLOWS: (1) GRAY - A SEMI-EMPIRICAL MODEL WHICH CALCULATES AN EOS FROM THE GRUNEISEN MODEL FOR A SOLID, ASSUMING THAT THE SOLID IS HARMONIC. IT CALCULATES THE LIQUID STATE BY MODIFYING THE SOLID FREE ENERGY BY AN ENTROPY CORRECTION ASSOCIATED WITH LOSS OF ORDER. GRAY COVERS DENSITIES BETWEEN 2.71 AND 8.0 G PER CM3 AND TEMPERATURES FROM 0.025 TO 1.0 EV. THE SOLID WAS ASSUMED TO BE IN THE ARAGONITE PHASE. (2) TIGER-CHEQ - THESE MODELS WERE USED IN THE LOW-TEMPERATURE, LOW DENSITY REGION WHICH IS SENSITIVE TO THE CHEMICAL EQUILIBRIUM OF CACO3 AND THE DISSOCIATED SPECIES OF CACO3. TIGER CALCULATES THE GASEOUS EOS PROPERTIES OF THE MIXTURE USING A BKW EOS MODEL. IN THE VAPOR-SOLID REGION, THE CODE CHEQ WAS USED TO SOLVE THE EQUILIBRIUM COMPOSITIONS OF CHEMICAL SPECIES BY EXTENT-OF-REACTION VARIABLE METHOD. (3) OCCIPITAL - COVERS HIGH-TEMPERATURE, LOW DENSITY REGION. CACO3 IS ASSUMED TO BE COMPLETELY DISSOCIATED INTO ELECTRONS, IONS, AND NEUTRAL ATOMS. THE CONCENTRATIONS OF EACH ARE OBTAINED FROM THE SAHA EQUATION, AND THE THERMODYNAMIC PROPERTIES ARE COMPUTED ASSUMING THAT THE MIXTURES BEHAVE LIKE AN IDEAL GAS. (4) TFNUC - CALCULATES ELECTRONIC CONTRIBUTIONS TO THE EOS USING THOMAS-FERMI THEORY WITH KIRZHNITS CORRECTIONS FOR THE WAVE NATURE OF ELECTRONS AND THE ELECTRON EXCHANGE CONTRIBUTION. NUCLEAR CONTRIBUTIONS ARE CALCULATED WITH A GRUNEISEN MODEL AT LOW TEMPERATURE AND THE ONE-COMPONENT PLASMA MODEL AT HIGH TEMPERATURE.

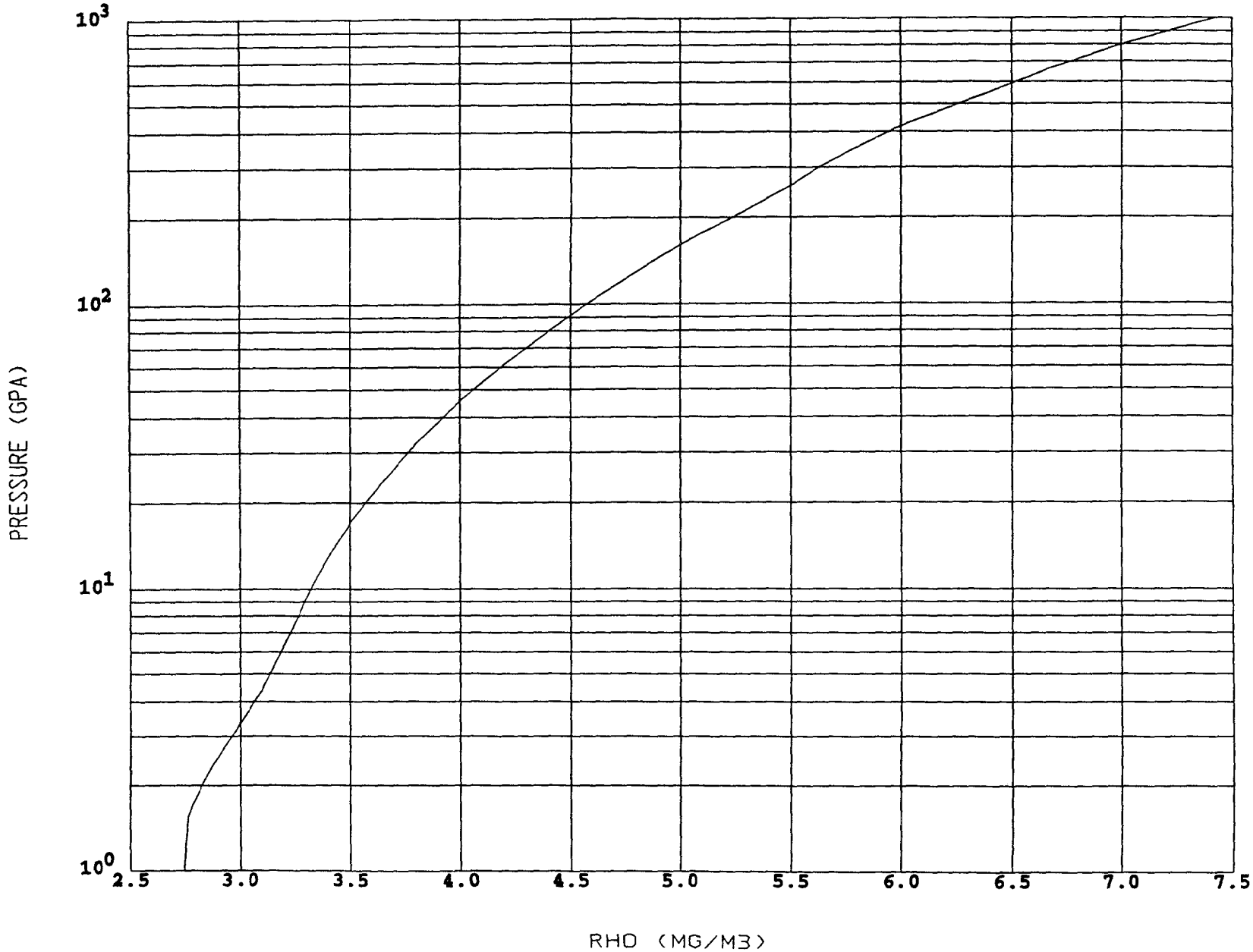

7330-IST
TEMP (K)
A-2.90+02
B-4.06+02
C-5.80+02
D-1.16+03
E-1.74+03
F-2.32+03
G-3.48+03
H-5.80+03
I-8.12+03
J-1.16+04
K-2.90+04
L-6.96+04
M-1.16+05
N-2.90+05
O-6.96+05
P-1.16+06
Q-2.90+06
R-6.96+06
S-1.74+07
T-4.64+07
U-2.90+08
WED 12JUL 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA



T1 SES2D CRAY 02

7330-HU1
E0 MJ/KG
0.00+00

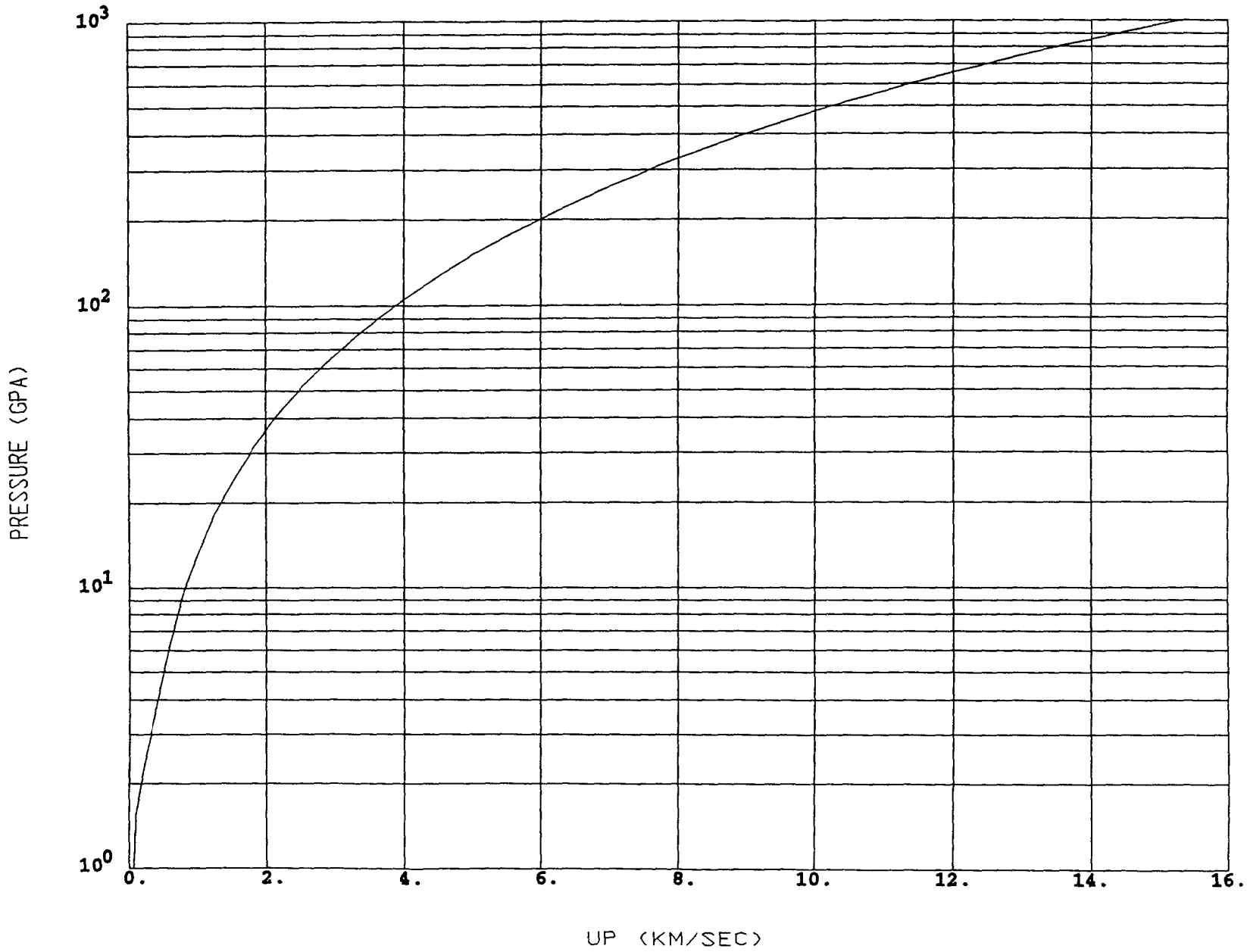
WED 12JUL 95 TABLE 301



T1 SES2D CRA1

7330-HU1
E0 MJ/KG
0.00+00

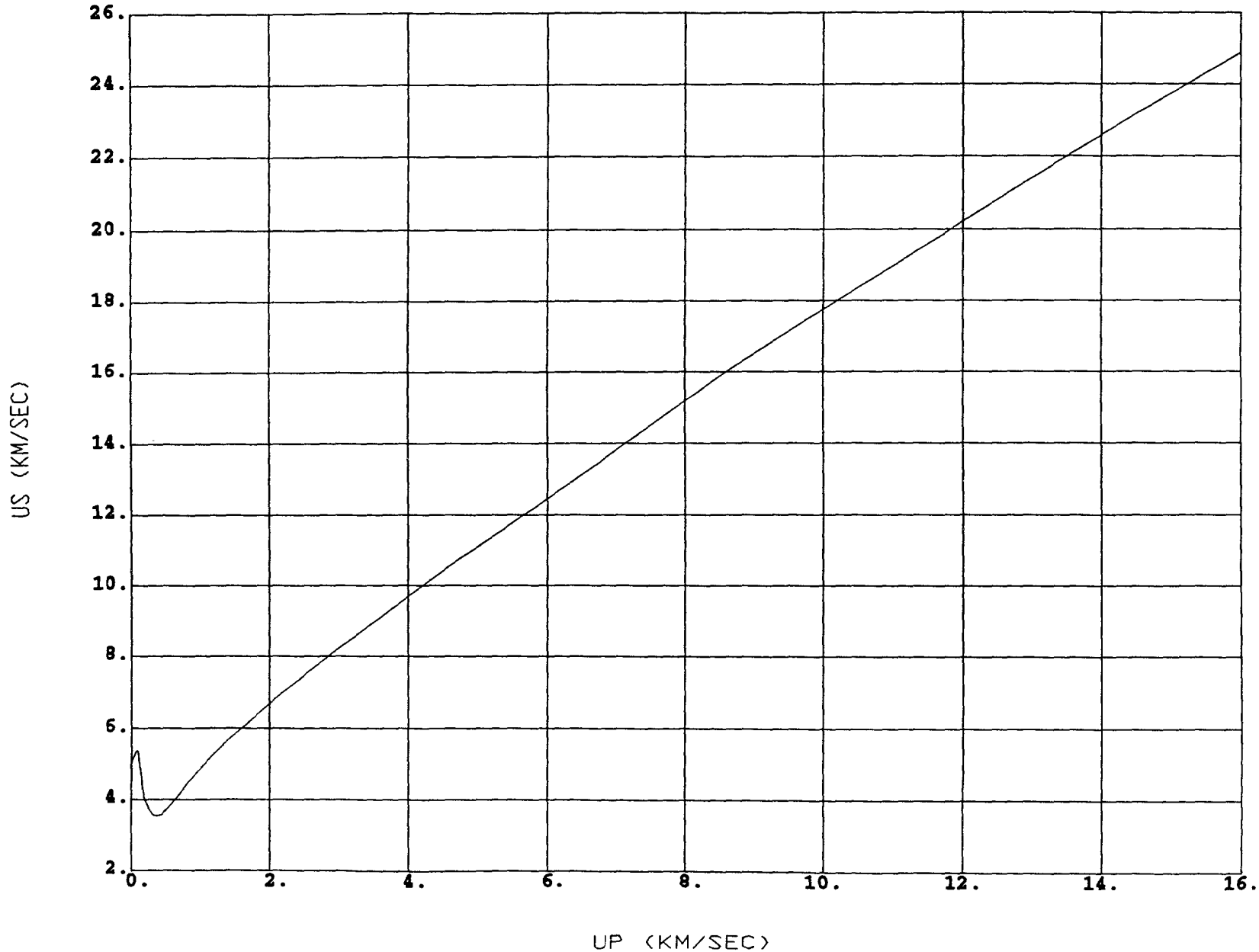
WED 12JUL 95 TABLE 301



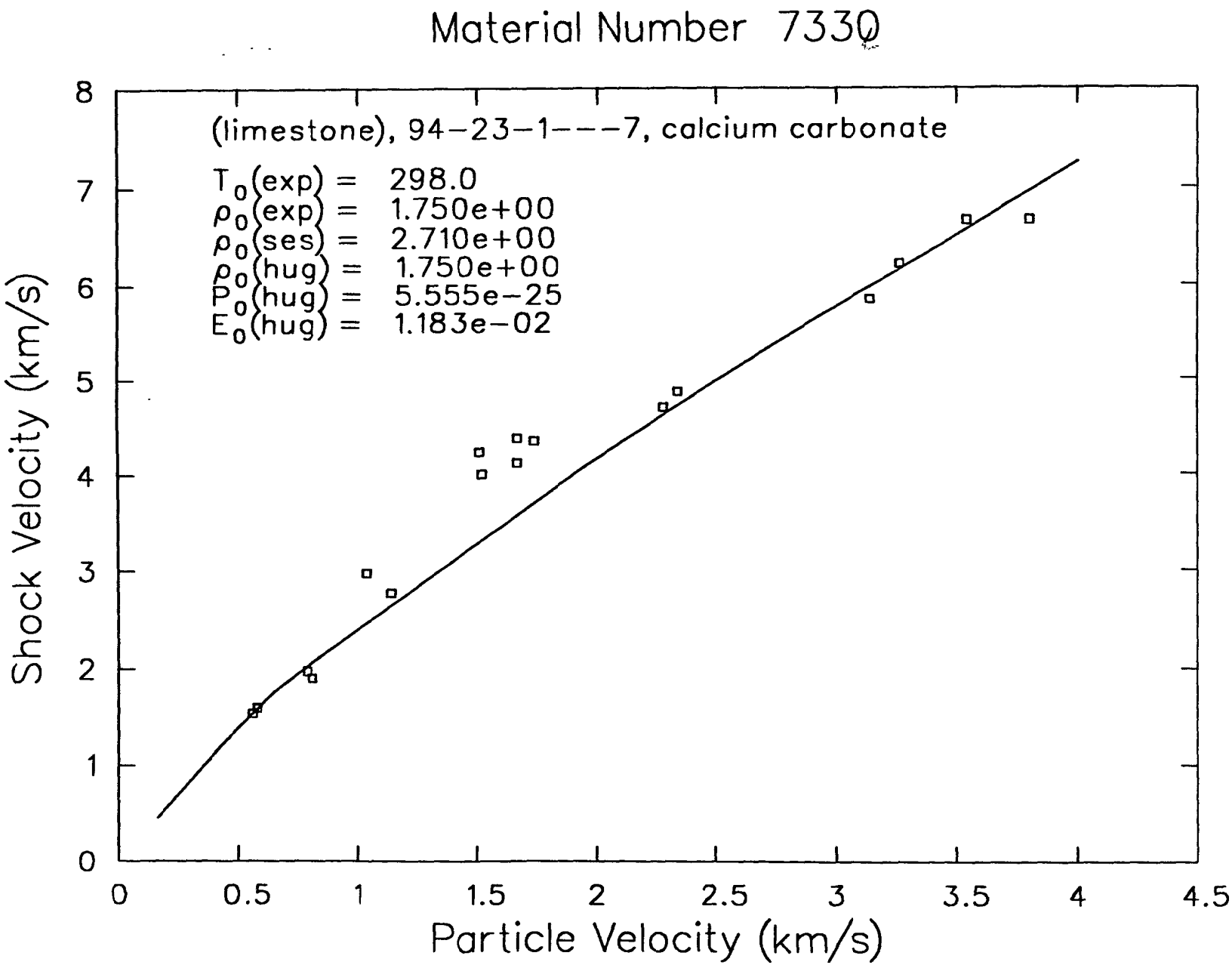
T1 SES2D CRAY 02

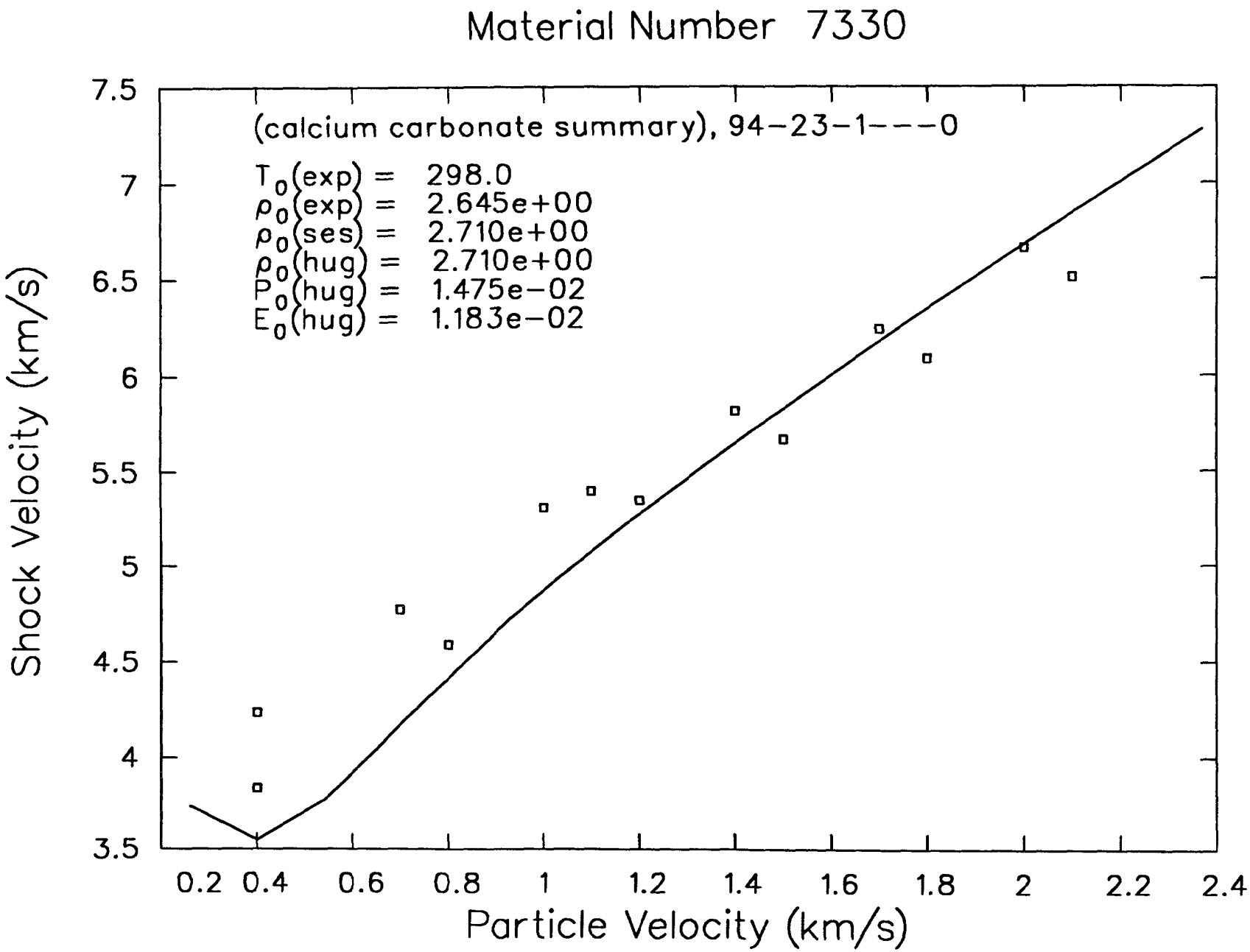
7330-HU1
E0 MJ/KG
0.00+00

WED 12JUL 95 TABLE 301



T1 SES2D CRA


Material Number 7330
(limestone), 94-23-1---7, calcium carbonate
T_0(exp) = 298.0
ρ_0(exp) = 1.750e+00
ρ_0(ses) = 2.710e+00
ρ_0(hug) = 1.750e+00
P_0(hug) = 5.555e-25
E_0(hug) = 1.183e-02
Shock Velocity (km/s)
Particle Velocity (km/s)
0
1
2
3
4
5
6
7
8
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5


Material Number 7330
(calcium carbonate summary), 94-23-1---0
T_0(exp) = 298.0
ρ_0(exp) = 2.645e+00
ρ_0(ses) = 2.710e+00
ρ_0(hug) = 2.710e+00
P_0(hug) = 1.475e-02
E_0(hug) = 1.183e-02
Shock Velocity (km/s)
Particle Velocity (km/s)
7.5
7
6.5
6
5.5
5
4.5
4
3.5
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4

MATERIAL NUMBER SUMMARY

7331 MATERIAL. CALCITE

COMP. CACO3
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0018E+01
NORMAL DENSITY. 2.7110E+00

GAMMA(COMPUTED). 1.0663

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	67					
201	5					
301	8103	72	37	0.0000E+00	2.7110E-06	5.4220E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	2.7110E-06	5.4220E-06	5.4220E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	7991	71	37	2.7110E-06	5.4220E-06	5.4220E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	287	71	1	2.7110E-06	5.4220E-06	5.4220E+04
				0.0000E+00	-2.7231E-11	0.0000E+00
401	73					

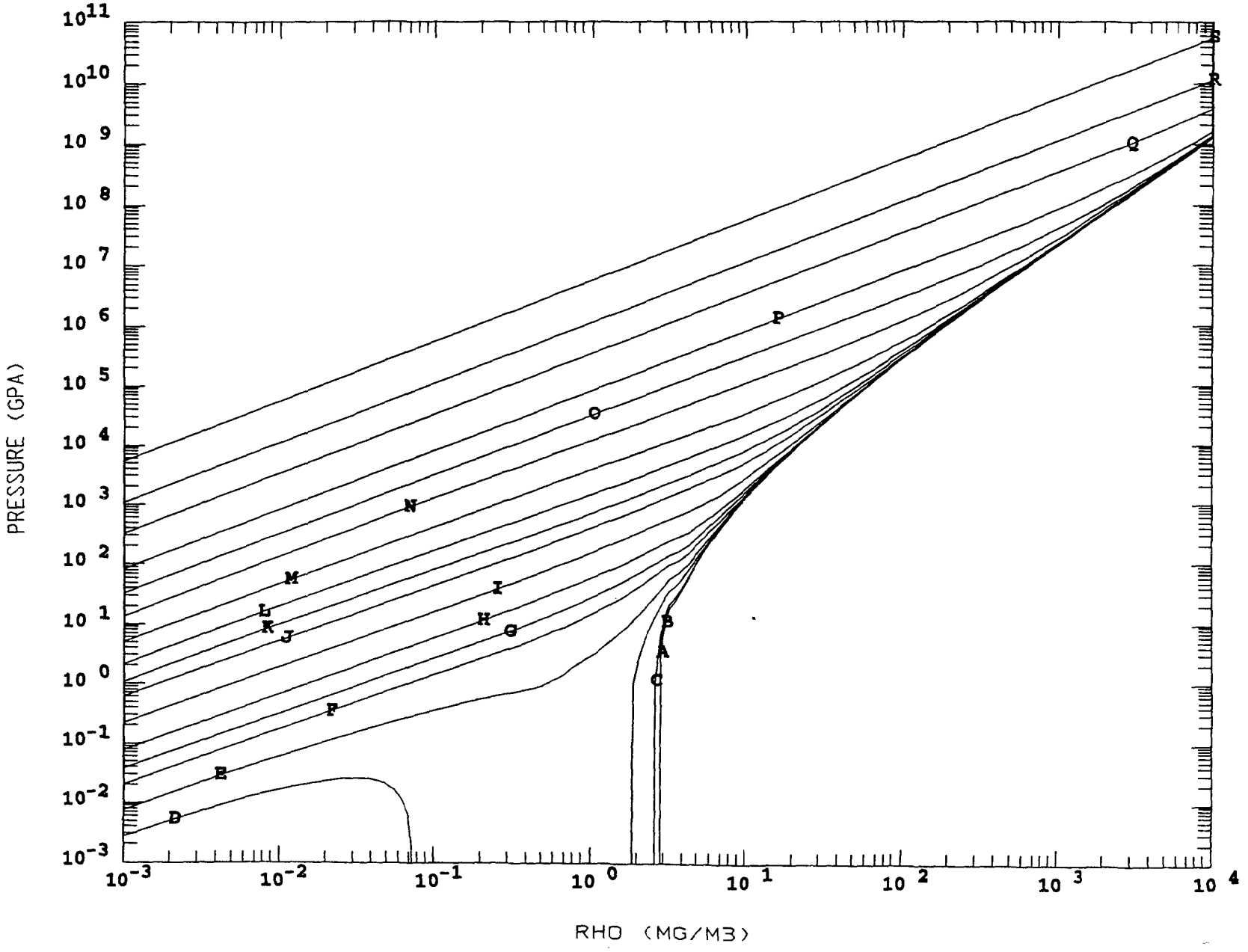
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JAN 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 102387.
DATE OF LAST UPDATE. 20288.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN = 1). GAMREF = 1.12, DEBKEL = 750, TMELT = 1612. COLD CURVE FROM SHOCK DATA. US-UP COMPOSED OF THREE STRAIGHT LINES (UP,US) = (0.0,5.13), (0.86,6.30), (1.74,6.30), (3.71,9.00). CMAT = 1.70, ECOHKC = 135.6, FACLJ = 0.325. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 10,250 K.

7331-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05

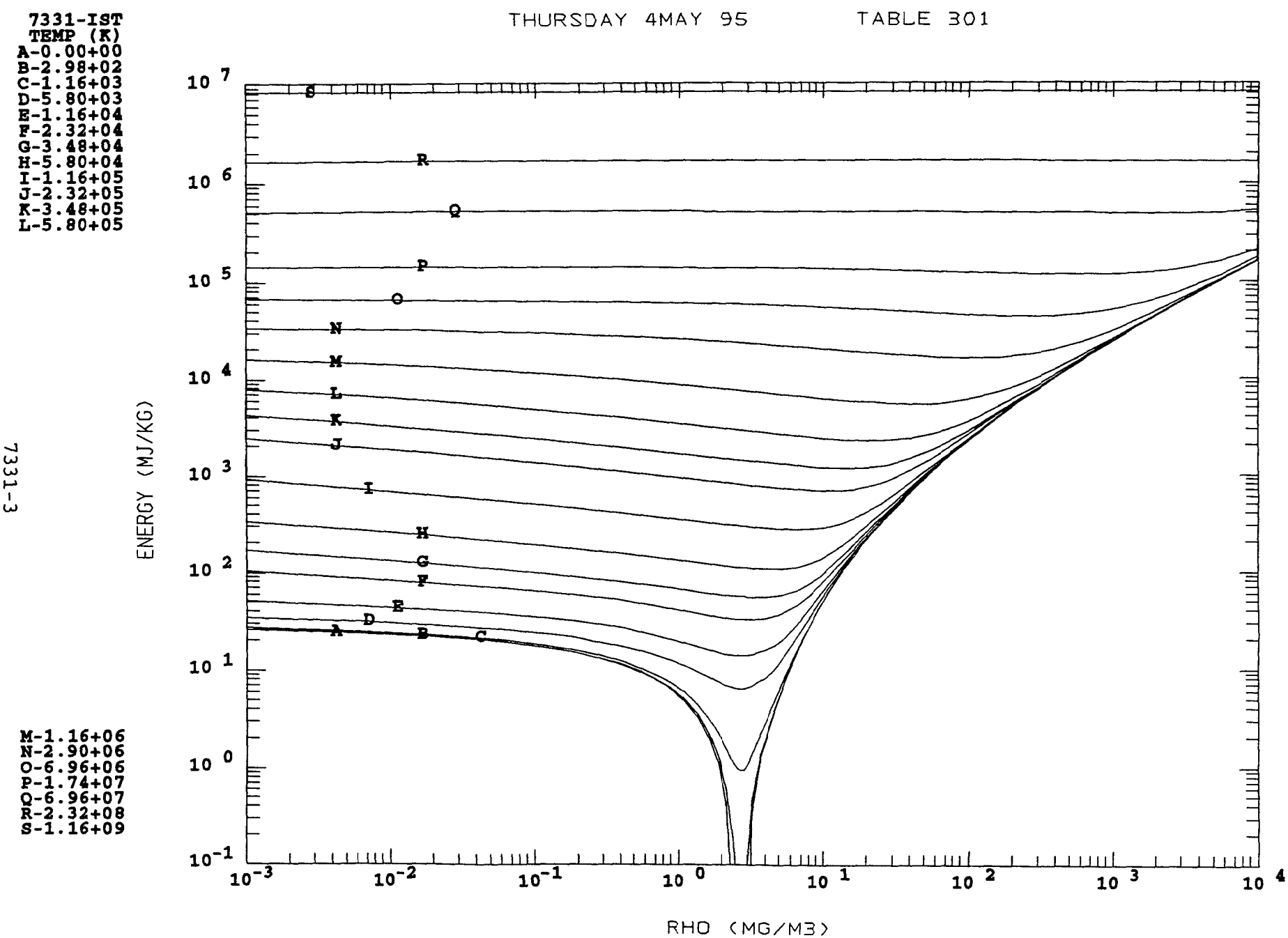
THURSDAY 4MAY 95 TABLE 301



M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09

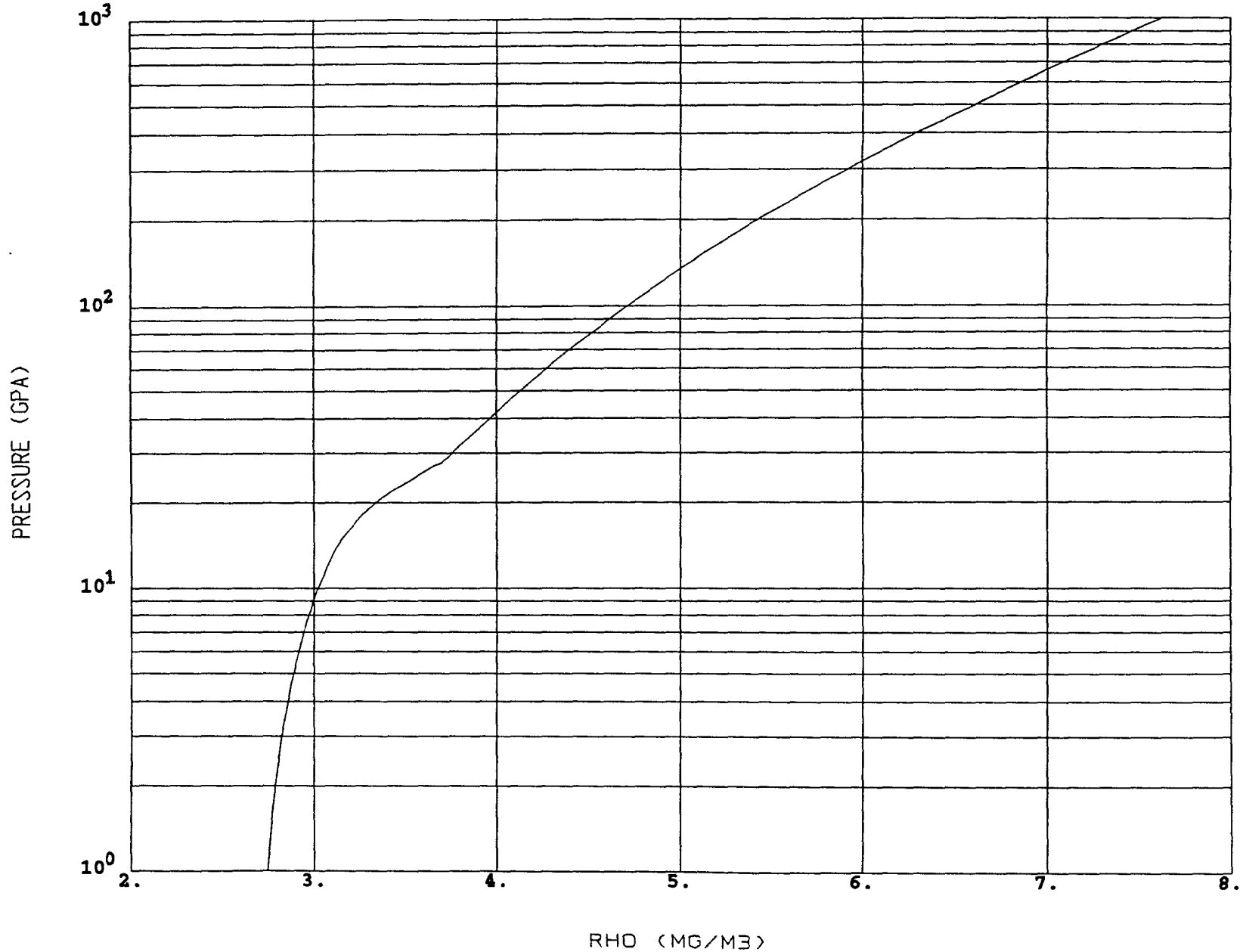
7331-2

T1 SES2D CRAY


7331-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7331-HU1
E0 MJ/KG
0.00+00

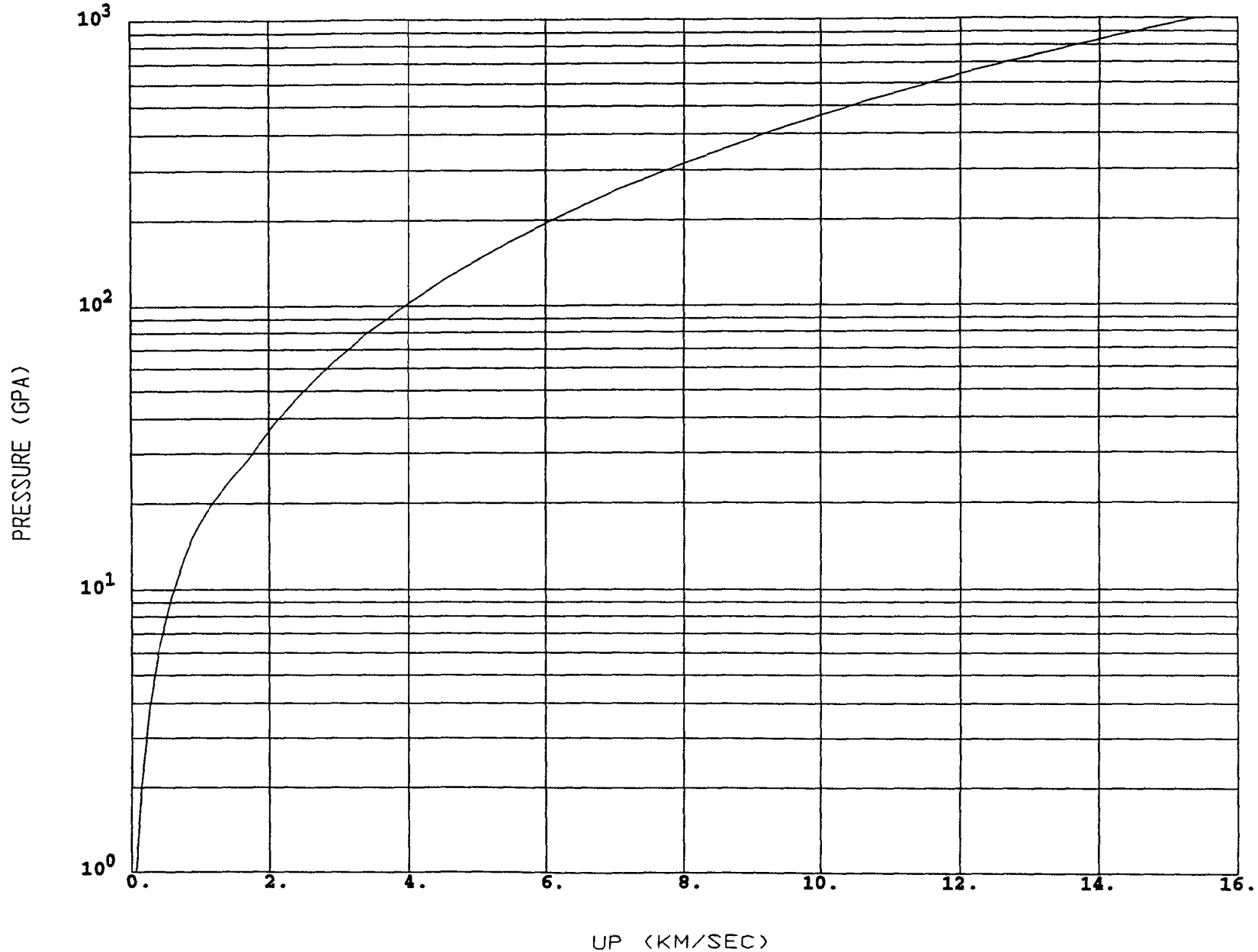
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA

7331-HU1
E0 MJ/KG
0.00+00

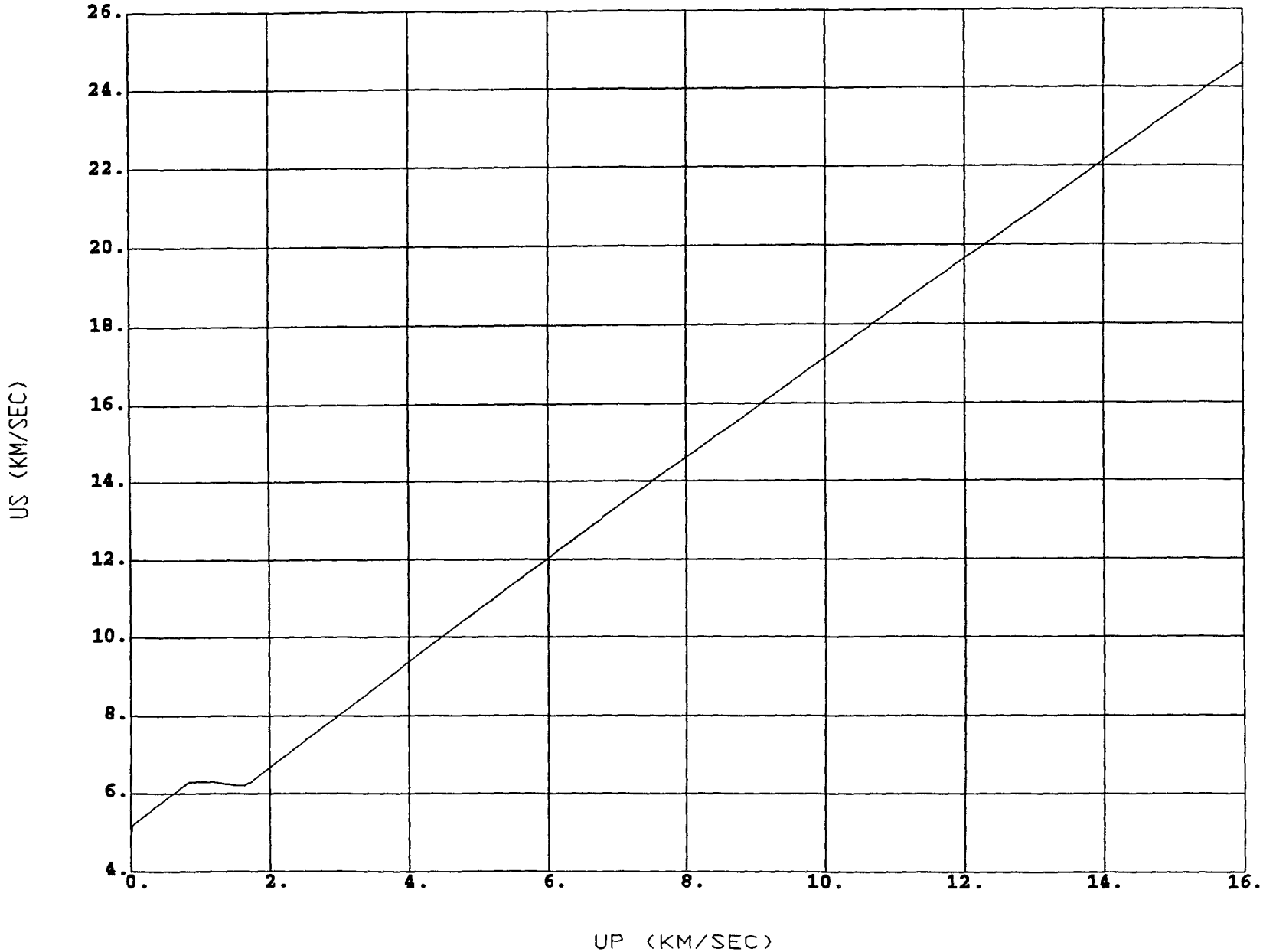
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY 02

7331-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA

MATERIAL NUMBER SUMMARY

7380 MATERIAL. QUARTZ

COMP. SIO2
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0028E+01
NORMAL DENSITY. 2.2040E+00

GAMMA(COMPUTED). 1.9608

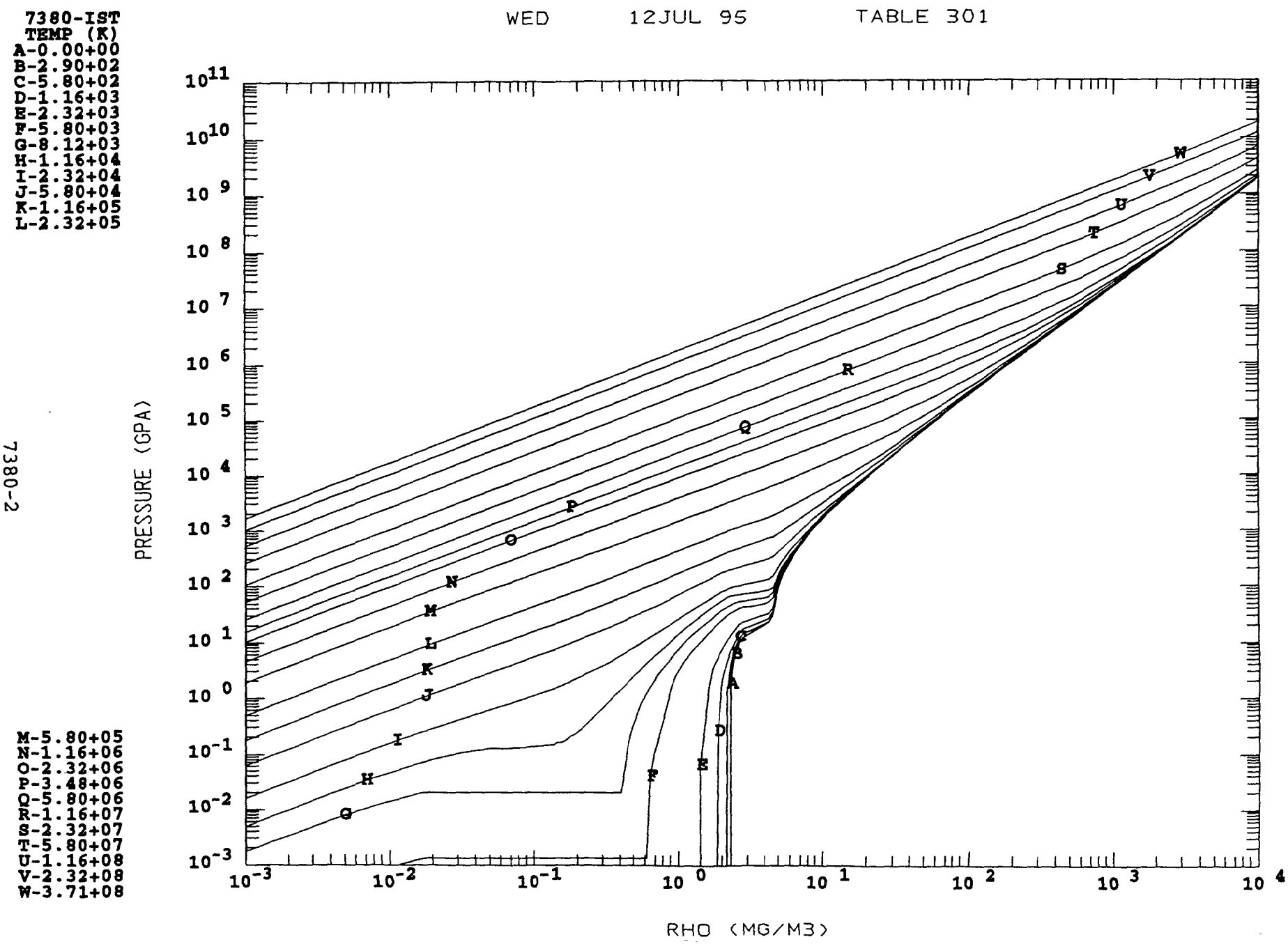
TABLE SUMMARY.

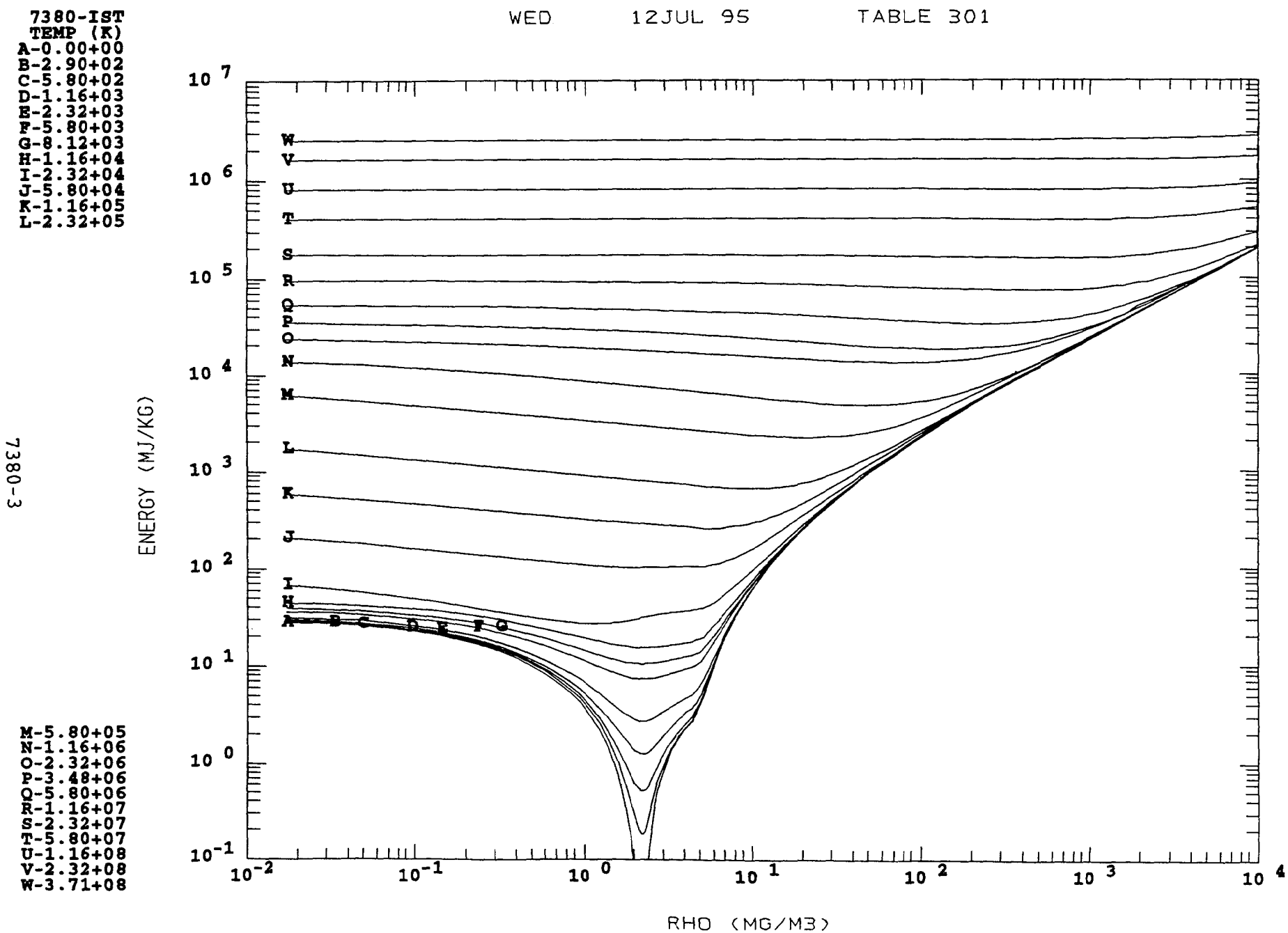
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	15					
102	65					
201	5					
301	4772	101	23	0.0000E+00	1.7219E-02	4.4080E+04
				0.0000E+00	2.5000E-02	3.2000E+04
303	4772	101	23	0.0000E+00	1.7219E-02	4.4080E+04
				0.0000E+00	2.5000E-02	3.2000E+04
304	4772	101	23	0.0000E+00	1.7219E-02	4.4080E+04
				0.0000E+00	2.5000E-02	3.2000E+04
305	4772	101	23	0.0000E+00	1.7219E-02	4.4080E+04
				0.0000E+00	2.5000E-02	3.2000E+04
306	306	101	1	0.0000E+00	1.7219E-02	4.4080E+04
				0.0000E+00	0.0000E+00	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. AUG 73
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 80173.
DATE OF LAST UPDATE. 101582.
SOURCE. J. BARNES, J. ROOD
REFS. NONE
CODES. SESAME I

COMMENTS. THE TWO TEMPERATURE TABLES FOR THIS MATERIAL (TABLES 303-306) ARE A VERY ROUGH APPROXIMATION AND WERE DERIVED FROM THE CODE TWOTEMP (AND NOT FROM THE ORIGINAL EOS CALCULATIONS, WHICH IN MOST CASES ARE NO LONGER REPRODUCIBLE). THE TABLES ARE VERY NOISY DUE BOTH TO NOISE IN THE ORIGINAL DATA (WHICH SHOWS UP WHEN THE COLD CURVE IS SUBTRACTED TO GENERATE THE THERMAL CONTRIBUTION) AND TO THE CONSTRAINT THAT NO CROSSING ISOTHERMS ARE ALLOWED. IF YOU HAVE ANY PROBLEMS USING THESE TABLES, CONTACT BOB ALBERS (T-4).

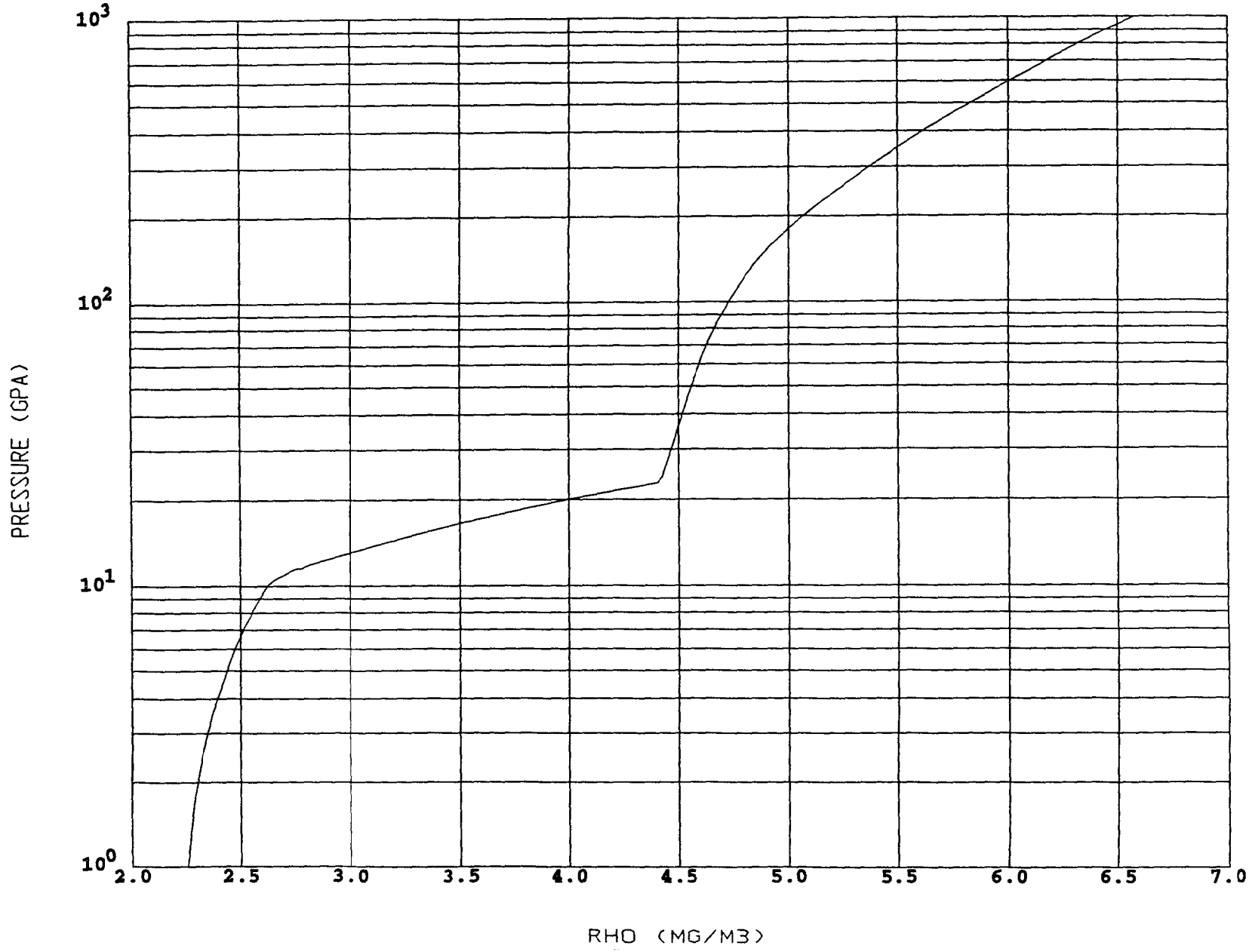

7380-IST
TEMP (K)
A-0.00+00
B-2.90+02
C-5.80+02
D-1.16+03
E-2.32+03
F-5.80+03
G-8.12+03
H-1.16+04
I-2.32+04
J-5.80+04
K-1.16+05
L-2.32+05
M-5.80+05
N-1.16+06
O-2.32+06
P-3.48+06
Q-5.80+06
R-1.16+07
S-2.32+07
T-5.80+07
U-1.16+08
V-2.32+08
W-3.71+08
WED 12JUL 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D GRA



T1 SES2D CRAY 02

7380-HU1
E0 MJ/KG
0.00+00

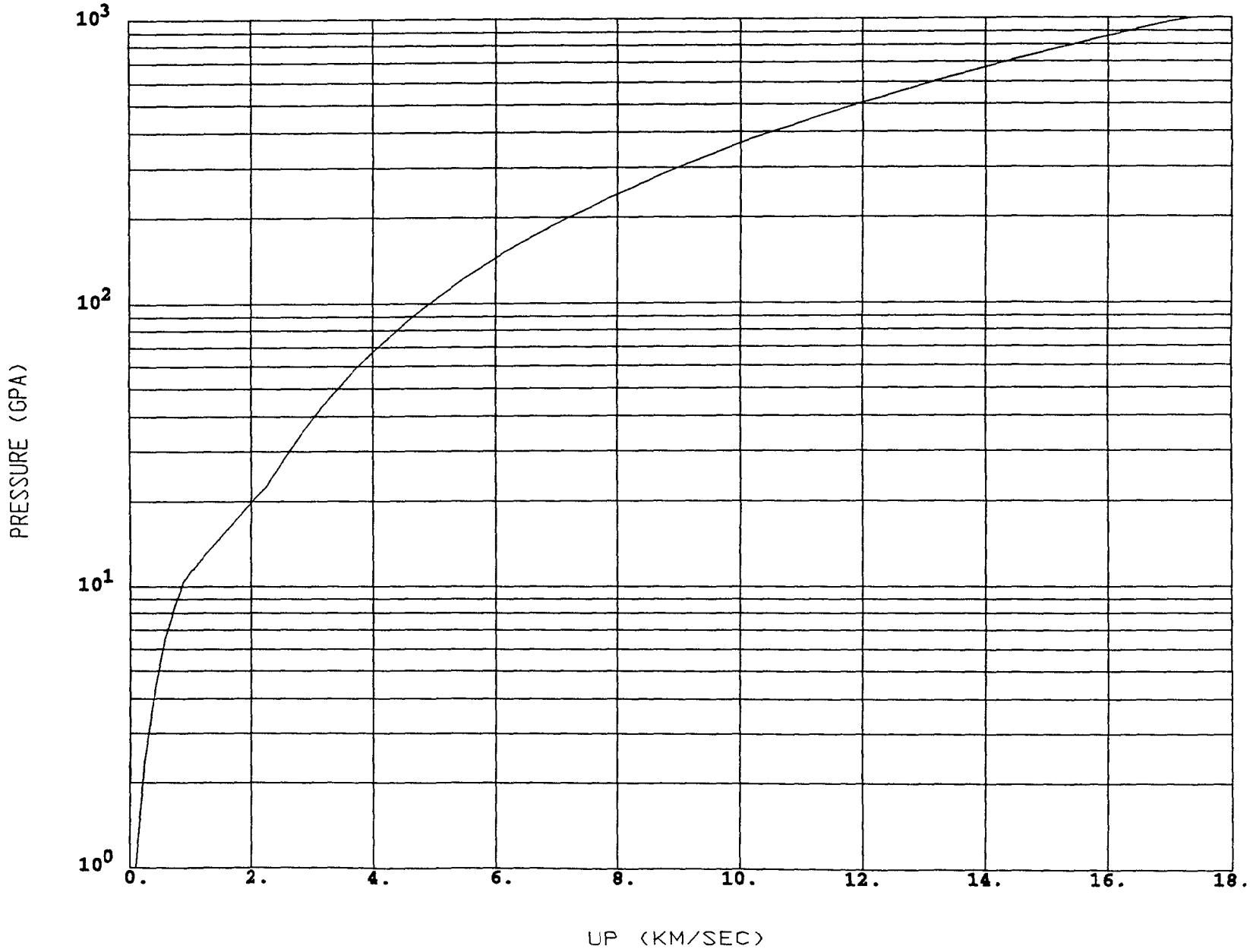
WED 12JUL 95 TABLE 301



T1 SES2D CRA\

7380-HU1
E0 MJ/KG
0.00+00

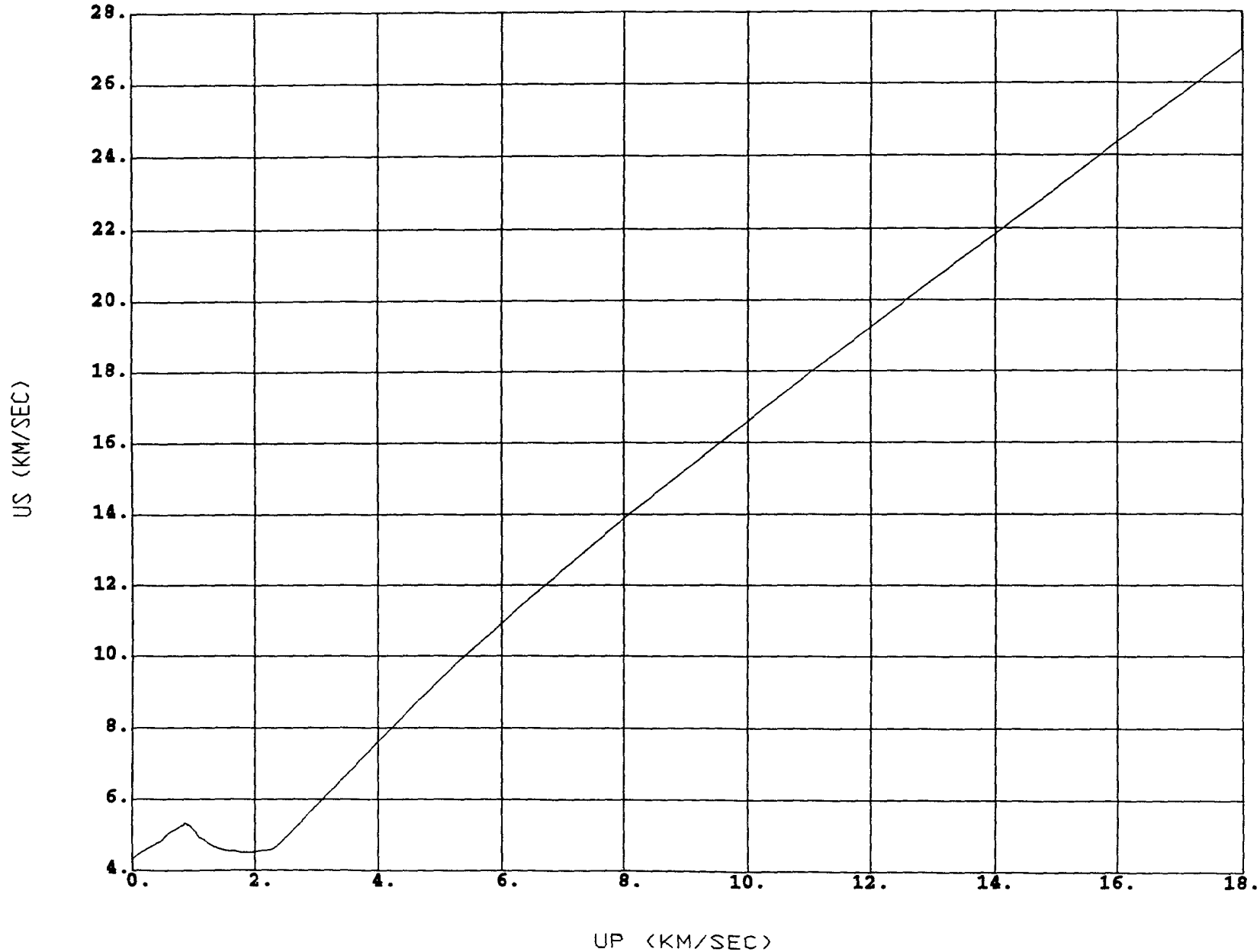
WED 12JUL 95 TABLE 301



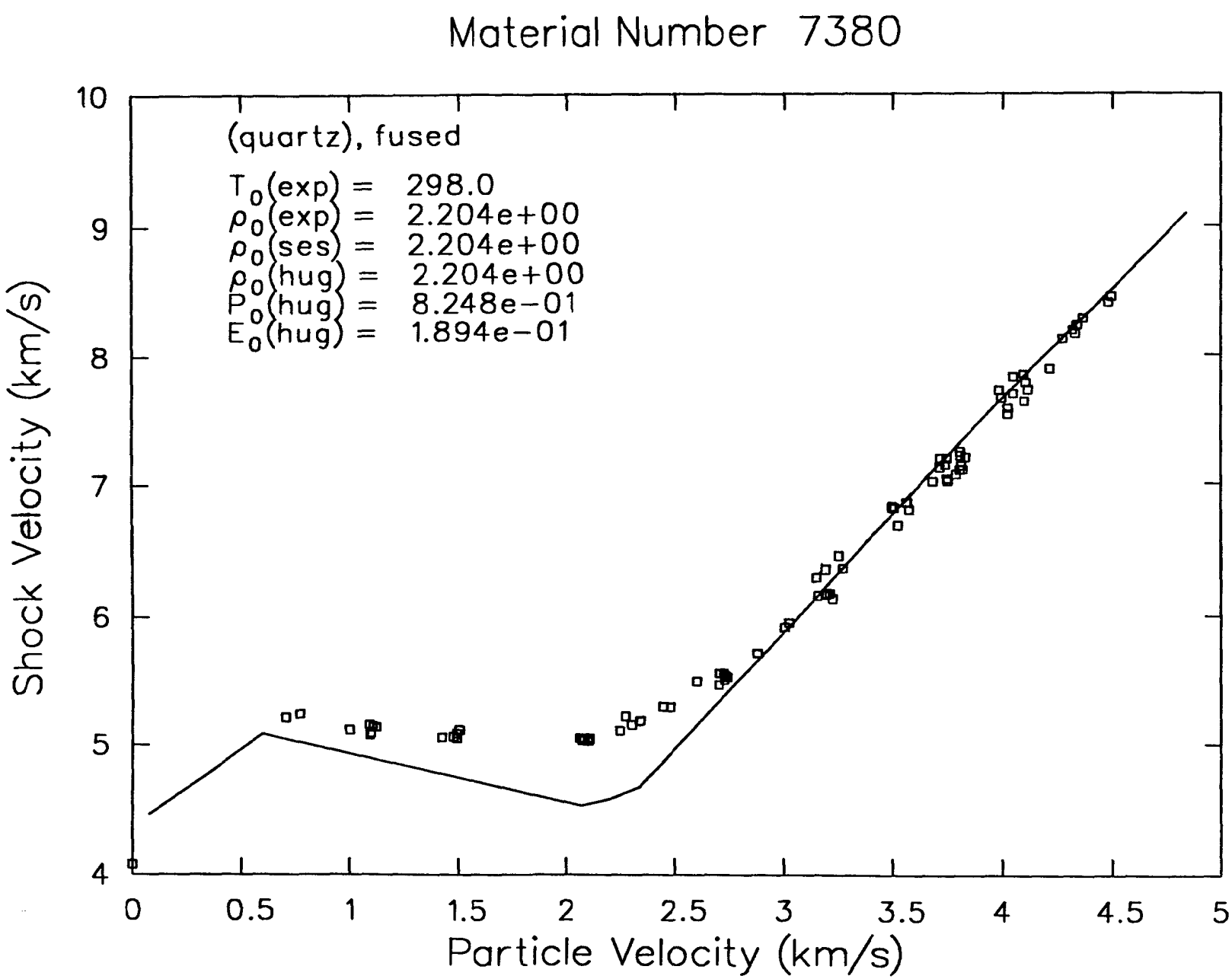
T1 SES2D CRAY 02

7380-HU1
E0 MJ/KG
0.00+00

WED 12JUL 95 TABLE 301



T1 SES2D CRA


Material Number 7380
(quartz), fused
T_0(exp) = 298.0
ρ_0(exp) = 2.204e+00
ρ_0(ses) = 2.204e+00
ρ_0(hug) = 2.204e+00
P_0(hug) = 8.248e-01
E_0(hug) = 1.894e-01
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9
8
7
6
5
4
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

MATERIAL NUMBER SUMMARY

7381 MATERIAL. QUARTZ

COMP. SIO2
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0028E+01
NORMAL DENSITY. 2.2040E+00

GAMMA(COMPUTED). 1.4419

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	14					
102	29					
201	5					
301	3980	36	54	0.0000E+00	2.2040E-04	2.2040E+04
				0.0000E+00	2.5261E-02	9.9999E+04
303	3980	36	54	0.0000E+00	2.2040E-04	2.2040E+04
				0.0000E+00	2.5261E-02	9.9999E+04
304	3980	36	54	0.0000E+00	2.2040E-04	2.2040E+04
				0.0000E+00	2.5261E-02	9.9999E+04
305	3980	36	54	0.0000E+00	2.2040E-04	2.2040E+04
				0.0000E+00	2.5261E-02	9.9999E+04
306	111	36	1	0.0000E+00	2.2040E-04	2.2040E+04
				0.0000E+00	0.0000E+00	0.0000E+00

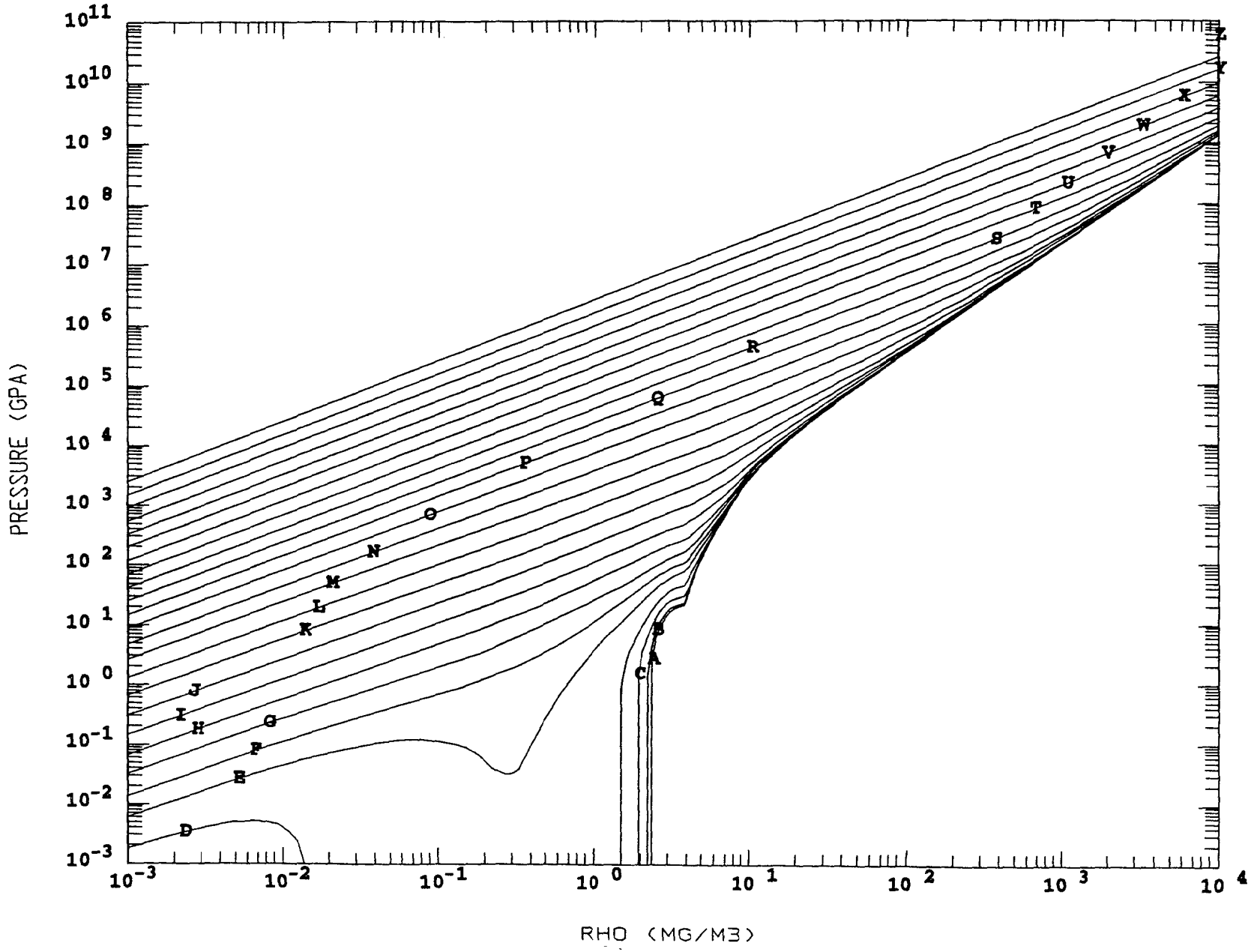
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. FEB 81
VERSION NUMBER. 6
DATE ADDED TO LIBRARY. 22681.
DATE OF LAST UPDATE. 102082.
SOURCE. R. ALBERS
REFS. NONE
CODES. EOSLTS, SUB2T

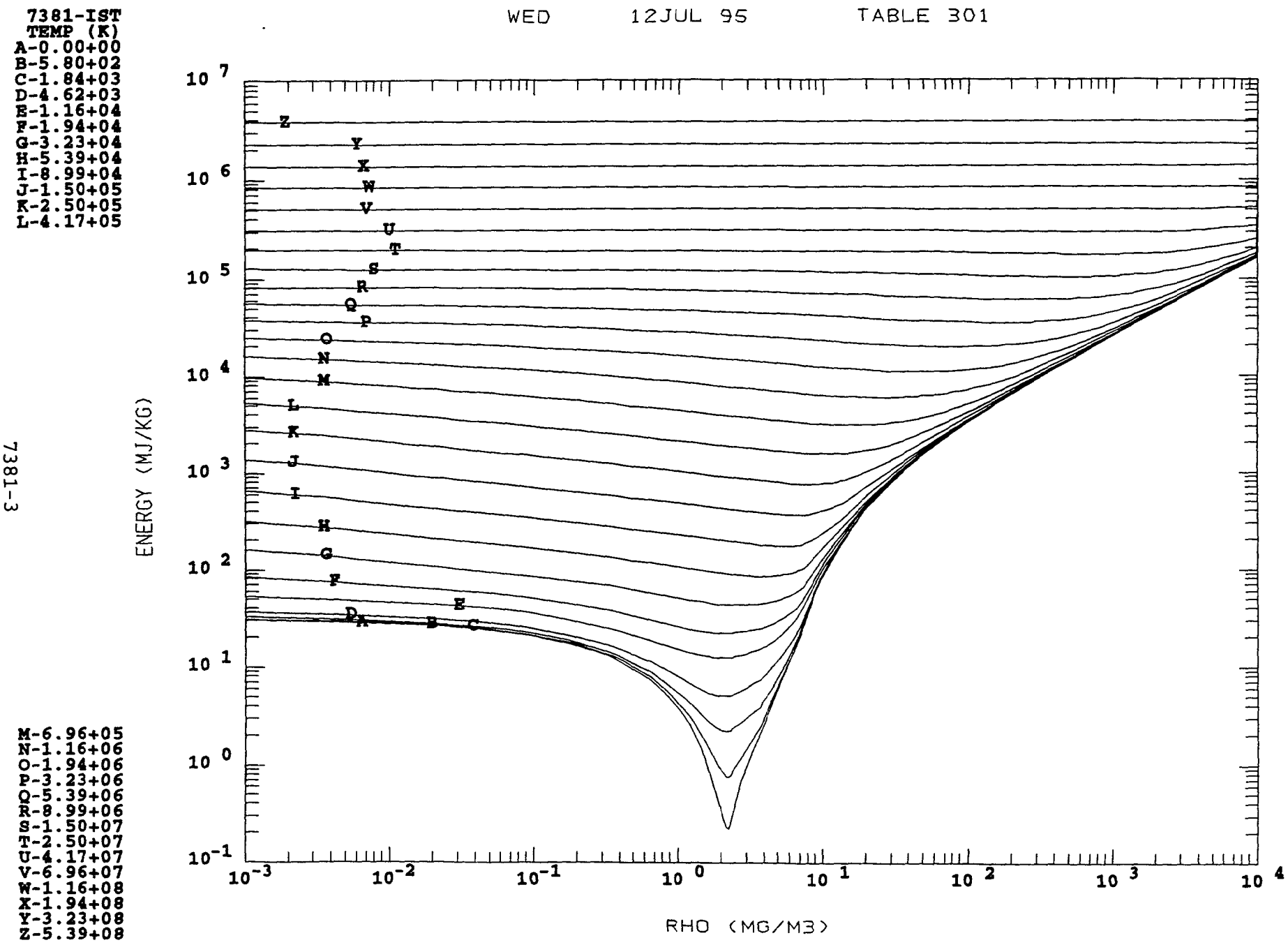
COMMENTS. THE TWO TEMPERATURE TABLES (303-306) FOR THIS MATERIAL HAVE BEEN MODIFIED FROM THEIR ORIGIONAL HAPHAZARD FORMAT TO BRING THEM INTO THE NOW STANDARD TWO TEMPERATURE FORMAT. IF THERE ARE ANY PROBLEMS, CONTACT BOB ALBERS (T-4).

7381-IST
TEMP (K)
A-0.00+00
B-5.80+02
C-1.84+03
D-4.62+03
E-1.16+04
F-1.94+04
G-3.23+04
H-5.39+04
I-8.99+04
J-1.50+05
K-2.50+05
L-4.17+05

WED 12JUL 95 TABLE 301

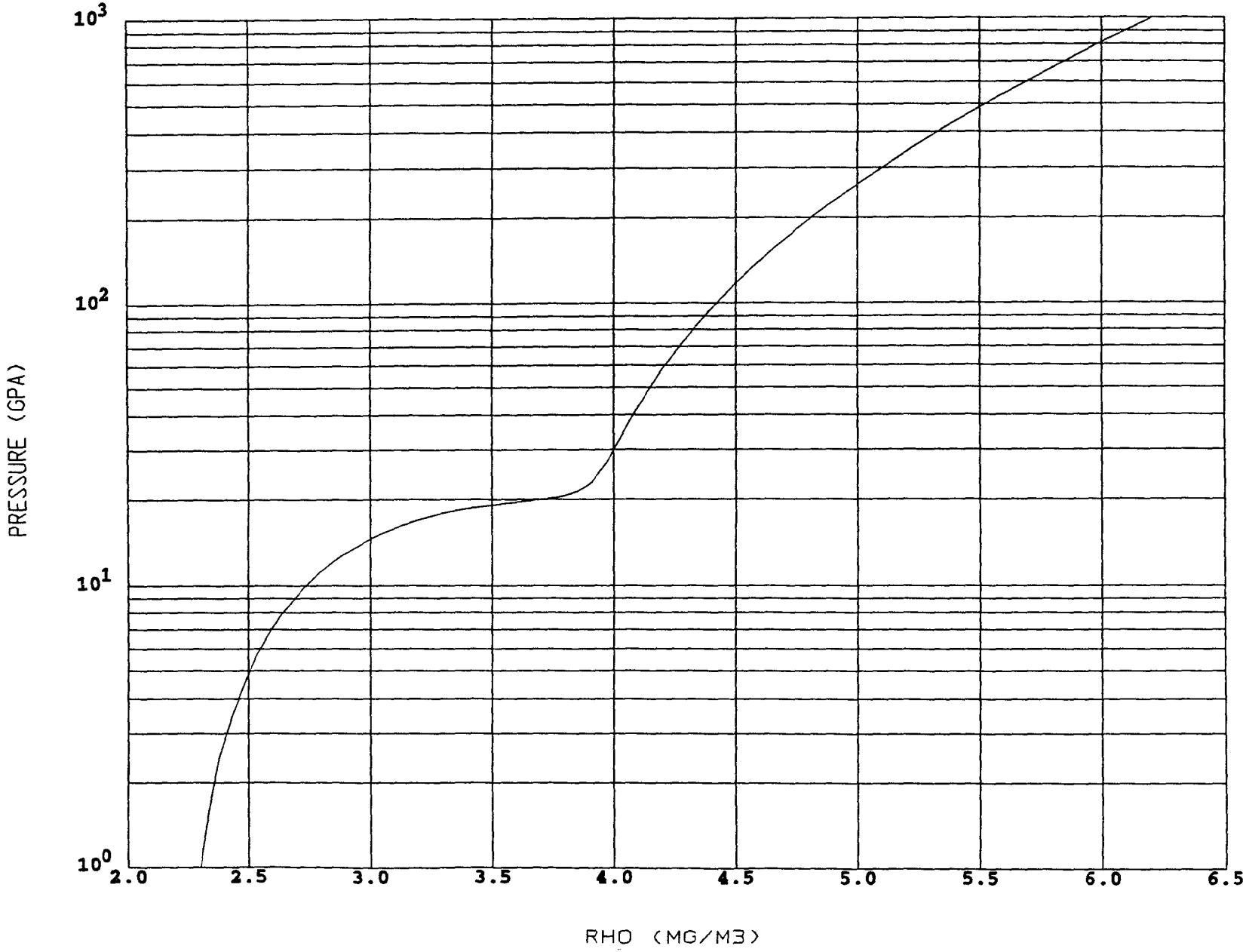


M-6.96+05
N-1.16+06
O-1.94+06
P-3.23+06
Q-5.39+06
R-8.99+06
S-1.50+07
T-2.50+07
U-4.17+07
V-6.96+07
W-1.16+08
X-1.94+08
Y-3.23+08
Z-5.39+08


WED 12JUL 95 TABLE 301
7381-IST
TEMP (K)
A-0.00+00
B-5.80+02
C-1.84+03
D-4.62+03
E-1.16+04
F-1.94+04
G-3.23+04
H-5.39+04
I-8.99+04
J-1.50+05
K-2.50+05
L-4.17+05
M-6.96+05
N-1.16+06
O-1.94+06
P-3.23+06
Q-5.39+06
R-8.99+06
S-1.50+07
T-2.50+07
U-4.17+07
V-6.96+07
W-1.16+08
X-1.94+08
Y-3.23+08
Z-5.39+08
ENERGY (MJ/KG)
RHO (MG/M3)

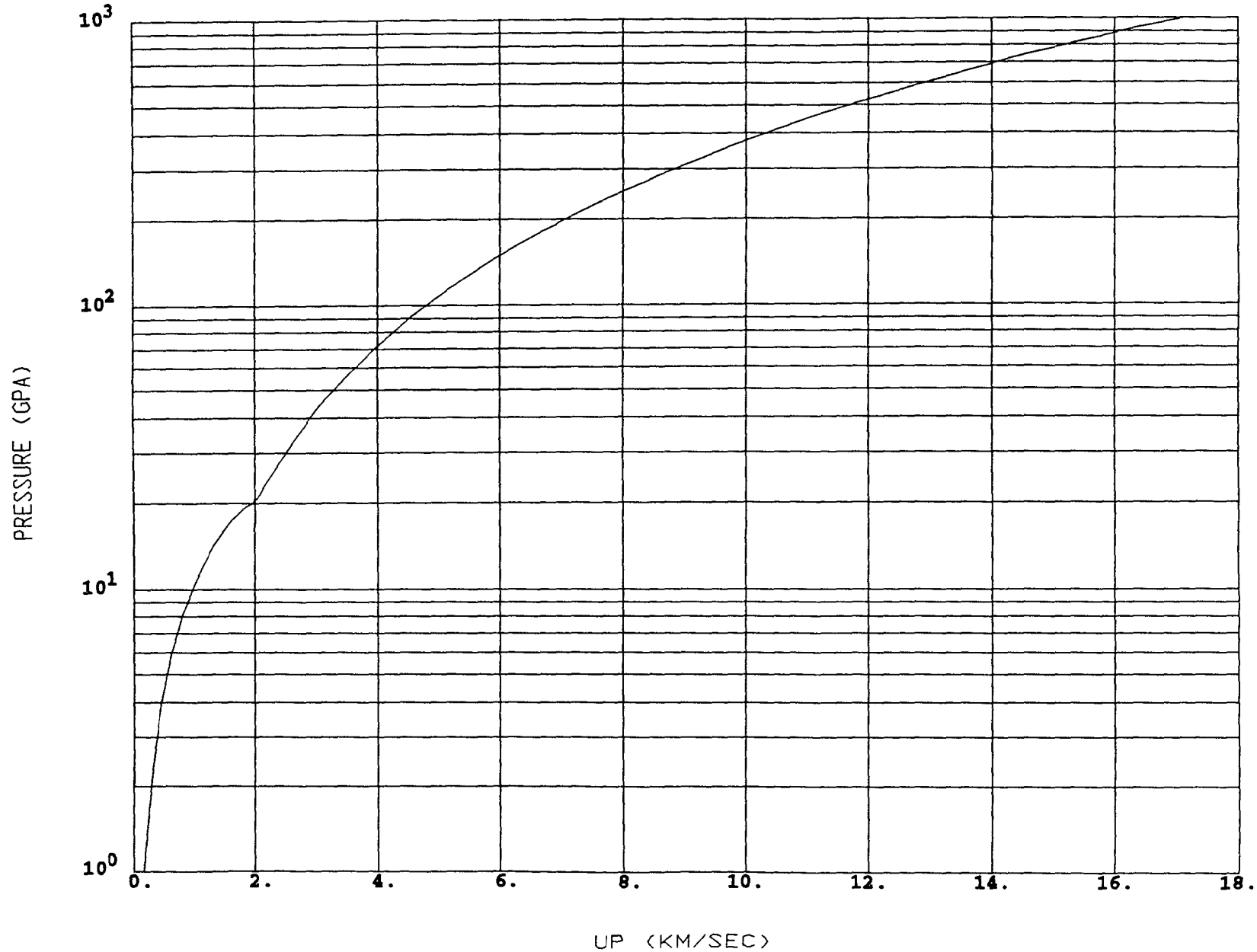
7381-HU1
E0 MJ/KG
0.00+00

WED 12JUL 95 TABLE 301



7381-HU1
E0 MJ/KG
0.00+00

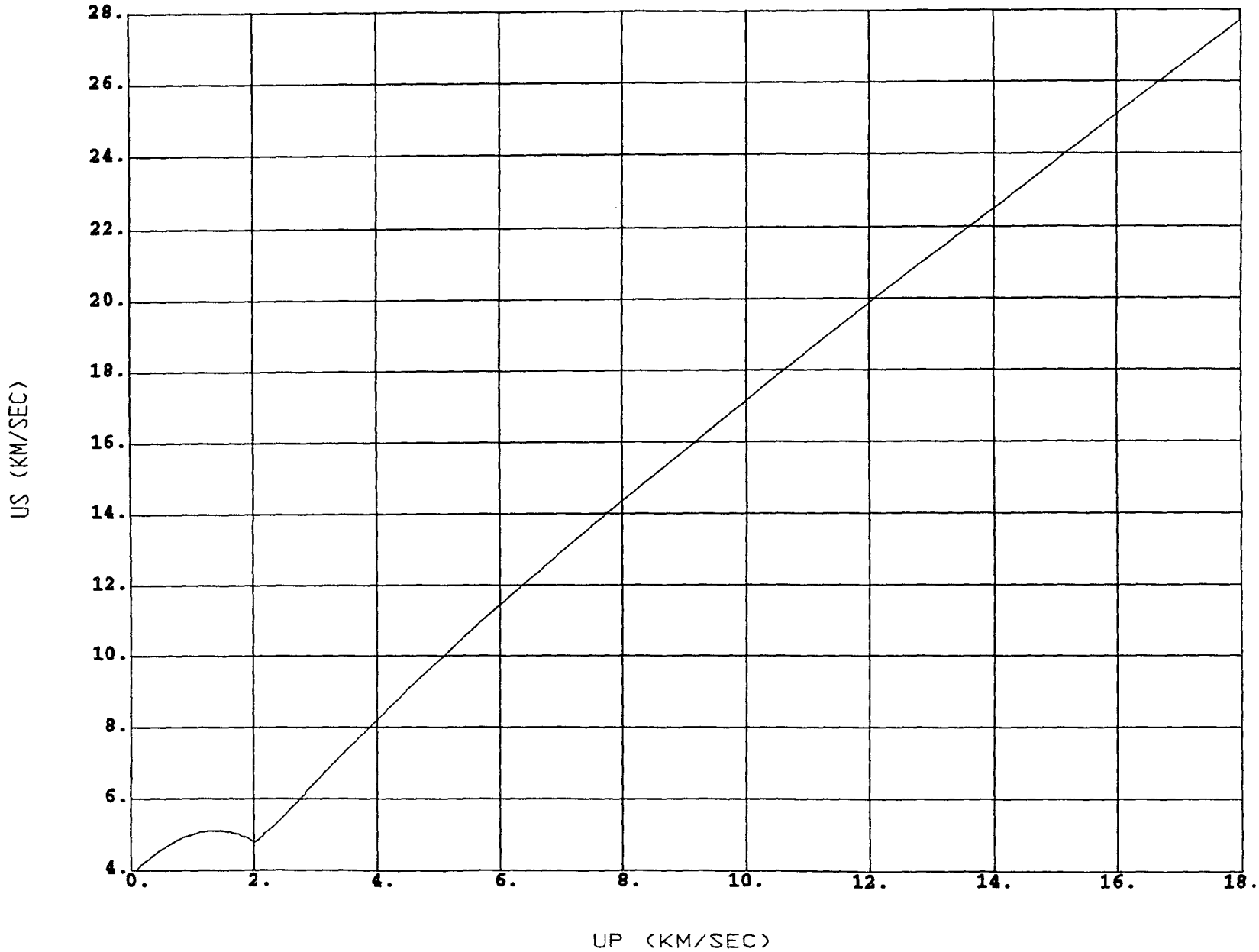
WED 12JUL 95 TABLE 301

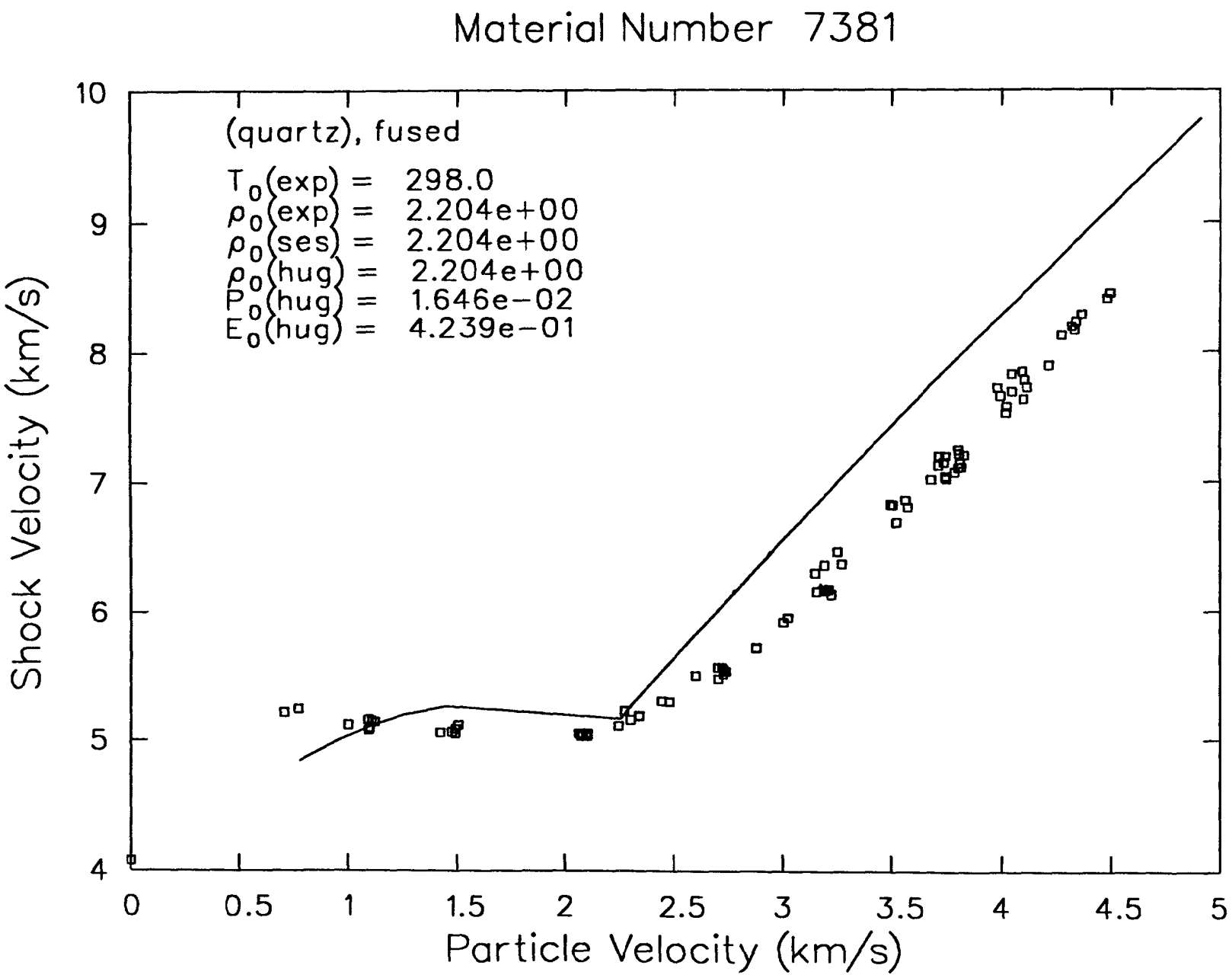


T1 SES2D CRAY 02

7381-HU1
E0 MJ/KG
0.00+00

WED 12JUL 95 TABLE 301




Material Number 7381
(quartz), fused
T_0(exp) = 298.0
ρ_0(exp) = 2.204e+00
ρ_0(ses) = 2.204e+00
ρ_0(hug) = 2.204e+00
P_0(hug) = 1.646e-02
E_0(hug) = 4.239e-01
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9
8
7
6
5
4
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

MATERIAL NUMBER | SUMMARY

7383 MATERIAL. POLYCRYSTAL QUARTZ

COMP. SIO2
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0028E+01
NORMAL DENSITY. 2.6500E+00

GAMMA(COMPUTED). 0.6513

TABLE SUMMARY.

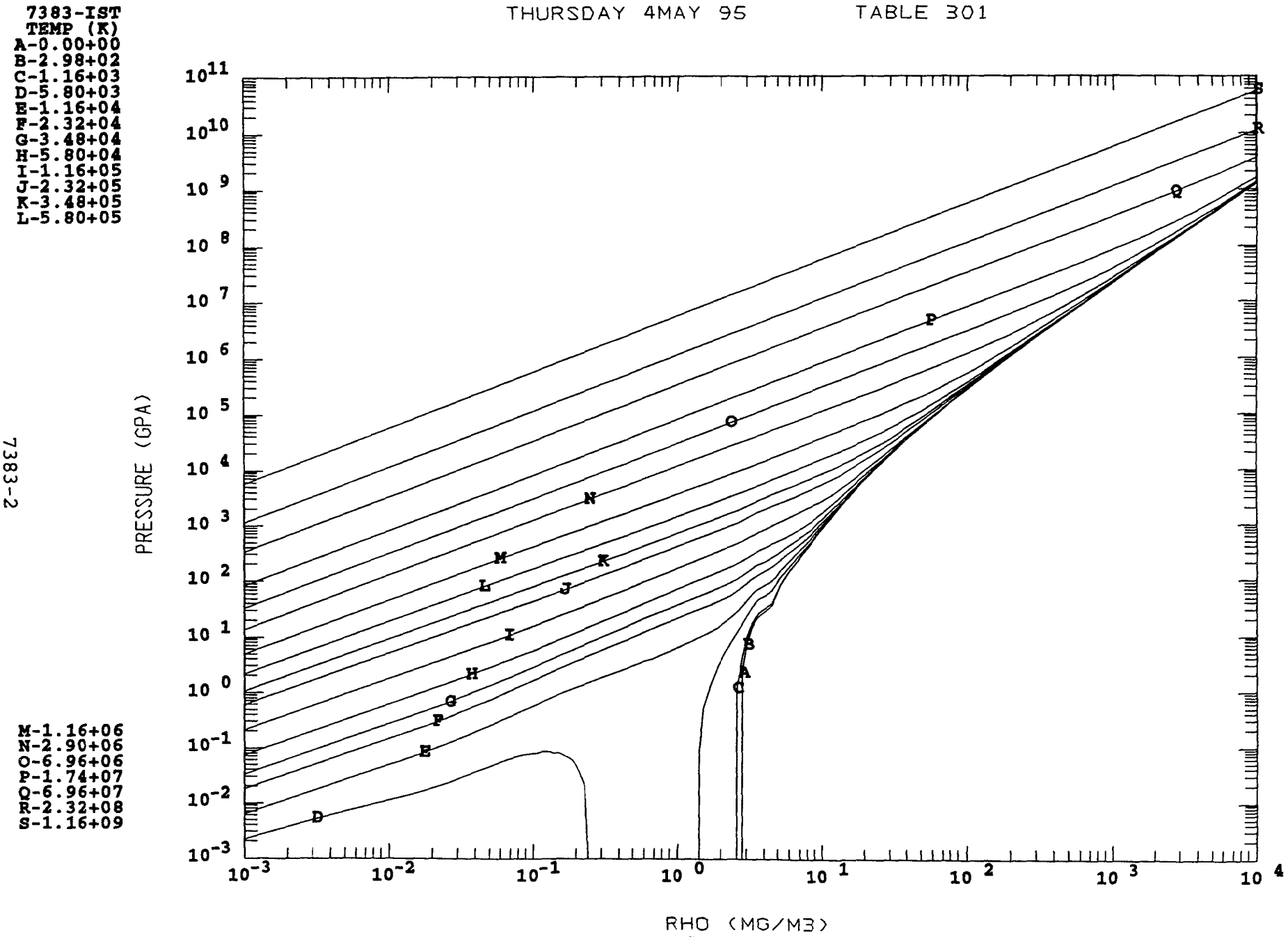
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	17					
102	99					
201	5					
301	8215	73	37	0.0000E+00	2.6500E-06	5.3000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	2.6500E-06	5.3000E-06	5.3000E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	8103	72	37	2.6500E-06	5.3000E-06	5.3000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	291	72	1	2.6500E-06	5.3000E-06	5.3000E+04
				0.0000E+00	-1.2054E-11	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

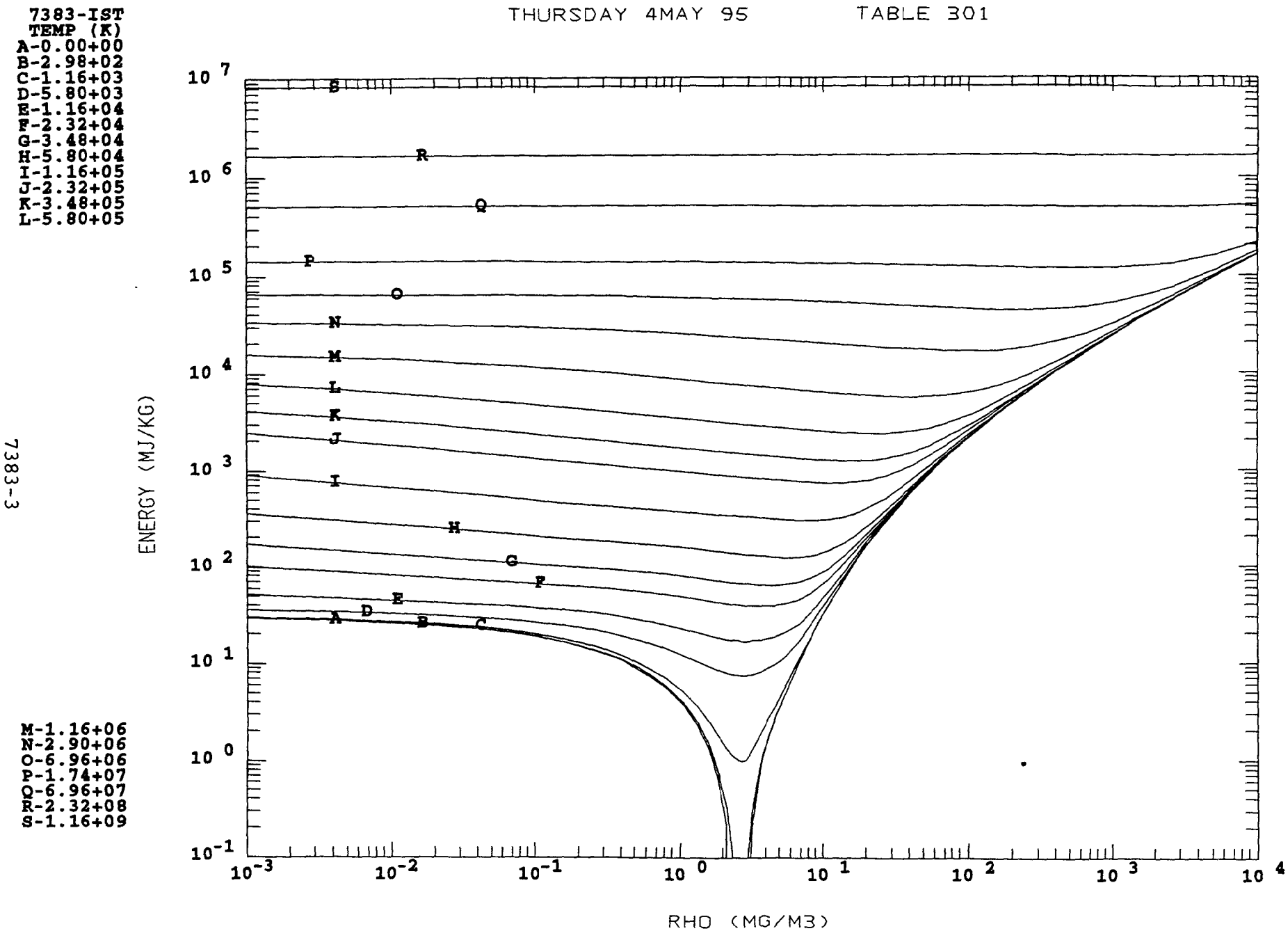
DATE. NOV 84
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 112784.
DATE OF LAST UPDATE. 112784.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING THROUGHOUT. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. COLD CURVE FROM SHOCK DATA AND SOUND VELOCITIES. USED US-UP COMPOSED OF 3 STRAIGHT LINES, UP = 0.0, 1.0, 2.41, 4.0, 26.76 AND US = 3.75, 5.7, 5.7, 8.641, 38.87 RESPECTIVELY. DATA FROM CHUNG AND SIMMONS, WACKERLE, RAGAN, AND MCQUEEN, FRITZ, AND HOPSON. TFD MATCHES MADE AT A COMPRESSION OF 1.868. ECOH = 146 KCAL PER MOLE FROM B. ALBERS CHARTD NUCLEAR MODEL. SPECIAL GAMMA (IGRUN = 7) WITH GAMEPS = 0.5, GAMREF = 0.653, DGAMMA1 = 1.1227, AND DGAMMA2= 0.0. THIS GAMMA FITS DATA DUE TO WACKERLE AND MCQUEEN, FRITZ, AND MARSH. DEBYEREF = 950 KELVIN FROM LORD AND MORROW. THIS EOS IS PRETTY GOOD FOR POLYCRYSTAL QUARTZ AND ONLY SLIGHTLY LESS ACCURATE FOR CRYSTAL QUARTZ.

THURSDAY 4MAY 95 TABLE 301

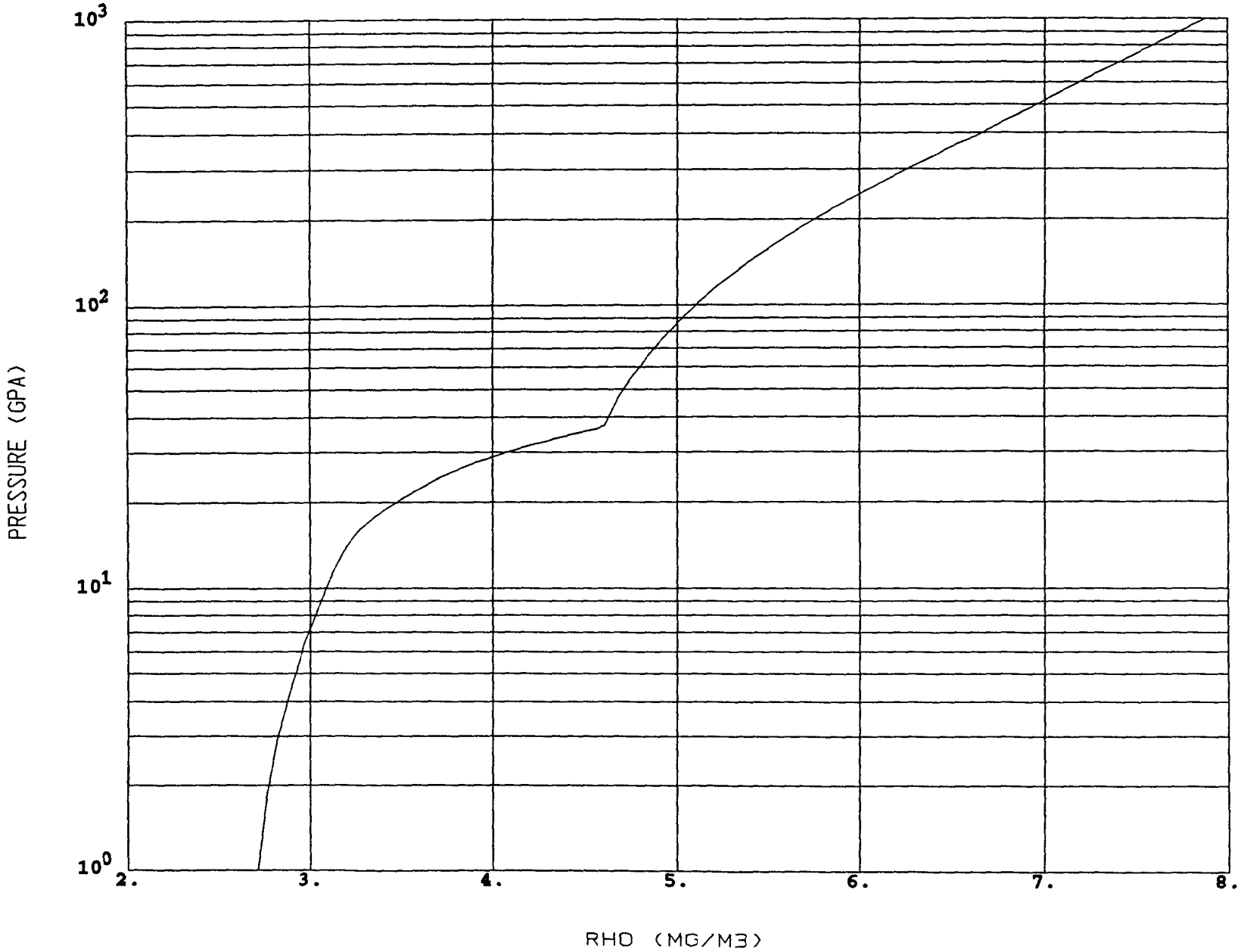


T1 SES2D CRAY


7383-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D GRAY 02

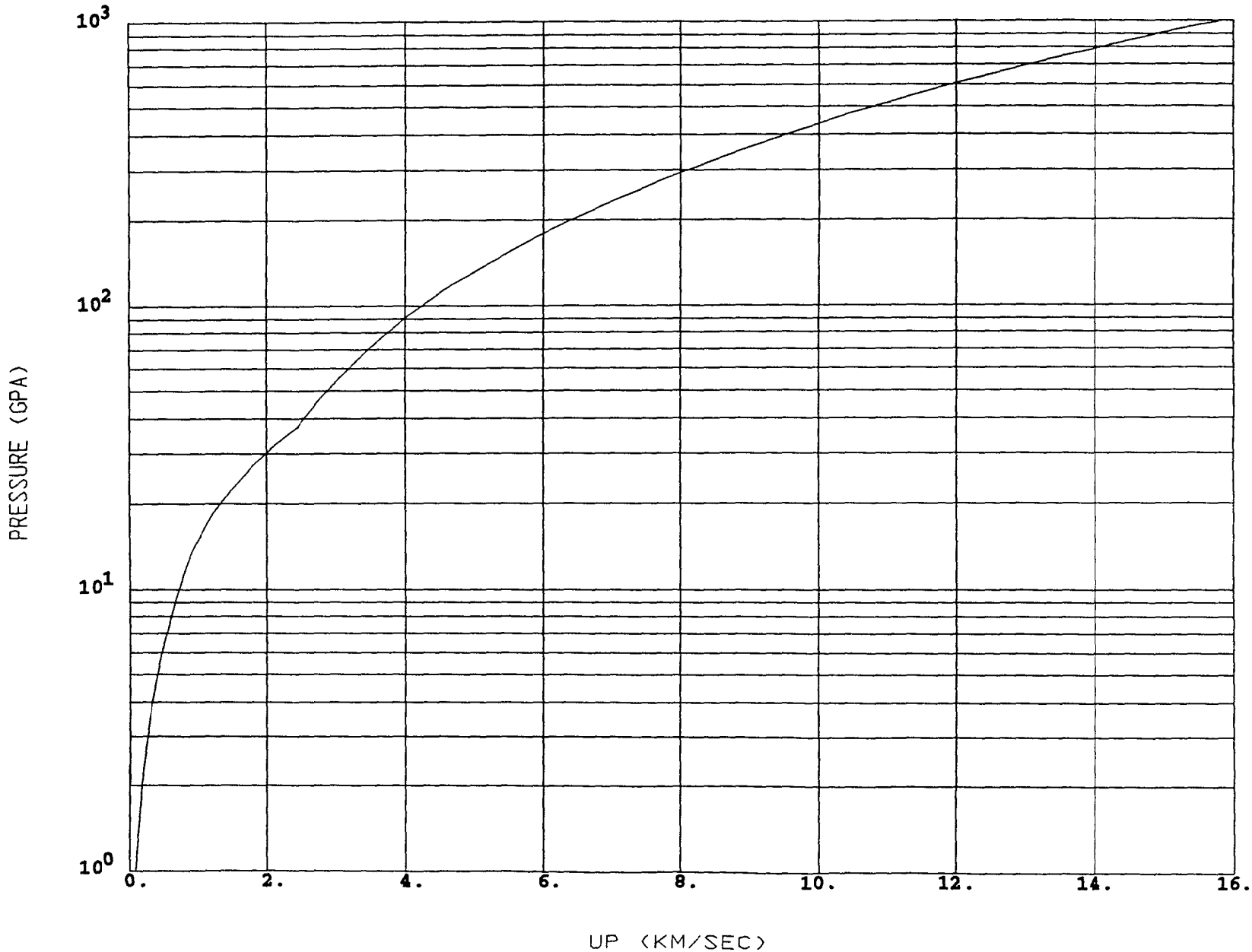
7383-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



7383-HU1
E0 MJ/KG
0.00+00

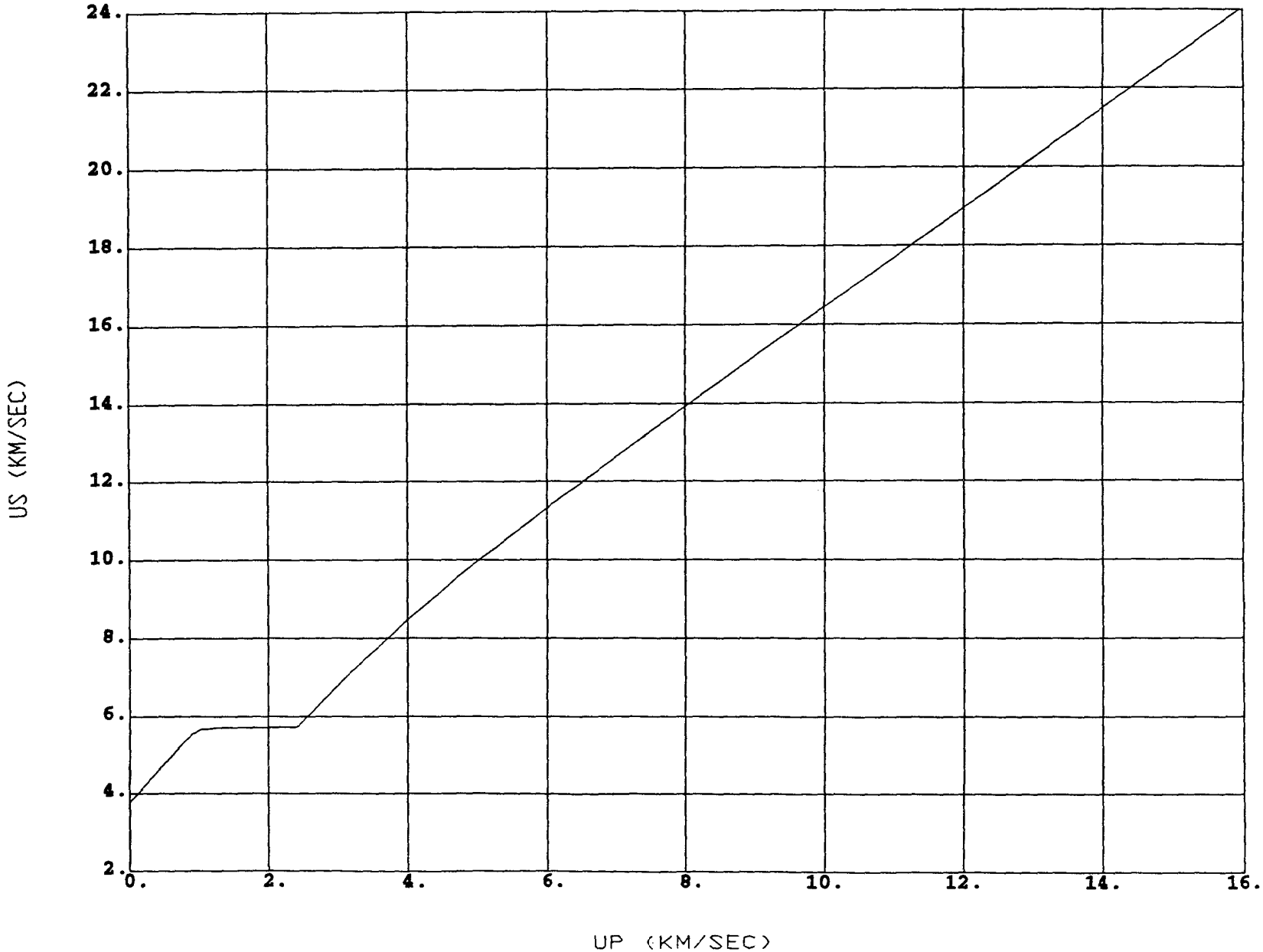
THURSDAY 4MAY 95 TABLE 301



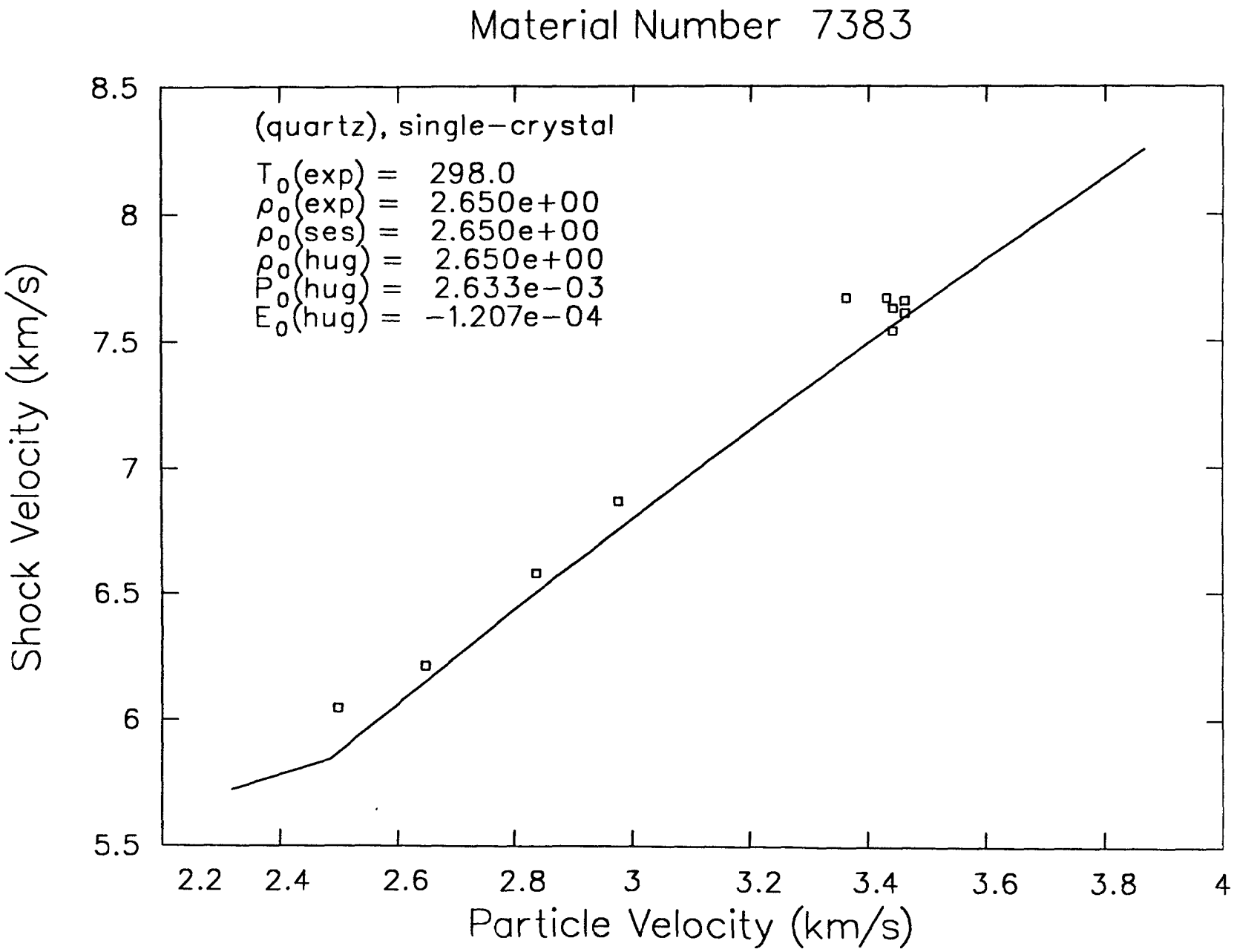
T1 SES2D CRAY 02

7383-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA


Material Number 7383
(quartz), single-crystal
T_0(exp) = 298.0
ρ_0(exp) = 2.650e+00
ρ_0(ses) = 2.650e+00
ρ_0(hug) = 2.650e+00
P_0(hug) = 2.633e-03
E_0(hug) = -1.207e-04
Shock Velocity (km/s)
Particle Velocity (km/s)
8.5
8
7.5
7
6.5
6
5.5
2.2
2.4
2.6
2.8
3
3.2
3.4
3.6
3.8
4

MATERIAL NUMBER | SUMMARY

7385 MATERIAL. POLYCRYSTAL QUARTZ

COMP. SIO2
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0028E+01
NORMAL DENSITY. 2.6500E+00

GAMMA(COMPUTED). 0.6487

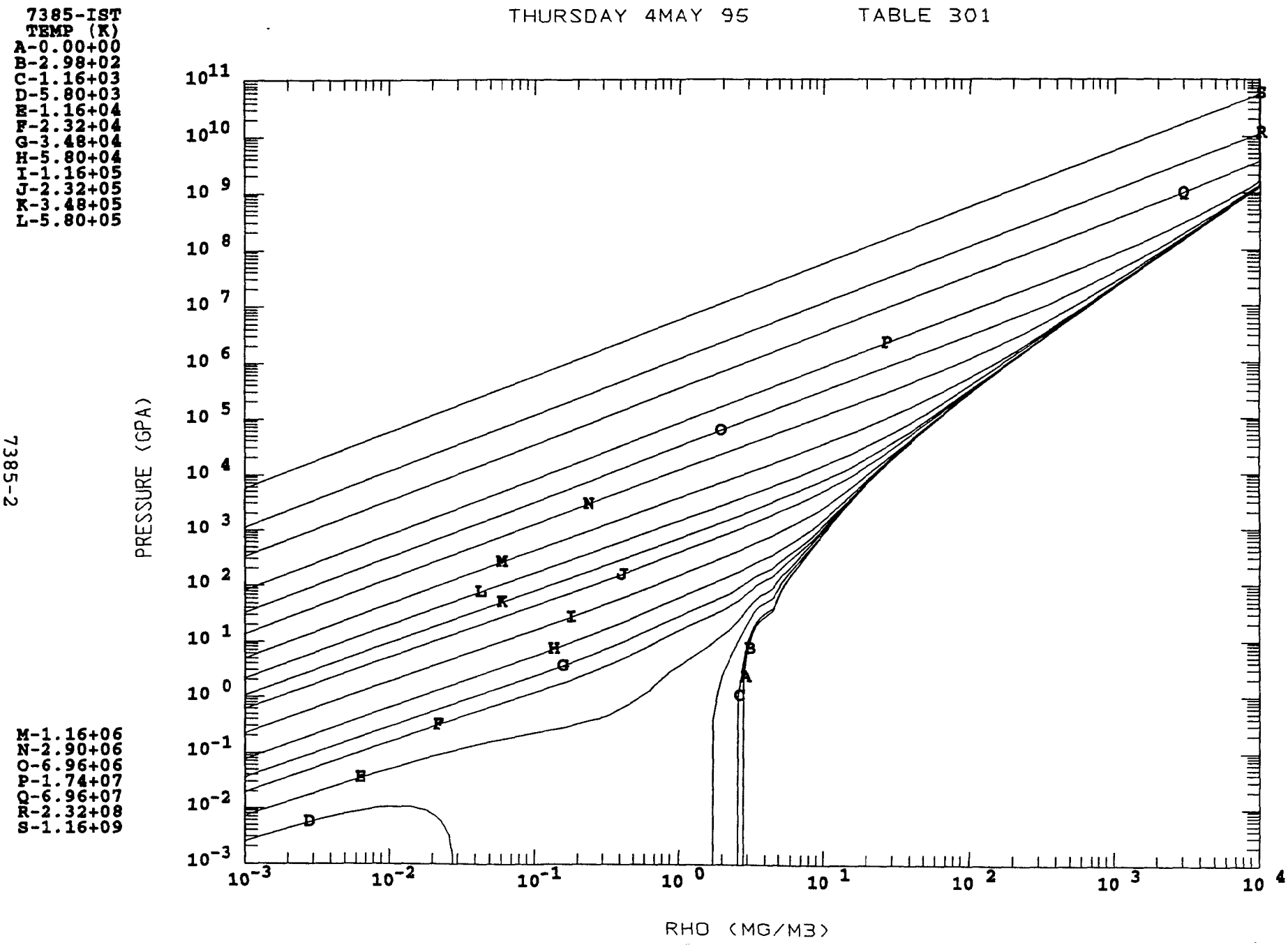
TABLE SUMMARY.

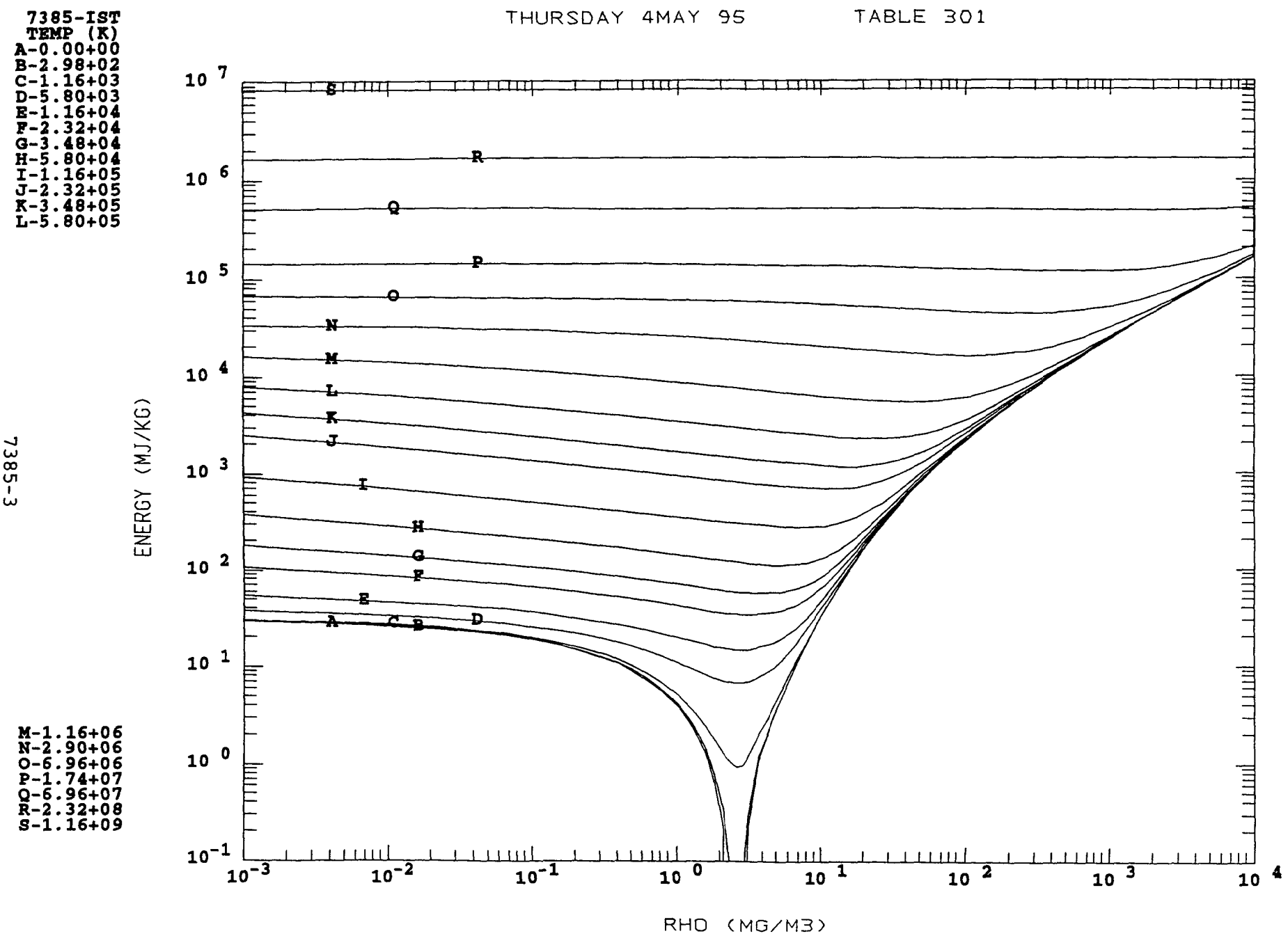
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	17					
102	9					
201	5					
301	8215	73	37	0.0000E+00	2.6500E-06	5.3000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	2.6500E-06	5.3000E-06	5.3000E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	8103	72	37	2.6500E-06	5.3000E-06	5.3000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	291	72	1	2.6500E-06	5.3000E-06	5.3000E+04
				0.0000E+00	-1.2044E-11	0.0000E+00
401	73					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 87
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 32387.
DATE OF LAST UPDATE. 22388.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. THIS IS THE SAME AS 7383 EXCEPT THE CHARTJD NUCLEAR MODEL WAS USED.


7385-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA

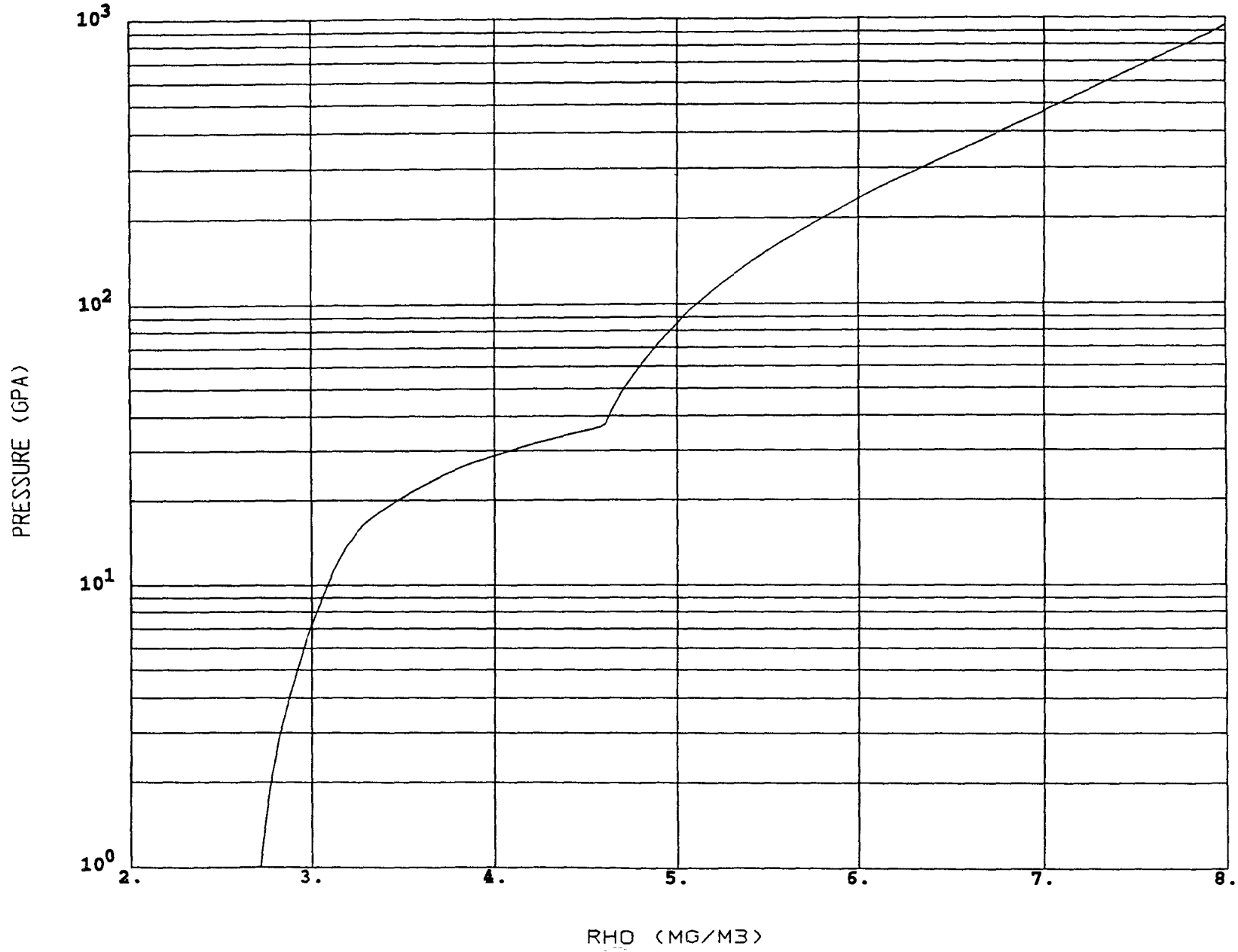


7385-3

T1 SES2D CRAY 02

7385-HU1
E0 MJ/KG
0.00+00

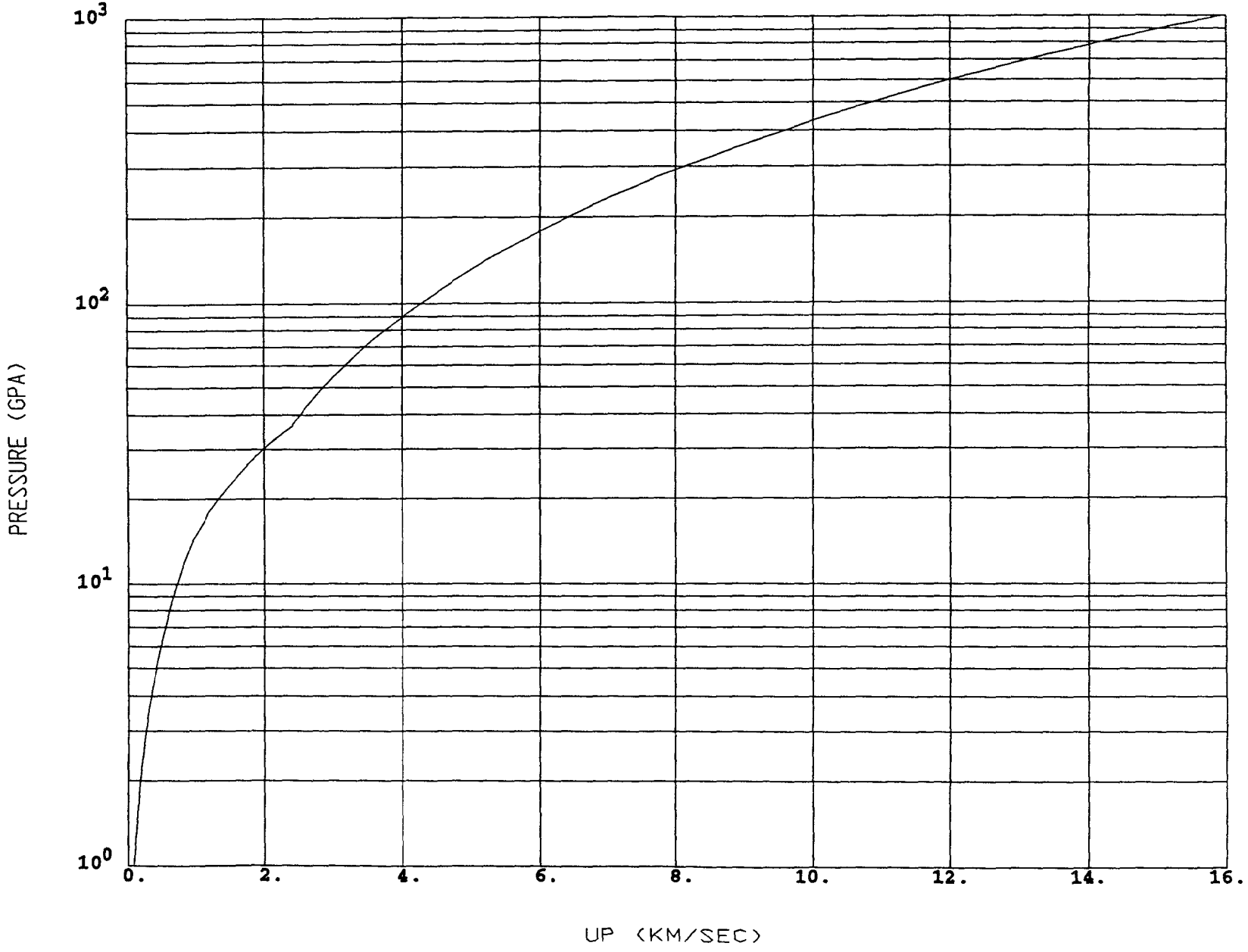
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA1

7385-HU1
E0 MJ/KG
0.00+00

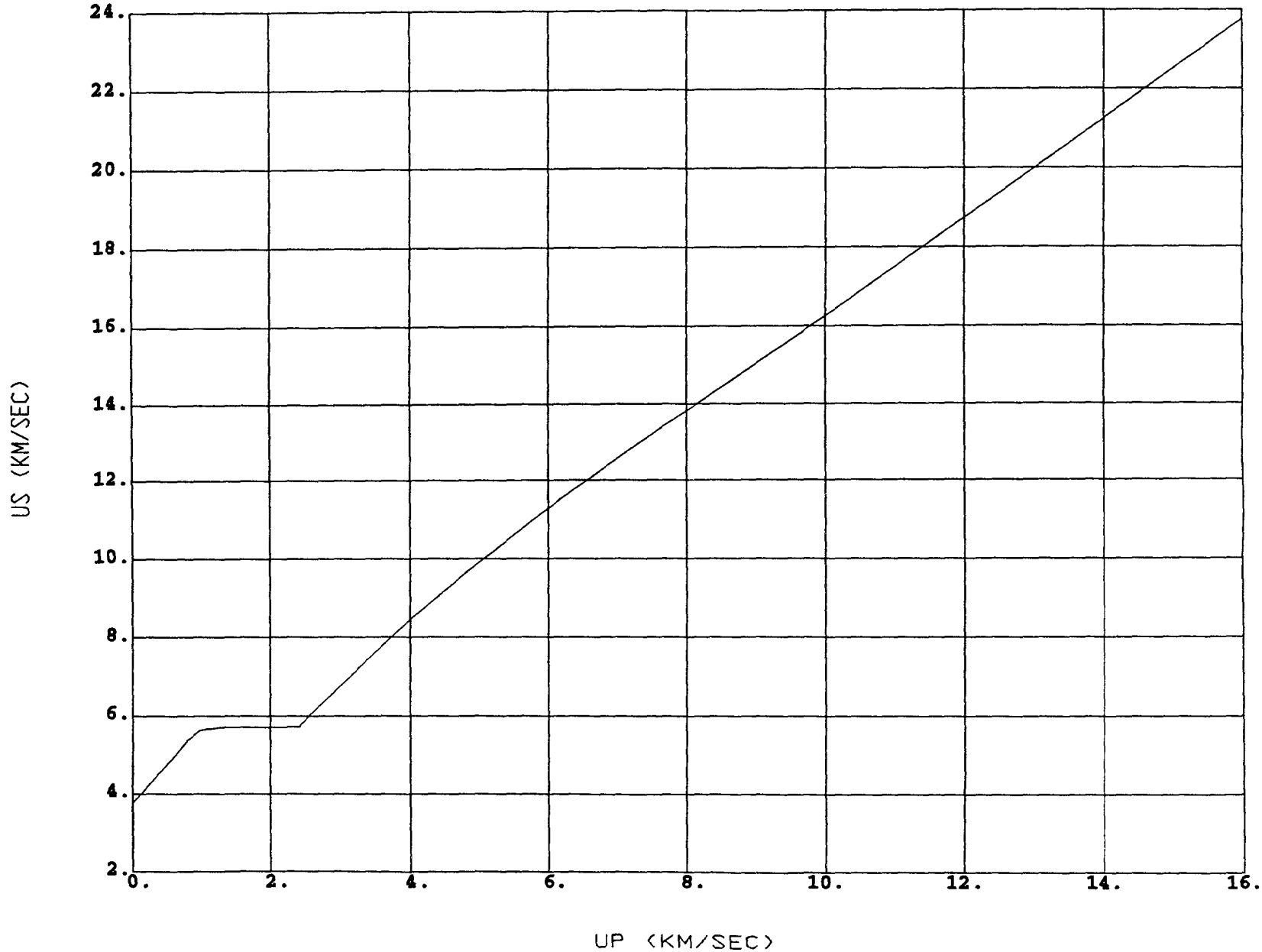
THURSDAY 4MAY 95 TABLE 301



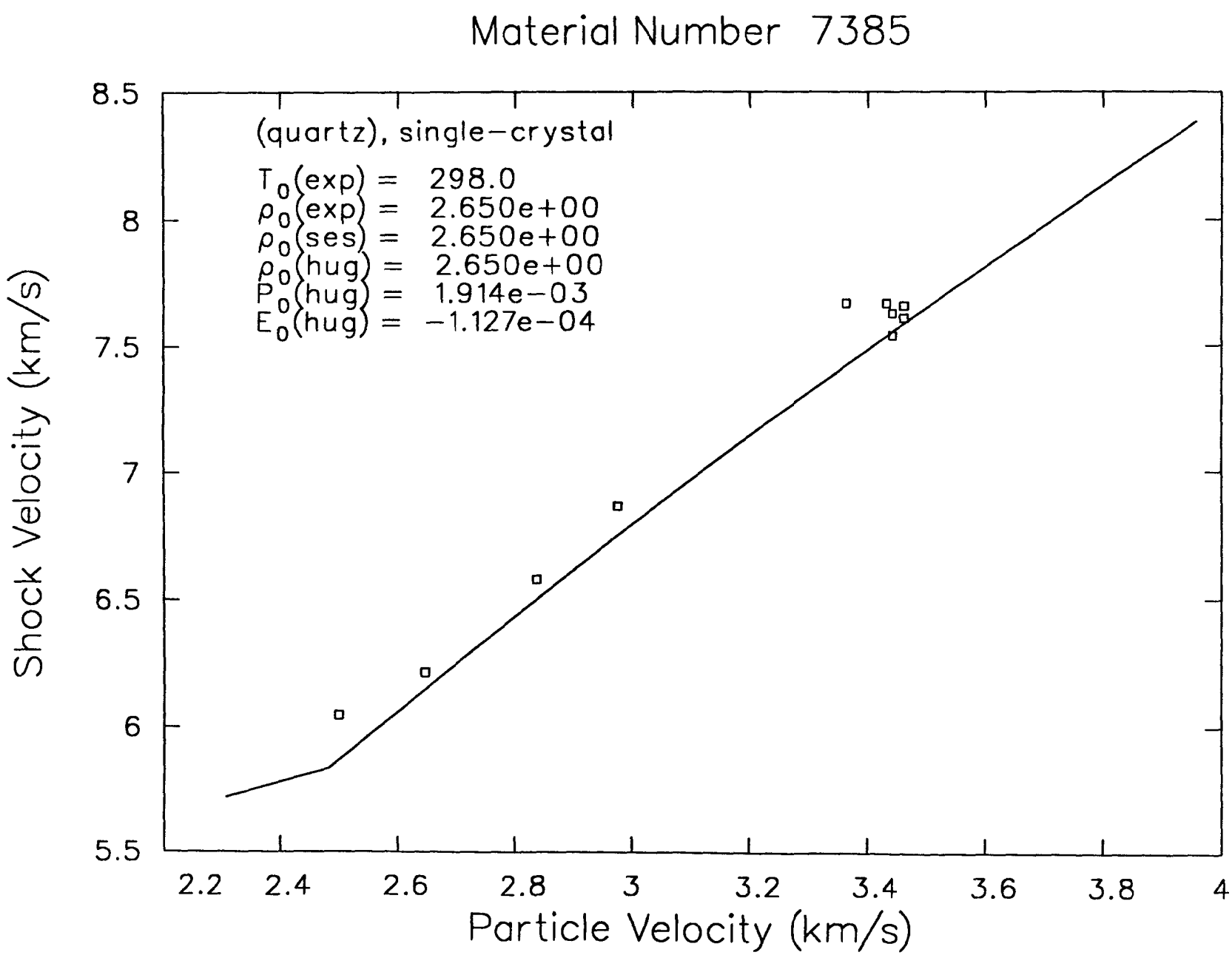
T1 SES2D CRAY 02

7385-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA


Material Number 7385
(quartz), single-crystal
T_0(exp) = 298.0
ρ_0(exp) = 2.650e+00
ρ_0(ses) = 2.650e+00
ρ_0(hug) = 2.650e+00
P_0(hug) = 1.914e-03
E_0(hug) = -1.127e-04
Shock Velocity (km/s)
Particle Velocity (km/s)
8.5
8
7.5
7
6.5
6
5.5
2.2
2.4
2.6
2.8
3
3.2
3.4
3.6
3.8
4

MATERIAL NUMBER	SUMMARY
7386	MATERIAL. FUSED QUARTZ

COMP. SIO2
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0028E+01
NORMAL DENSITY. 2.2040E+00

GAMMA(COMPUTED). 0.6487

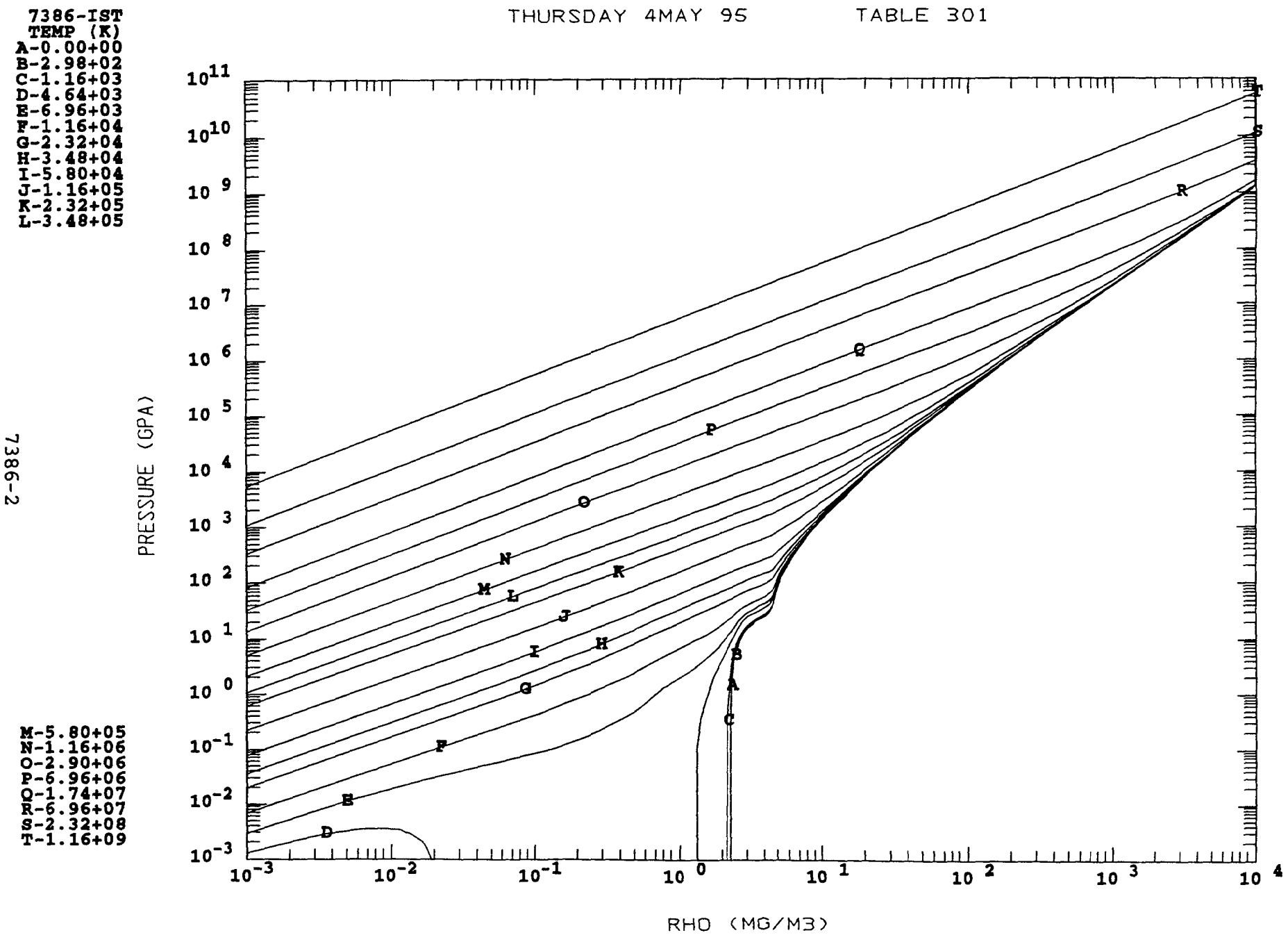
TABLE SUMMARY.

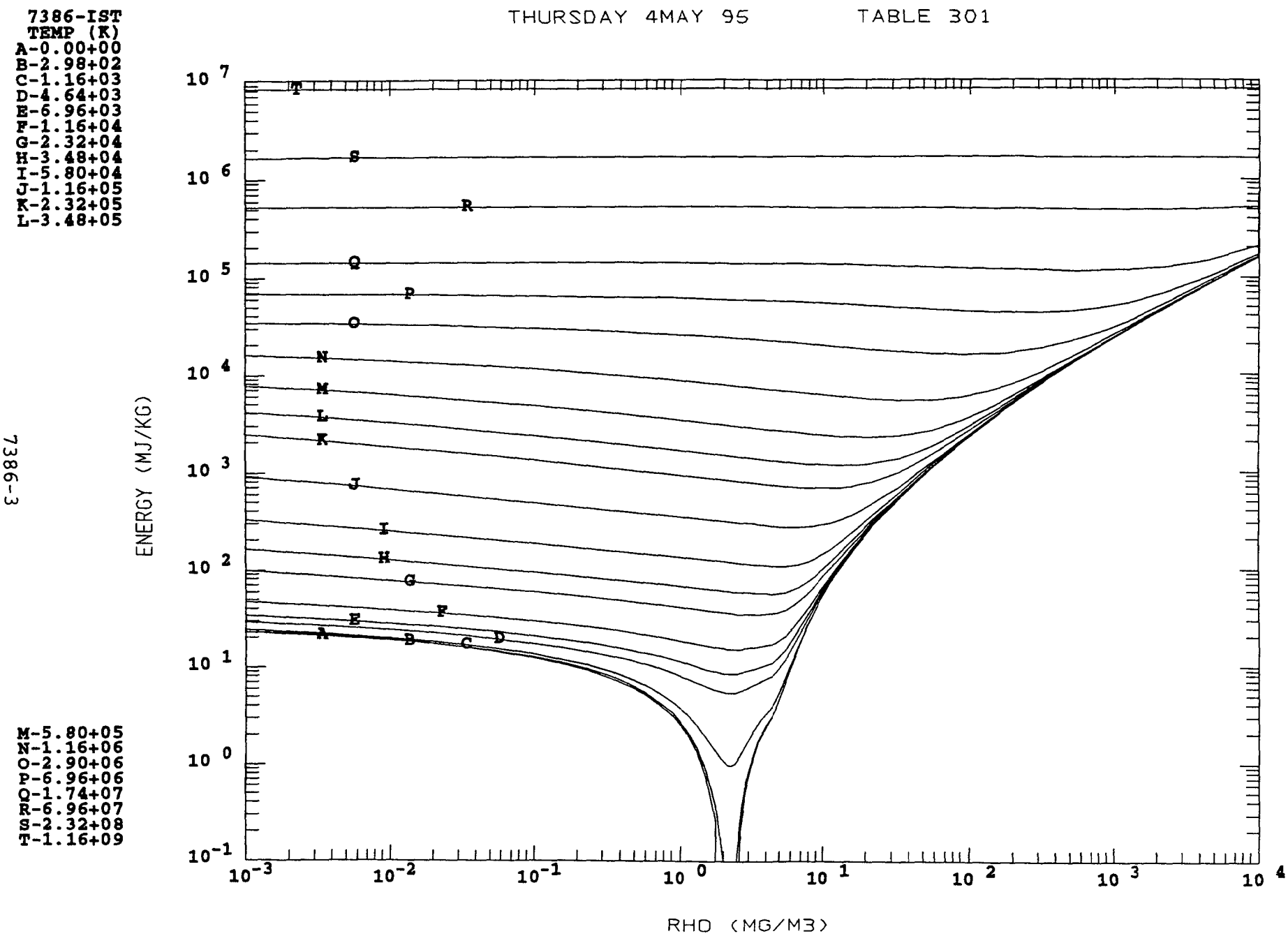
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	85					
201	5					
301	8891	75	39	0.0000E+00	2.2040E-06	4.4080E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	8891	75	39	0.0000E+00	2.2040E-06	4.4080E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	8891	75	39	0.0000E+00	2.2040E-06	4.4080E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8773	74	39	2.2040E-06	4.4080E-06	4.4080E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	299	74	1	2.2040E-06	4.4080E-06	4.4080E+04
				0.0000E+00	-8.3488E-11	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. NOV 88
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 71588.
DATE OF LAST UPDATE. 40891.
SOURCE. J. BOETTGER
REFS. LA-11488-MS
CODES. GRIZZLY

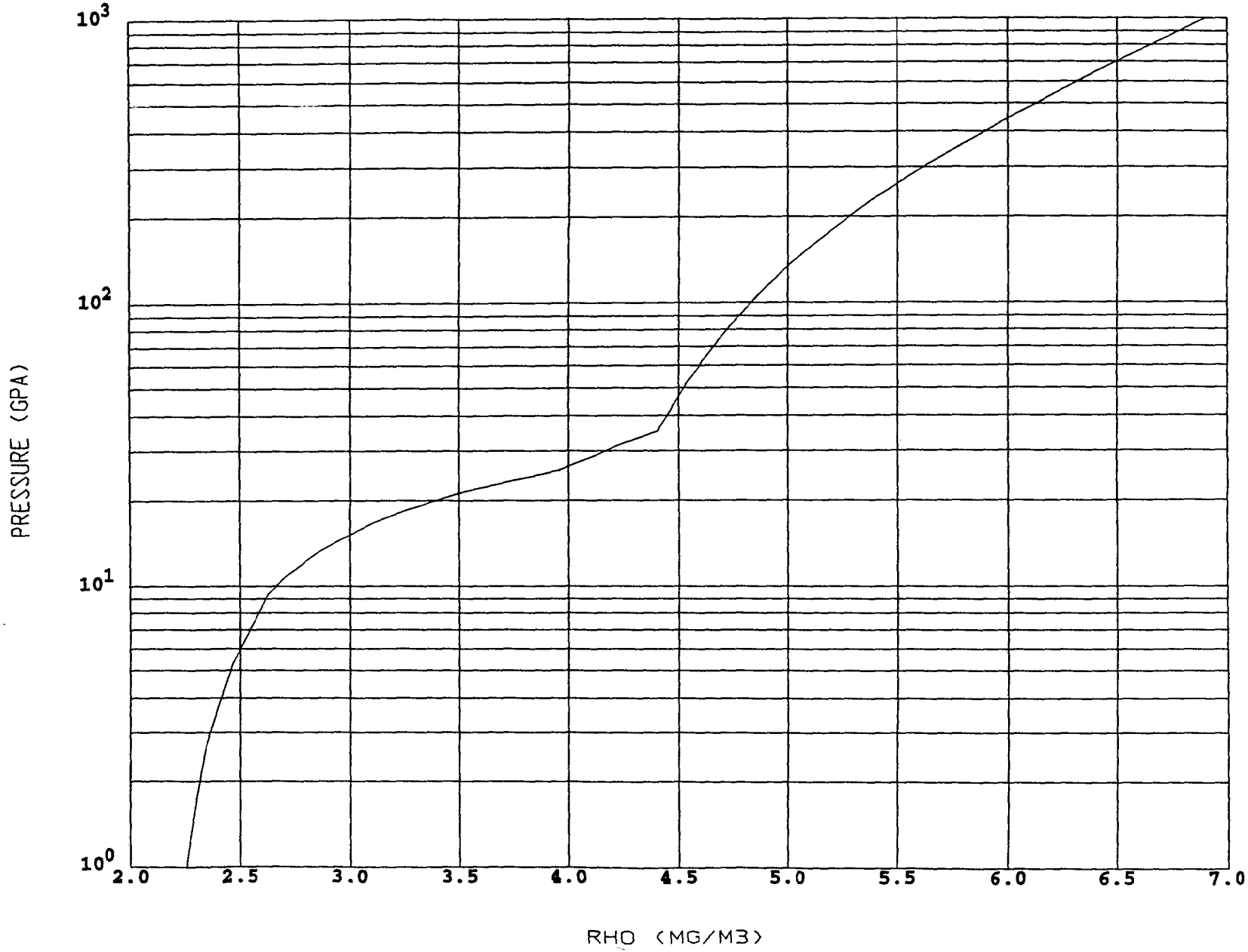
COMMENTS. THE ELECTRONIC CONTRIBUTION AND THE COLD CURVE FOR HIGH COMPRESSIONS WERE CONSTRUCTED BY FIRST APPLYING TFD THEORY TO EACH COMPONENT SEPARATELY AND THEN USING ADDITIVE VOLUME MIXING. FOR COMPRESSIONS LESS THAN 2.1 THE COLD CURVE WAS DERIVED FROM A 4 LINE FIT TO EXPERIMENTAL HUGONIOT DATA DEFINED BY FIVE (UP,US) POINTS - (0.00,4.09), (0.85,5.1), (2.25,5.1), (2.877,5.71), (4.494,8.461). THE EXPANDED COLD CURVE USES A LENNARD-JONES FORM WITH FACLJ = 3.0 AND ECOHKC = 146. THE CHARTJD NUCLEAR MODEL WAS USED WITH DEBKEL = 950, GAMREF = 0.65, TMELT = 1900. THIS EOS IS SUPERIOR TO 7381 FOR FUSED QUARTZ. IT IS NOT INTENDED AS AN EOS FOR CRYSTALLINE OR POLYCRYSTALLINE QUARTZ.


7386-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-4.64+03
E-6.96+03
F-1.16+04
G-2.32+04
H-3.48+04
I-5.80+04
J-1.16+05
K-2.32+05
L-3.48+05
M-5.80+05
N-1.16+06
O-2.90+06
P-6.96+06
Q-1.74+07
R-6.96+07
S-2.32+08
T-1.16+09
THURSDAY 4MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY


7386-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-4.64+03
E-6.96+03
F-1.16+04
G-2.32+04
H-3.48+04
I-5.80+04
J-1.16+05
K-2.32+05
L-3.48+05
M-5.80+05
N-1.16+06
O-2.90+06
P-6.96+06
Q-1.74+07
R-6.96+07
S-2.32+08
T-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7386-HU1
E0 MJ/KG
0.00+00

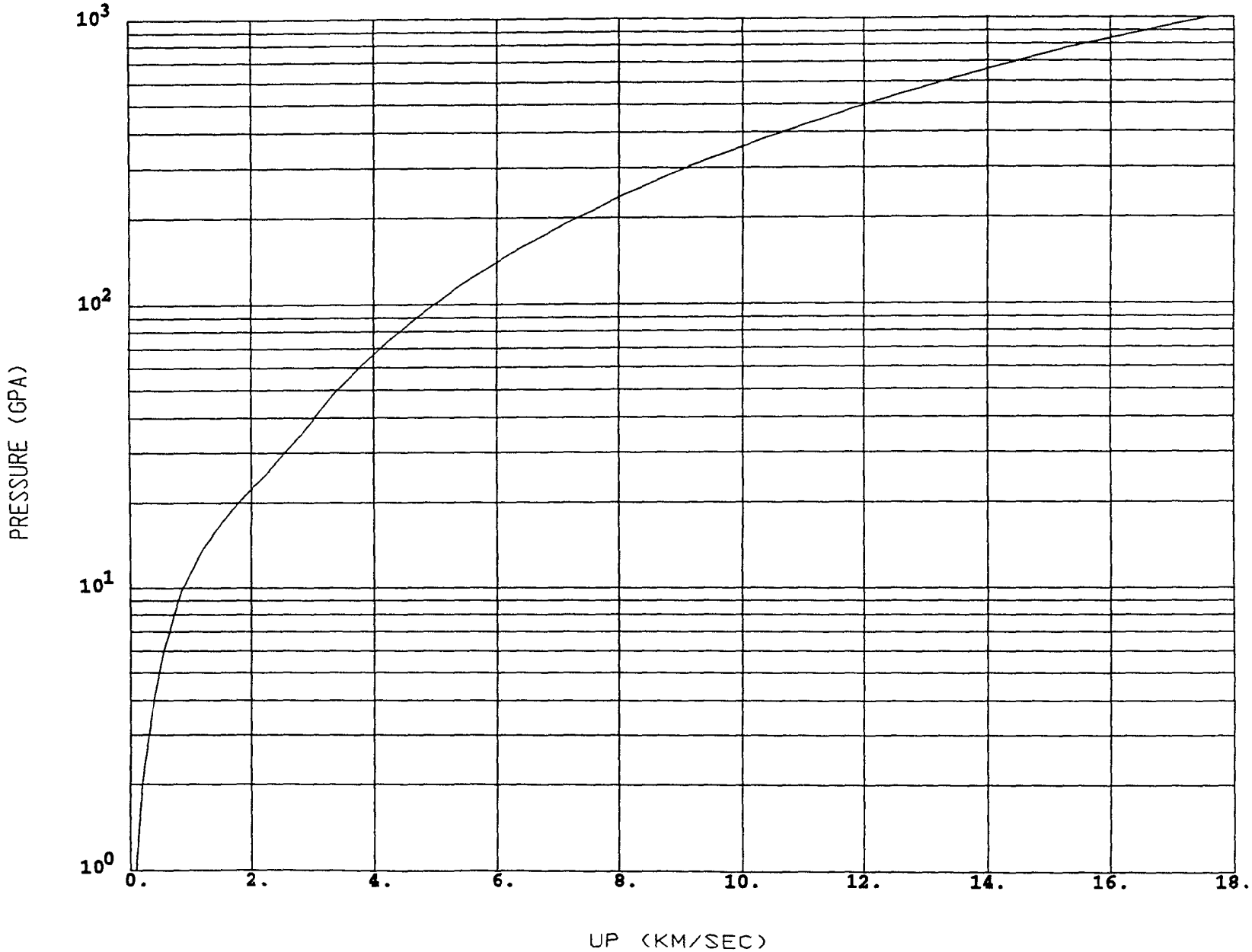
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY

7386-HU1
E0 MJ/KG
0.00+00

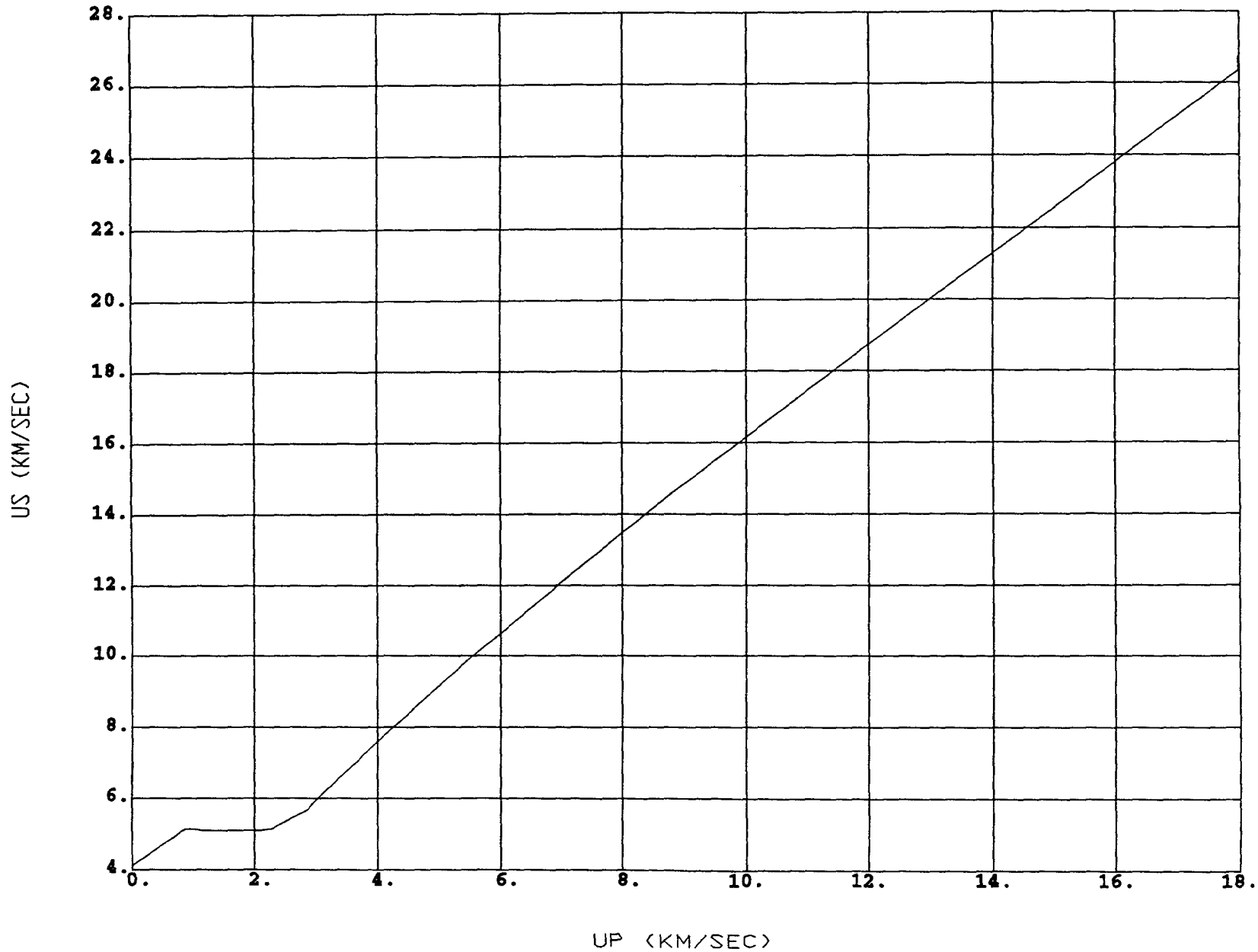
THURSDAY 4MAY 95 TABLE 301



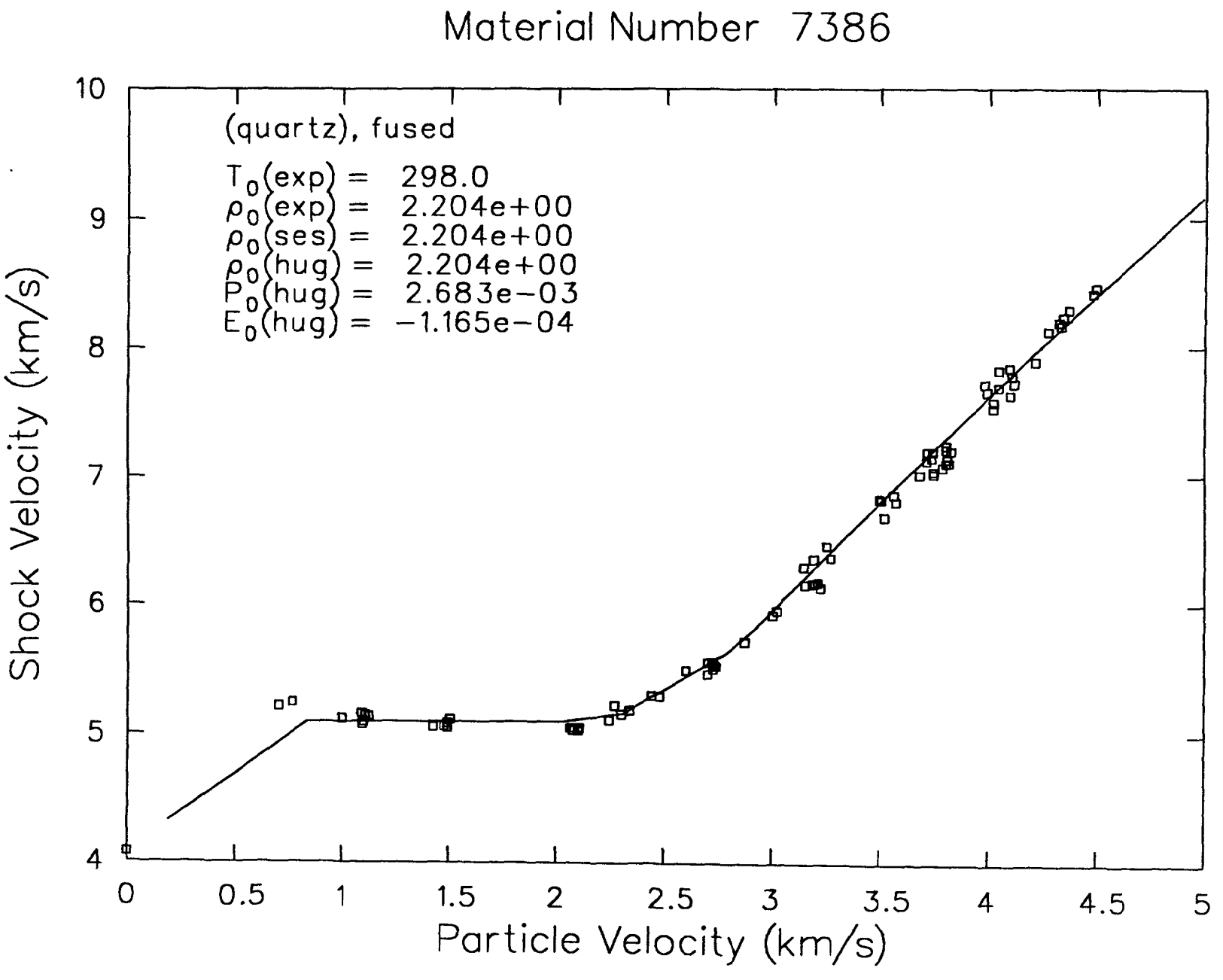
T1 SES2D CRAY 02

7386-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7386
(quartz), fused
T_0(exp) = 298.0
ρ_0(exp) = 2.204e+00
ρ_0(ses) = 2.204e+00
ρ_0(hug) = 2.204e+00
P_0(hug) = 2.683e-03
E_0(hug) = -1.165e-04
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9
8
7
6
5
4
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

7386-7

MATERIAL NUMBER SUMMARY

7387 MATERIAL. FUSED QUARTZ

COMP. SIO2
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0028E+01
NORMAL DENSITY. 2.2040E+00

GAMMA(COMPUTED). 0.6436

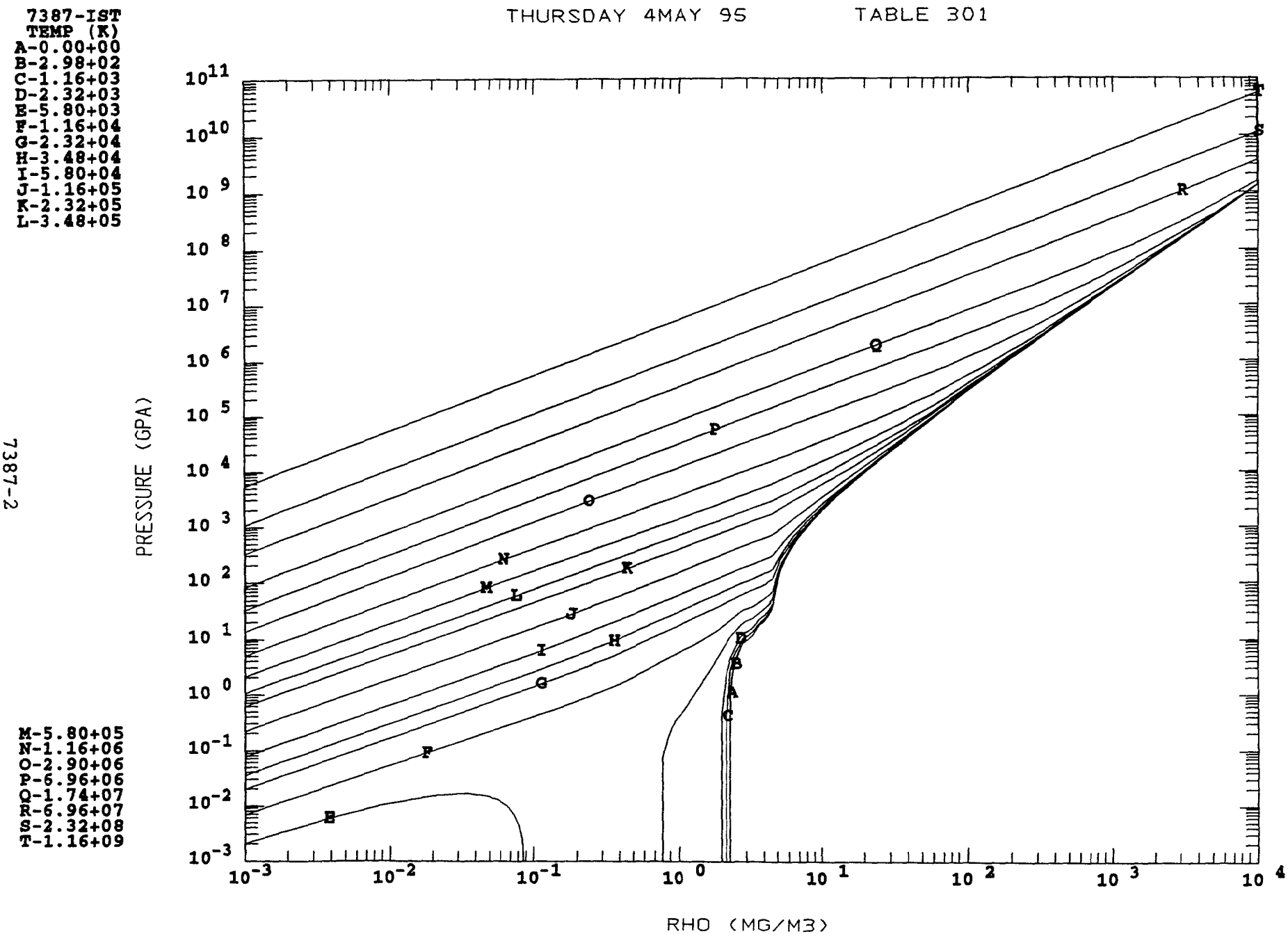
TABLE SUMMARY.

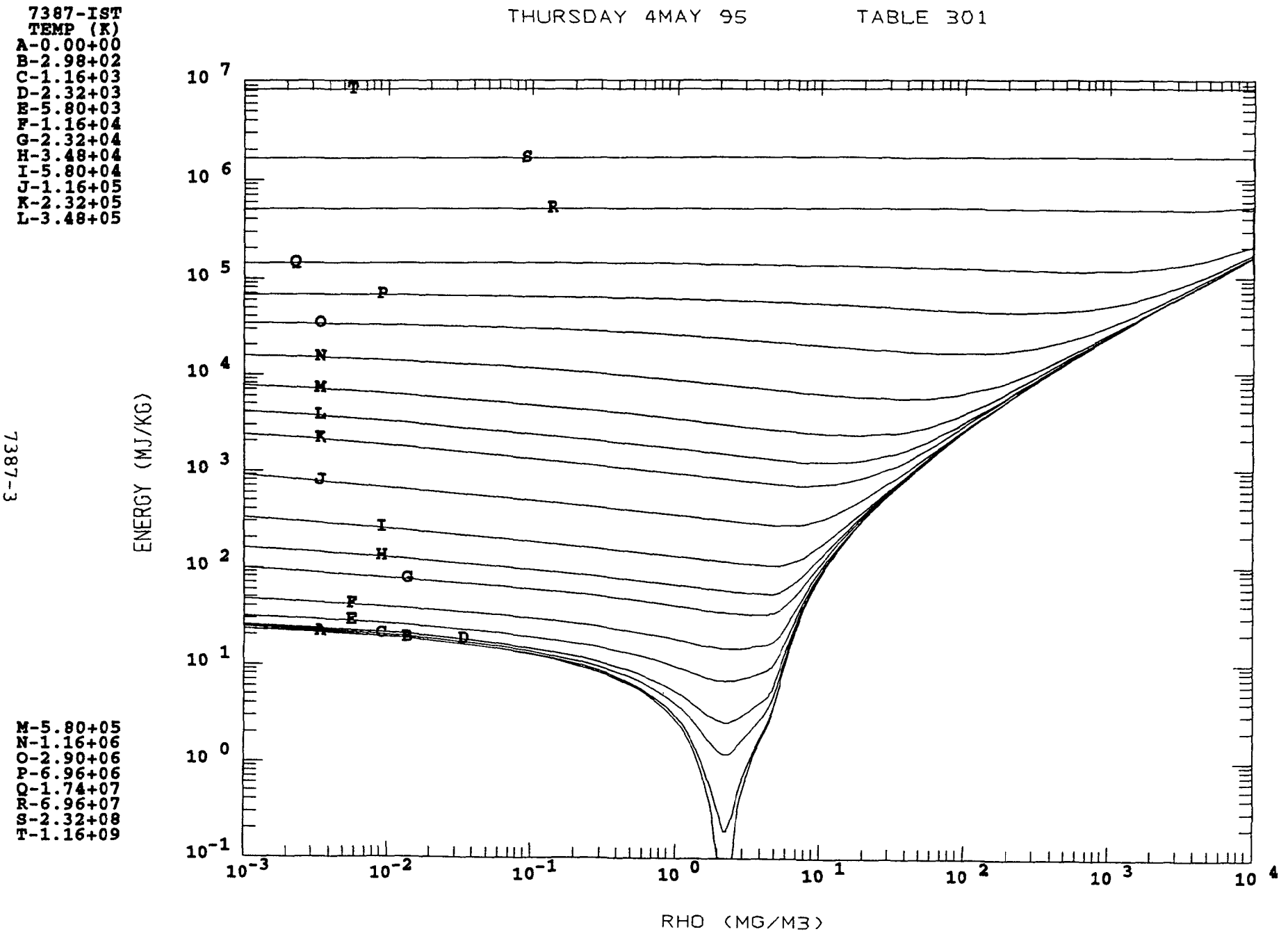
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	18					
102	56					
201	5					
301	9717	82	39	0.0000E+00	2.2040E-06	4.4080E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	9717	82	39	0.0000E+00	2.2040E-06	4.4080E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	9481	80	39	0.0000E+00	2.2040E-06	1.1020E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	9363	79	39	2.2040E-06	4.4080E-06	1.1020E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	319	79	1	2.2040E-06	4.4080E-06	1.1020E+04
				0.0000E+00	-8.2734E-11	0.0000E+00
401	81					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 94
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 60394.
DATE OF LAST UPDATE. 60994.
SOURCE. J. C. BOETTGER
REFS. REPORT IN PREPARATION
CODES. GRIZZLY

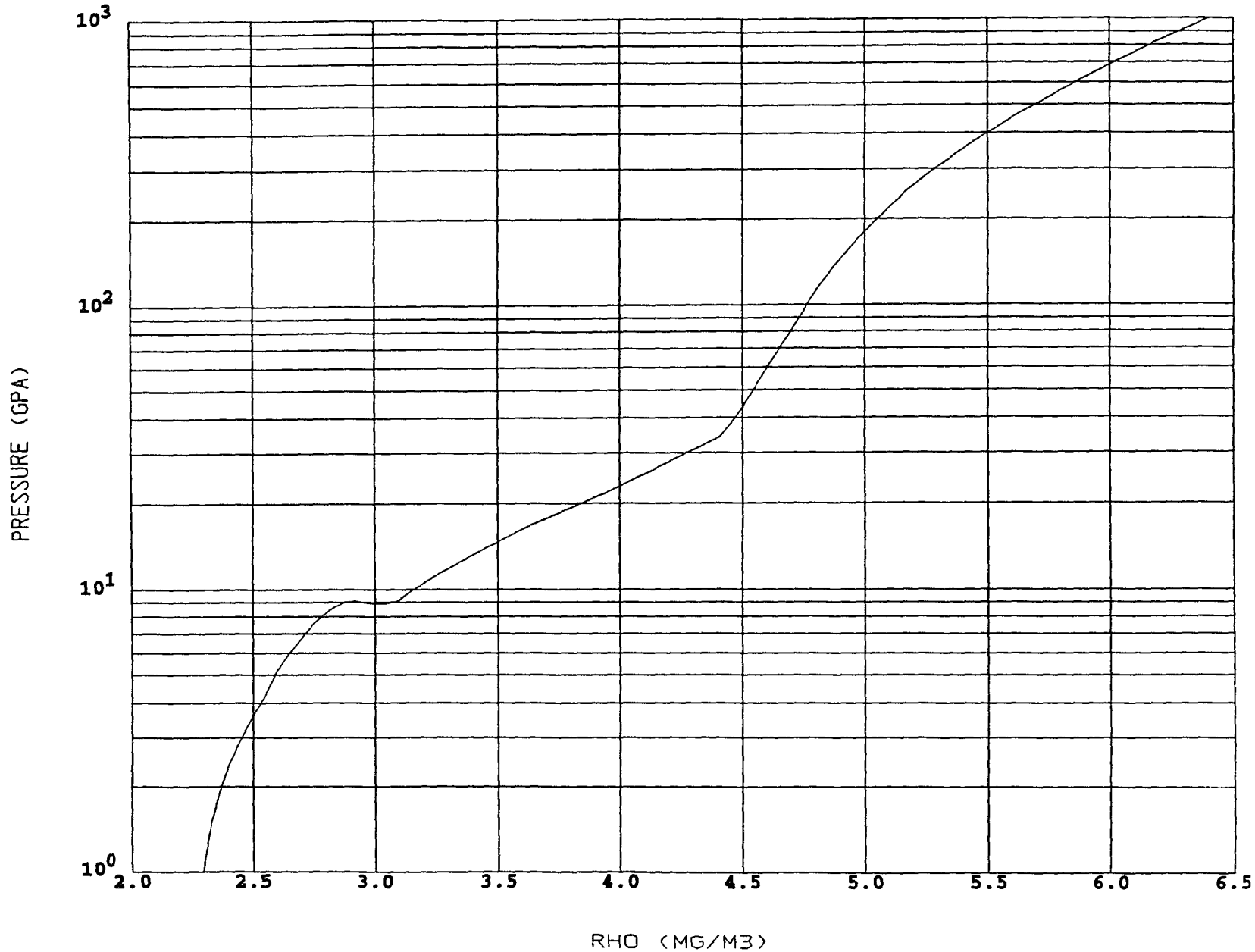
COMMENTS. THE ELECTRONIC TABLE IS MIXED TFD. THE NUCLEAR TABLE WAS OBTAINED WITH THE CHARTJD MODEL USING IGRUN=1, GAMREF=0.65, DEBKEL=495 KELVIN, AND TMELT=1900 KELVIN. THE CHUG MODEL WAS USED FOR THE COLD CURVE WITH CMAT=2.15, ECOHKC=145.1, FACLJ=3.0, AND AN 11 POINT FIT TO THE HUGONIOT; (UP,US)= (0.0,4.095), (0.247,3.88), (0.35,3.870), (0.509,3.902), (0.688,4.128), (0.853,4.265), (0.985,4.268), (1.10,3.85), (2.15,4.838), (2.80,5.60), (4.5,8.45)


7387-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-2.32+03
E-5.80+03
F-1.16+04
G-2.32+04
H-3.48+04
I-5.80+04
J-1.16+05
K-2.32+05
L-3.48+05
M-5.80+05
N-1.16+06
O-2.90+06
P-6.96+06
Q-1.74+07
R-6.96+07
S-2.32+08
T-1.16+09
THURSDAY 4MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA1


7387-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-2.32+03
E-5.80+03
F-1.16+04
G-2.32+04
H-3.48+04
I-5.80+04
J-1.16+05
K-2.32+05
L-3.48+05
M-5.80+05
N-1.16+06
O-2.90+06
P-6.96+06
Q-1.74+07
R-6.96+07
S-2.32+08
T-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7387-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301

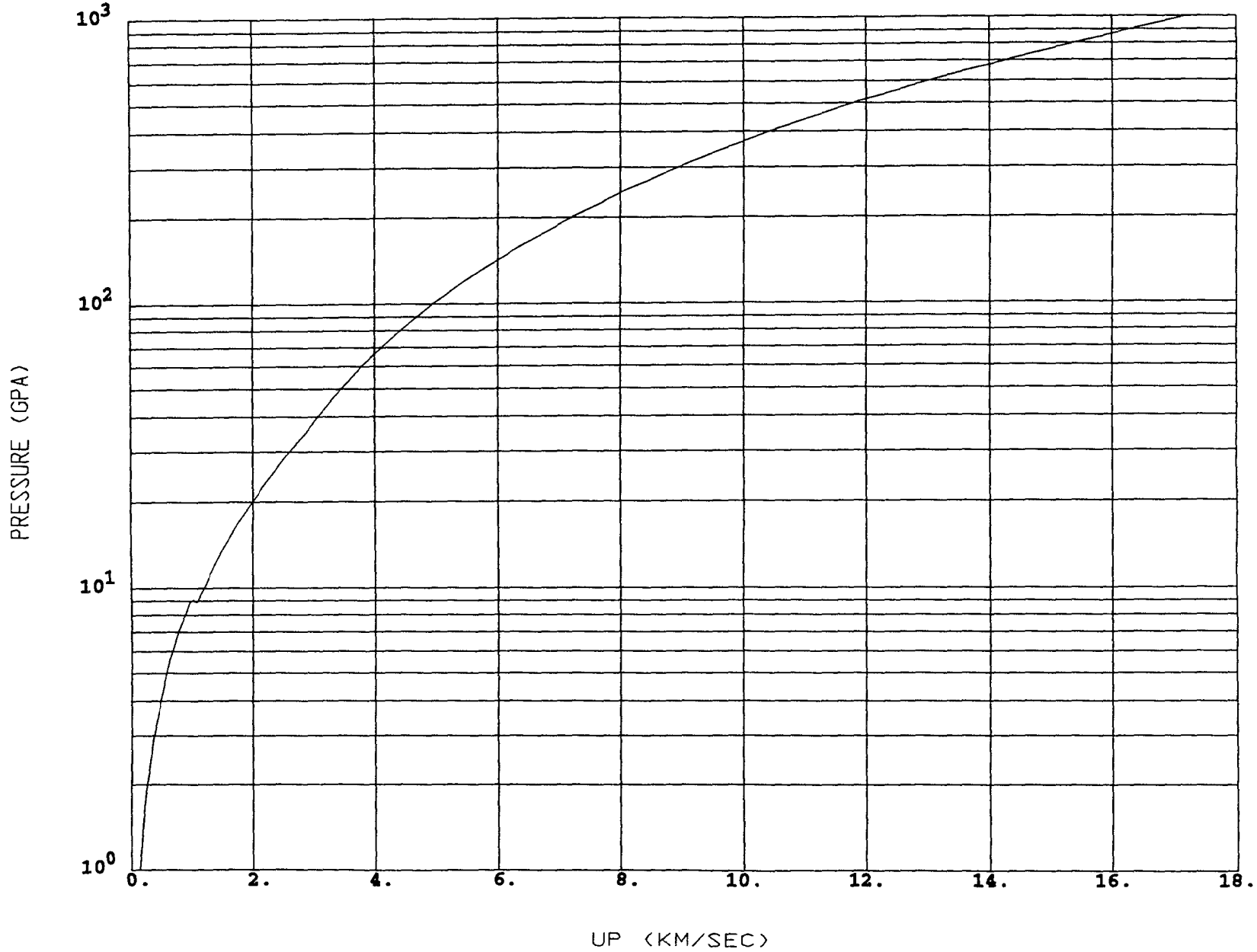


T1 SES2D CRAY

7387-4

7387-HU1
E0 MJ/KG
0.00+00

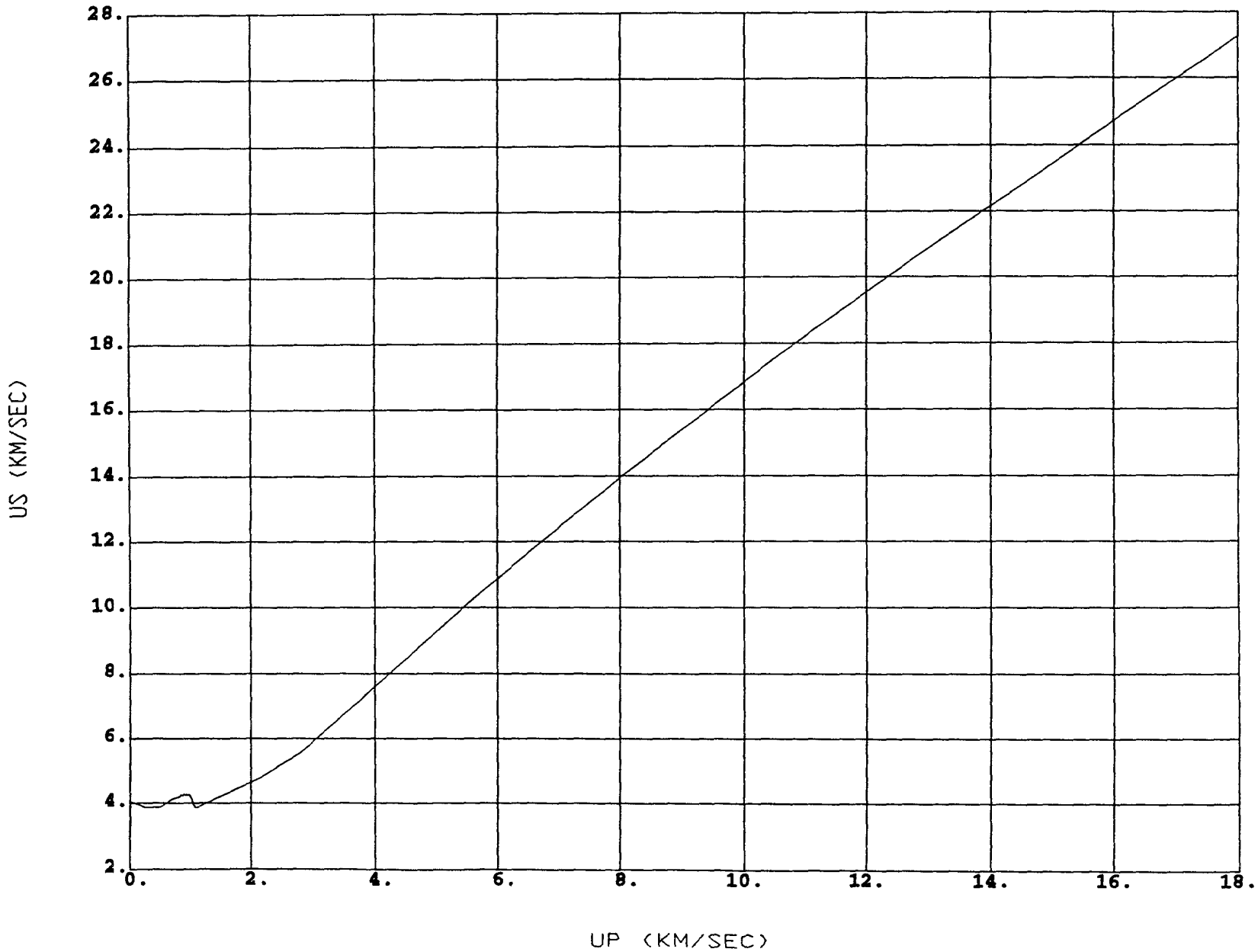
THURSDAY 4MAY 95 TABLE 301



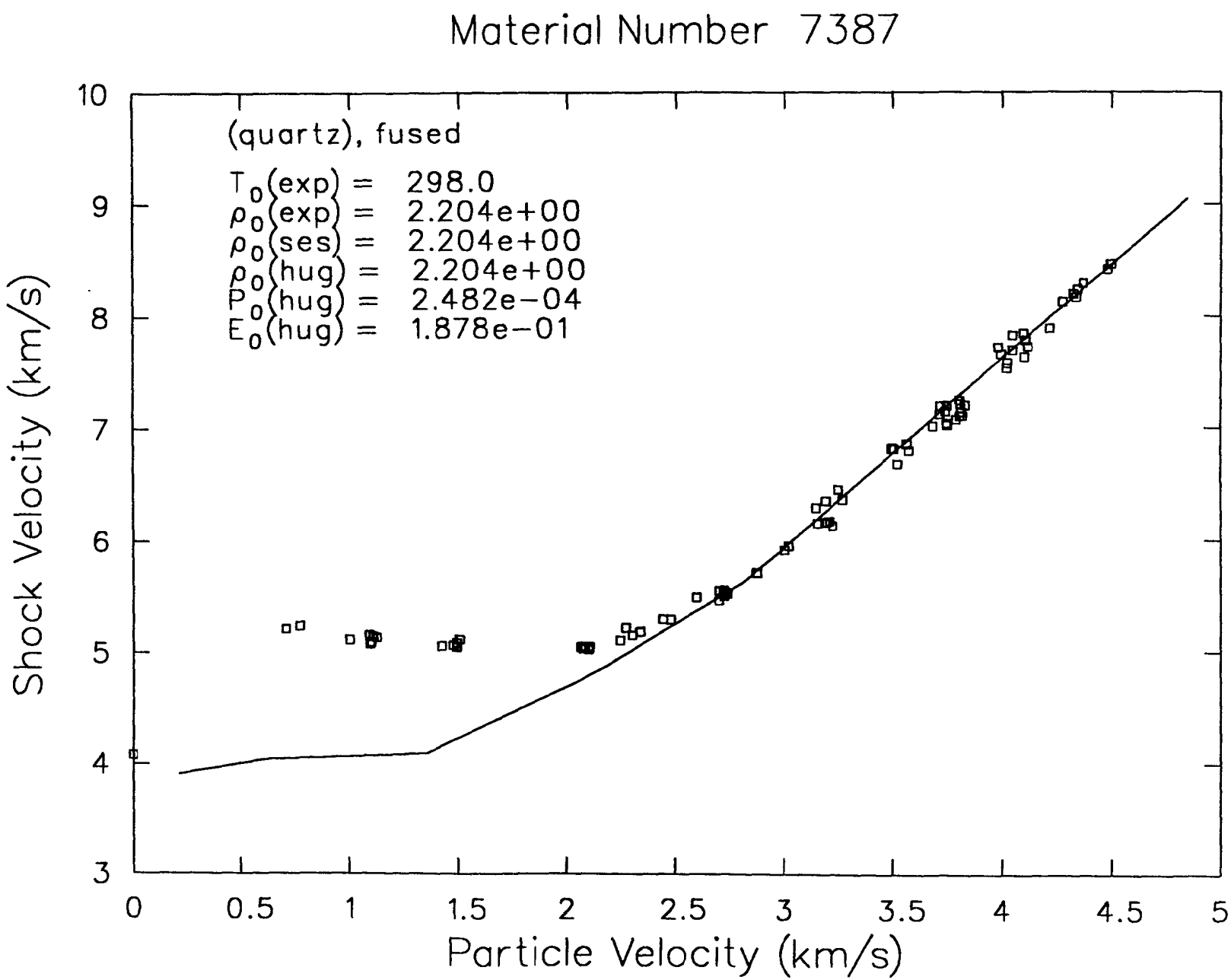
T1 SES2D CRAY 02

7387-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA1


Material Number 7387
(quartz), fused
T_0(exp) = 298.0
ρ_0(exp) = 2.204e+00
ρ_0(ses) = 2.204e+00
ρ_0(hug) = 2.204e+00
P_0(hug) = 2.482e-04
E_0(hug) = 1.878e-01
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9
8
7
6
5
4
3
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

7387-8

MATERIAL NUMBER	SUMMARY
7390	MATERIAL. WESTERLY GRANITE

COMP. SIO2 73.9 WT%, AL2O3 14.9 WT%, K2O 4.5 WT%, CAO 3.3 WT%, F
EO 2.0 WT% PLUS TRACE AMOUNTS OF OTHER OXIDES
ATOMIC NUMBER. 1.0272E+01
ATOMIC MASS. 2.0669E+01
NORMAL DENSITY. 2.6270E+00

GAMMA(COMPUTED). 0.1073

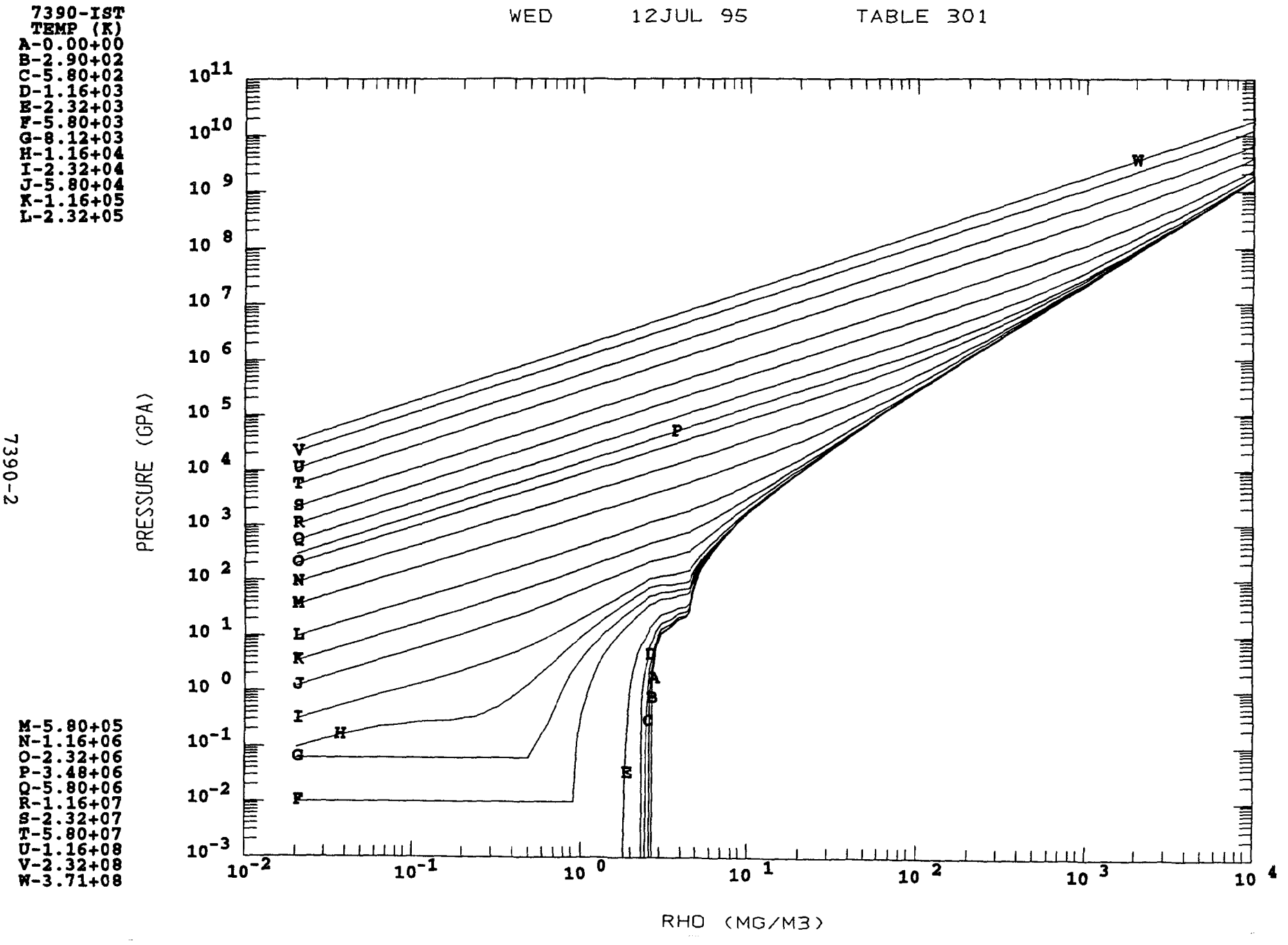
TABLE SUMMARY.

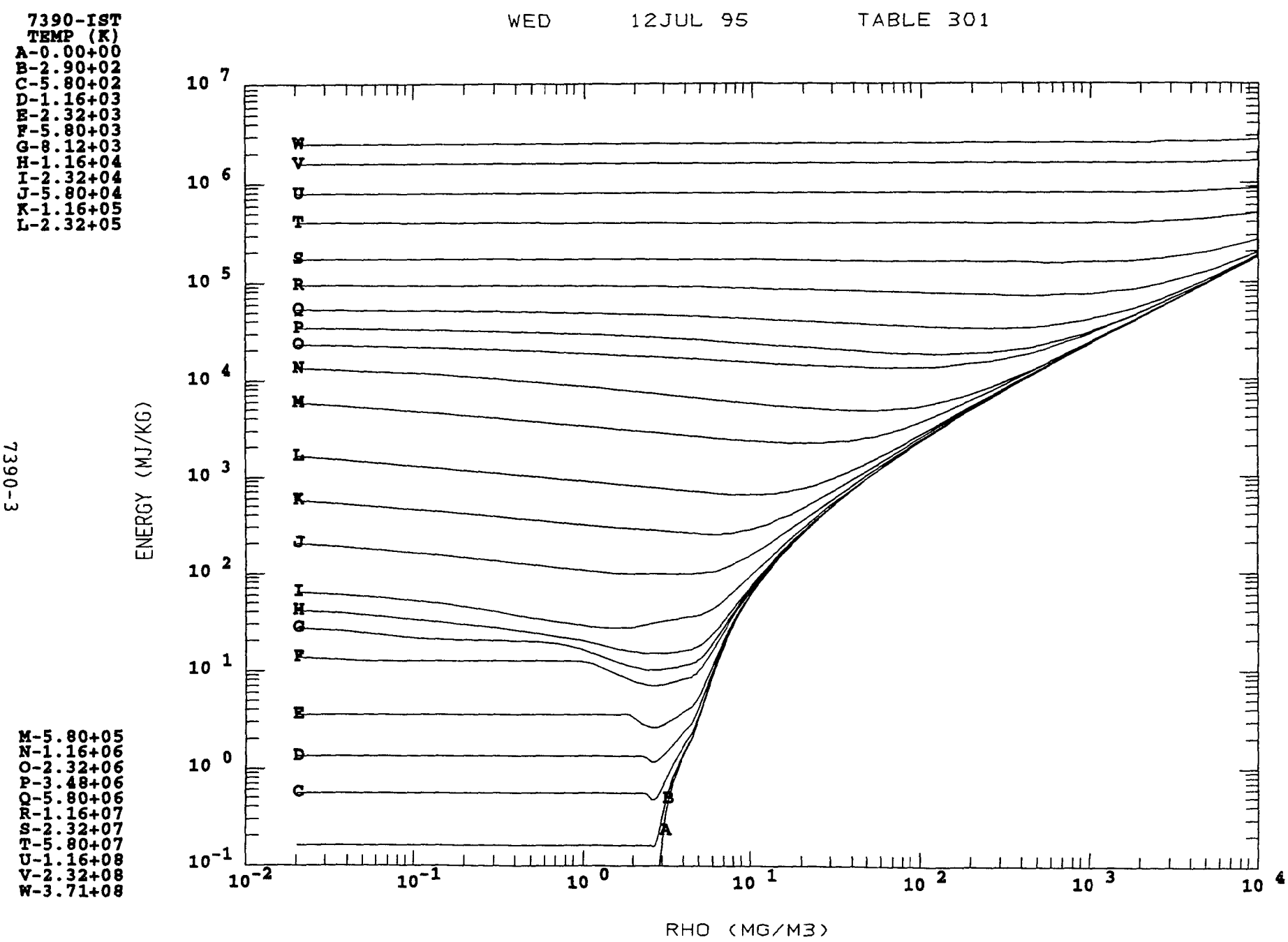
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	30					
102	65					
201	5					
301	4725	100	23	2.0523E-02	3.9158E-02	5.2540E+04
				0.0000E+00	2.5000E-02	3.2000E+04
303	4725	100	23	2.0523E-02	3.9158E-02	5.2540E+04
				0.0000E+00	2.5000E-02	3.2000E+04
304	4725	100	23	2.0523E-02	3.9158E-02	5.2540E+04
				0.0000E+00	2.5000E-02	3.2000E+04
305	4725	100	23	2.0523E-02	3.9158E-02	5.2540E+04
				0.0000E+00	2.5000E-02	3.2000E+04
306	303	100	1	2.0523E-02	3.9158E-02	5.2540E+04
				0.0000E+00	0.0000E+00	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. MAR 75, JAN 79
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 32075.
DATE OF LAST UPDATE. 101582.
SOURCE. J. BARNES, J. ROOD
REFS. NONE
CODES. SESAME I

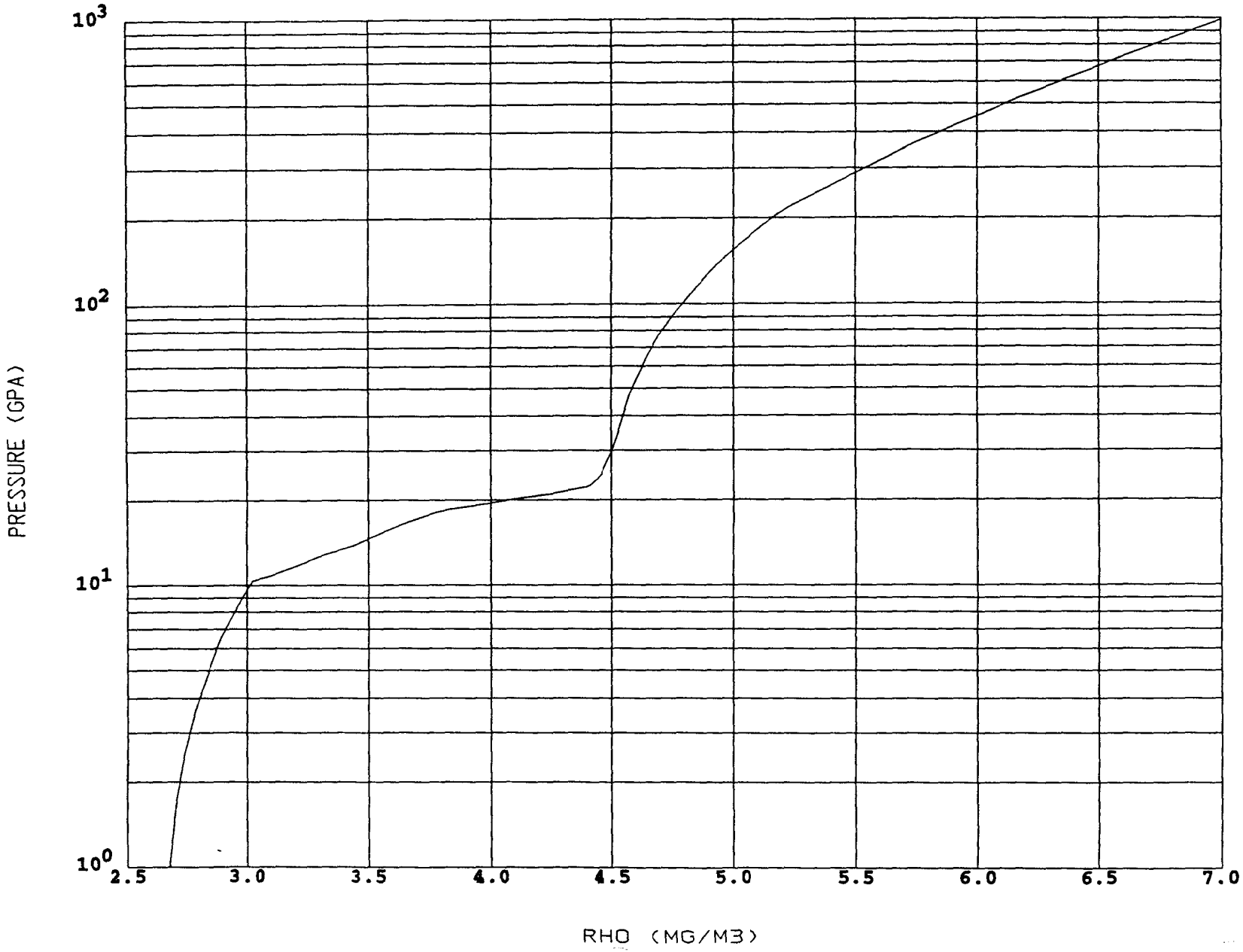
COMMENTS. THE TWO TEMPERATURE TABLES FOR THIS MATERIAL (TABLES 303-306) ARE A VERY ROUGH APPROXIMATION AND WERE DERIVED FROM THE CODE TWOTEMP (AND NOT FROM THE ORIGINAL EOS CALCULATIONS, WHICH IN MOST CASES ARE NO LONGER REPRODUCIBLE). THE TABLES ARE VERY NOISY DUE BOTH TO NOISE IN THE ORIGINAL DATA (WHICH SHOWS UP WHEN THE COLD CURVE IS SUBTRACTED TO GENERATE THE THERMAL CONTRIBUTION) AND TO THE CONSTRAINT THAT NO CROSSING ISOTHERMS ARE ALLOWED. IF YOU HAVE ANY PROBLEMS USING THESE TABLES, CONTACT BOB ALBERS (T-4).


7390-IST
TEMP (K)
A-0.00+00
B-2.90+02
C-5.80+02
D-1.16+03
E-2.32+03
F-5.80+03
G-8.12+03
H-1.16+04
I-2.32+04
J-5.80+04
K-1.16+05
L-2.32+05
M-5.80+05
N-1.16+06
O-2.32+06
P-3.48+06
Q-5.80+06
R-1.16+07
S-2.32+07
T-5.80+07
U-1.16+08
V-2.32+08
W-3.71+08
WED 12JUL 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY


7390-IST
TEMP (K)
A-0.00+00
B-2.90+02
C-5.80+02
D-1.16+03
E-2.32+03
F-5.80+03
G-8.12+03
H-1.16+04
I-2.32+04
J-5.80+04
K-1.16+05
L-2.32+05
M-5.80+05
N-1.16+06
O-2.32+06
P-3.48+06
Q-5.80+06
R-1.16+07
S-2.32+07
T-5.80+07
U-1.16+08
V-2.32+08
W-3.71+08
WED 12JUL 95 TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
10 7
10 6
10 5
10 4
10 3
10 2
10 1
10 0
10-1
10-2
10-1
10 0
10 1
10 2
10 3
10 4
7390-3
T1 SES2D CRAY 02

7390-HU1
E0 MJ/KG
0.00+00

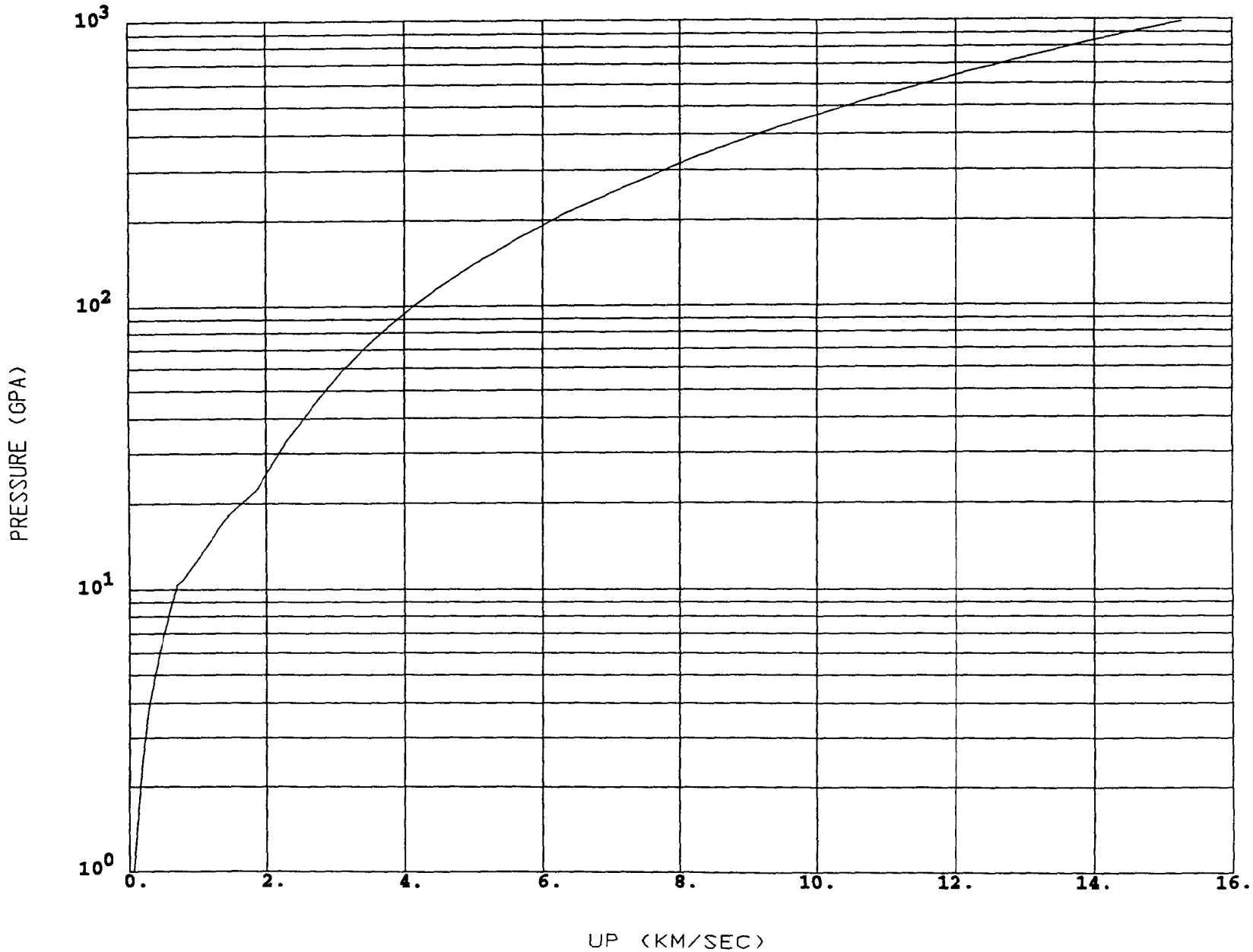
WED 12JUL 95 TABLE 301



T1 SESAD CRAY

7390-HU1
E0 MJ/KG
0.00+00

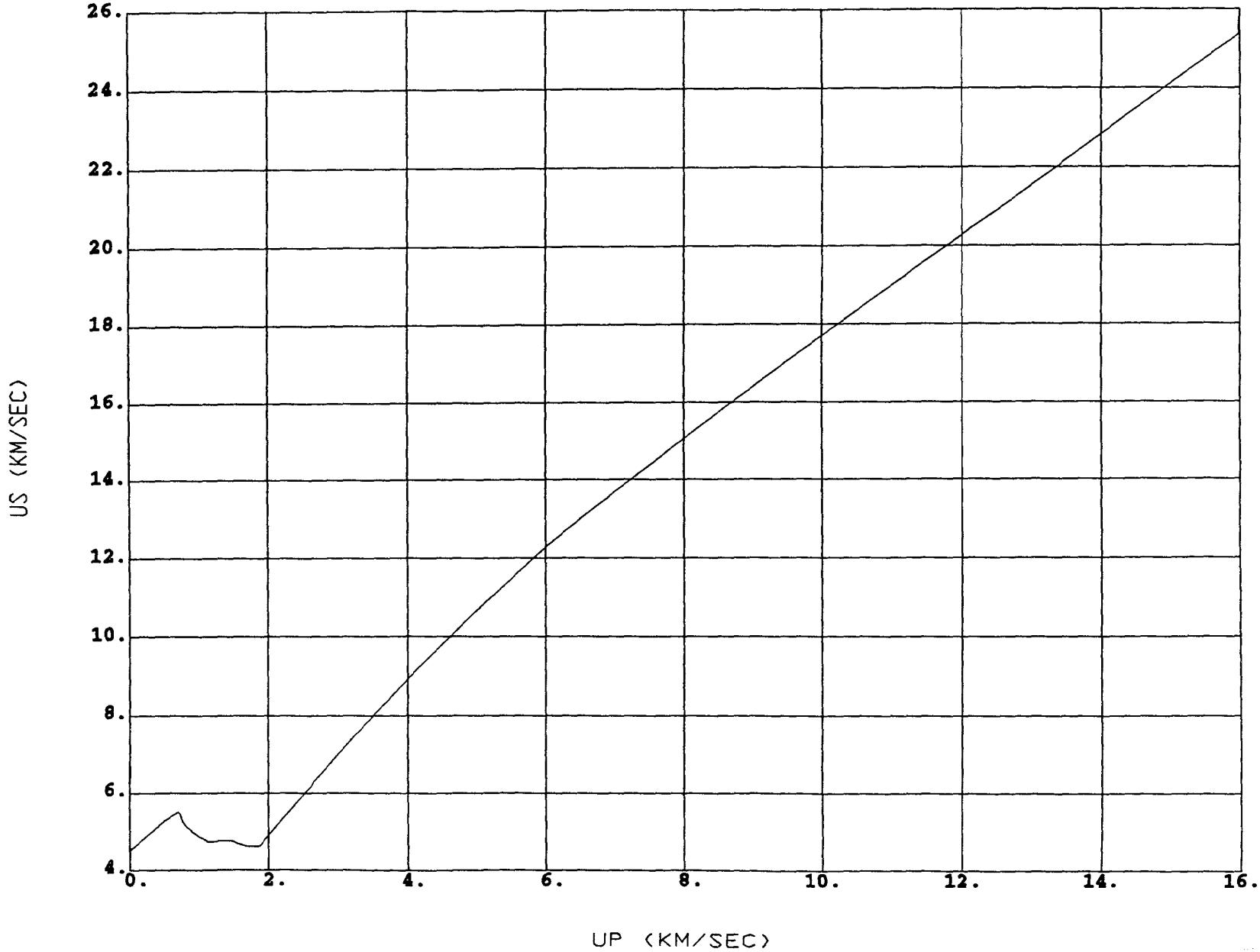
WED 12JUL 95 TABLE 301



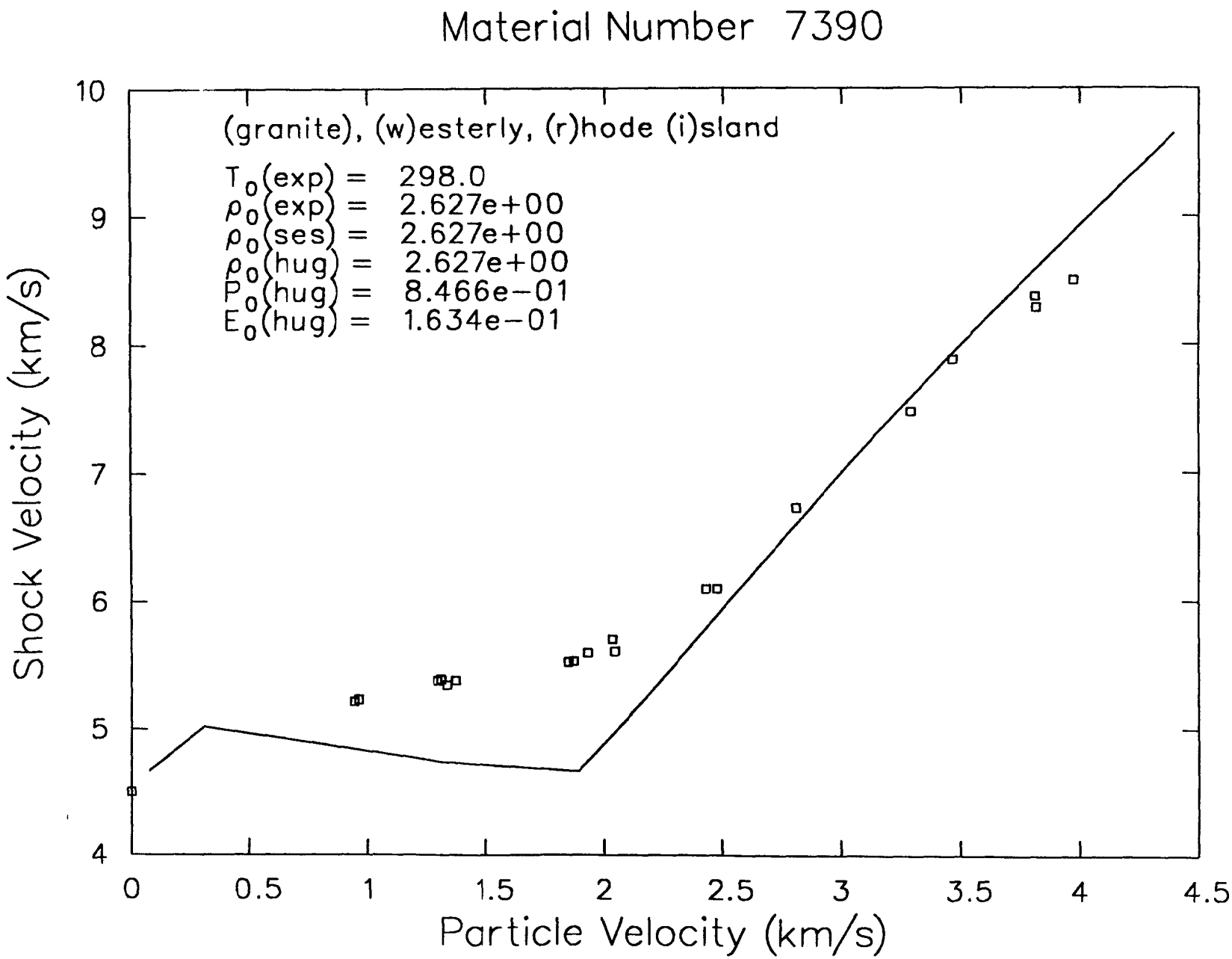
T1 SES2D CRAY 02

7390-HU1
E0 MJ/KG
0.00+00

WED 12JUL 95 TABLE 301



T1 SES2D CRAY


Material Number 7390
(granite), (w)esterly, (r)hode (i)sland
T_0(exp) = 298.0
ρ_0(exp) = 2.627e+00
ρ_0(ses) = 2.627e+00
ρ_0(hug) = 2.627e+00
P_0(hug) = 8.466e−01
E_0(hug) = 1.634e−01
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9
8
7
6
5
4
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

MATERIAL NUMBER | SUMMARY

7391 MATERIAL. WESTERLY GRANITE

COMP. NUMBER PERCENT O(0.6285), SI(0.2525), AL(0.0587), NA(0.02
54), K(0.0242), FE(0.0055), CA(0.0052)
ATOMIC NUMBER. 1.0312E+01
ATOMIC MASS. 2.0776E+01
NORMAL DENSITY. 2.6270E+00

GAMMA(COMPUTED). 0.6512

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	28					
102	46					
201	5					
301	9009	76	39	0.0000E+00	2.6270E-06	2.6270E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	9009	76	39	0.0000E+00	2.6270E-06	2.6270E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	10307	87	39	0.0000E+00	2.6270E-06	2.6270E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	10189	86	39	2.6270E-06	5.2540E-06	2.6270E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	303	75	1	2.6270E-06	5.2540E-06	2.6270E+04
				0.0000E+00	-6.8368E-12	0.0000E+00

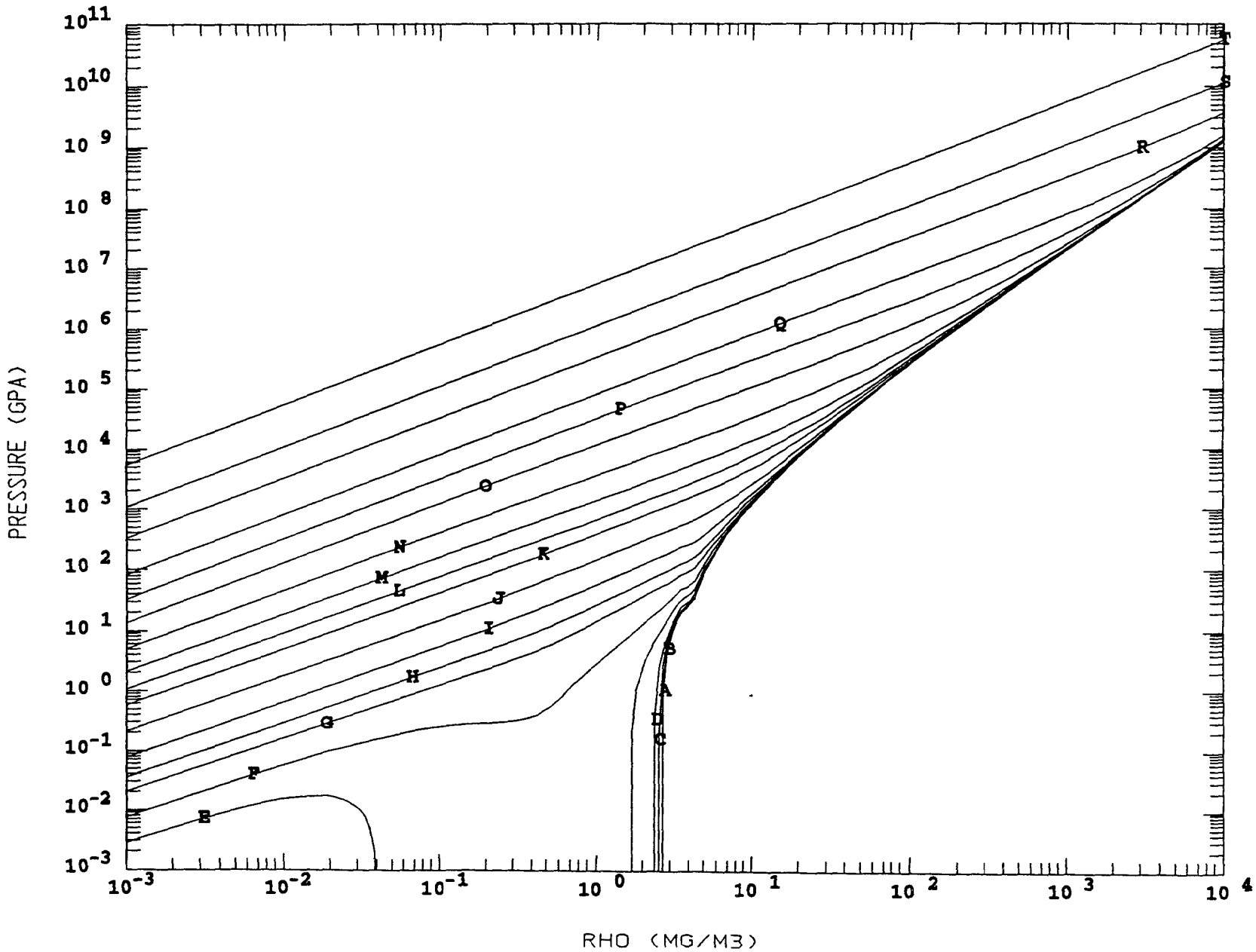
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. OCT 92
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 100192.
DATE OF LAST UPDATE. 11493.
SOURCE. J. BOETTGER
REFS. LA-12470-MS
CODES. GRIZZLY

COMMENTS. ELECTRONIC THERMAL CONTRIBUTIONS AND THE HIGH PRESSURE COLD CURVE ARE FROM MIXED TFD. FOR COMPRESSIONS LESS THAN 2.0, THE COLD CURVE WAS DERIVED FROM A MODEL HUGONIOT AS DESCRIBED IN LA-12470-MS. THE EXPANDED COLD CURVE USED A LENNARD-JONES FORM WITH FACLJ=1.0 AND ECOHKC=146. THE CHARTJD NUCLEAR MODEL WAS USED WITH DEBKEL=950, GAMREF=0.65, TMELT=2000, IGRUN=1.

7391-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-2.32+03
E-5.80+03
F-1.16+04
G-2.32+04
H-3.48+04
I-5.80+04
J-1.16+05
K-2.32+05
L-3.48+05

THURSDAY 4MAY 95 TABLE 301

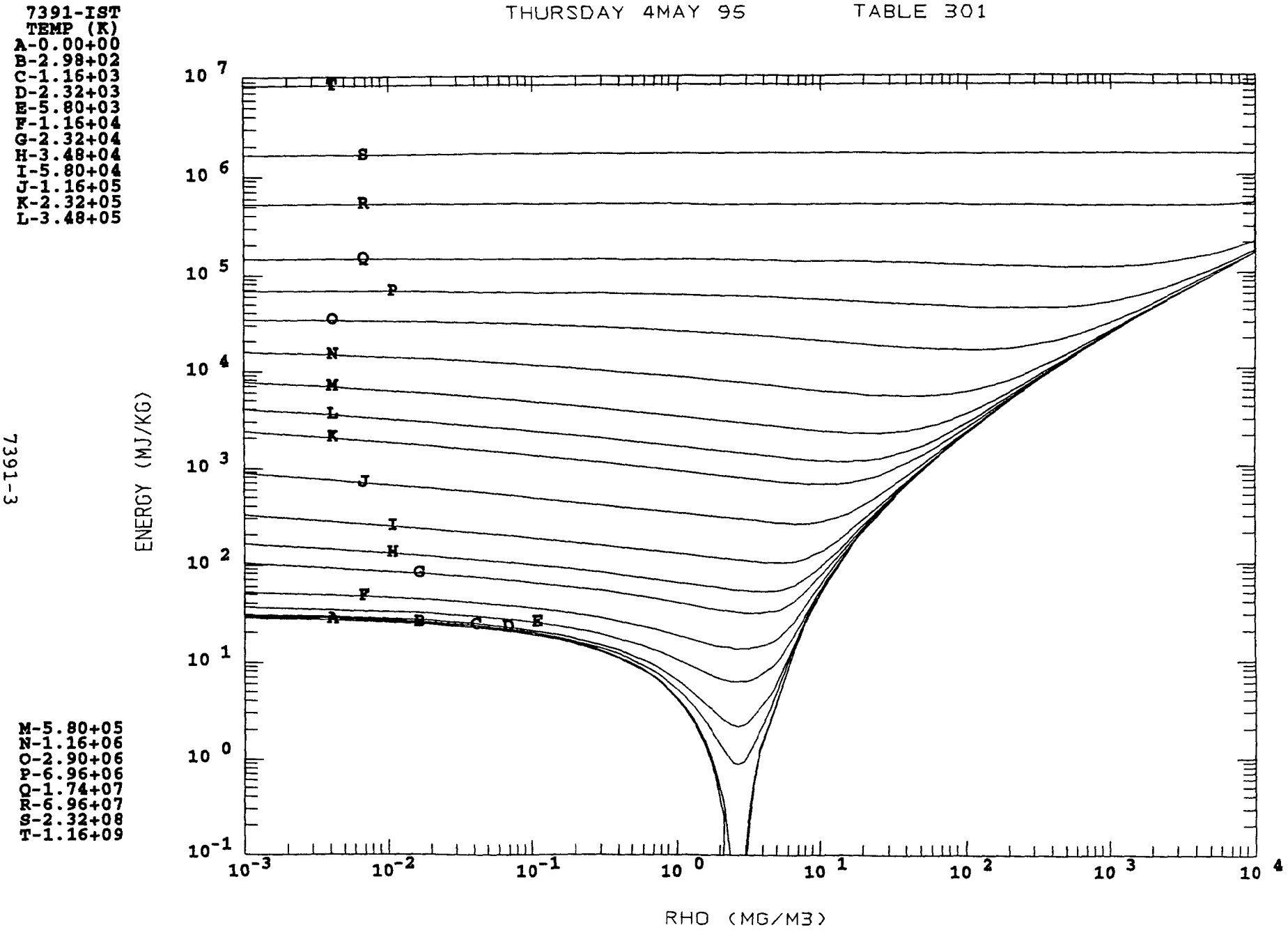


M-5.80+05
N-1.16+06
O-2.90+06
P-6.96+06
Q-1.74+07
R-6.96+07
S-2.32+08
T-1.16+09

7391-2

T1 SES2D CRA

THURSDAY 4MAY 95 TABLE 301

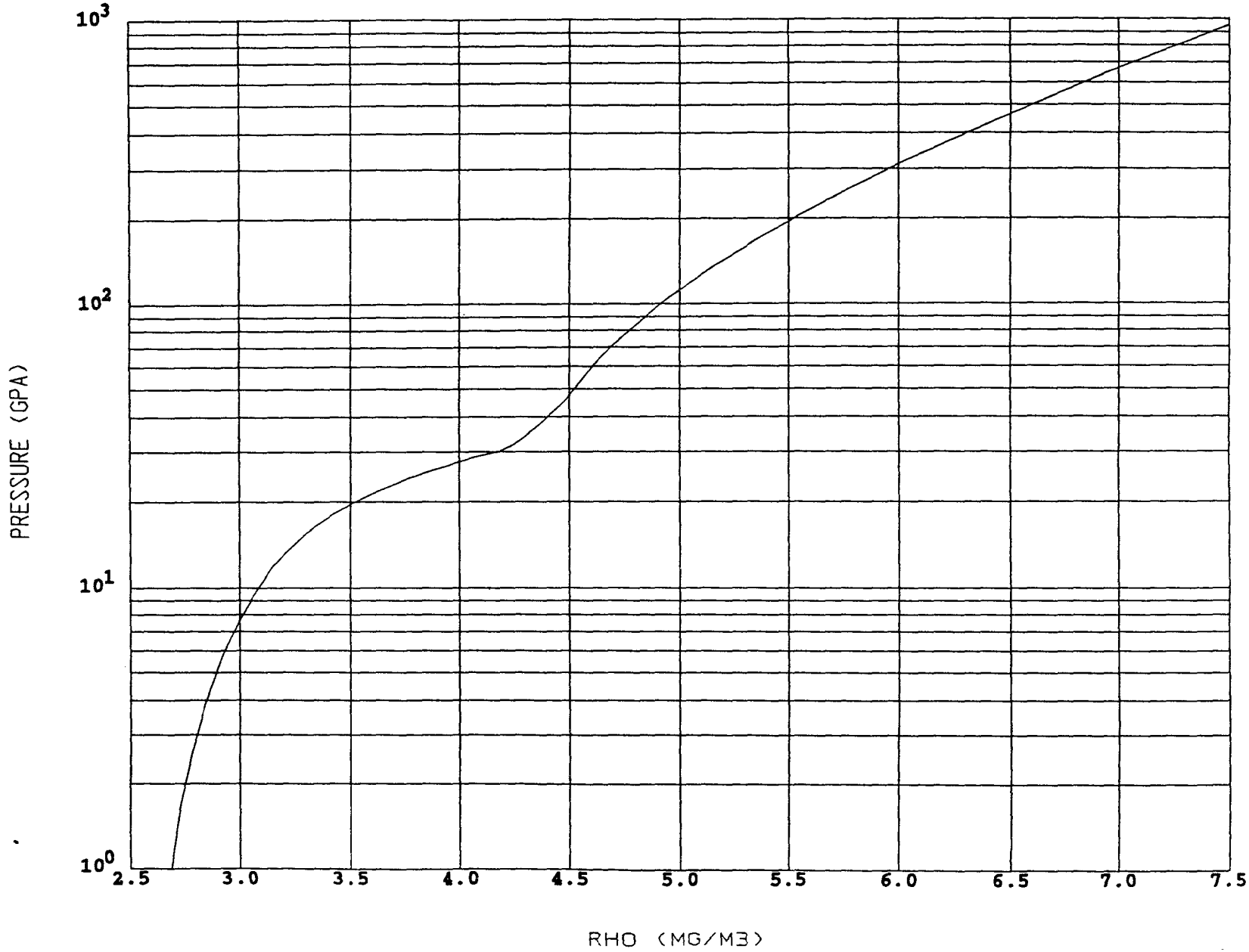


7391-3

T1 SES2D CRAY 02

7391-HU1
E0 MJ/KG
0.00+00

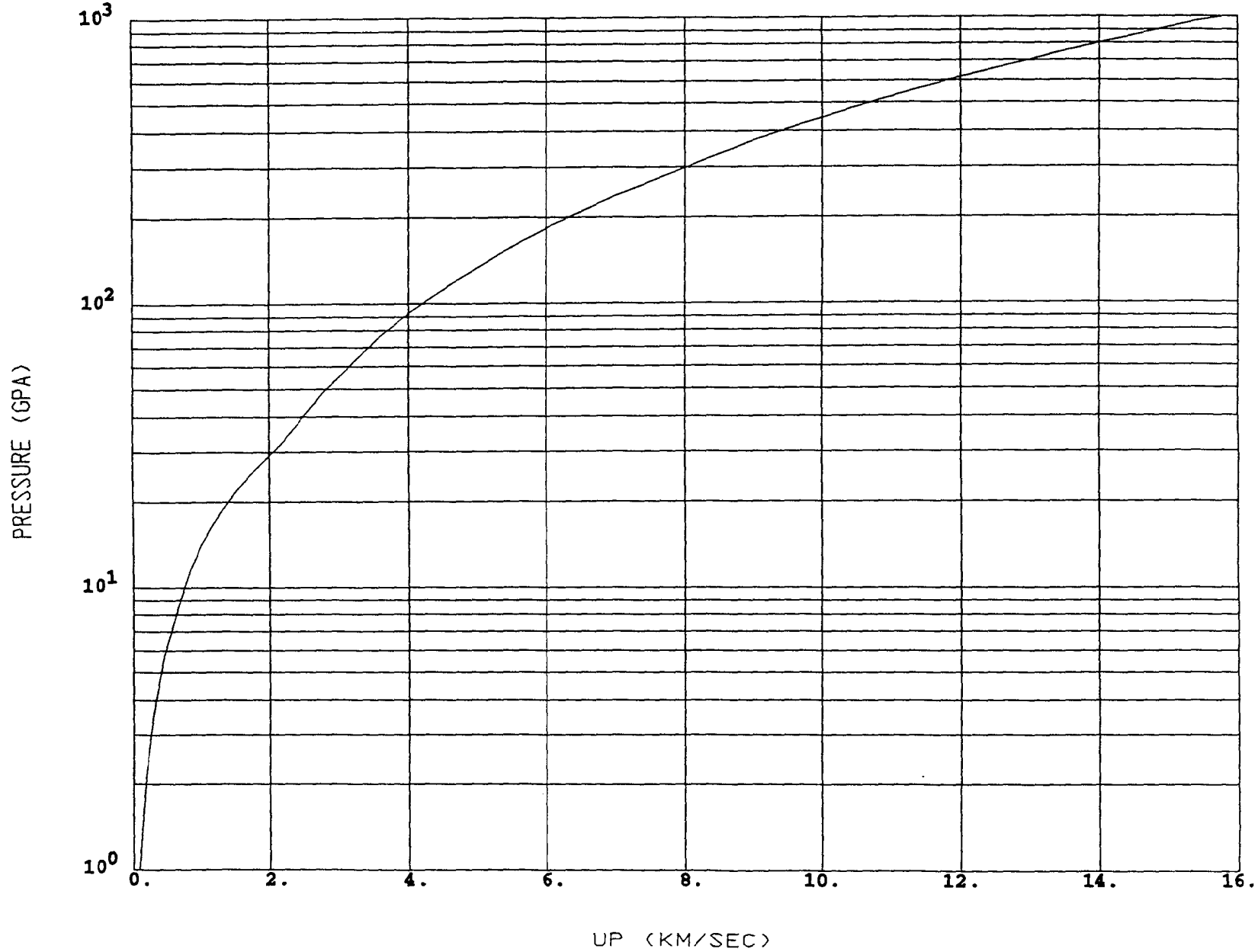
THURSDAY 4MAY 95 TABLE 301



T1 SES2D GRA\

7391-HU1
E0 MJ/KG
0.00+00

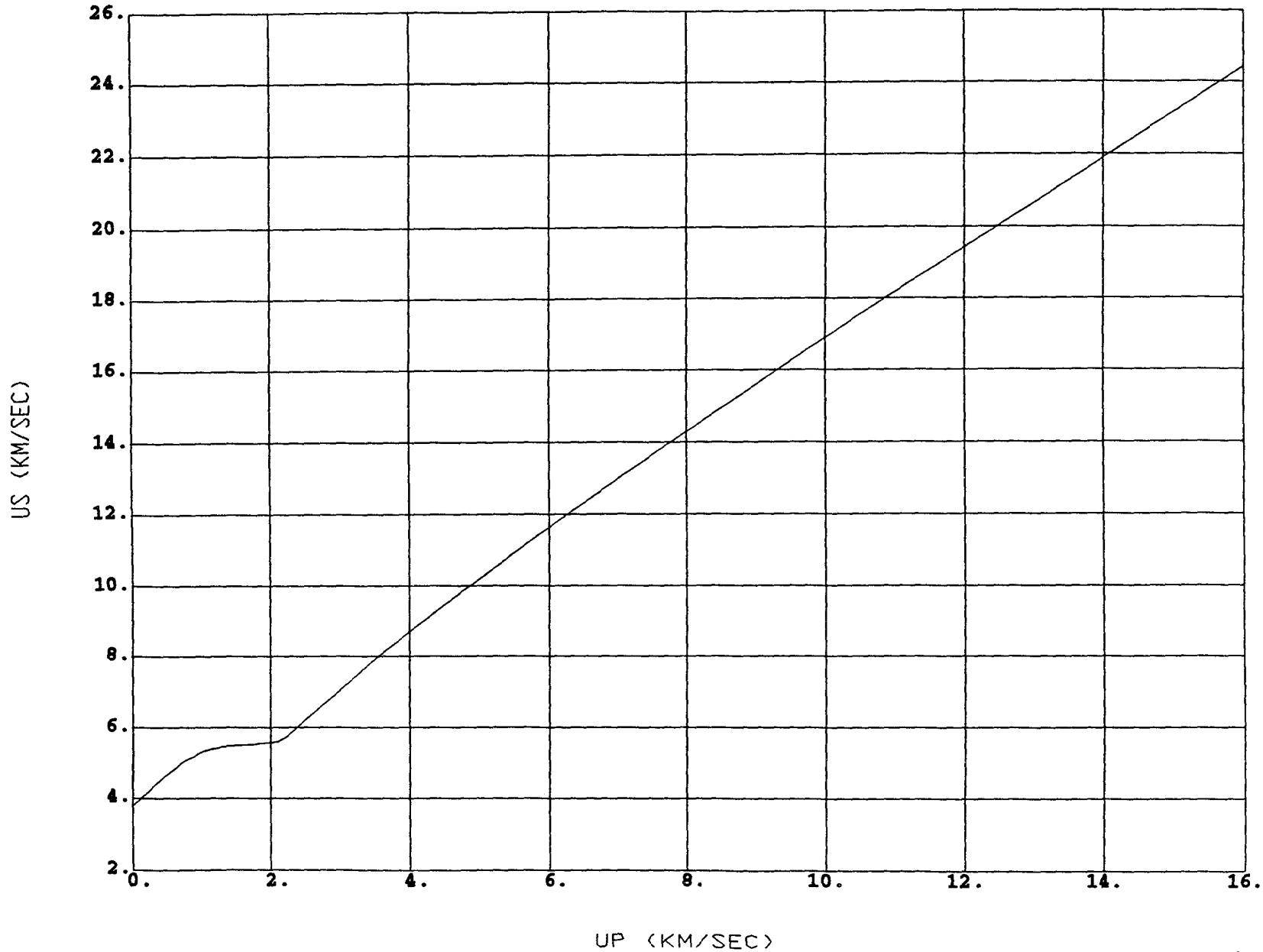
THURSDAY 4MAY 95 TABLE 301



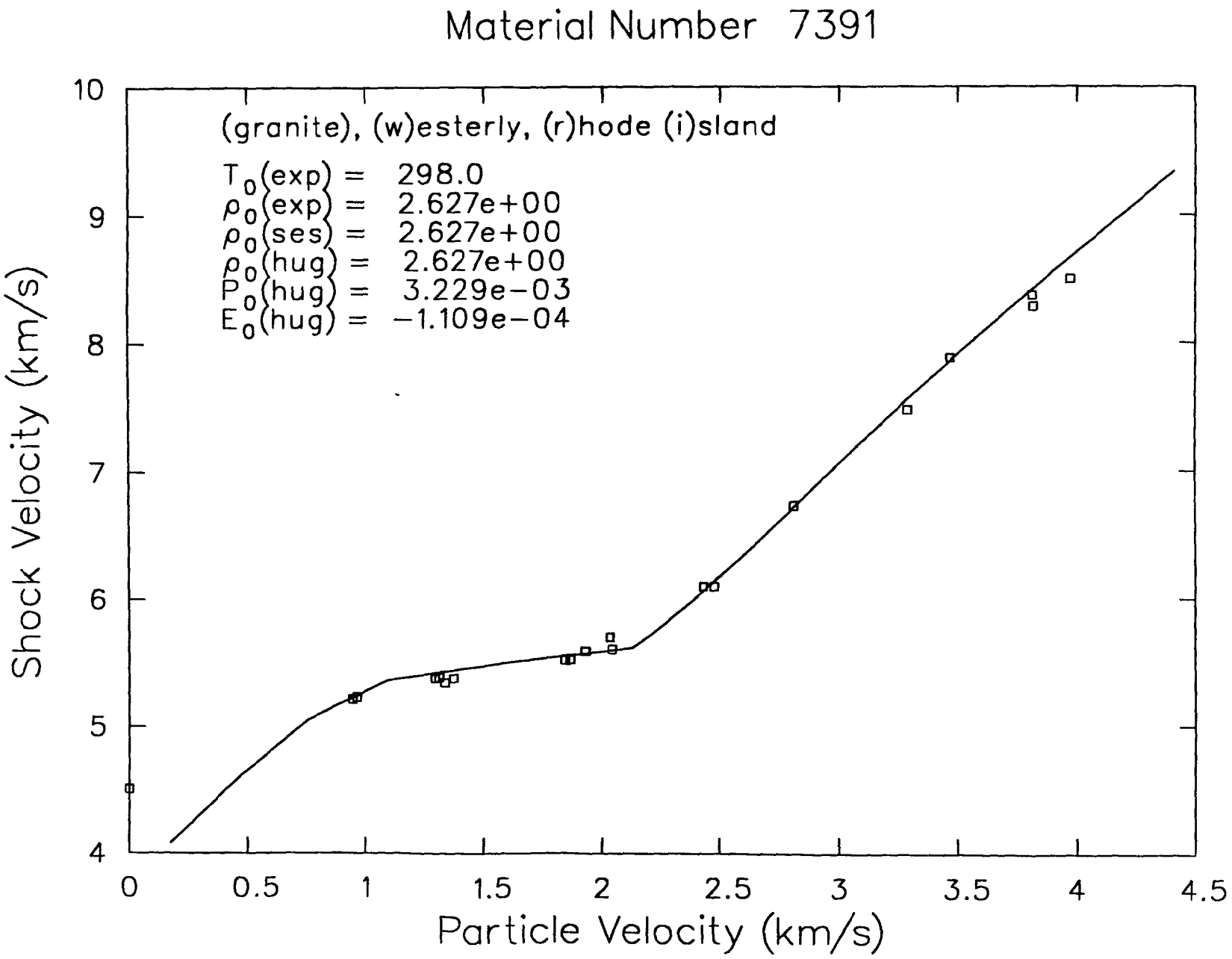
T1 SES2D CRAY 02

7391-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA


Material Number 7391
(granite), (w)esterly, (r)hode (i)sland
T_0(exp) = 298.0
ρ_0(exp) = 2.627e+00
ρ_0(ses) = 2.627e+00
ρ_0(hug) = 2.627e+00
P_0(hug) = 3.229e−03
E_0(hug) = −1.109e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9
8
7
6
5
4
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

MATERIAL NUMBER | SUMMARY

7410 MATERIAL. ALUMINA

COMP. AL203
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0392E+01
NORMAL DENSITY. 3.9700E+00

GAMMA(COMPUTED). 1.5263

TABLE SUMMARY.

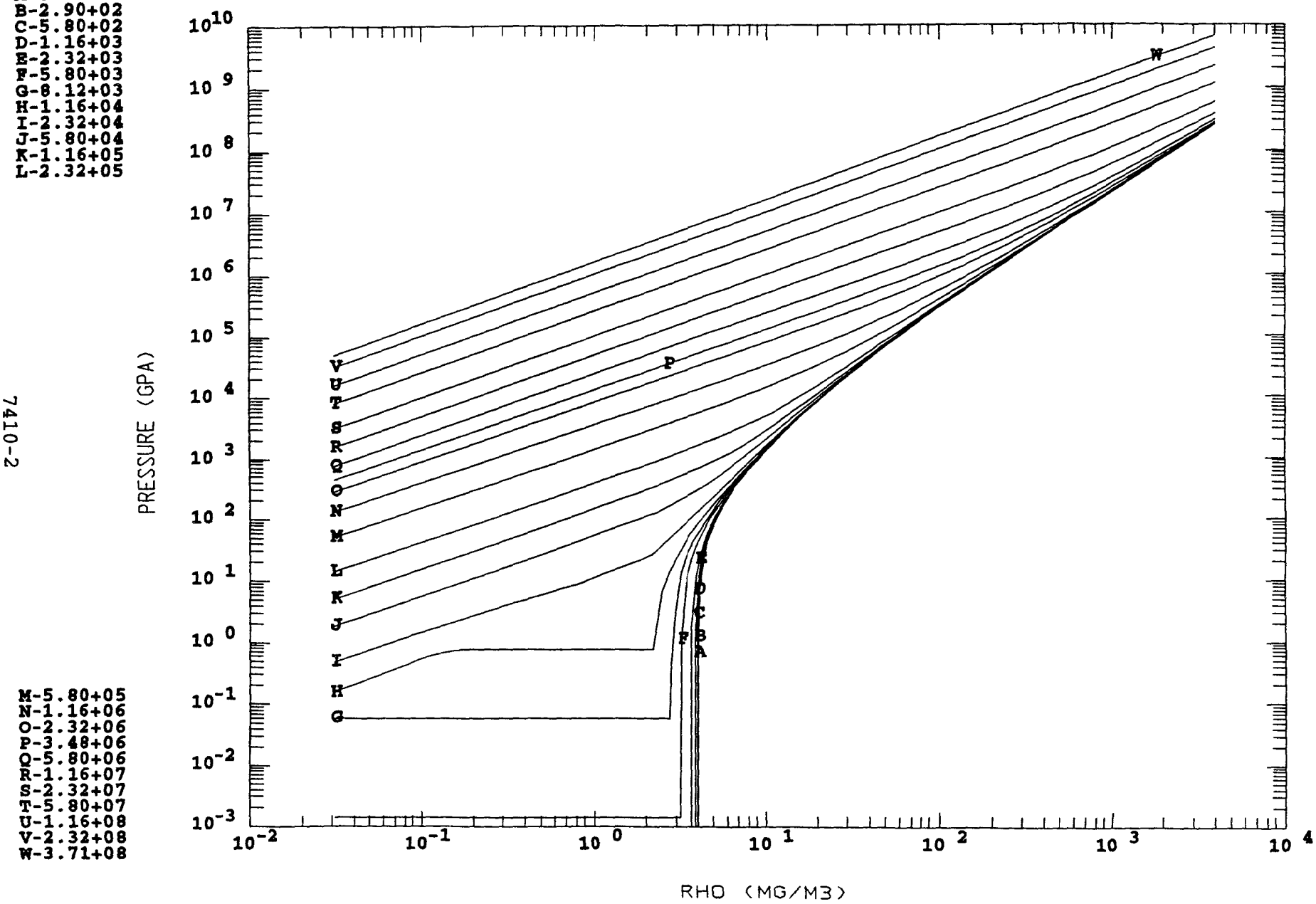
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	17					
102	65					
201	5					
301	4725	100	23	3.1016E-02	5.9177E-02	3.9700E+03
				0.0000E+00	2.5000E-02	3.2000E+04
303	4725	100	23	3.1016E-02	5.9177E-02	3.9700E+03
				0.0000E+00	2.5000E-02	3.2000E+04
304	4725	100	23	3.1016E-02	5.9177E-02	3.9700E+03
				0.0000E+00	2.5000E-02	3.2000E+04
305	4725	100	23	3.1016E-02	5.9177E-02	3.9700E+03
				0.0000E+00	2.5000E-02	3.2000E+04
306	303	100	1	3.1016E-02	5.9177E-02	3.9700E+03
				0.0000E+00	-3.8675E-09	0.0000E+00

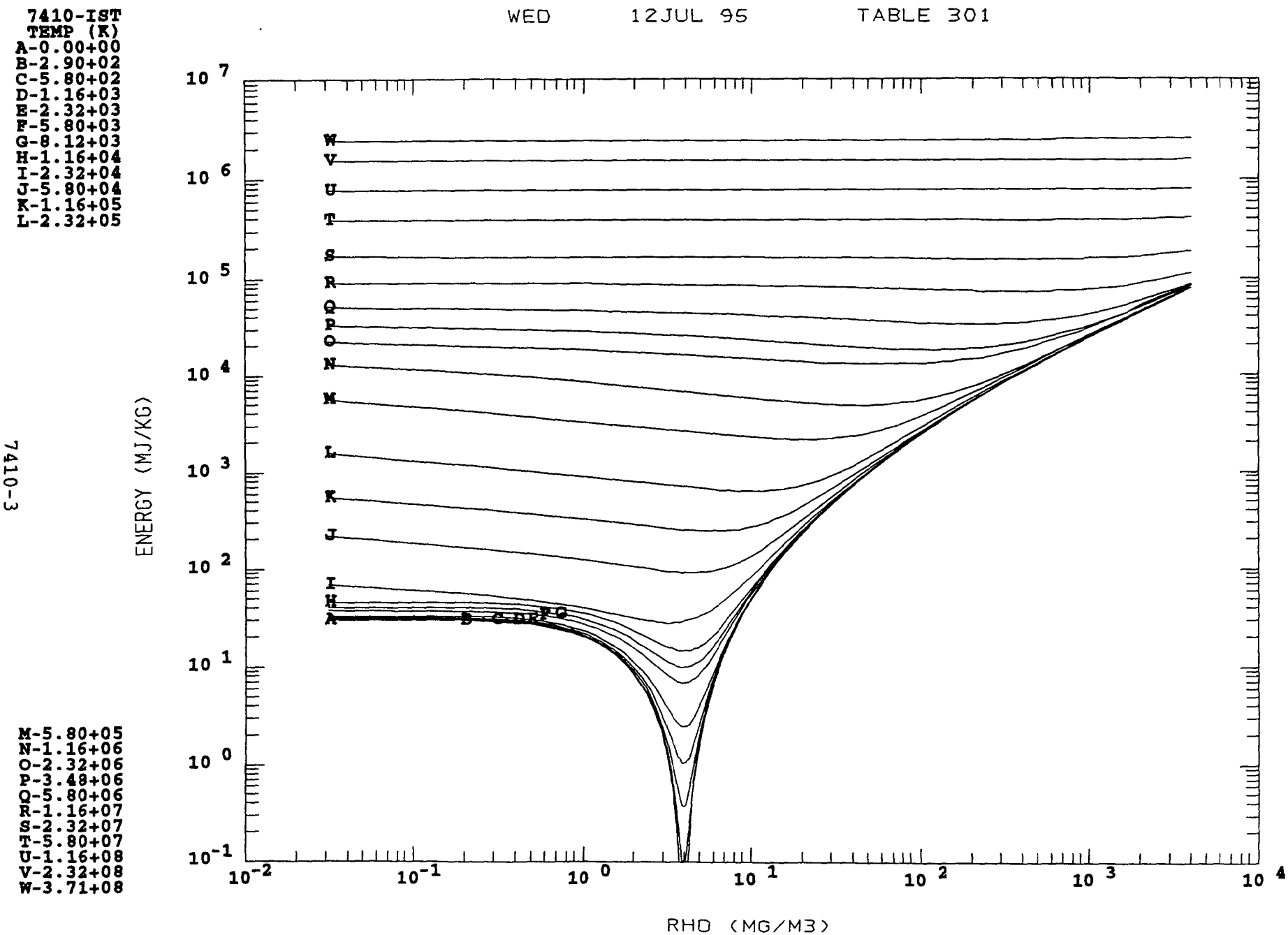
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. NOV 72, JAN 79
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 110272.
DATE OF LAST UPDATE. 101582.
SOURCE. J. BARNES, J. ROOD
REFS. NONE
CODES. SESAME I

COMMENTS. THE TWO TEMPERATURE TABLES FOR THIS MATERIAL (TABLES 303-306) ARE A VERY ROUGH APPROXIMATION AND WERE DERIVED FROM THE CODE TWOTEMP (AND NOT FROM THE ORIGINAL EOS CALCULATIONS, WHICH IN MOST CASES ARE NO LONGER REPRODUCIBLE). THE TABLES ARE VERY NOISY DUE BOTH TO NOISE IN THE ORIGINAL DATA (WHICH SHOWS UP WHEN THE COLD CURVE IS SUBTRACTED TO GENERATE THE THERMAL CONTRIBUTION) AND TO THE CONSTRAINT THAT NO CROSSING ISOTHERMS ARE ALLOWED. IF YOU HAVE ANY PROBLEMS USING THESE TABLES, CONTACT BOB ALBERS (T-4).

WED 12JUL 95 TABLE 301



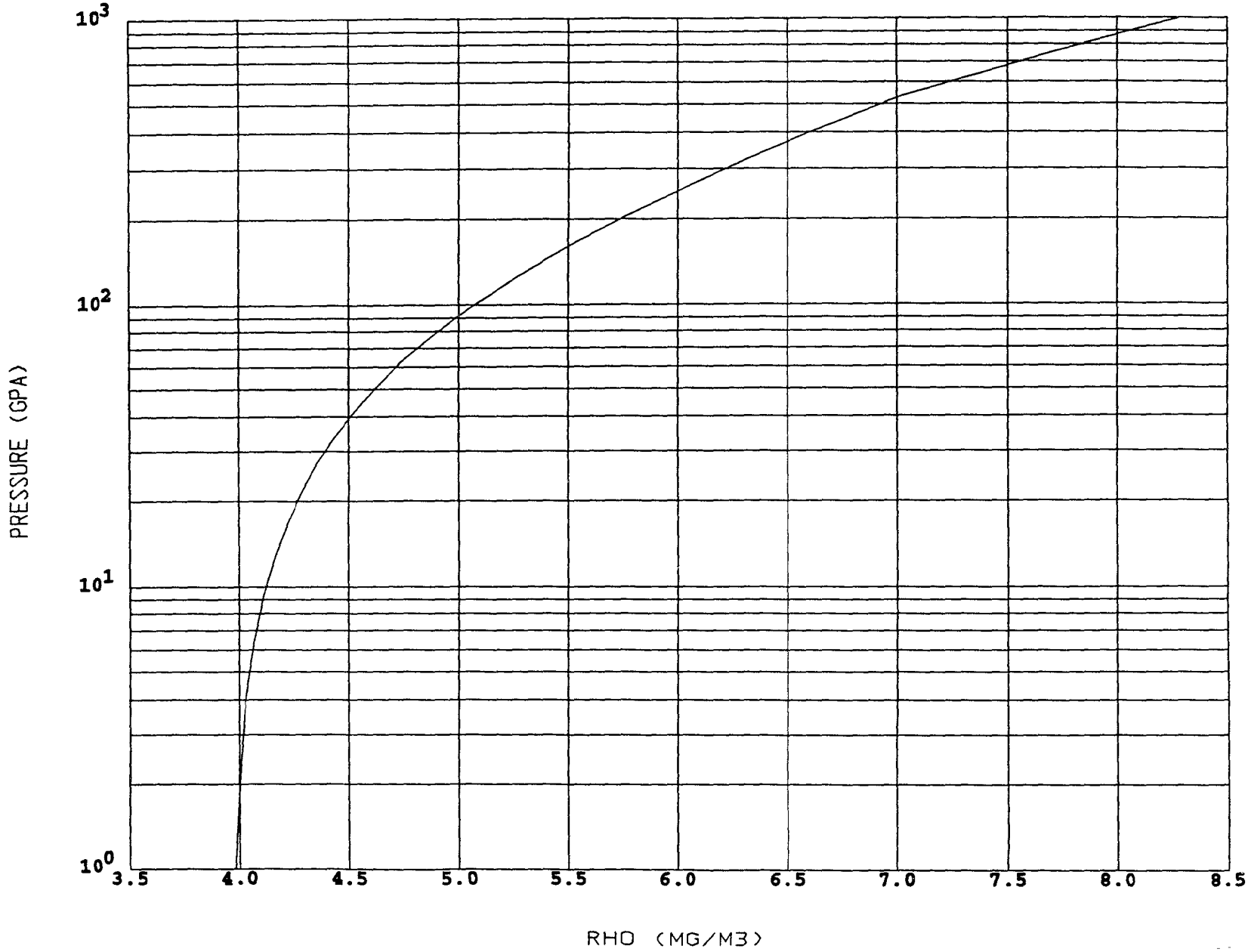


7410-3

T1 SES2D CRAY 02

7410-HU1
E0 MJ/KG
0.00+00

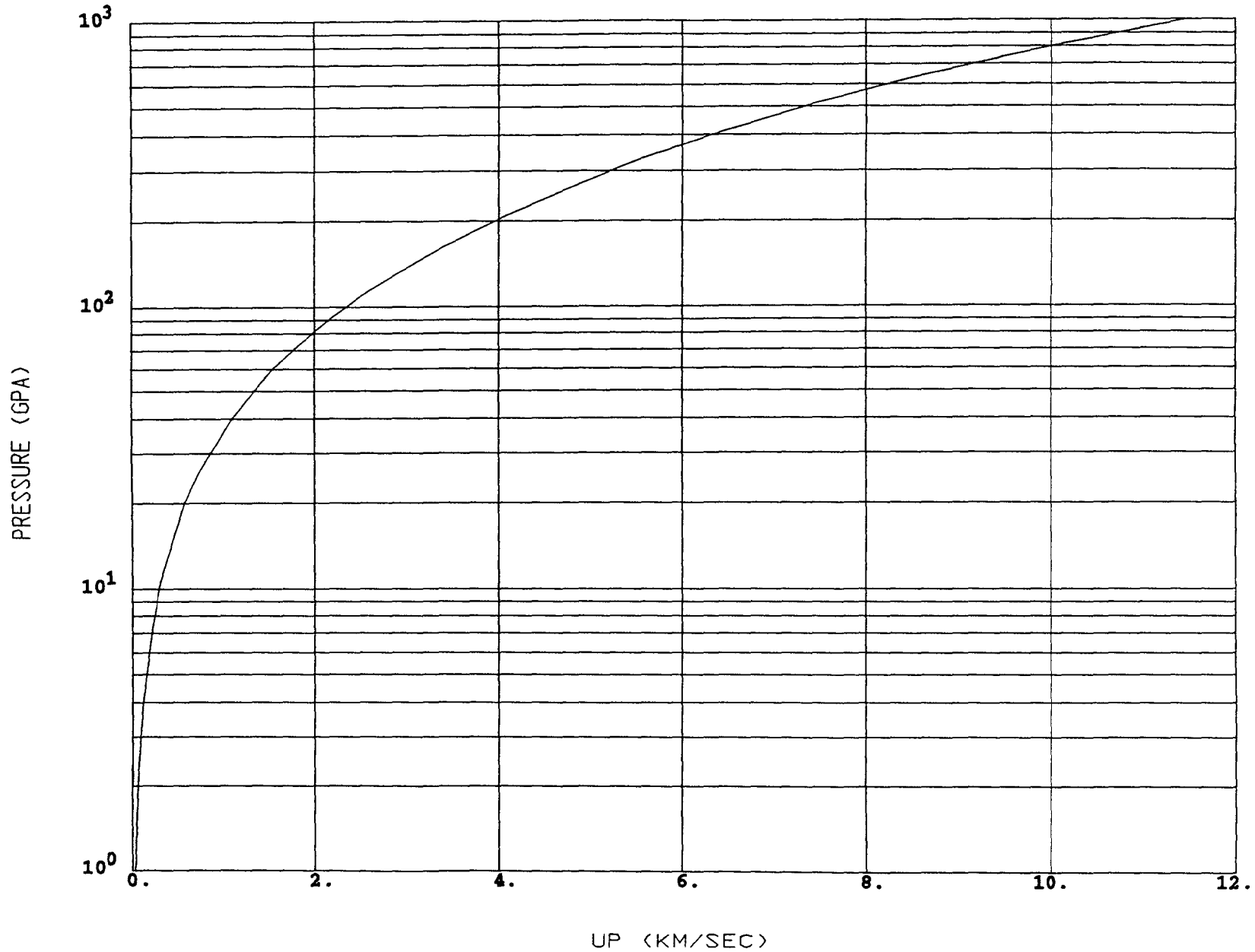
WED 12JUL 95 TABLE 301



T1 SES2D CRA

7410-HU1
E0 MJ/KG
0.00+00

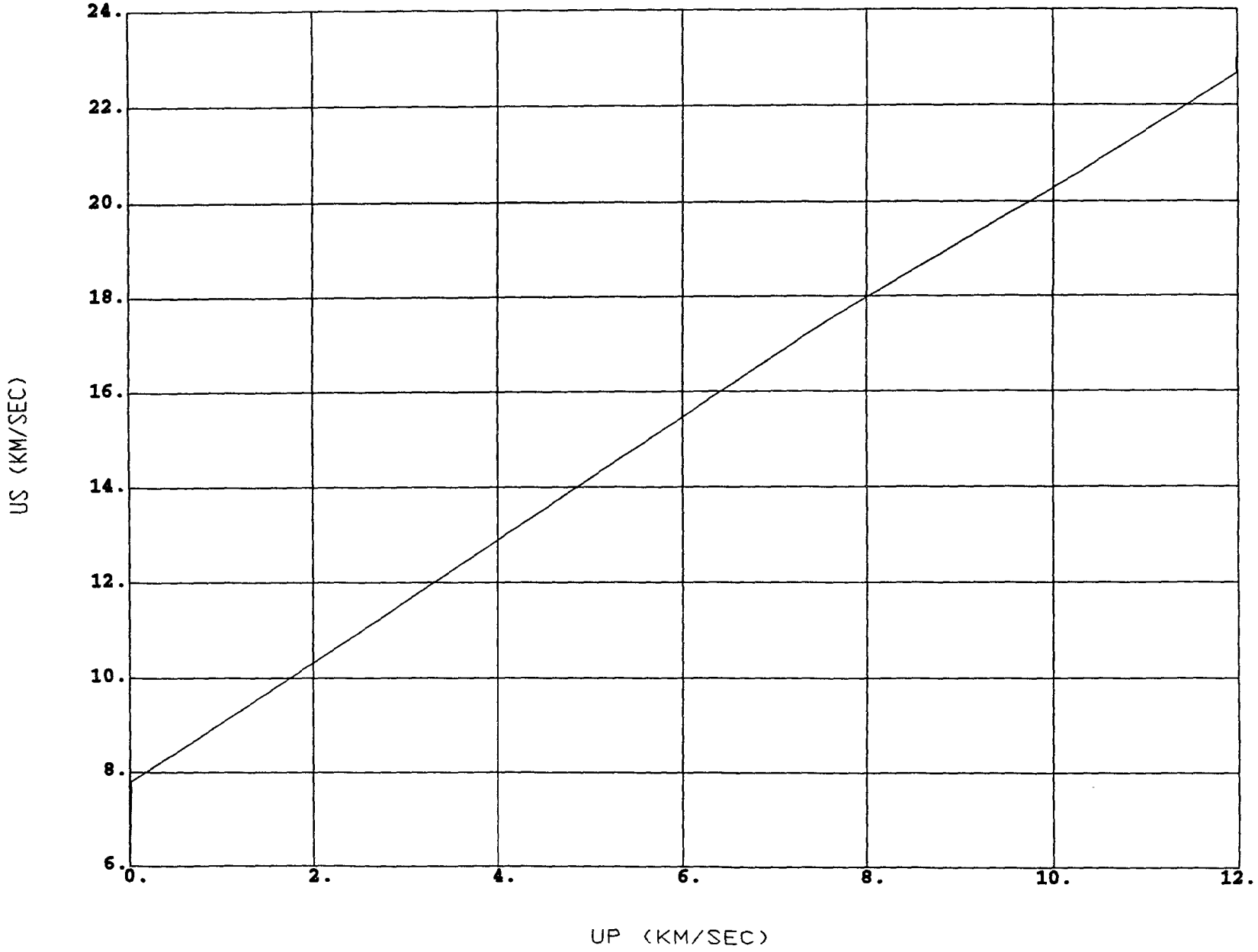
WED 12JUL 95 TABLE 301



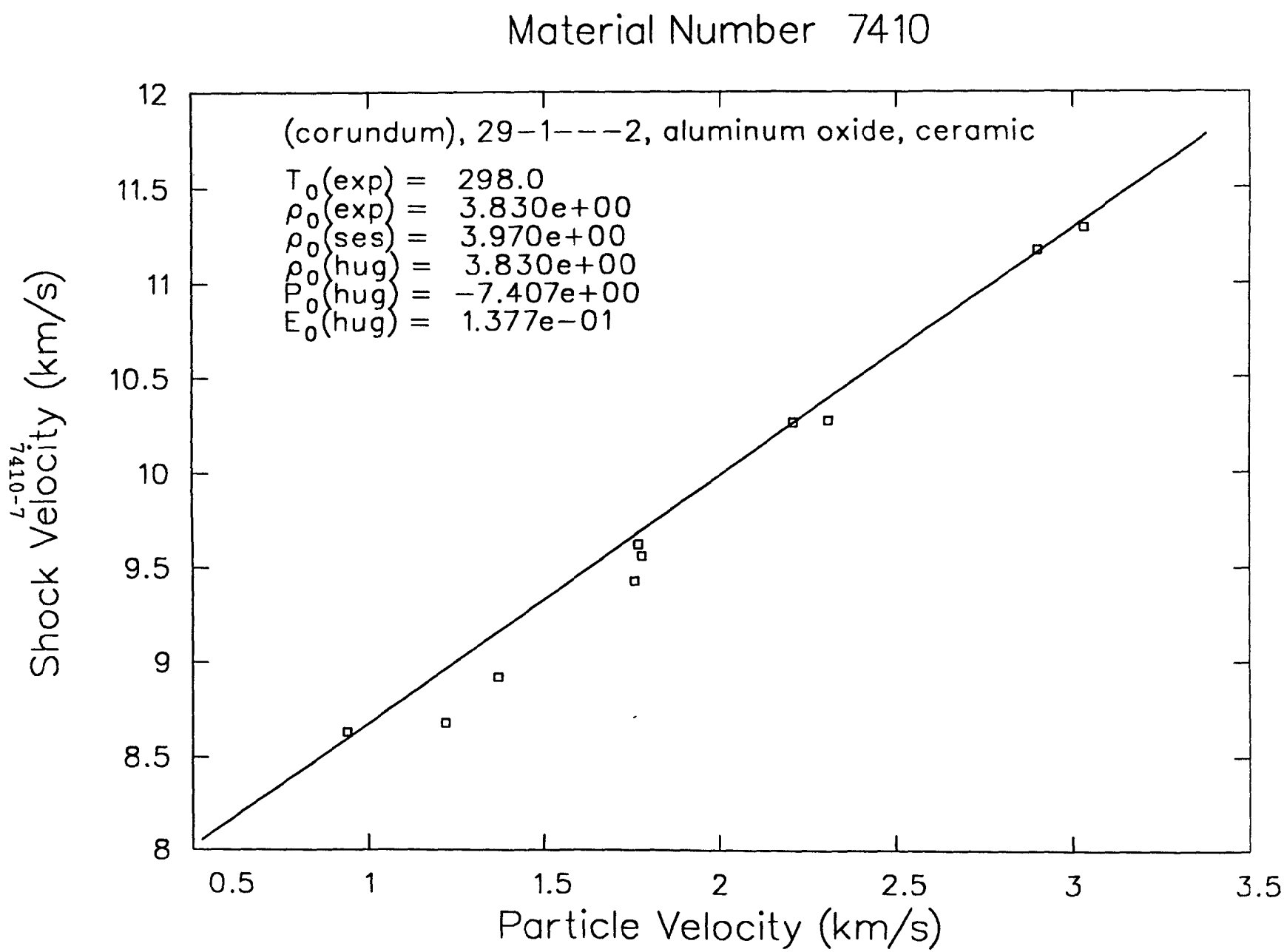
T1 SES2D CRAY 02

7410-HU1
E0 MJ/KG
0.00+00

WED 12JUL 95 TABLE 301



T1 SES2D CRA


Material Number 7410
(corundum), 29-1---2, aluminum oxide, ceramic
T_0(exp) = 298.0
ρ_0(exp) = 3.830e+00
ρ_0(ses) = 3.970e+00
ρ_0(hug) = 3.830e+00
P_0(hug) = -7.407e+00
E_0(hug) = 1.377e-01
Shock Velocity (km/s)
Particle Velocity (km/s)
12
11.5
11
10.5
10
9.5
9
8.5
8
0.5
1
1.5
2
2.5
3
3.5

MATERIAL NUMBER SUMMARY

7411 MATERIAL. ALUMINA

COMP. AL2O3
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0392E+01
NORMAL DENSITY. 3.9700E+00

GAMMA(COMPUTED). 1.5052

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	17					
102	66					
201	5					
301	7655	68	37	0.0000E+00	3.9700E-06	7.9400E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	3.9700E-06	7.9400E-06	7.9400E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	7543	67	37	3.9700E-06	7.9400E-06	7.9400E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	271	67	1	3.9700E-06	7.9400E-06	7.9400E+04
				0.0000E+00	-5.7901E-12	0.0000E+00
401	81					

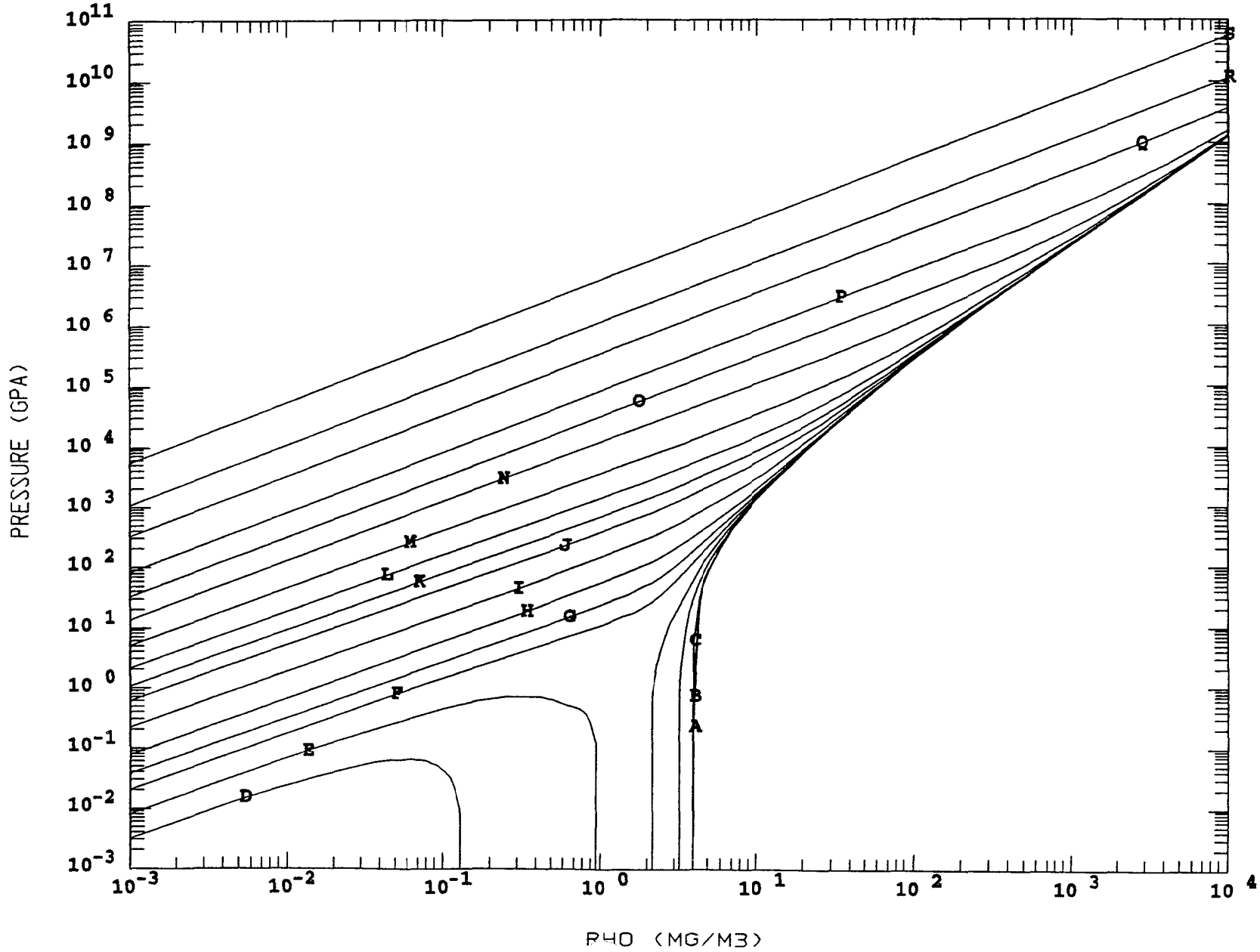
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 87
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 32387.
DATE OF LAST UPDATE. 22388.
SOURCE. J. BARNES, S. LYON
REFS. LA-11058-MS
CODES. GRIZZLY

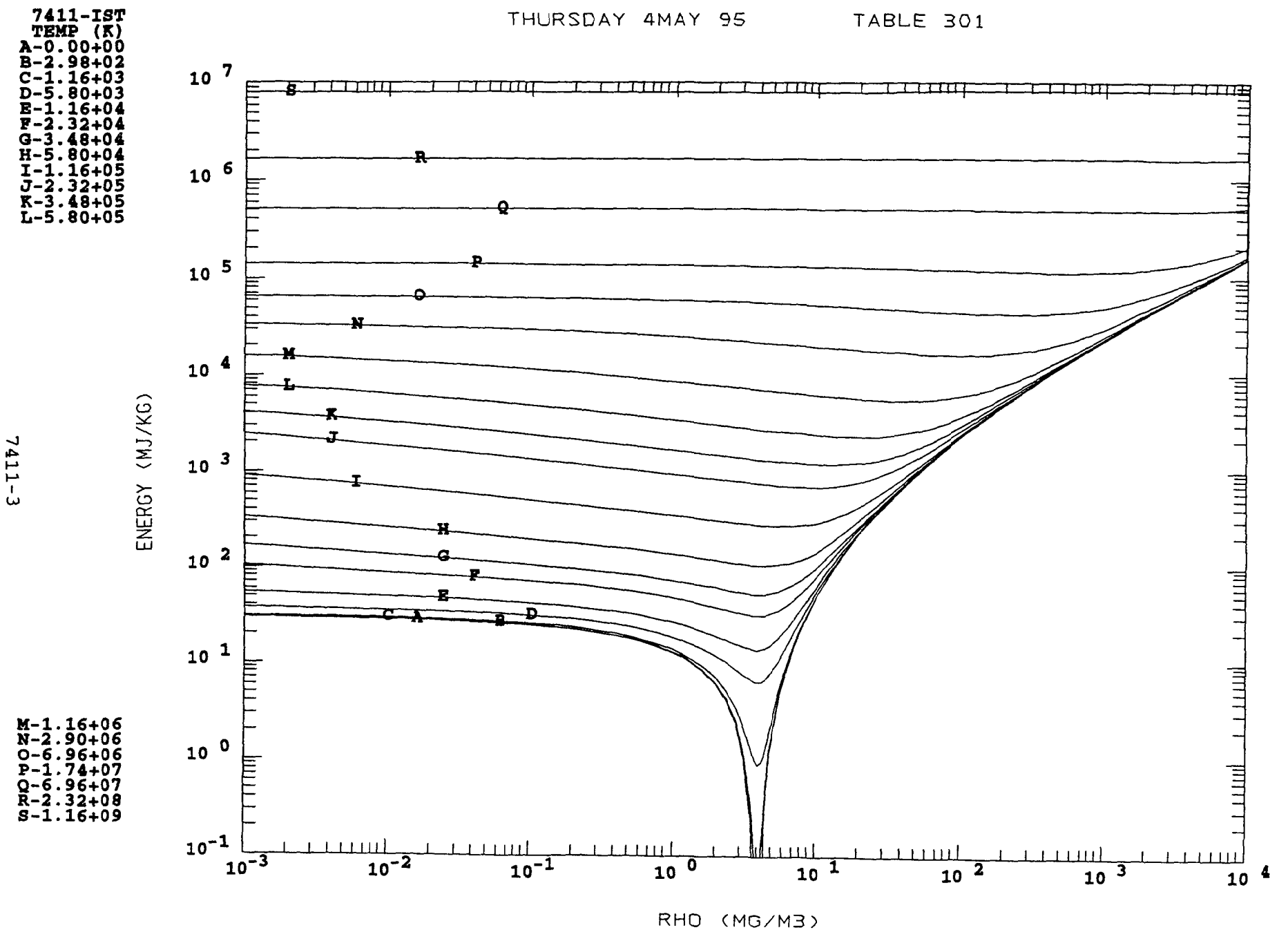
COMMENTS. AVERAGE ATOM MODELING THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN = 1). GAMREF = 1.595, DEBKEL = 1034, TMELT = 0. COLD CURVE FROM SHOCK DATA AND SOUND SPEED. USED US-UP COMPOSED OF A SINGLE STRAIGHT LINE WITH (UP,US) = (0.0,7.93), (3.062,11.903). CMAT = 1.35, ECOHKC = 145, FACLJ = 0.5. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 14,500 K.

7411-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05

THURSDAY 4MAY 95 TABLE 301

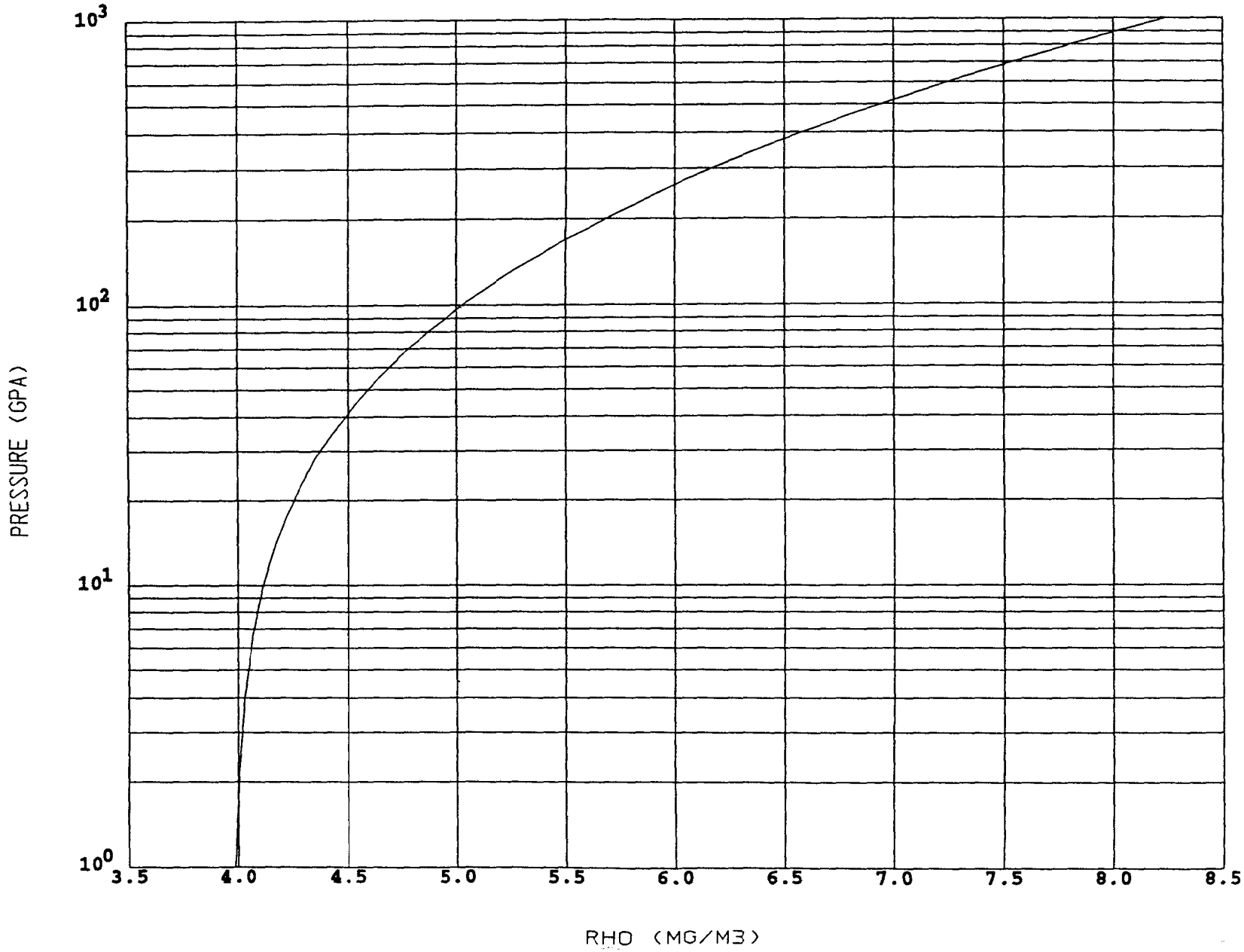


M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09


7411-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7411-HU1
E0 MJ/KG
0.00+00

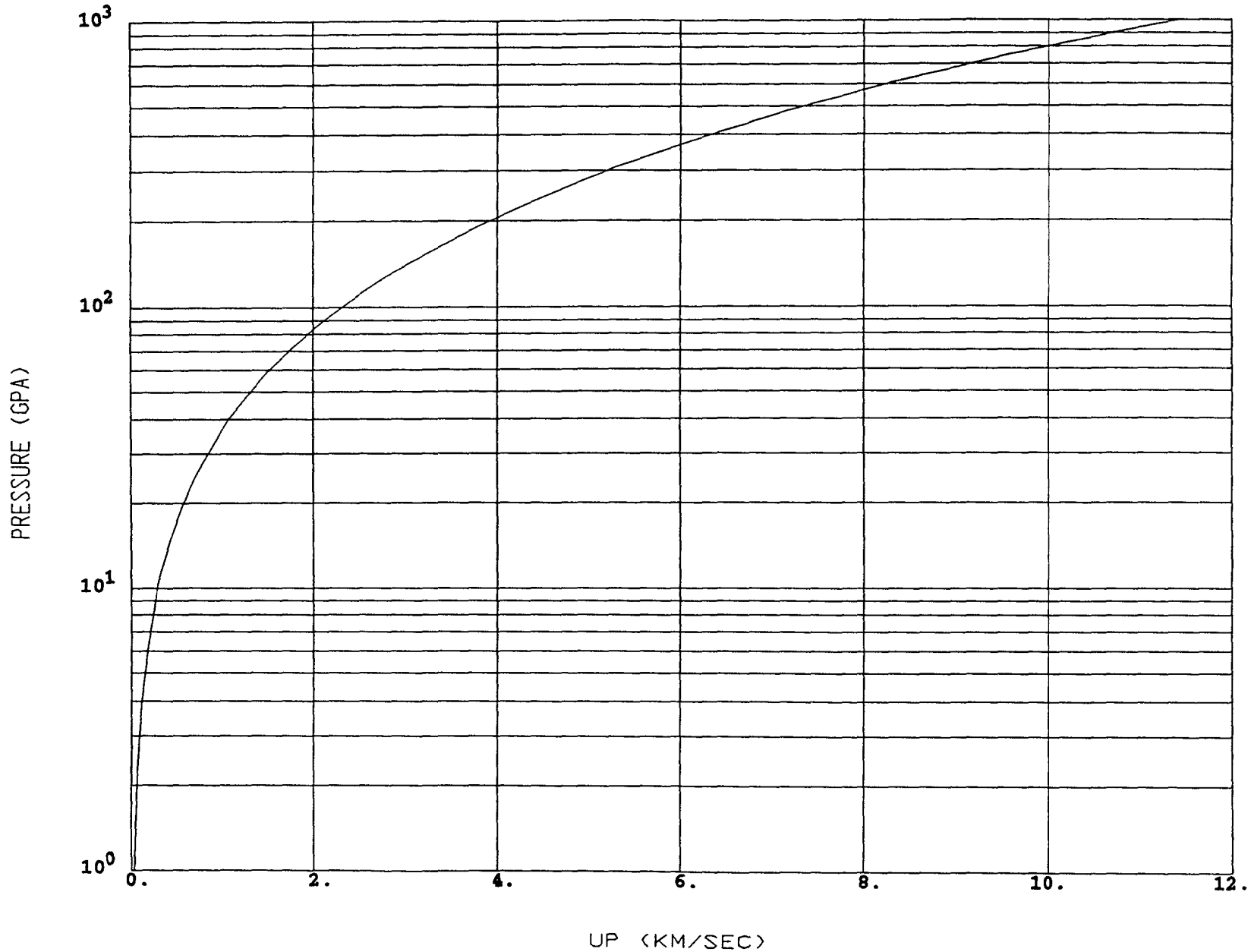
THURSDAY 4MAY 95 TABLE 301



T1 SES2D GPA

7411-HU1
E0 MJ/KG
0.00+00

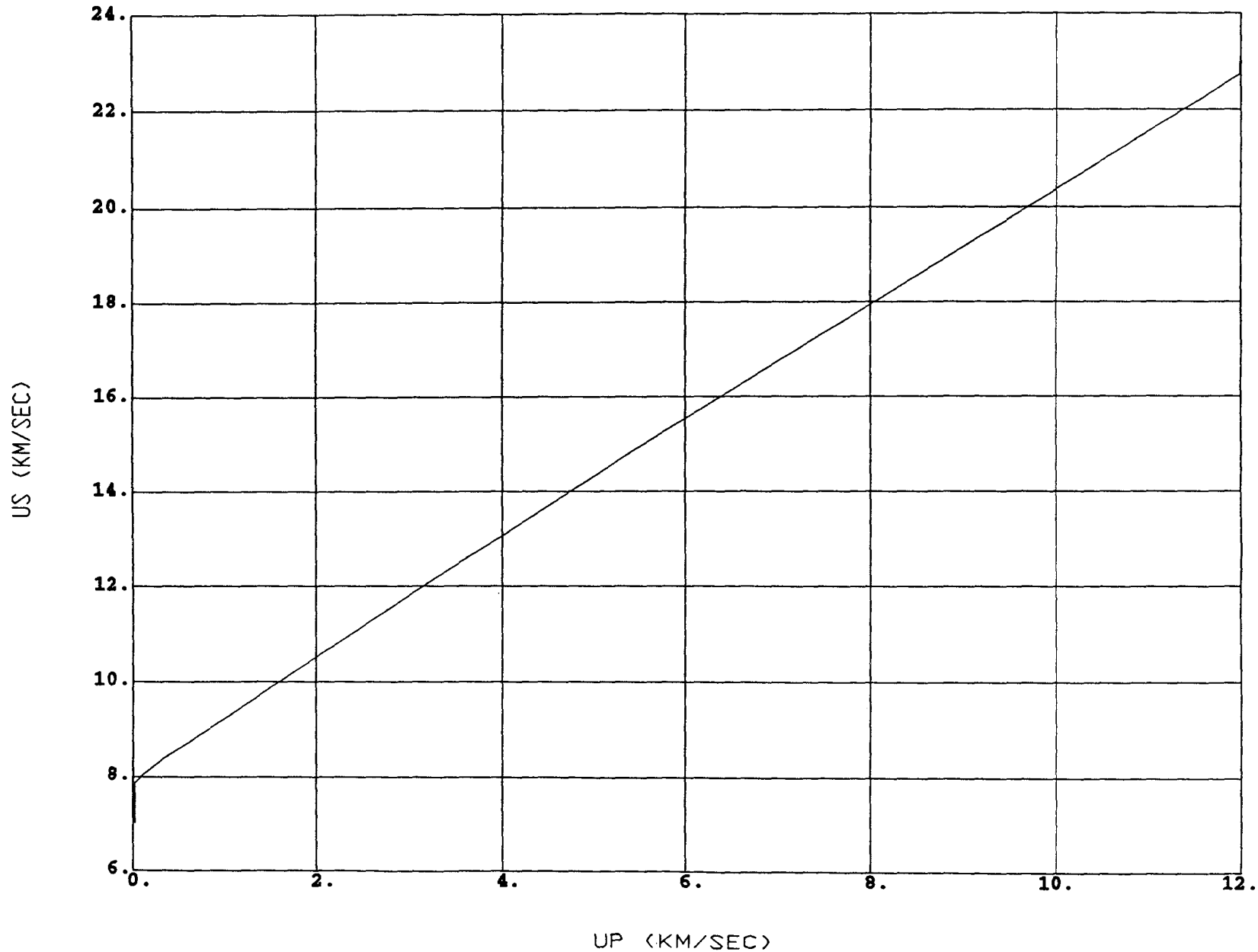
THURSDAY 4MAY 95 TABLE 301



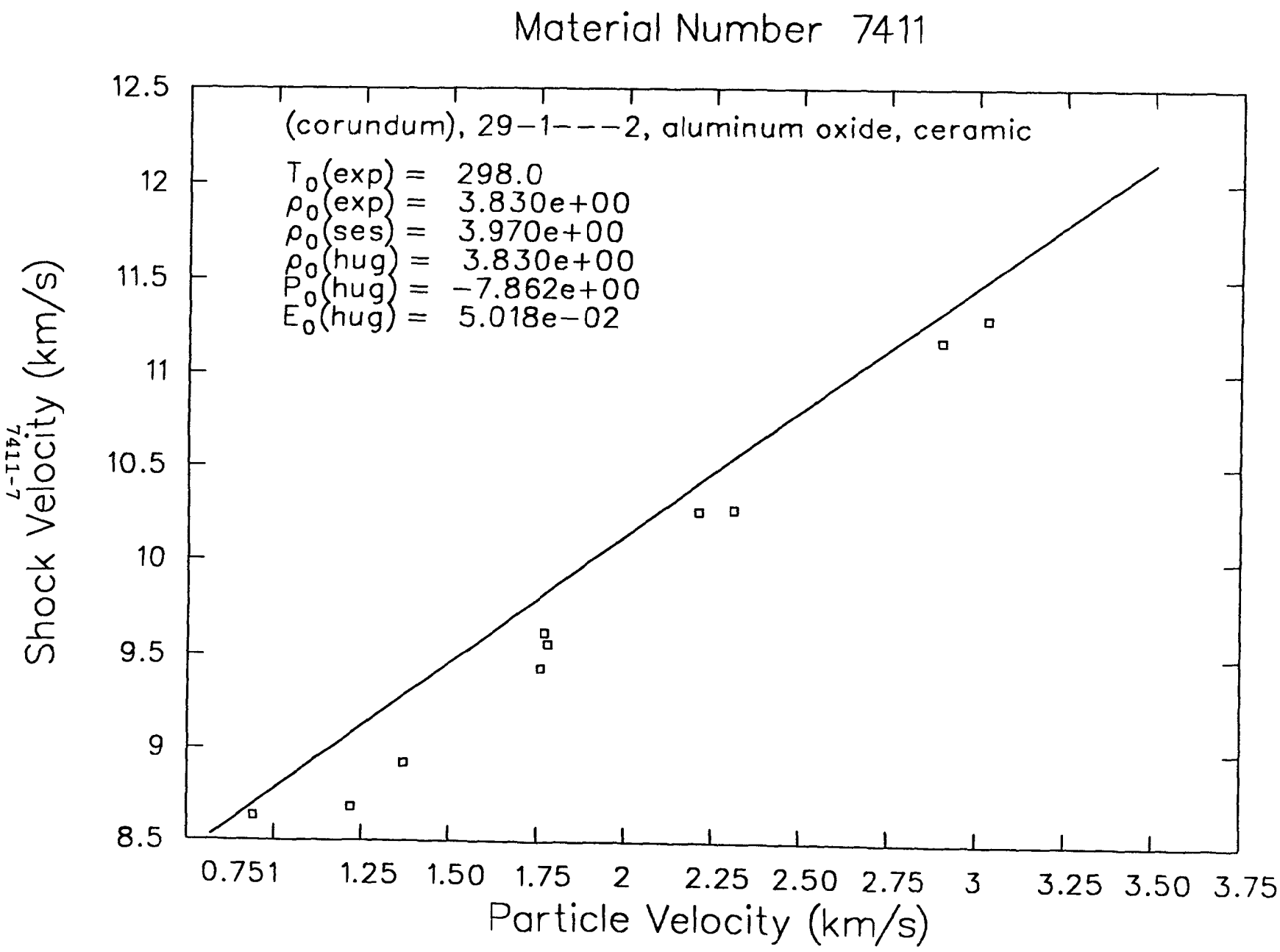
T1 SES2D CRAY 02

7411-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY

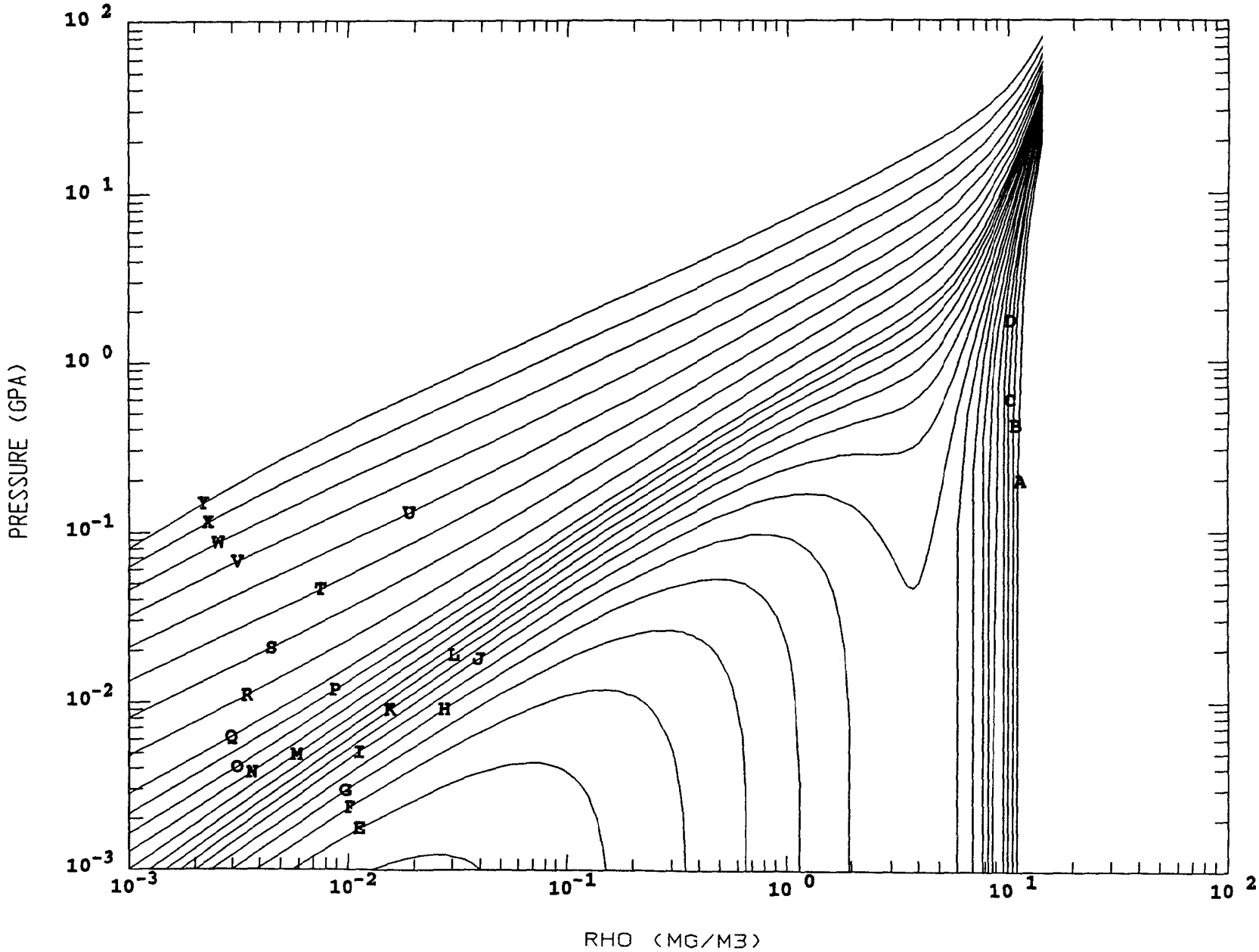

Material Number 7411
(corundum), 29-1---2, aluminum oxide, ceramic
T_0(exp) = 298.0
ρ_0(exp) = 3.830e+00
ρ_0(ses) = 3.970e+00
ρ_0(hug) = 3.830e+00
P_0(hug) = -7.862e+00
E_0(hug) = 5.018e-02
Shock Velocity (km/s)
12.5
12
11.5
11
10.5
10
9.5
9
8.5
0.751
1.25
1.50
1.75
2
2.25
2.50
2.75
3
3.25
3.50
3.75
Particle Velocity (km/s)

MATERIAL NUMBER	SUMMARY
7432	MATERIAL. URANIUM DIOXIDE

```
COMP. UO2
ATOMIC NUMBER.   3.6000E+01
ATOMIC MASS.     9.0000E+01
NORMAL DENSITY.  1.1000E+01

GAMMA(COMPUTED).     1.0543

TABLE SUMMARY.
TID    NW  NR  NT    R1/T1      R2/T2      RN/TN
101    17
201     5
301  5178 101  25 0.0000E+00 1.1000E-03 1.4300E+01
                  0.0000E+00 6.5640E-02 2.6256E+00
401   145
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 77, DEC 77
VERSION NUMBER.     4
DATE ADDED TO LIBRARY.    61077.
DATE OF LAST UPDATE.     113079.
SOURCE. B. BENNETT
REFS. NONE
CODES. EOSLTS
```

7432-IST
TEMP (K)
A-0.00+00
B-7.62+02
C-1.52+03
D-2.29+03
E-3.05+03
F-3.81+03
G-4.57+03
H-5.33+03
I-6.09+03
J-6.86+03
K-7.62+03
L-8.38+03

THURSDAY 4MAY 95 TABLE 301



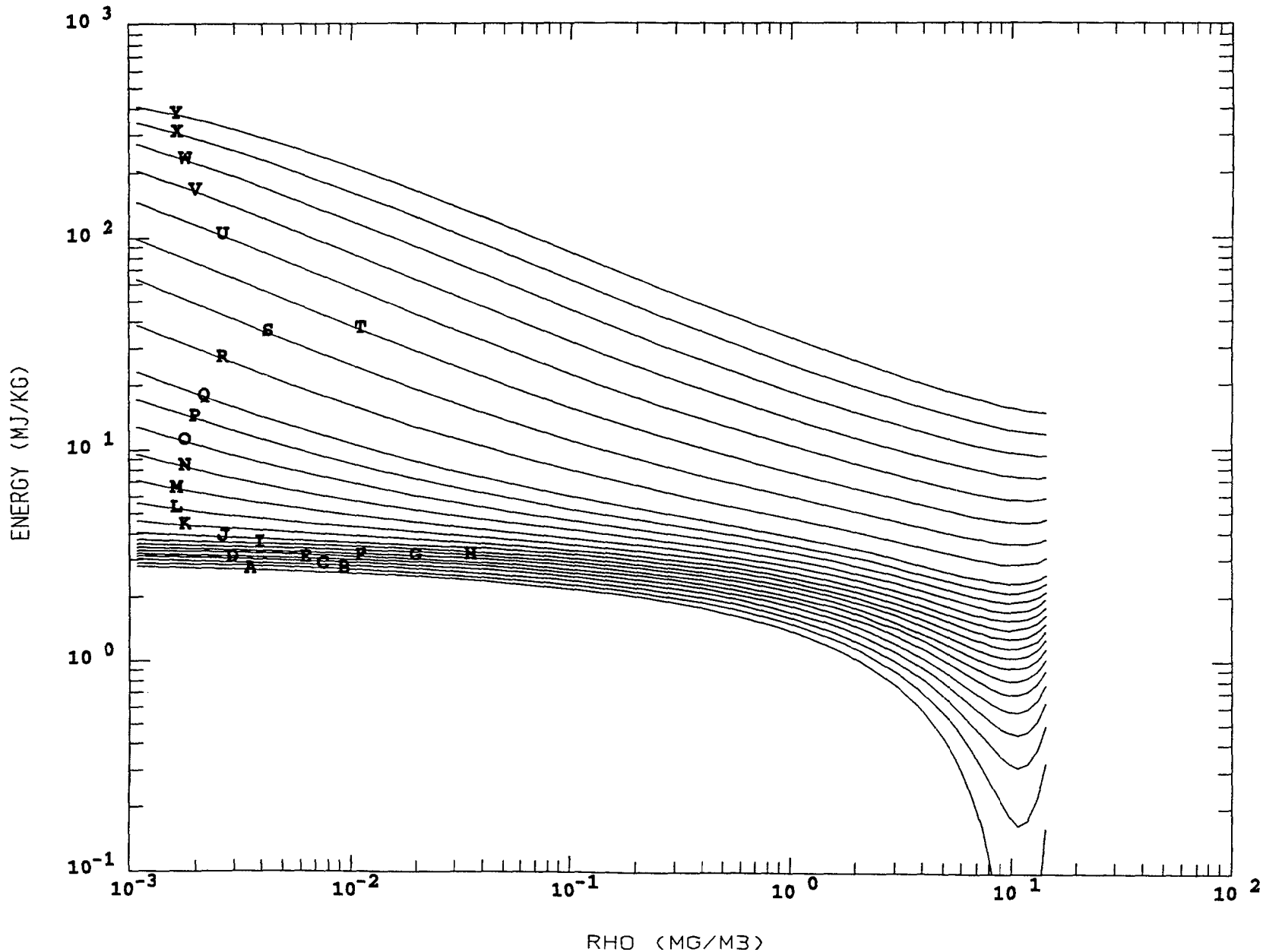
M-9.14+03
N-9.90+03
O-1.07+04
P-1.14+04
Q-1.22+04
R-1.37+04
S-1.53+04
T-1.72+04
U-1.93+04
V-2.16+04
W-2.42+04
X-2.72+04
Y-3.05+04

7432-2

T1 SES2D CRA

7432-IST
TEMP (K)
A-0.00+00
B-7.62+02
C-1.52+03
D-2.29+03
E-3.05+03
F-3.81+03
G-4.57+03
H-5.33+03
I-6.09+03
J-6.86+03
K-7.62+03
L-8.38+03

THURSDAY 4MAY 95 TABLE 301



M-9.14+03
N-9.90+03
O-1.07+04
P-1.14+04
Q-1.22+04
R-1.37+04
S-1.53+04
T-1.72+04
U-1.93+04
V-2.16+04
W-2.42+04
X-2.72+04
Y-3.05+04

7432-3

T1 SES2D CRAY 02

MATERIAL NUMBER	SUMMARY
7440	MATERIAL. HEMATITE

COMP. FE2O3
ATOMIC NUMBER. 1.5200E+01
ATOMIC MASS. 3.1938E+01
NORMAL DENSITY. 5.0070E+00

GAMMA(COMPUTED). 1.5484

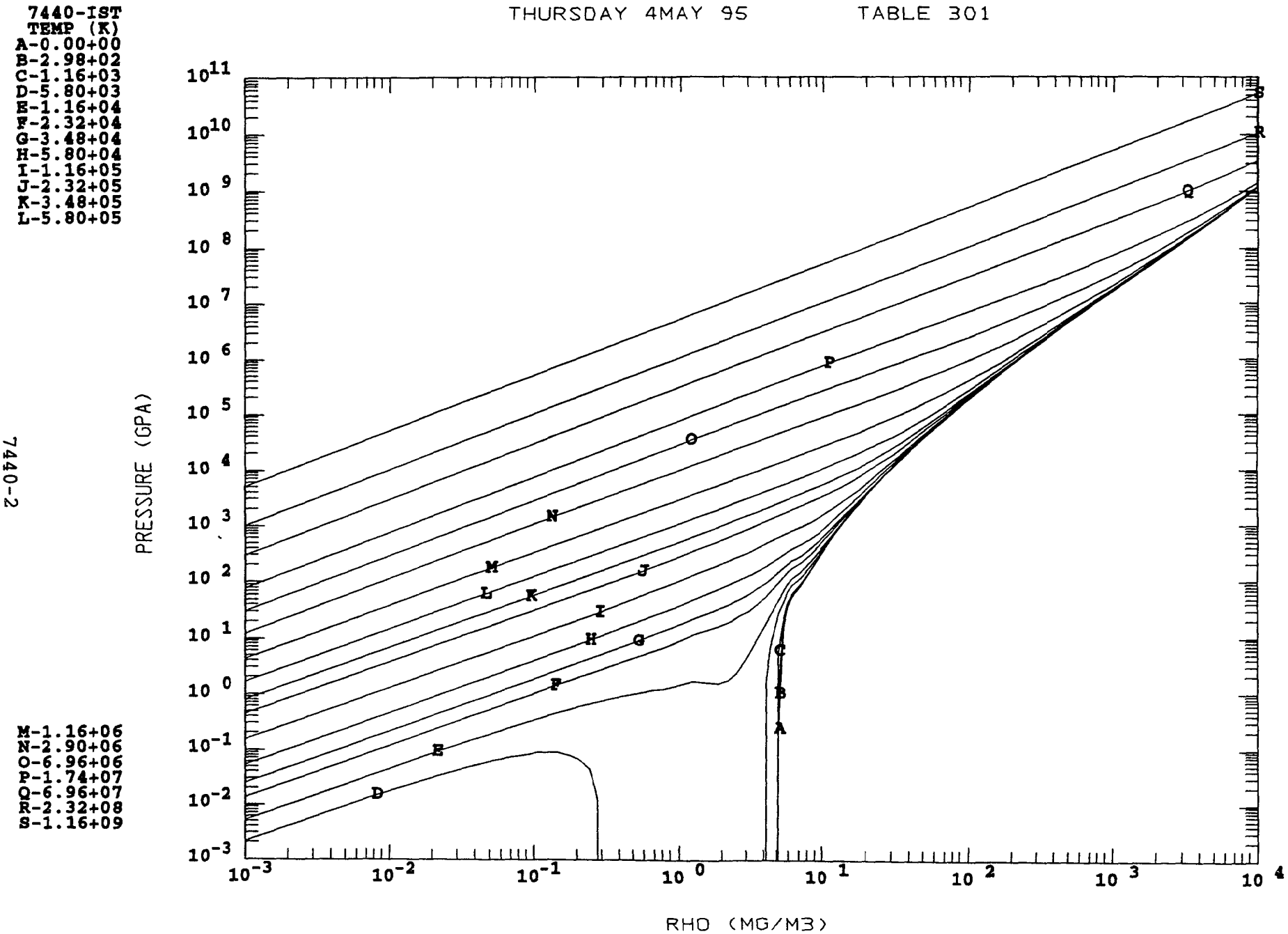
TABLE SUMMARY.

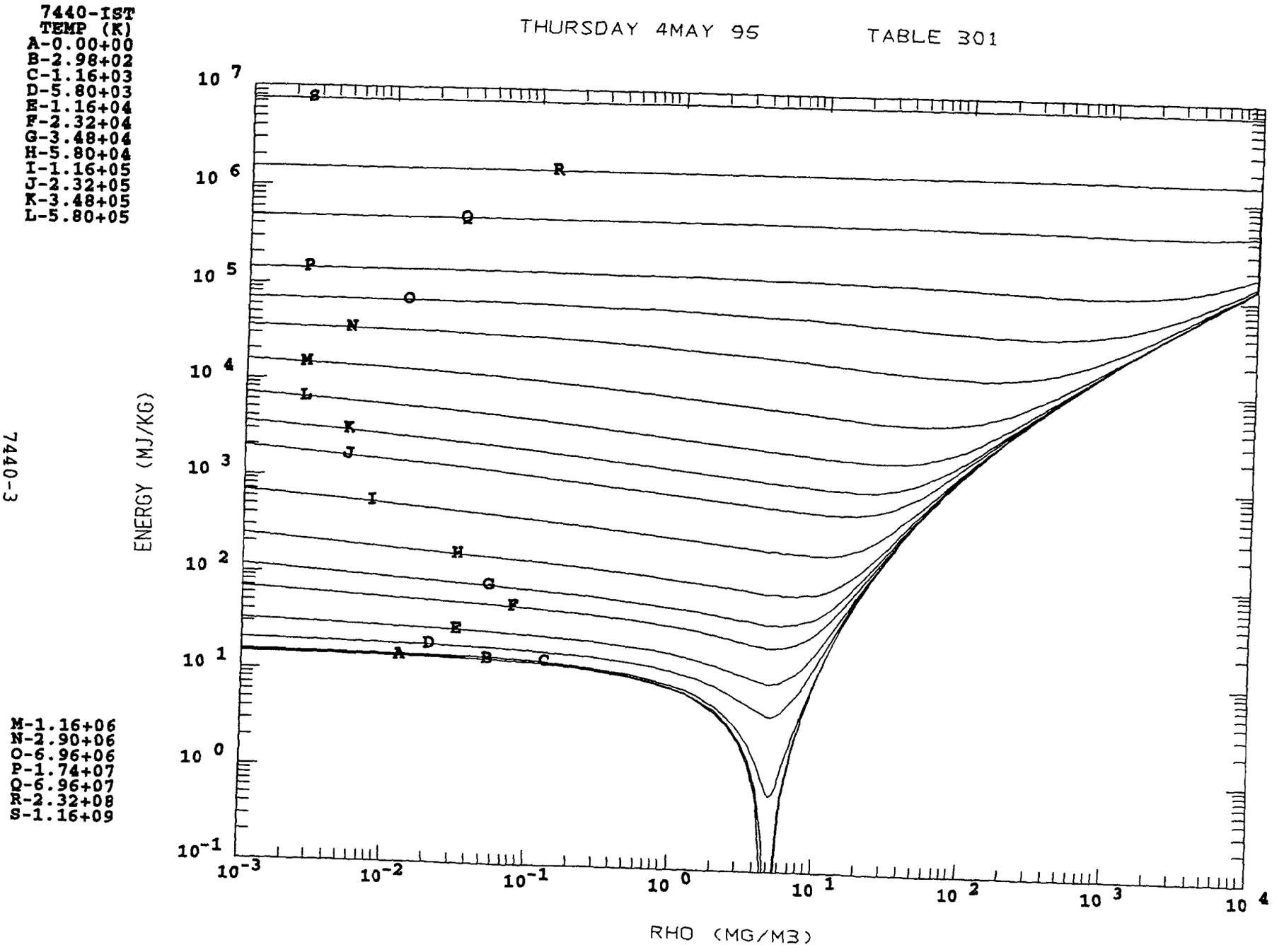
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	69					
201	5					
301	7991	71	37	0.0000E+00	5.0070E-06	1.0014E+05
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	5.0070E-06	1.0014E-05	1.0014E+05
				0.0000E+00	2.5000E-01	9.9999E+04
305	7879	70	37	5.0070E-06	1.0014E-05	1.0014E+05
				0.0000E+00	1.2500E-02	9.9999E+04
306	283	70	1	5.0070E-06	1.0014E-05	1.0014E+05
				0.0000E+00	-3.5743E-12	0.0000E+00
401	81					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 87
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 40387.
DATE OF LAST UPDATE. 21288.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN = 1). GAMREF = 1.64, DEBKEL = 610, TMELT = 1838. COLD CURVE FROM SHOCK DATA AND SOUND SPEED. US-UP COMPOSED OF THREE STRAIGHT LINES (UP,US) = (0.0,6.243), (0.95,7.50), (2.25,7.50), (3.20,8.75). CMAT = 1.58, ECOHKC = 114.2, FACLJ = 0.5. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 12,000 K.

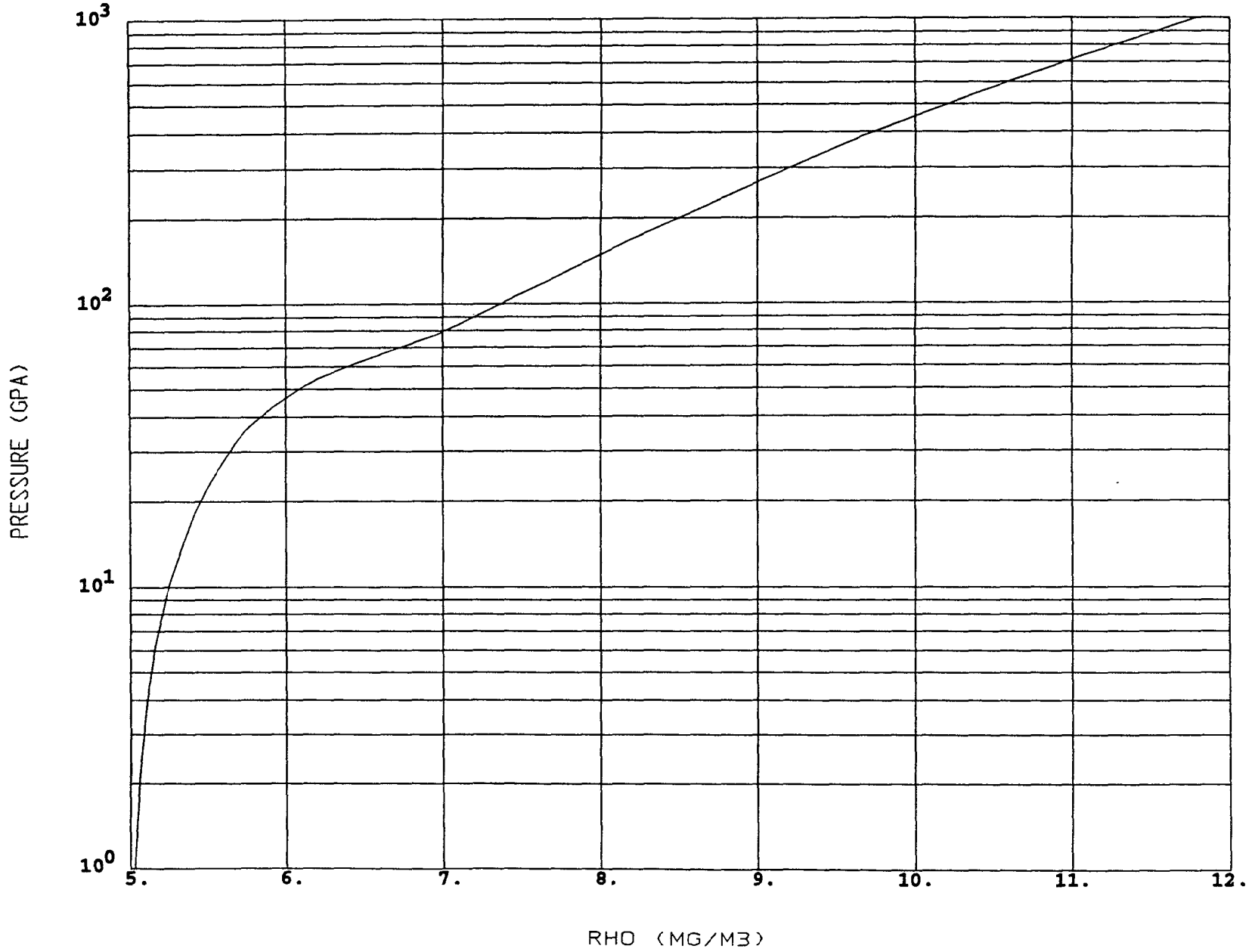

7440-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY



T1 SES2D CRAY 02

7440-HU1
E0 MJ/KG
0.00+00

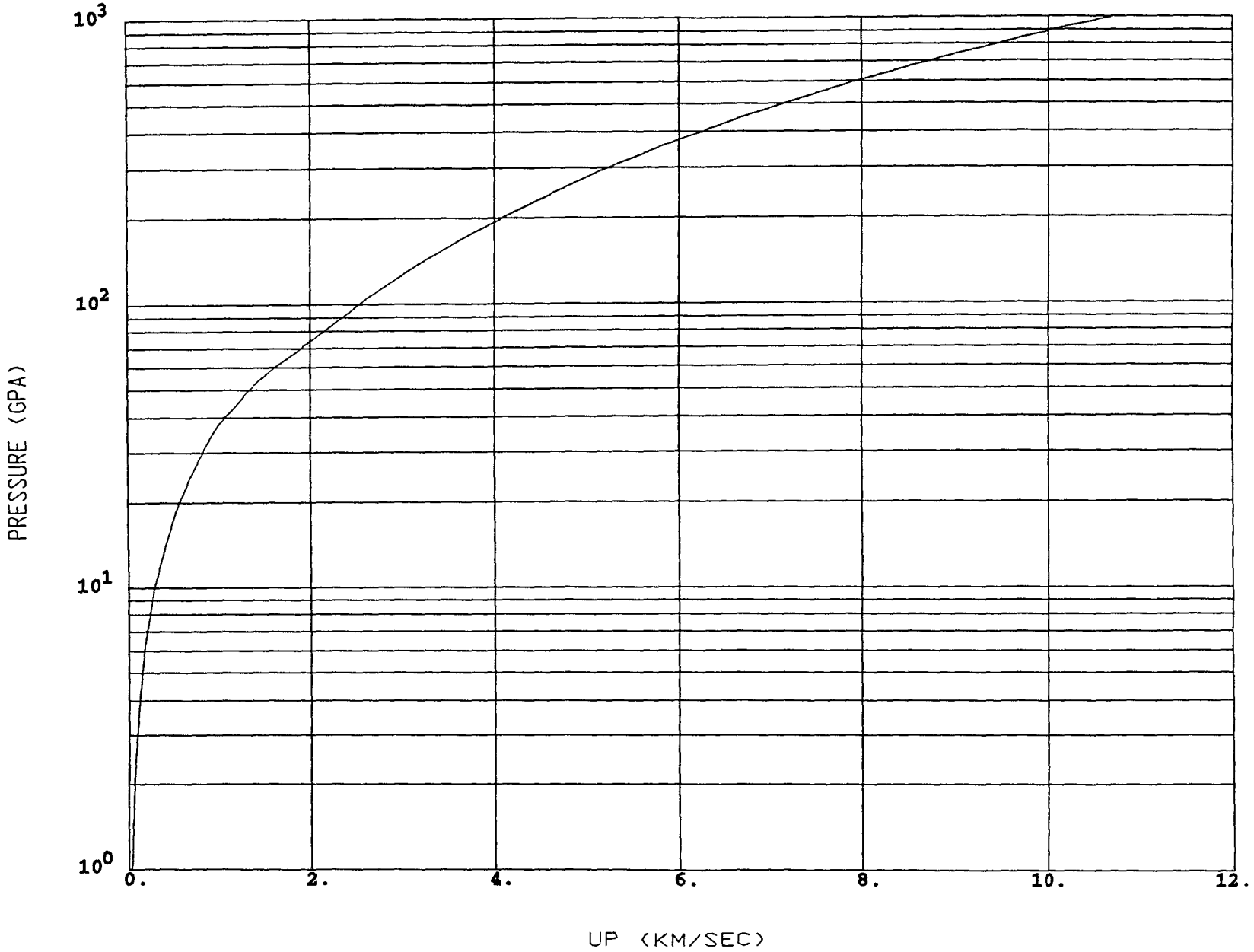
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY

7440-HU1
E0 MJ/KG
0.00+00

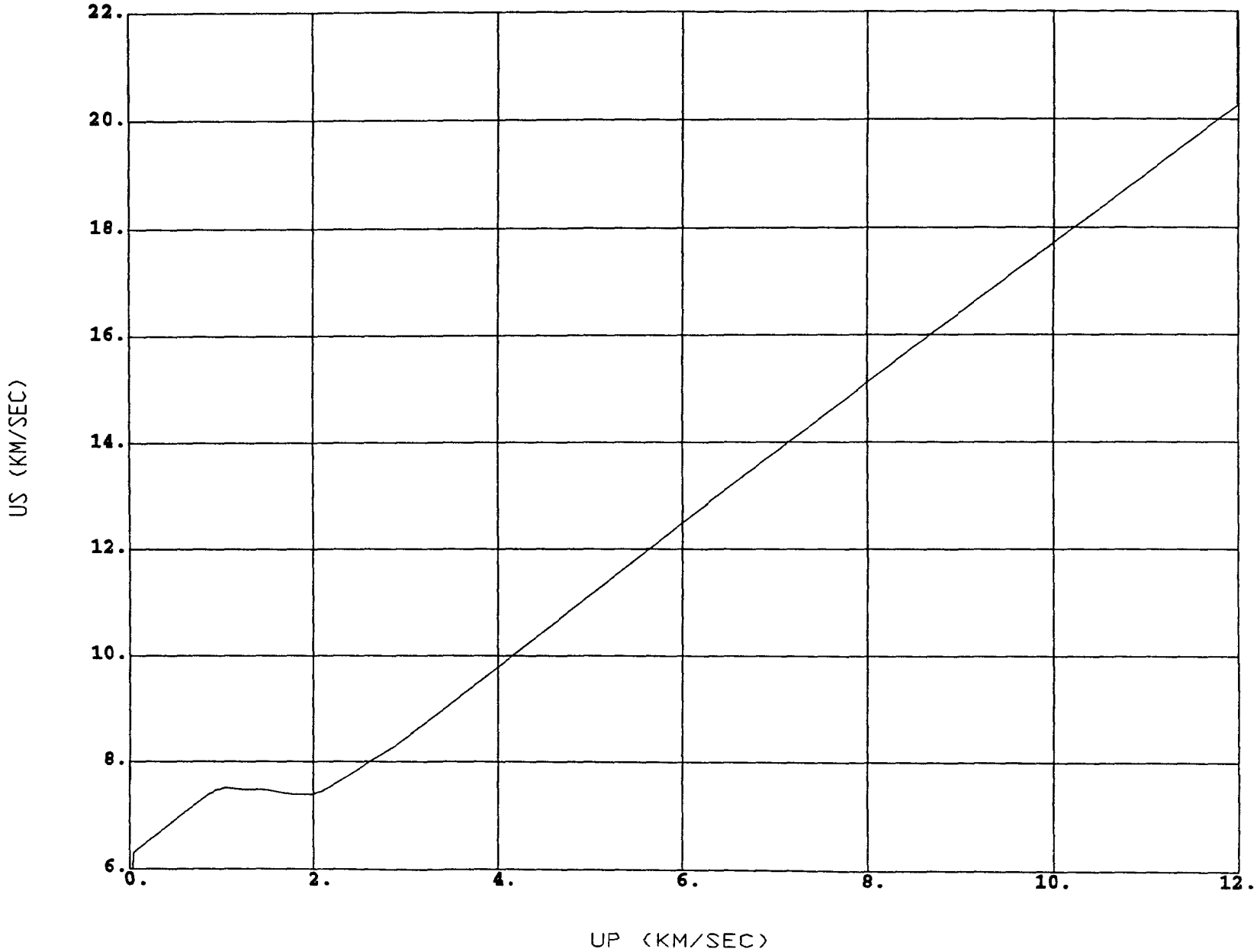
THURSDAY 4MAY 95 TABLE 301



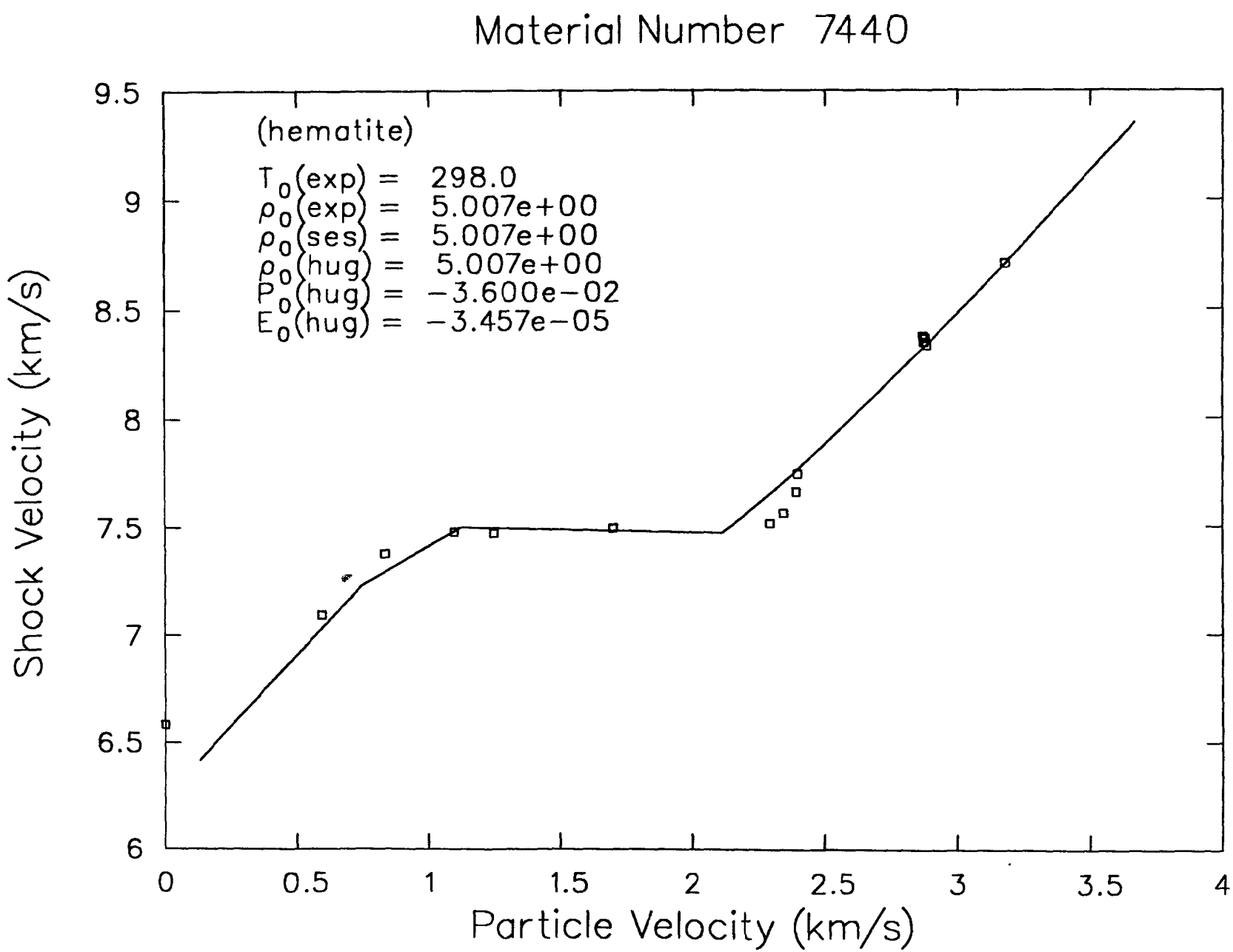
T1 SES2D CRAY 02

7440-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA1


Material Number 7440
(hematite)
T_0(exp) = 298.0
ρ_0(exp) = 5.007e+00
ρ_0(ses) = 5.007e+00
ρ_0(hug) = 5.007e+00
P_0(hug) = −3.600e−02
E_0(hug) = −3.457e−05
Shock Velocity (km/s)
Particle Velocity (km/s)
9.5
9
8.5
8
7.5
7
6.5
6
0
0.5
1
1.5
2
2.5
3
3.5
4

MATERIAL NUMBER	SUMMARY
7450	MATERIAL. CALCIUM OXIDE

COMP. CAO
ATOMIC NUMBER. 1.4000E+01
ATOMIC MASS. 2.8040E+01
NORMAL DENSITY. 2.9800E+00

GAMMA(COMPUTED). 2.2700

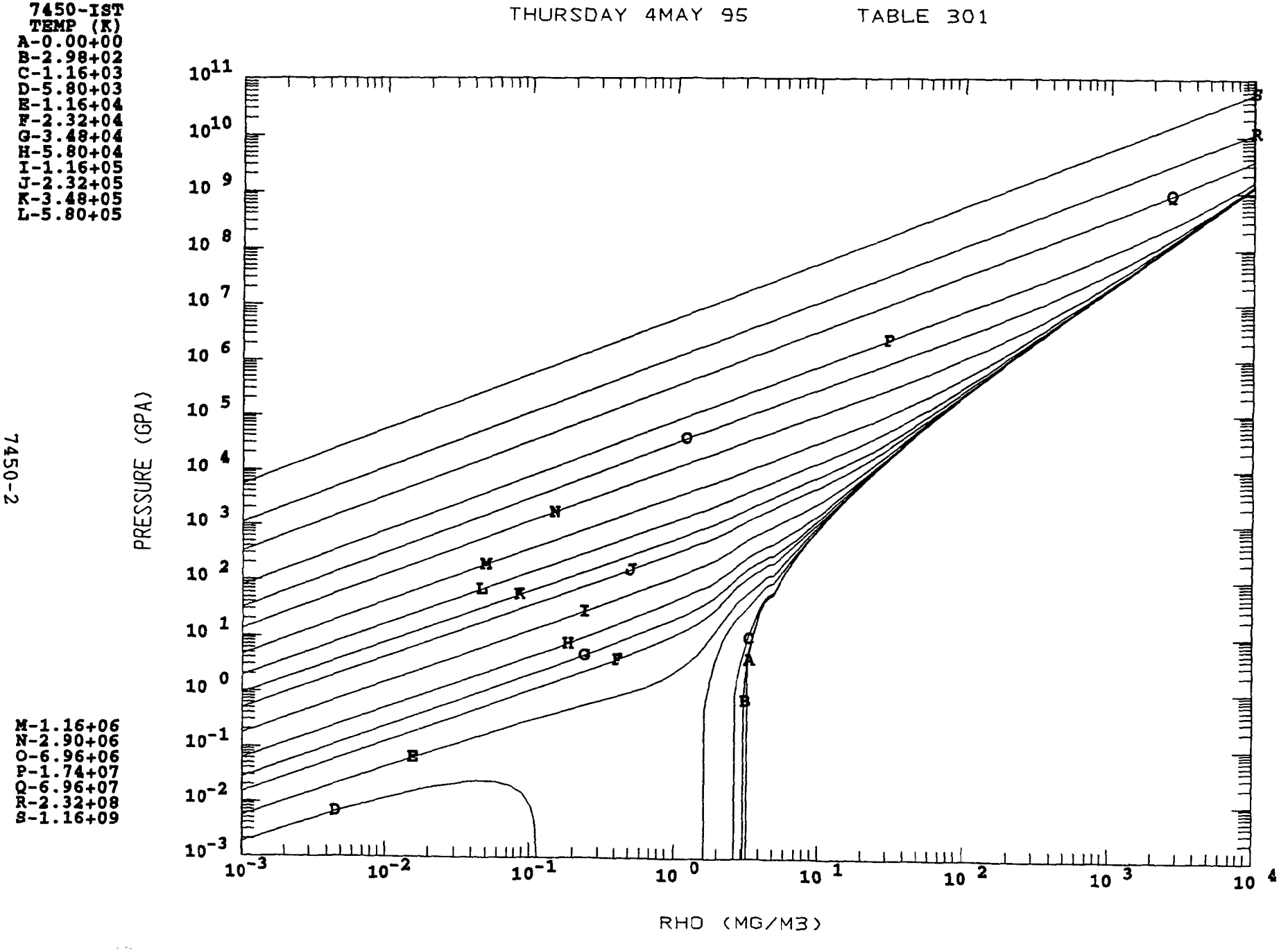
TABLE SUMMARY.

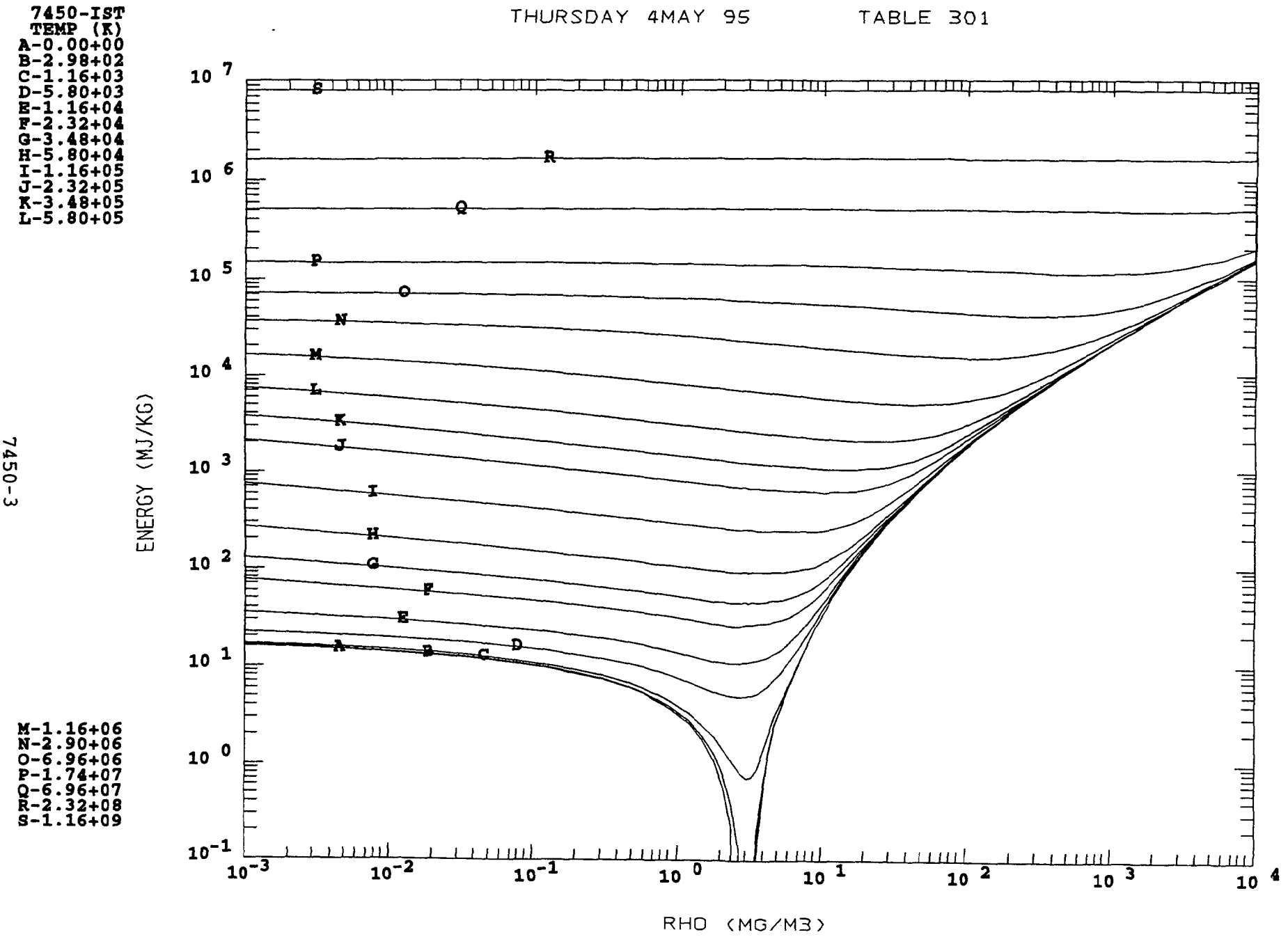
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	66					
201	5					
301	8103	72	37	0.0000E+00	2.9800E-06	5.9600E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	2.9800E-06	5.9600E-06	5.9600E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	7991	71	37	2.9800E-06	5.9600E-06	5.9600E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	287	71	1	2.9800E-06	5.9600E-06	5.9600E+04
				0.0000E+00	-4.1531E-11	0.0000E+00
401	73					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 87
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 41687.
DATE OF LAST UPDATE. 22388.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN = 1). GAMREF = 2.40, DEBKEL = 640, TMELT = 2853. COLD CURVE FROM SHOCK DATA. US-UP COMPOSED OF THREE STRAIGHT LINES (UP,US) = (0.0,3.70), (2.30,7.70), (3.05,7.70), (3.55,8.55). CMAT = 1.72, ECOHKC =126.7, FACLJ = 0.25. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 9000 K.

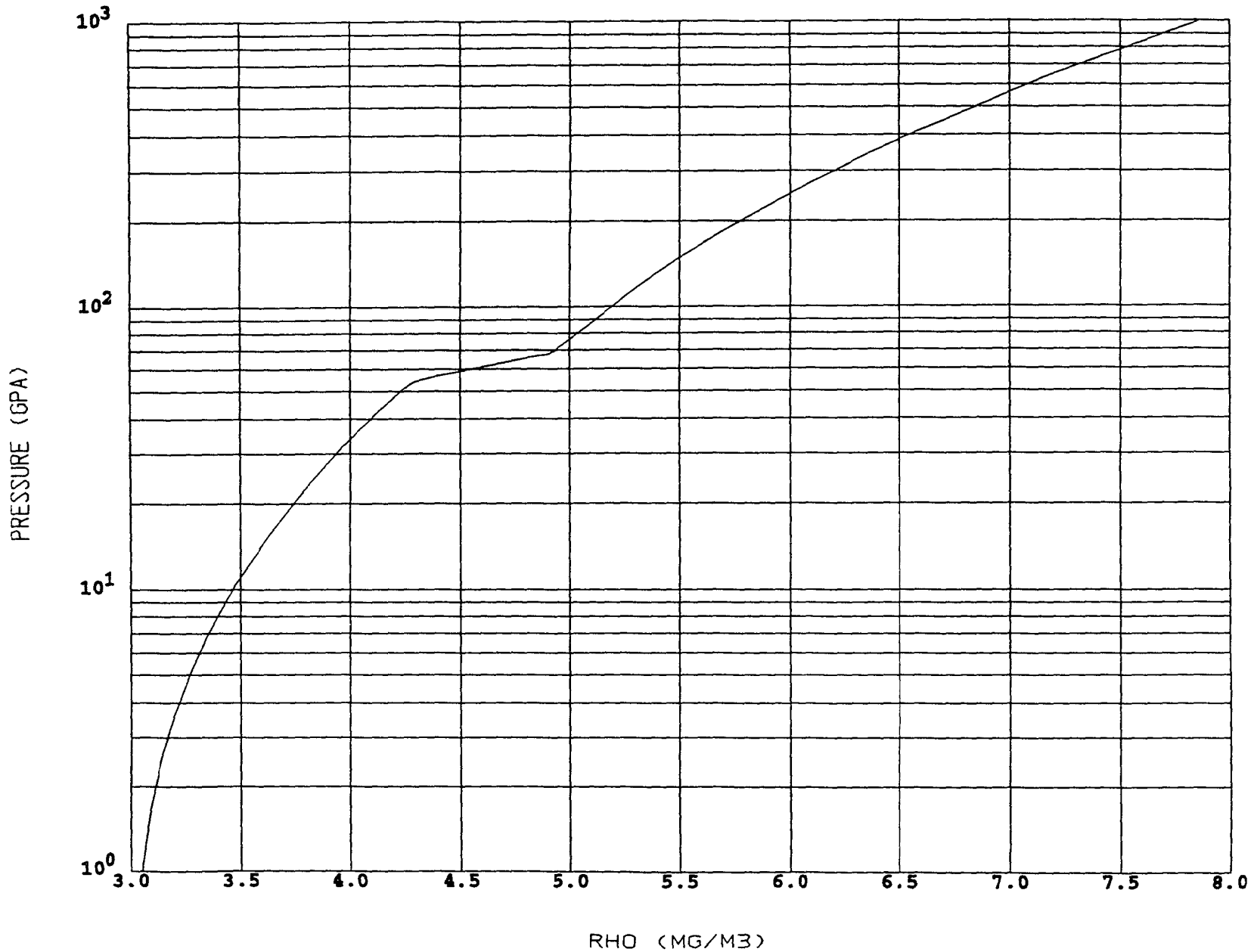

7450-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY



T1 SES2D CRAY 02

7450-HU1
E0 MJ/KG
0.00+00

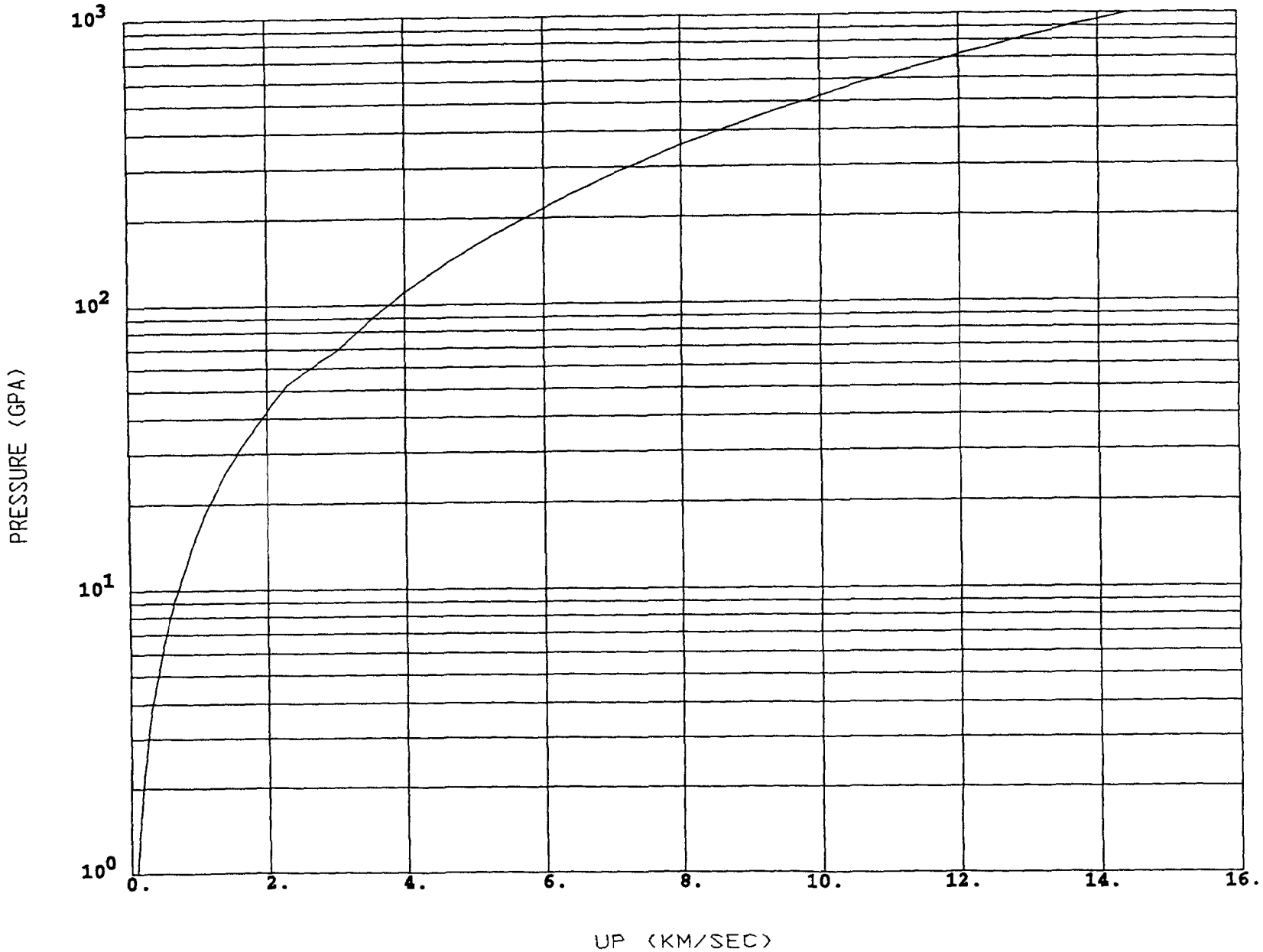
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY

7450-HU1
E0 MJ/KG
0.00+00

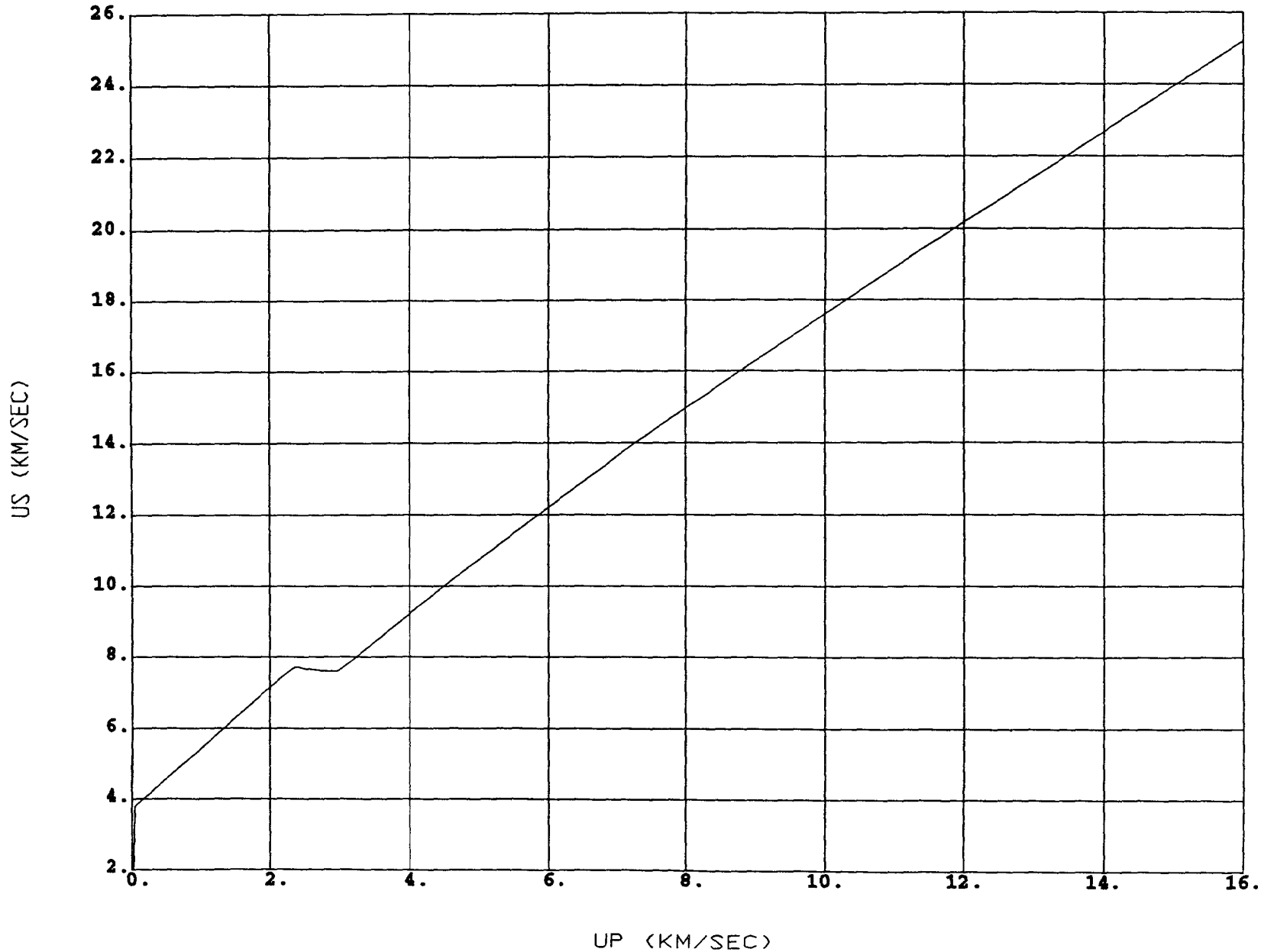
THURSDAY 4MAY 95 TABLE 301



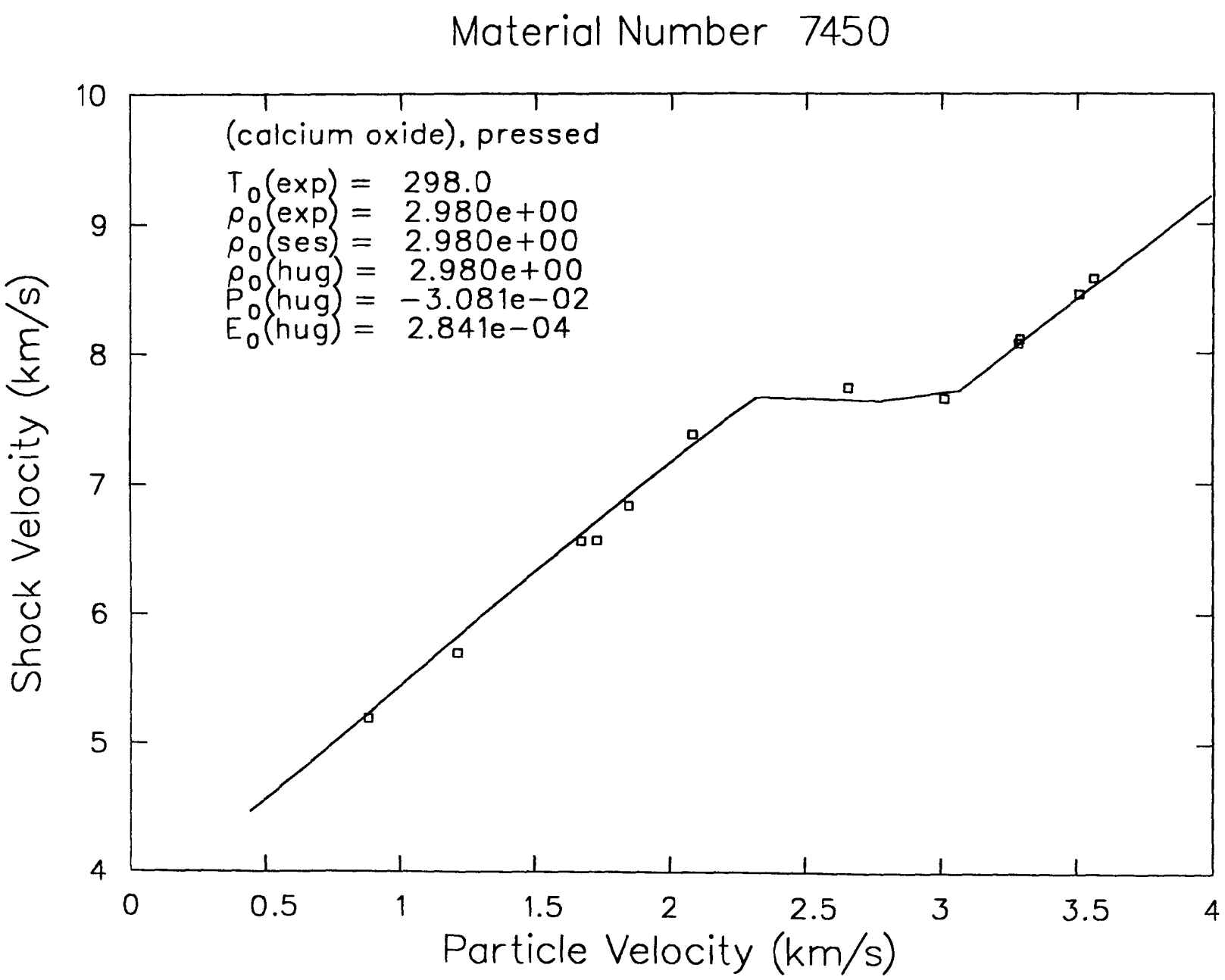
T1 SES2D CRAY 02

7450-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7450
(calcium oxide), pressed
T_0(exp) = 298.0
ρ_0(exp) = 2.980e+00
ρ_0(ses) = 2.980e+00
ρ_0(hug) = 2.980e+00
P_0(hug) = −3.081e−02
E_0(hug) = 2.841e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9
8
7
6
5
4
0
0.5
1
1.5
2
2.5
3
3.5
4

MATERIAL NUMBER SUMMARY

7460 MATERIAL. PERICLASE

COMP. MGO
ATOMIC NUMBER. 1.0000E+01
ATOMIC MASS. 2.0156E+01
NORMAL DENSITY. 3.5840E+00

GAMMA(COMPUTED). 1.6191

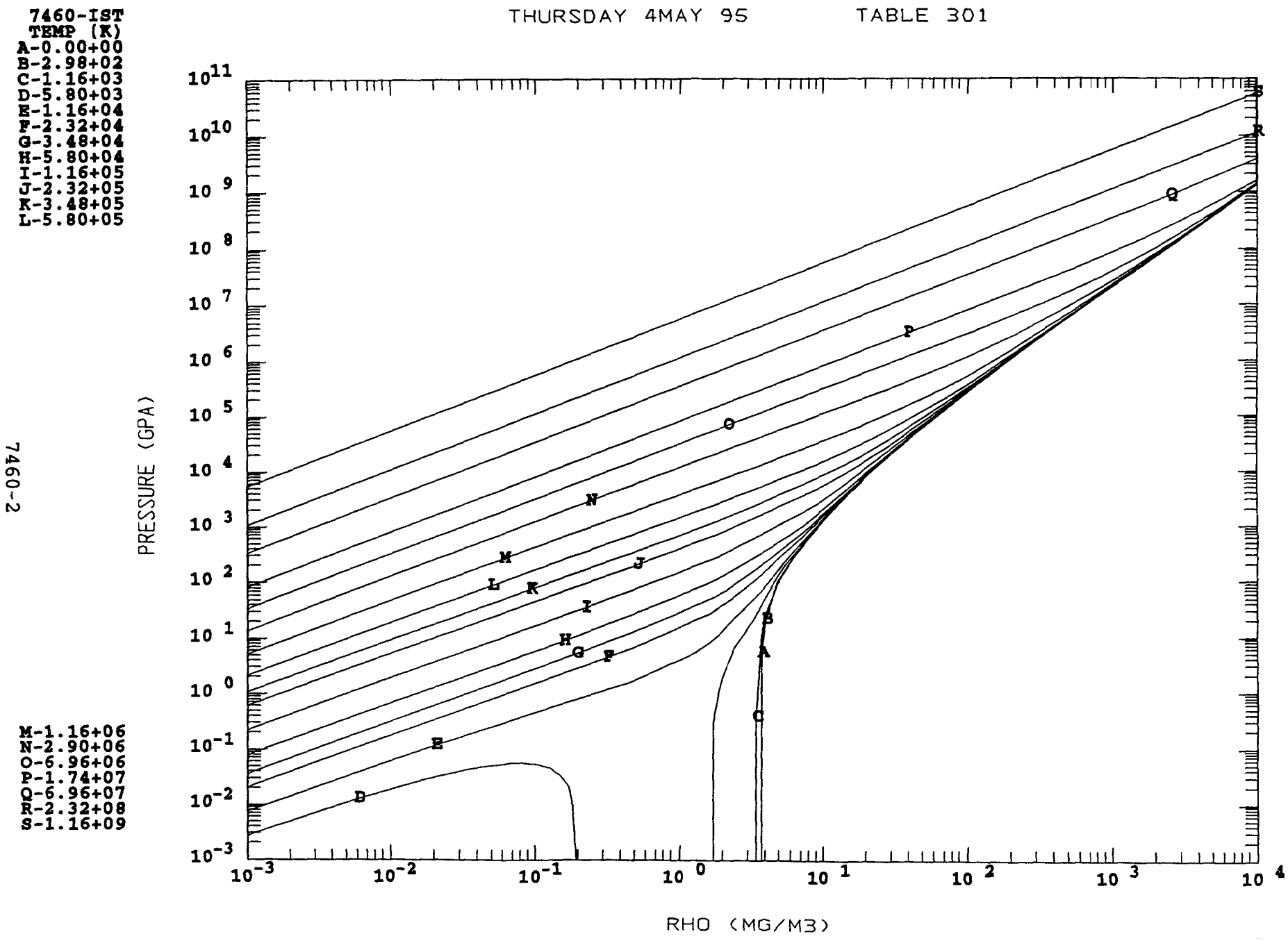
TABLE SUMMARY.

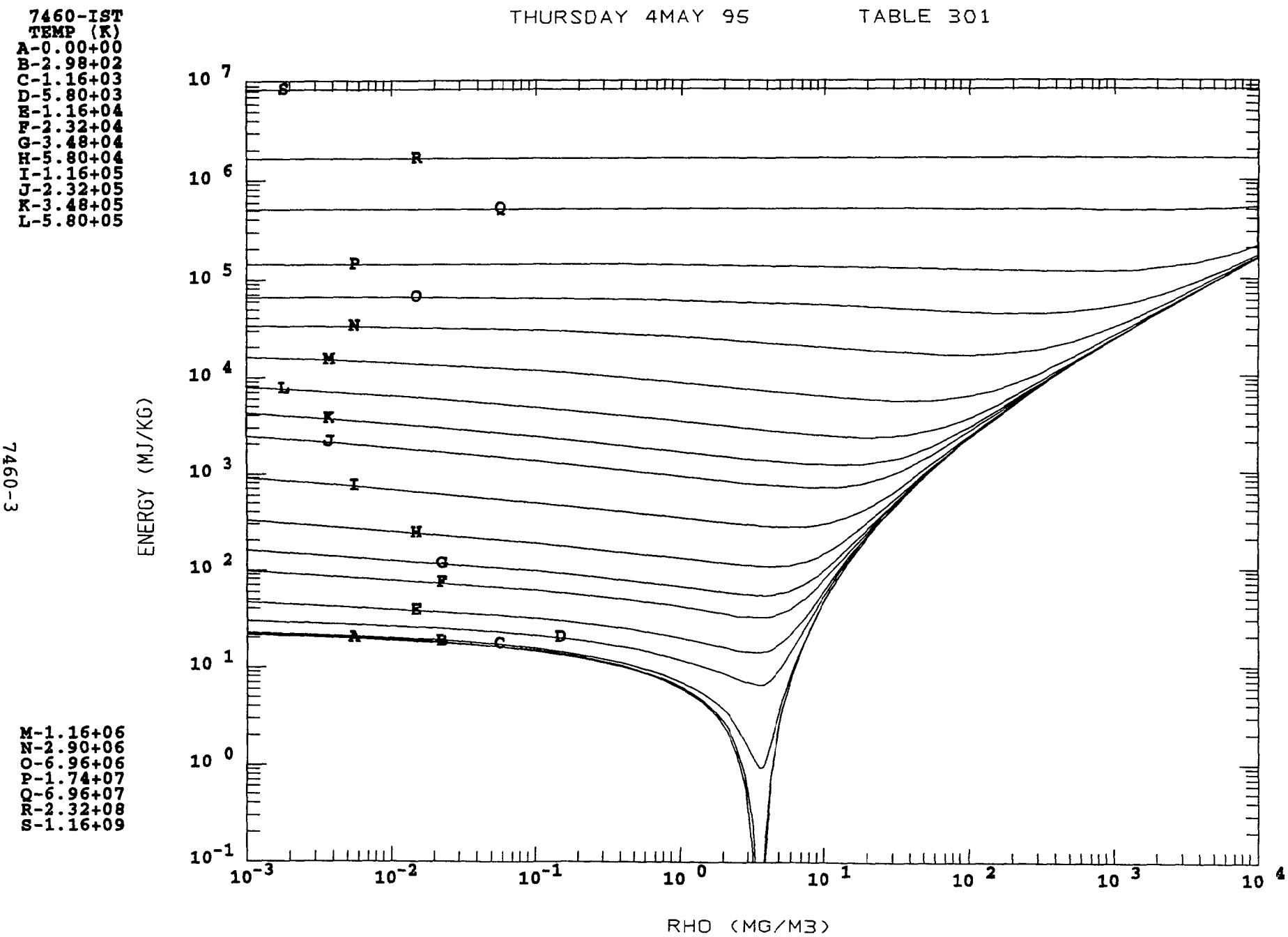
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	62					
201	5					
301	8215	73	37	0.0000E+00	3.5840E-06	7.1680E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7543	67	37	3.5840E-06	7.1680E-06	7.1680E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7655	68	37	3.5840E-06	7.1680E-06	7.1680E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	275	68	1	3.5840E-06	7.1680E-06	7.1680E+04
				0.0000E+00	-5.6669E-11	0.0000E+00
401	65					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JAN 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 122387.
DATE OF LAST UPDATE. 21188.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

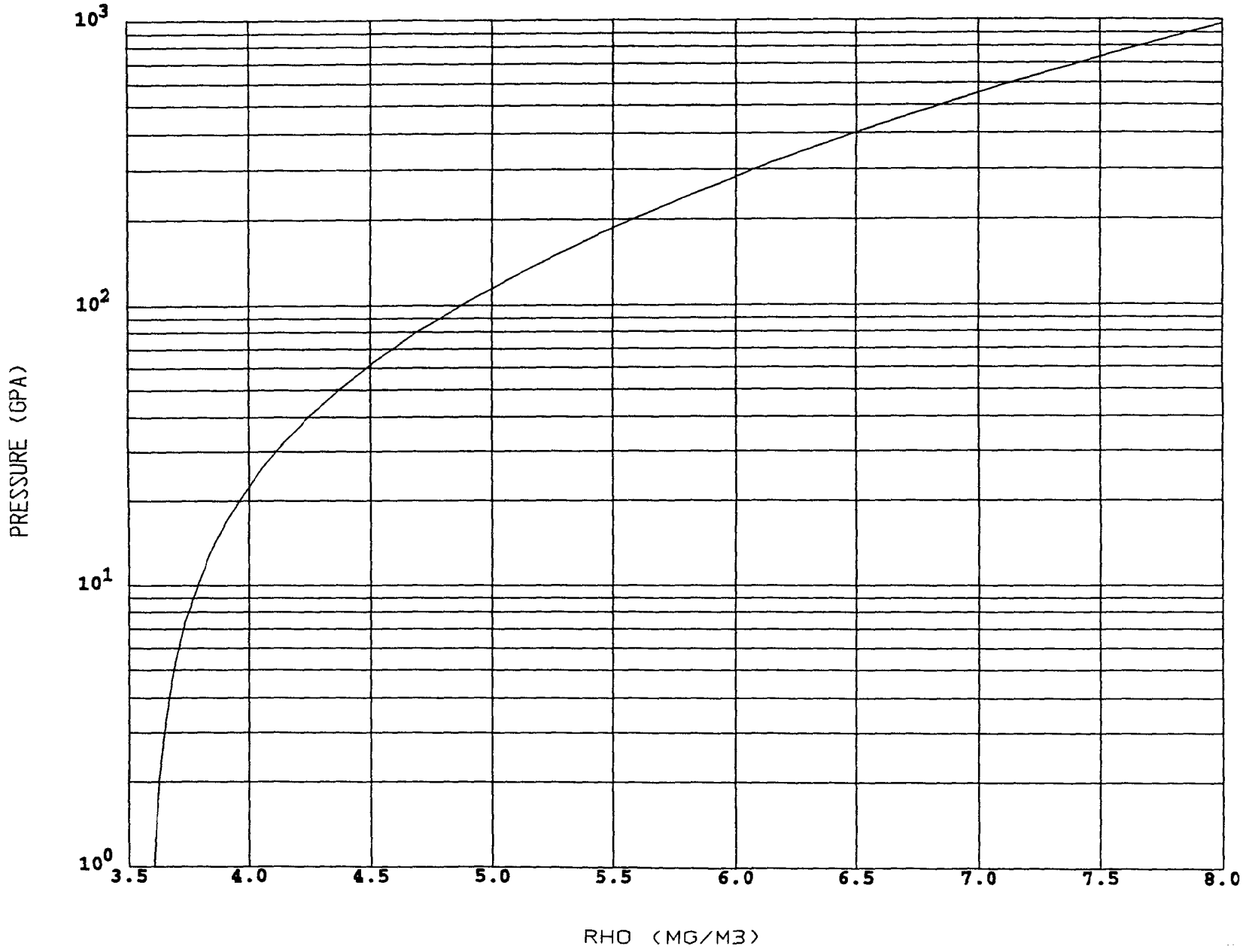
COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN = 1). GAMREF = 1.72, DEBKEL = 938, TMELT = 3125. COLD CURVE FROM SHOCK DATA. US-UP COMPOSED OF ONE STRAIGHT LINE WITH CO = 6.78 AND S = 1.292. CMAT = 1.98, ECOHKC = 118, FACLJ = 0.26. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 7850 K.


7460-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY


7460-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7460-HU1
E0 MJ/KG
0.00+00

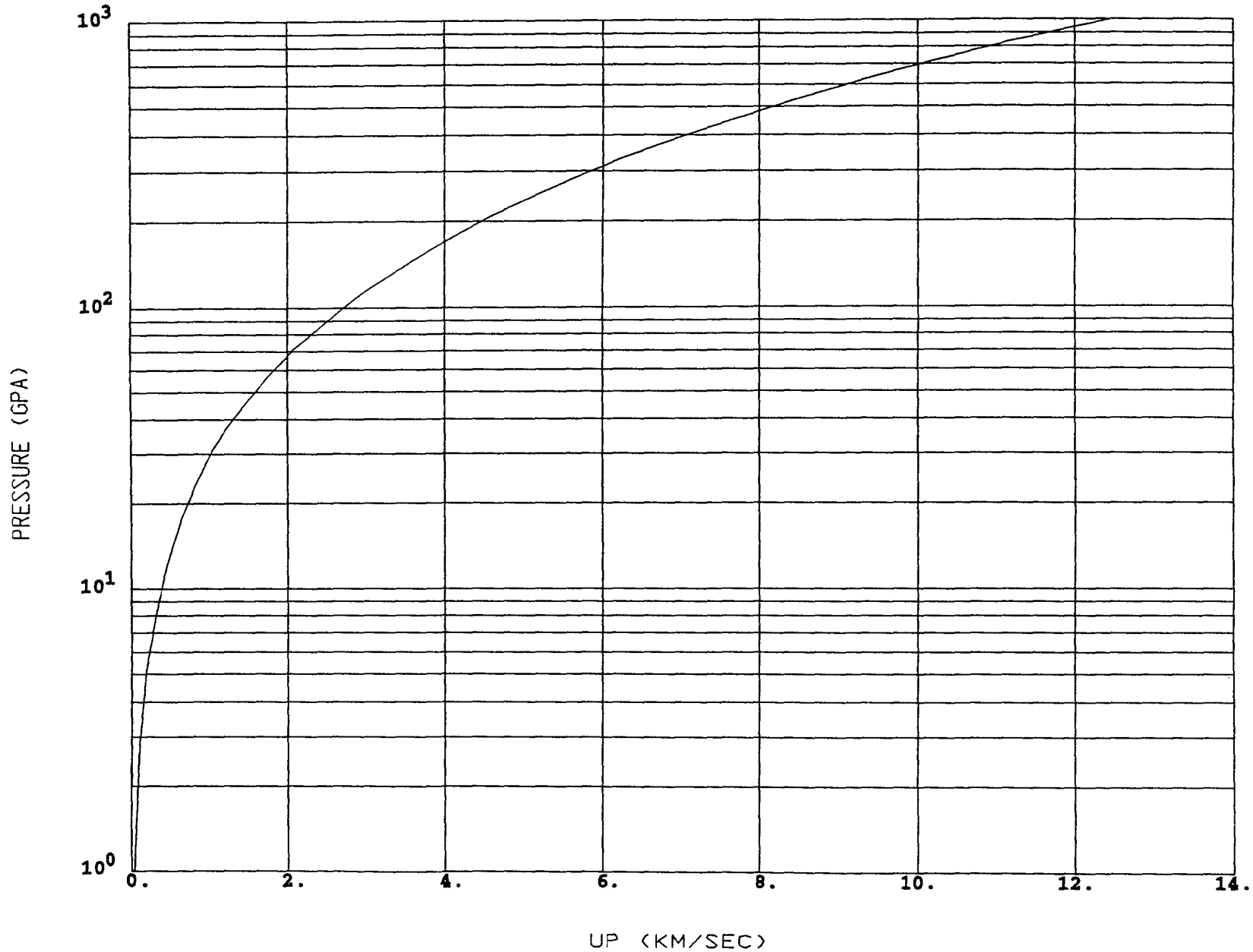
THURSDAY 4MAY 95 TABLE 301



T1 SRS2D CRAY

7460-HU1
E0 MJ/KG
0.00+00

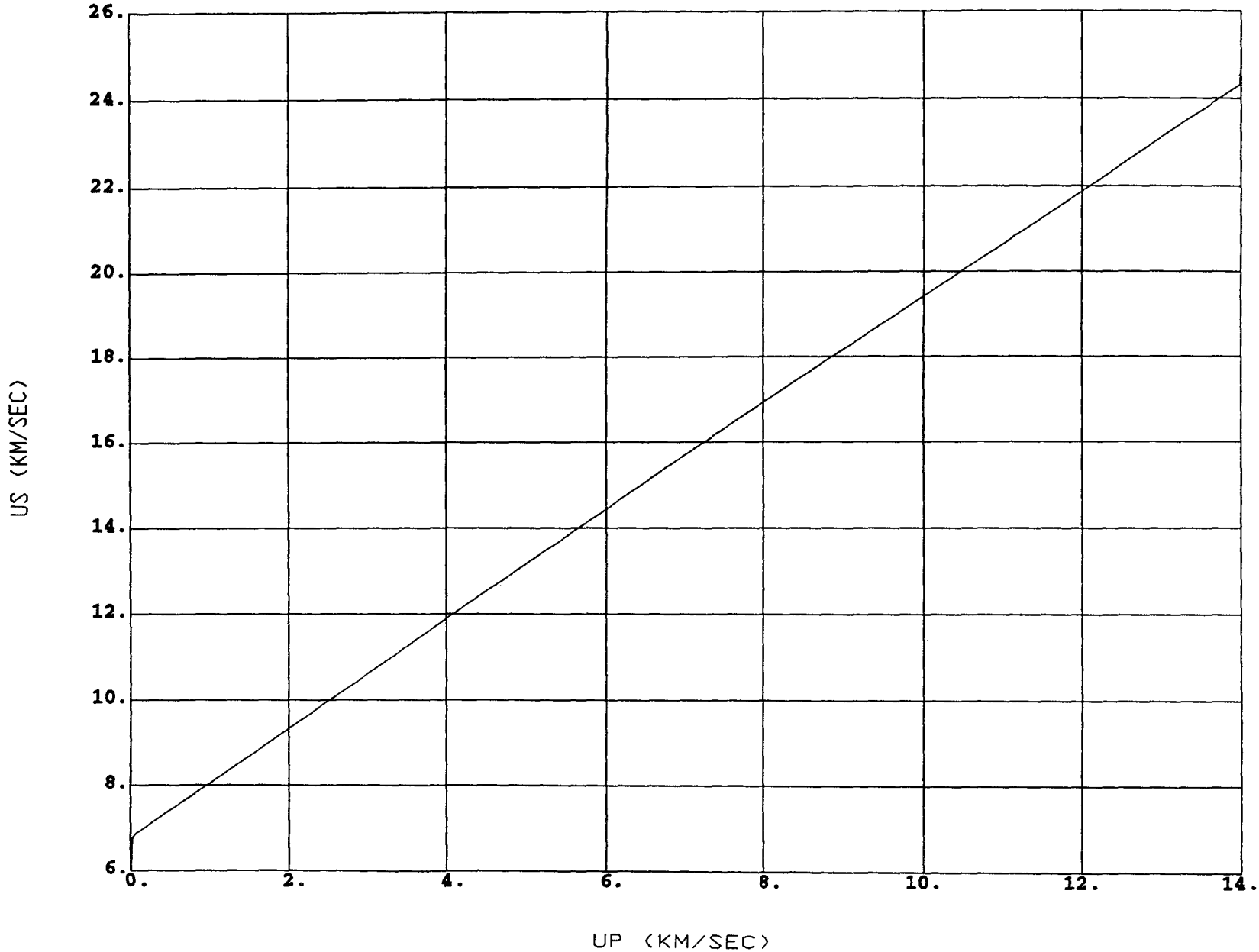
THURSDAY 4MAY 95 TABLE 301



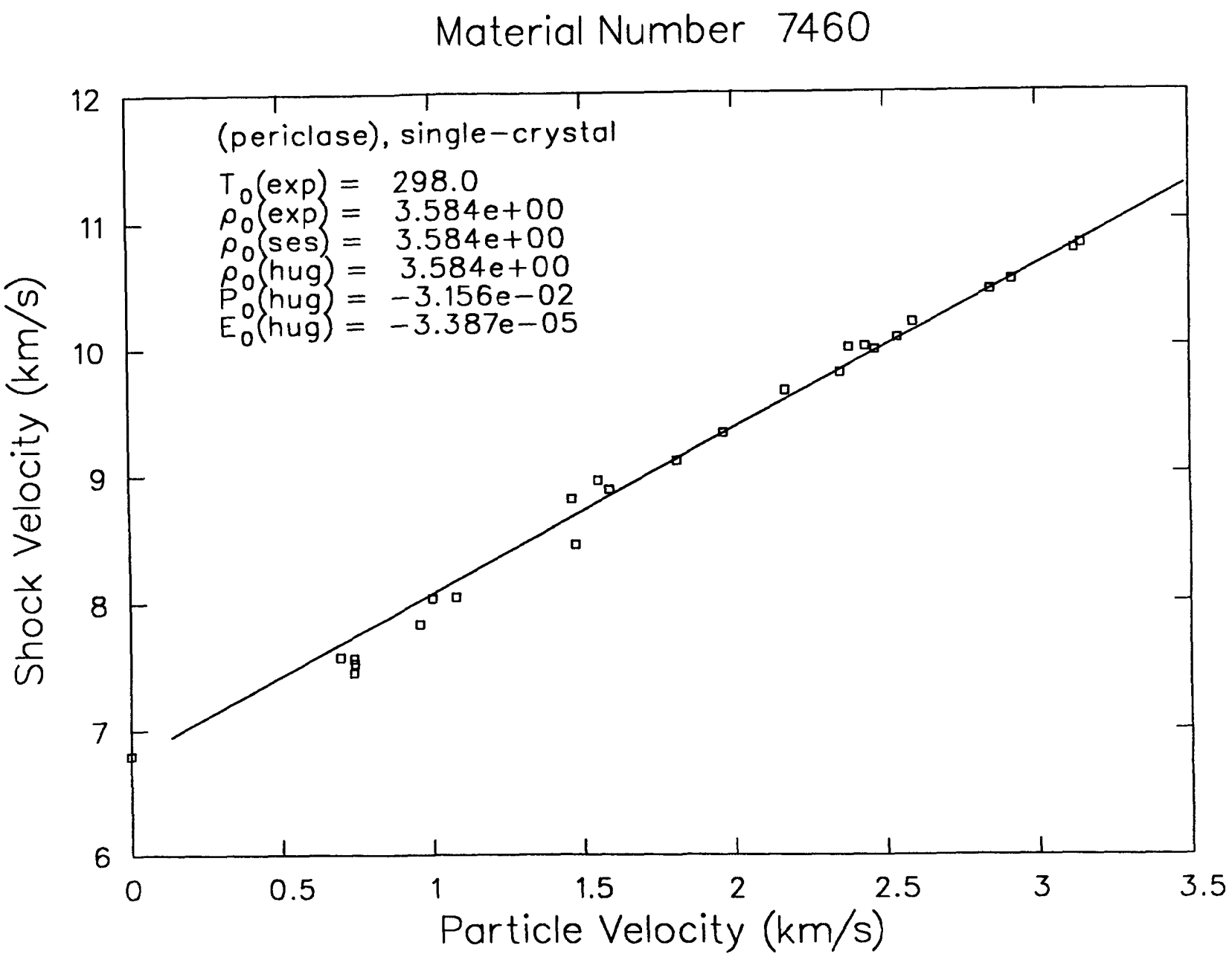
T1 SES2D CRAY 02

7460-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7460
(periclase), single-crystal
T_0(exp) = 298.0
ρ_0(exp) = 3.584e+00
ρ_0(ses) = 3.584e+00
ρ_0(hug) = 3.584e+00
P_0(hug) = -3.156e-02
E_0(hug) = -3.387e-05
Shock Velocity (km/s)
Particle Velocity (km/s)
12
11
10
9
8
7
6
0
0.5
1
1.5
2
2.5
3
3.5

MATERIAL NUMBER SUMMARY

7470 MATERIAL. TITANIUM DIOXIDE (Z=12.667, A=26.633)

COMP. TIO2
ATOMIC NUMBER. 1.2667E+01
ATOMIC MASS. 2.6633E+01
NORMAL DENSITY. 4.2600E+00

GAMMA(COMPUTED). 1.5926

TABLE SUMMARY.

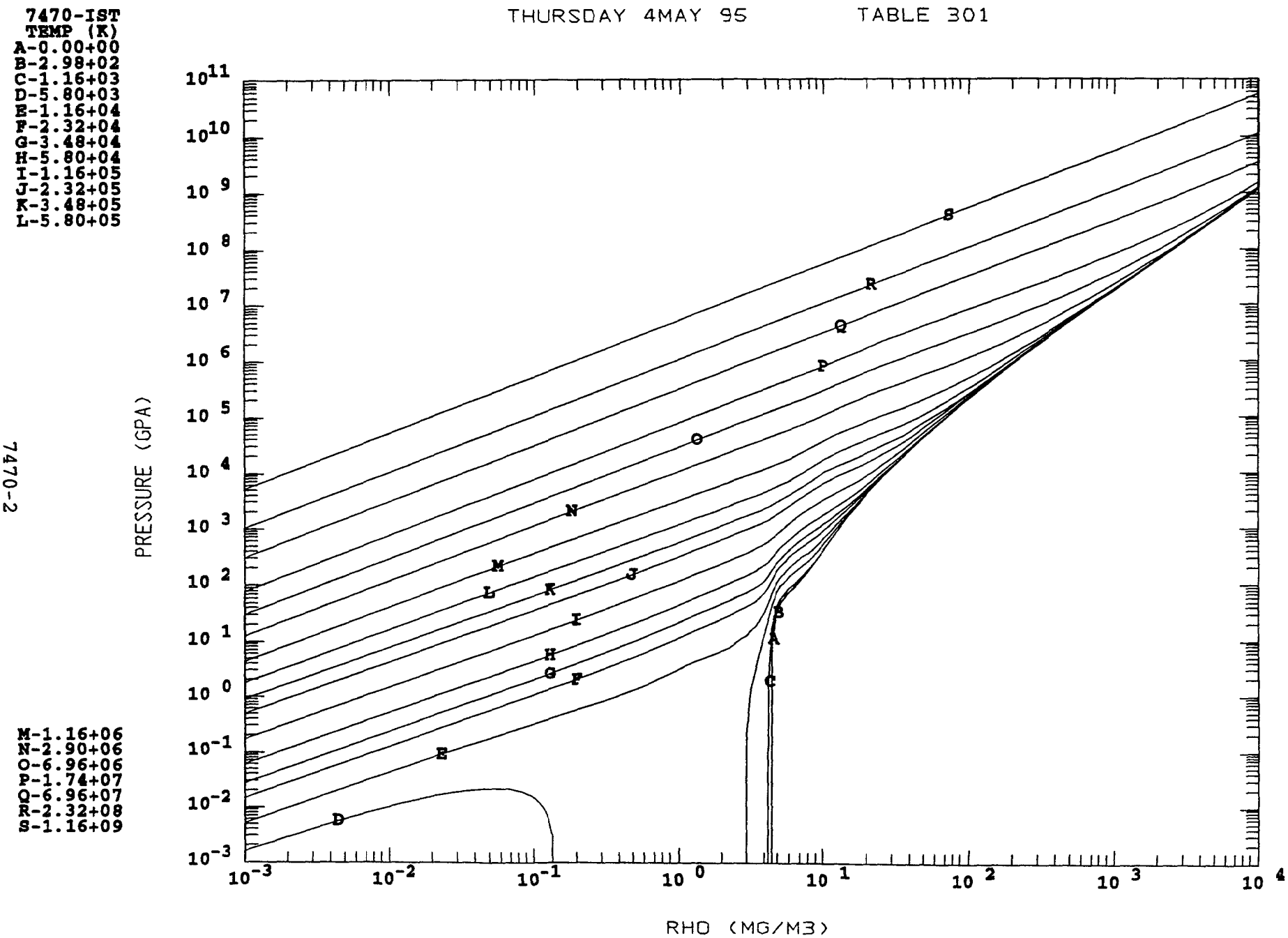
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	17					
102	69					
201	5					
301	7991	71	37	0.0000E+00	4.2600E-06	8.5200E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6535	65	33	4.2600E-06	8.5200E-06	8.5200E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	7879	70	37	4.2600E-06	8.5200E-06	8.5200E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	283	70	1	4.2600E-06	8.5200E-06	8.5200E+04
				0.0000E+00	-1.1157E-10	0.0000E+00
401	65					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

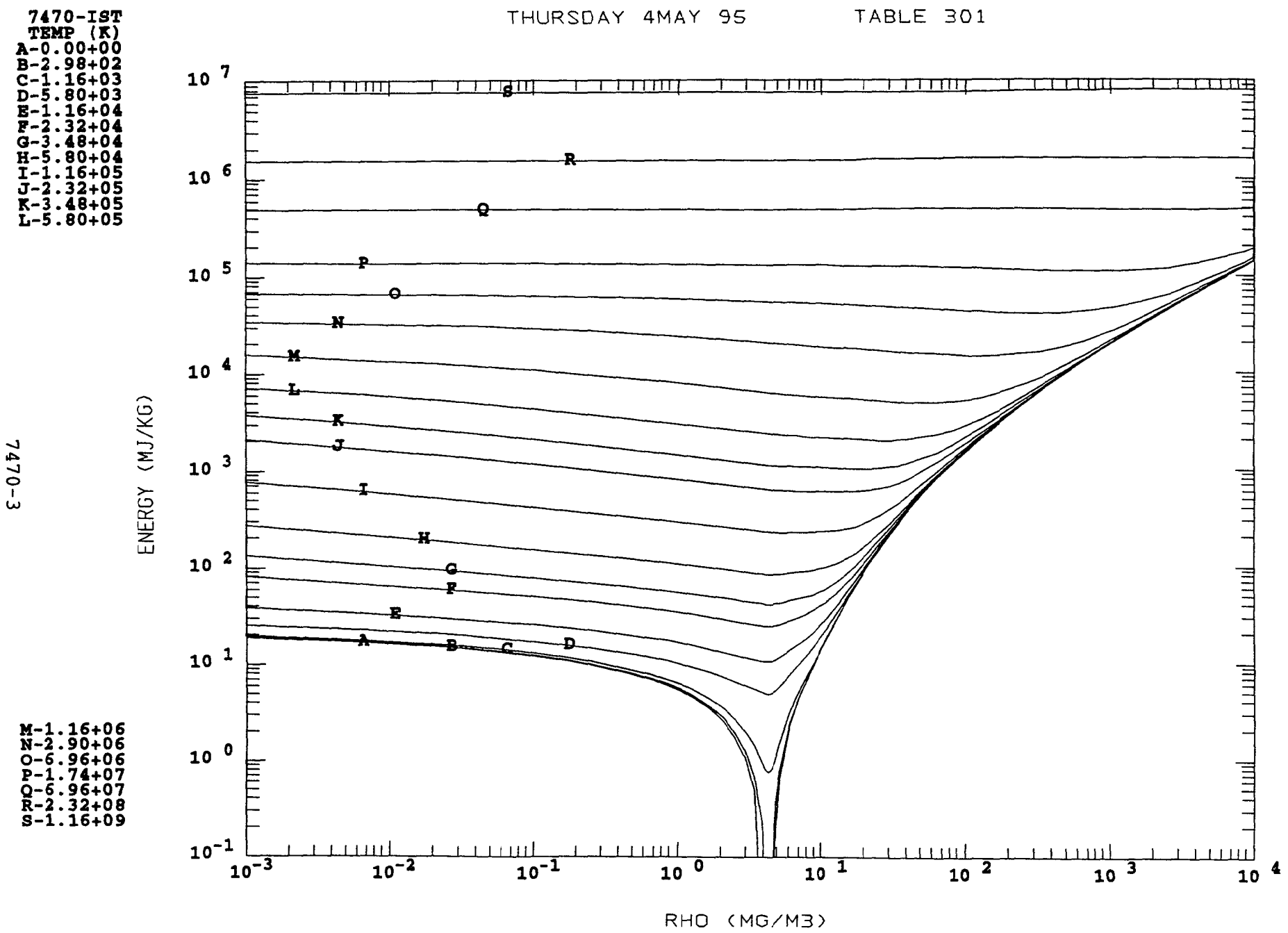
DATE. JAN 90
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 12690.
DATE OF LAST UPDATE. 11593.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTJD GAMMA (IGRUN=7). GAMREF=1.66667, GAMEPS= (0.66667,1.0), DGAMMA=(4.0,2.0), DEBKEL=350, TMELT= 2000. COLD CURVE FROM SHOCK DATA. USUP= (0.0,6.91),(0.951,8.18),(2.838,8.18),(5.0,12.3). ECOHKC=150, FACLJ=0.2, CMAT=1.69. CRITICAL TEMPERATURE IS 7350 KELVIN. 301 TABLE HAS VAN DER WAAL LOOPS. MELT (411,412) TABLES AVAILABLE.

THURSDAY 4MAY 95 TABLE 301

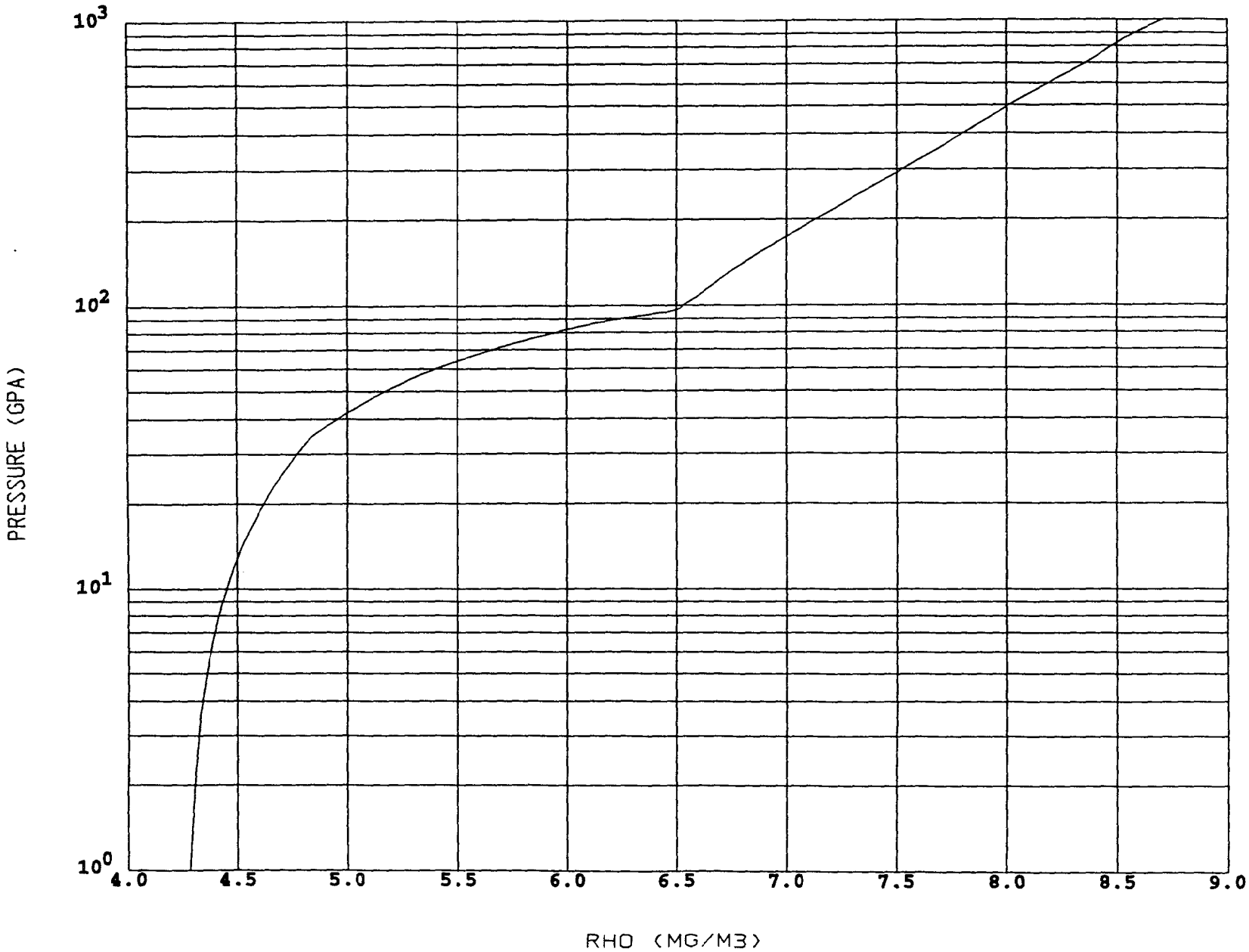


T1 SES2D GRA1


THURSDAY 4MAY 95 TABLE 301
7470-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7470-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301

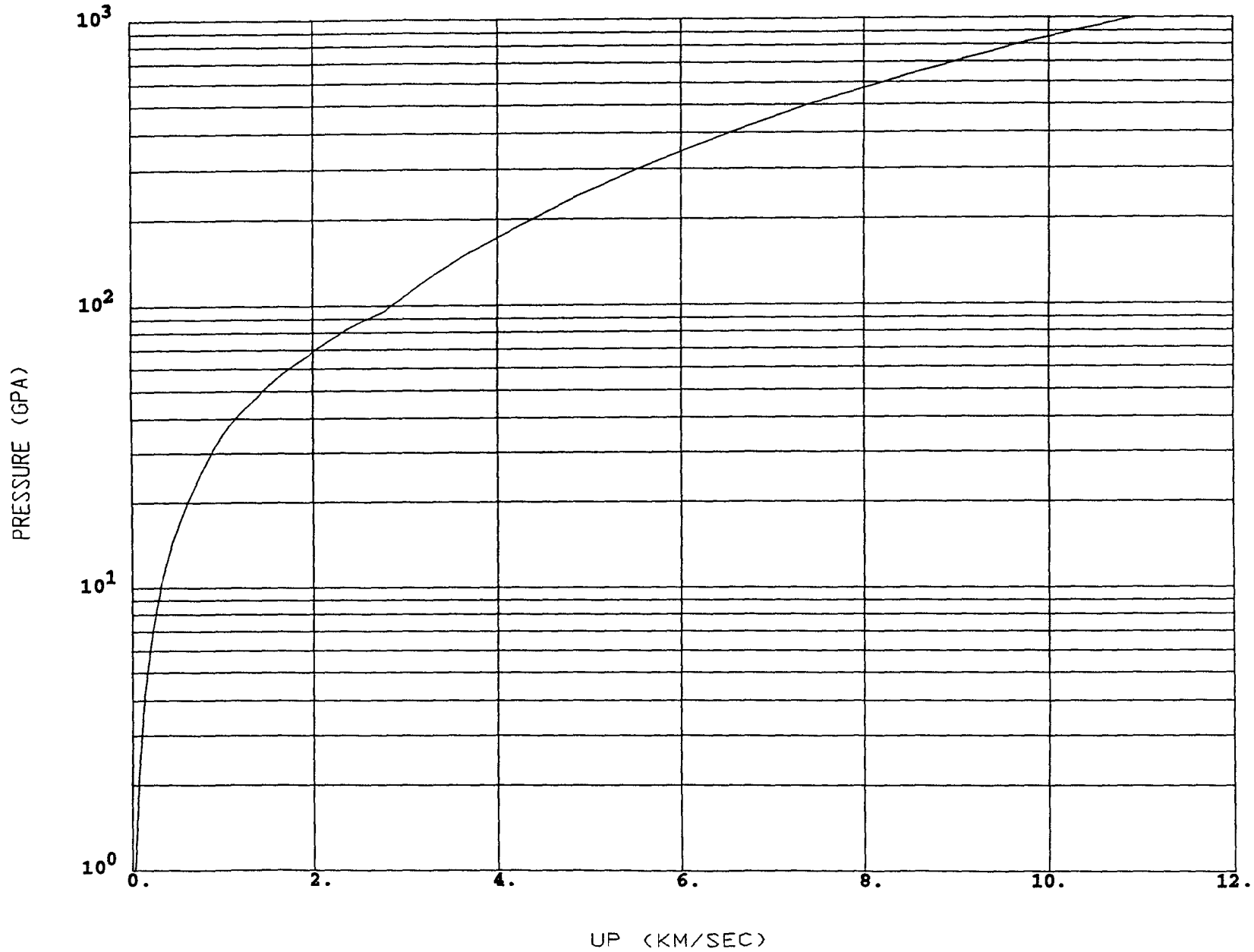


T1 SES2D CRAY

7470-4

7470-HU1
E0 MJ/KG
0.00+00

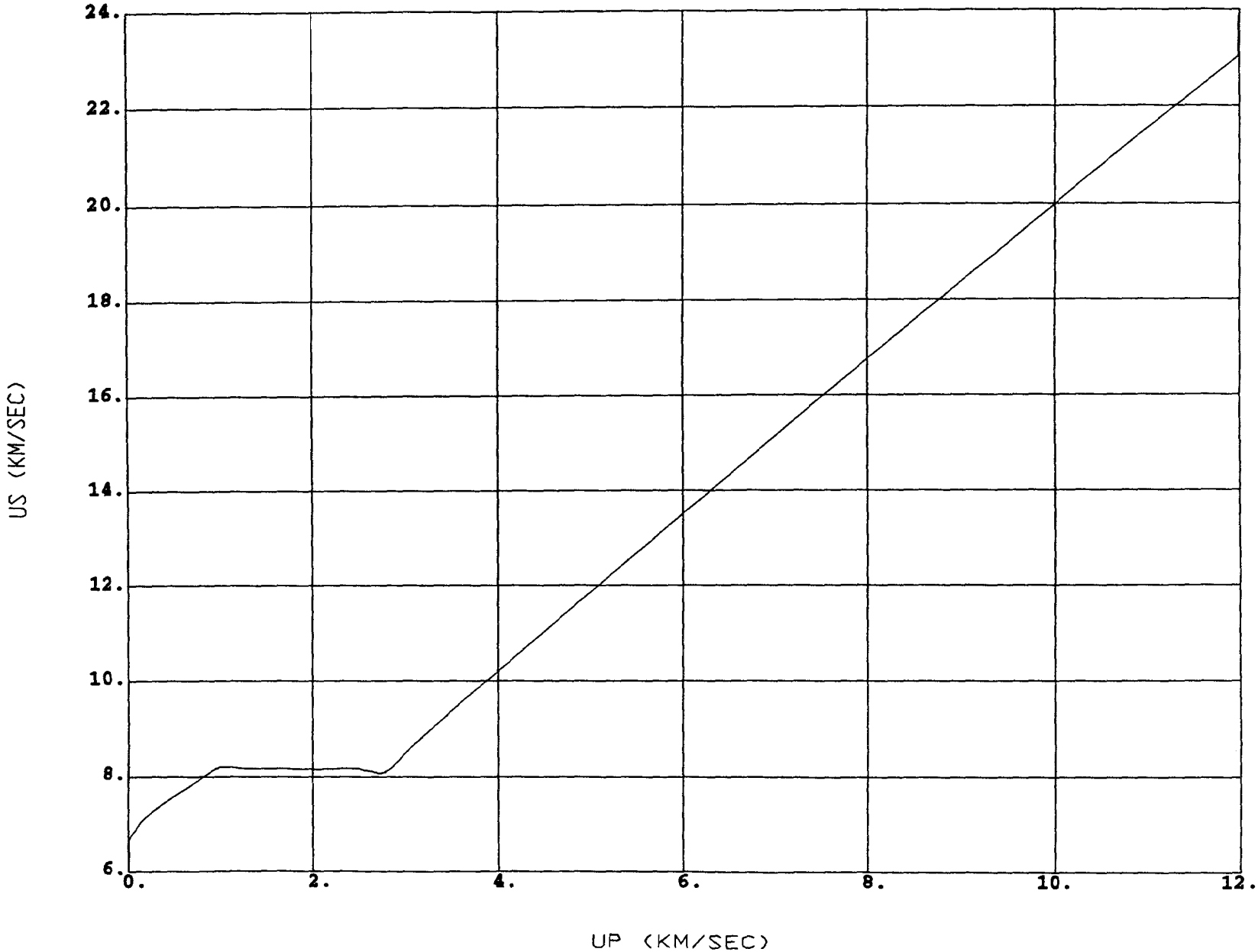
THURSDAY 4MAY 95 TABLE 301



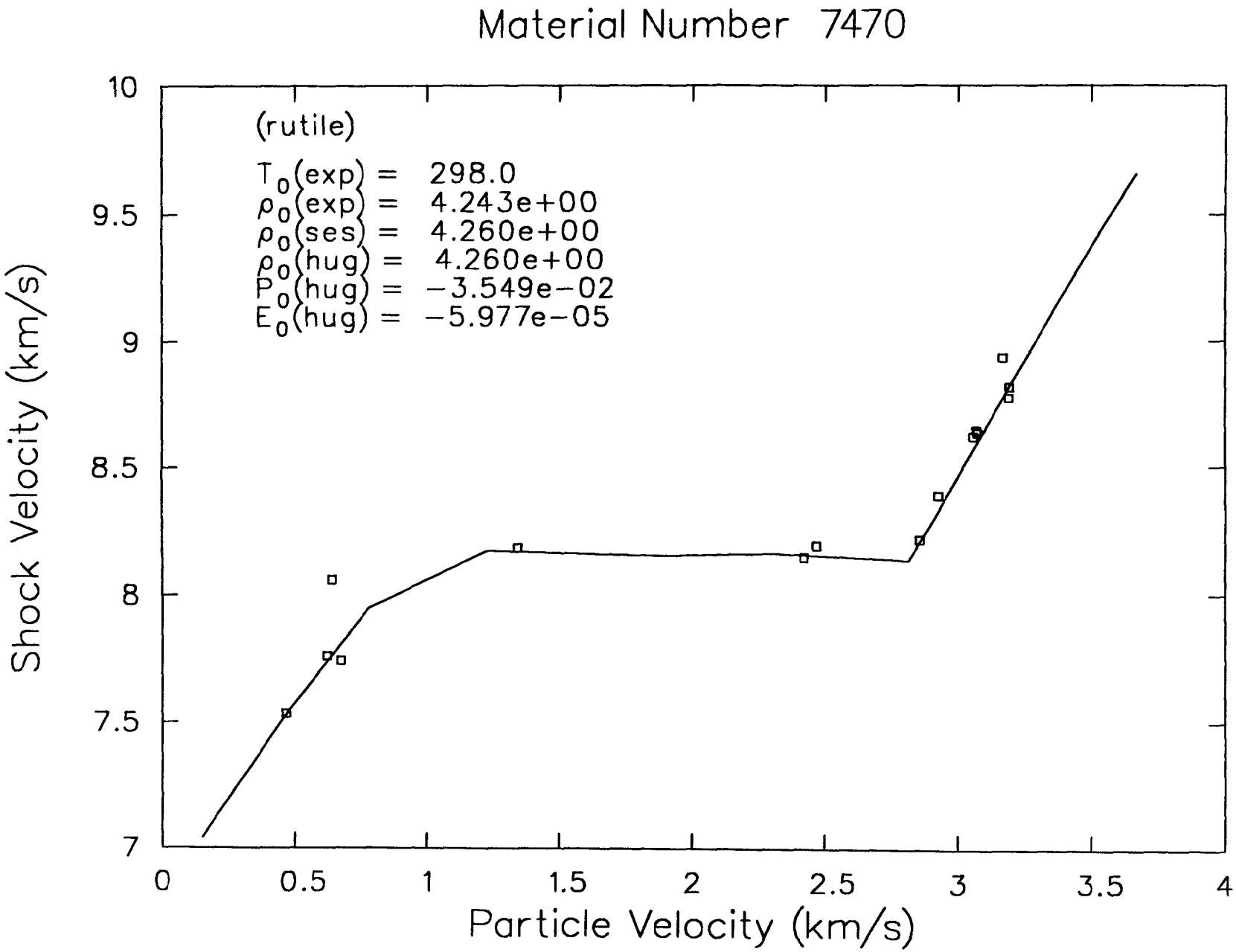
T1 SES2D CRAY 02

7470-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7470
(rutile)
T_0(exp) = 298.0
ρ_0(exp) = 4.243e+00
ρ_0(ses) = 4.260e+00
ρ_0(hug) = 4.260e+00
P_0(hug) = −3.549e−02
E_0(hug) = −5.977e−05
Shock Velocity (km/s)
Particle Velocity (km/s)
10
9.5
9
8.5
8
7.5
7
0
0.5
1
1.5
2
2.5
3
3.5
4

7470-7

MATERIAL NUMBER | SUMMARY

7510 MATERIAL. DOLOMITE

COMP. CAMG(CO3)2
ATOMIC NUMBER. 9.2000E+00
ATOMIC MASS. 1.8440E+01
NORMAL DENSITY. 2.8220E+00

GAMMA(COMPUTED). 1.1211

TABLE SUMMARY.

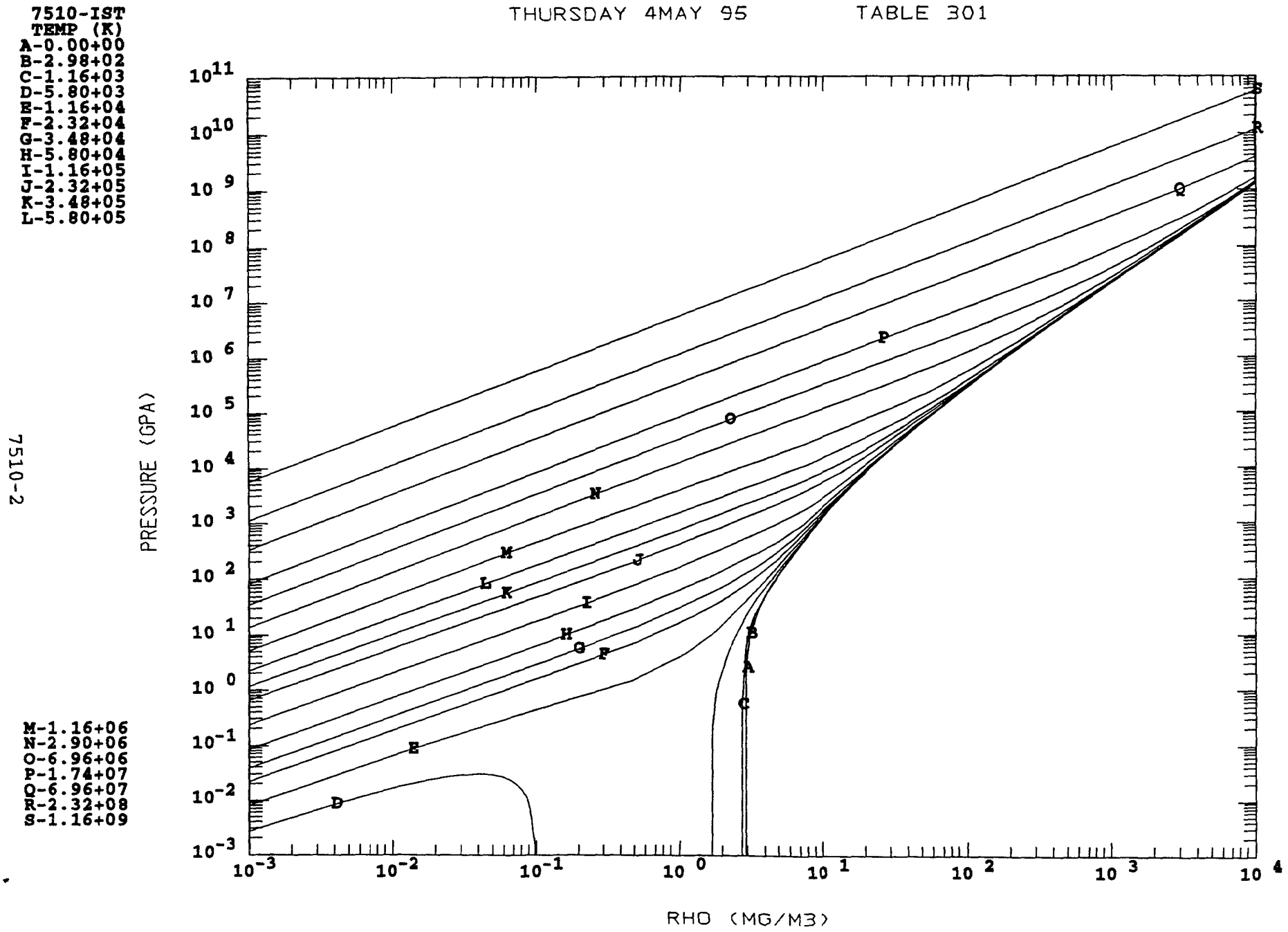
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	61					
201	5					
301	7767	69	37	0.0000E+00	2.8220E-06	5.6440E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7543	67	37	2.8220E-06	5.6440E-06	5.6440E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7655	68	37	2.8220E-06	5.6440E-06	5.6440E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	275	68	1	2.8220E-06	5.6440E-06	5.6440E+04
				0.0000E+00	-6.1804E-11	0.0000E+00
401	65					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

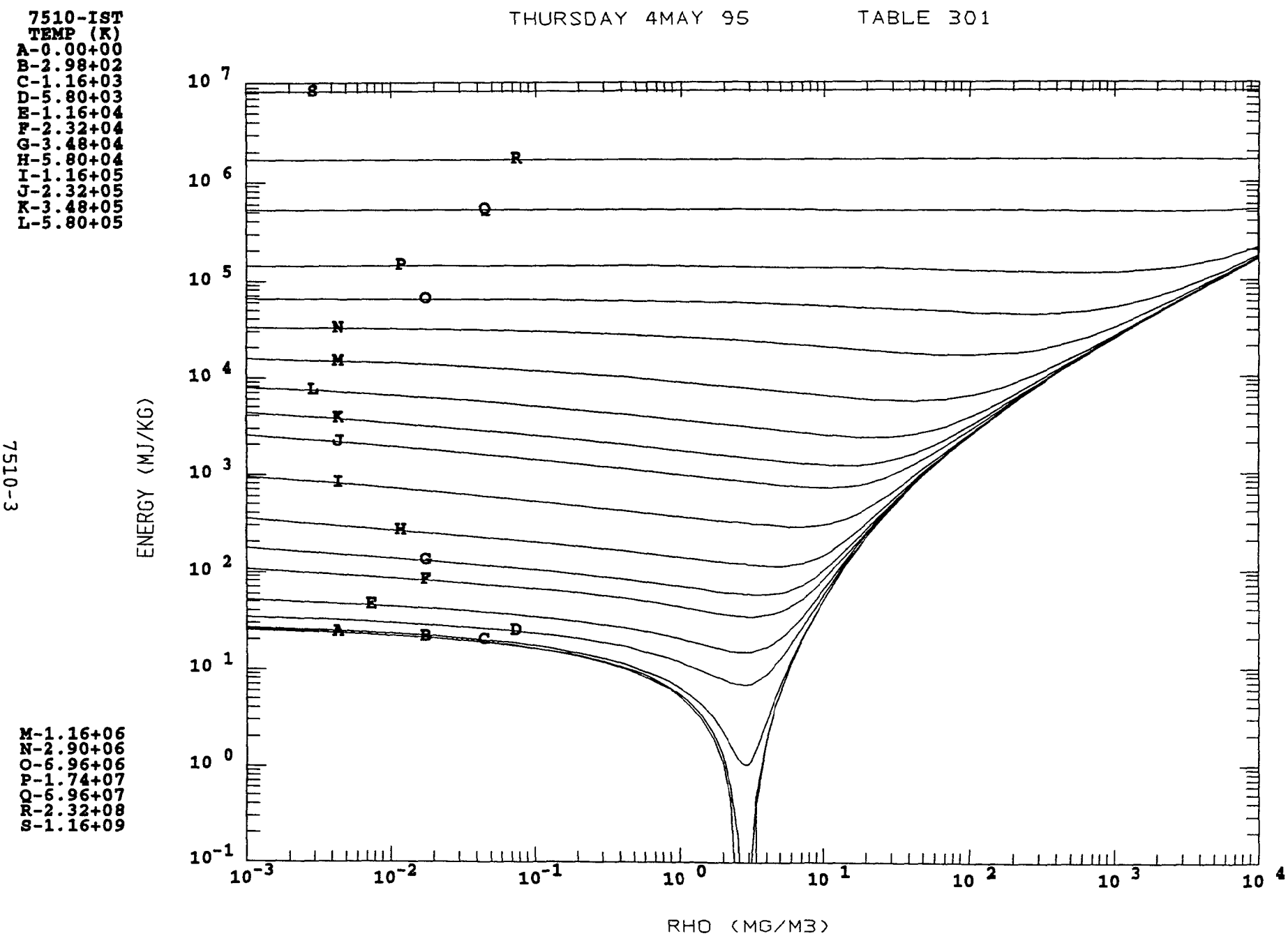
DATE. JAN 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 121487.
DATE OF LAST UPDATE. 20288.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN = 1). GAMREF = 1.2, DEBKEL = 750, TMELT = 1300. COLD CURVE FROM SHOCK DATA. US-UP COMPOSED OF ONE STRAIGHT LINE WITH CO = 5.4 AND S = 1.15. CMAT = 1.70, ECOH = 0.3, FACLJ = 0.25. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 8525 K.

THURSDAY 4MAY 95 TABLE 301

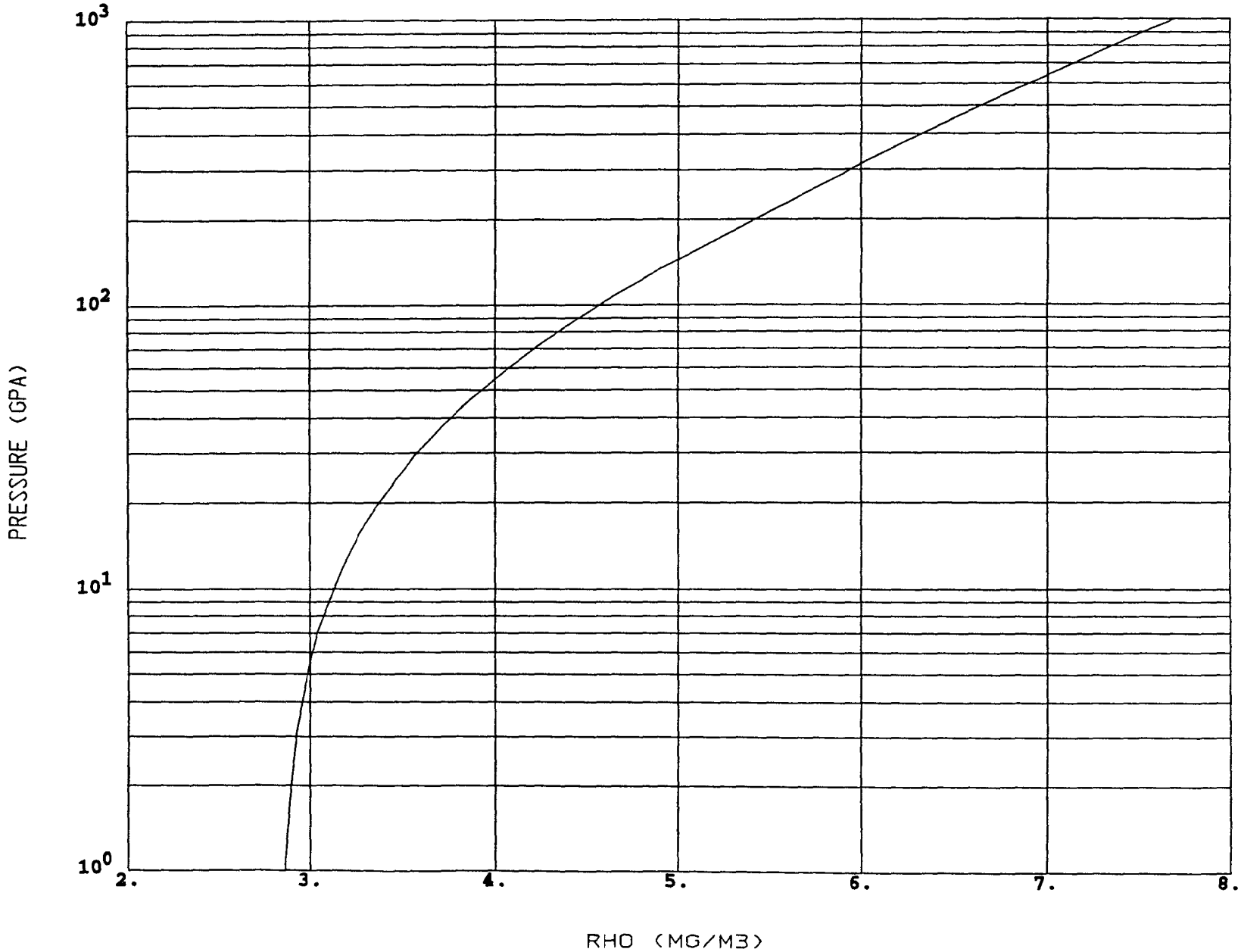


T1 SES2D CRAY


7510-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0
10^-1
10^-3
10^-2
10^-1
10^0
10^1
10^2
10^3
10^4
T1 SES2D CRAY 02

7510-HU1
E0 MJ/KG
0.00+00

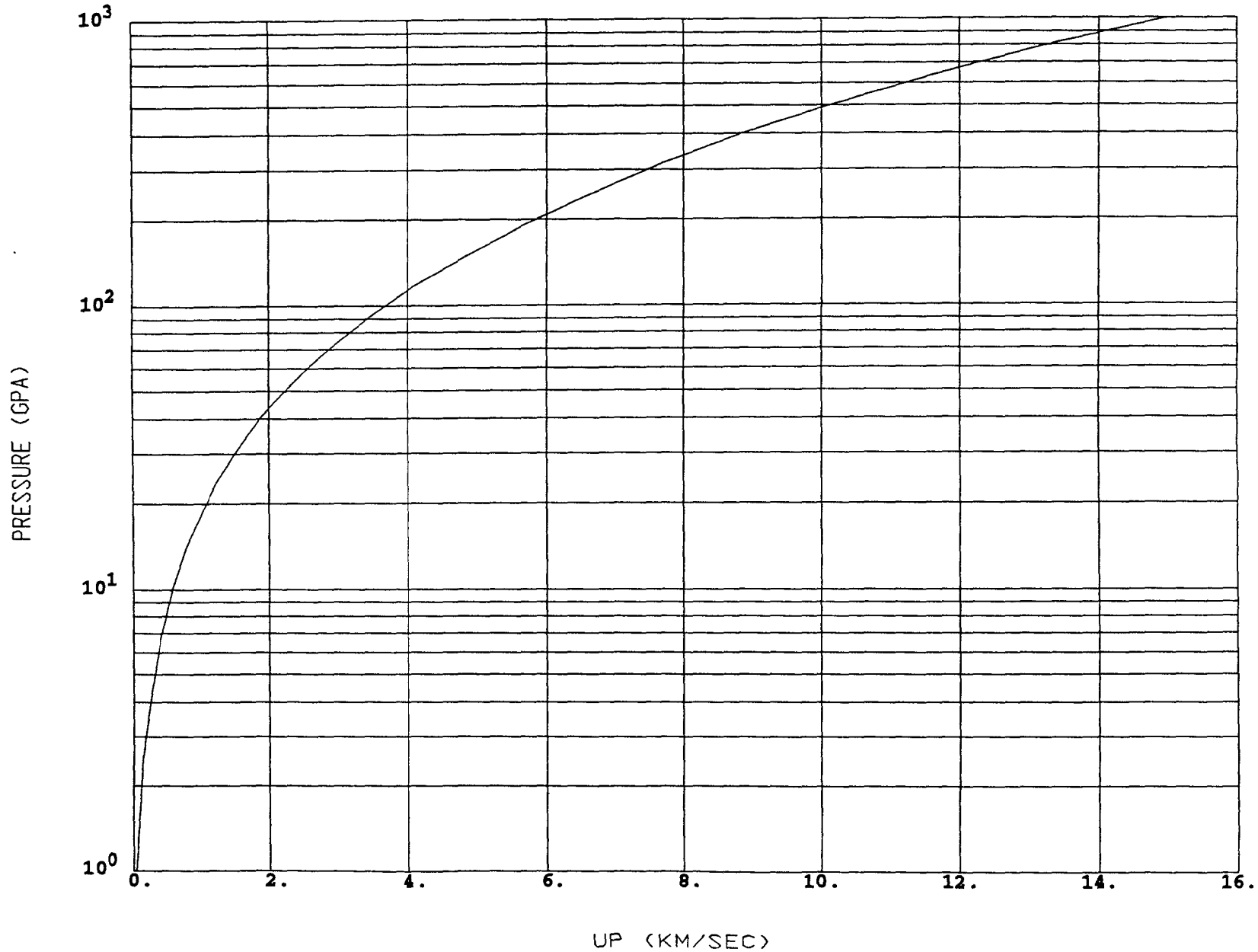
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA

7510-HU1
E0 MJ/KG
0.00+00

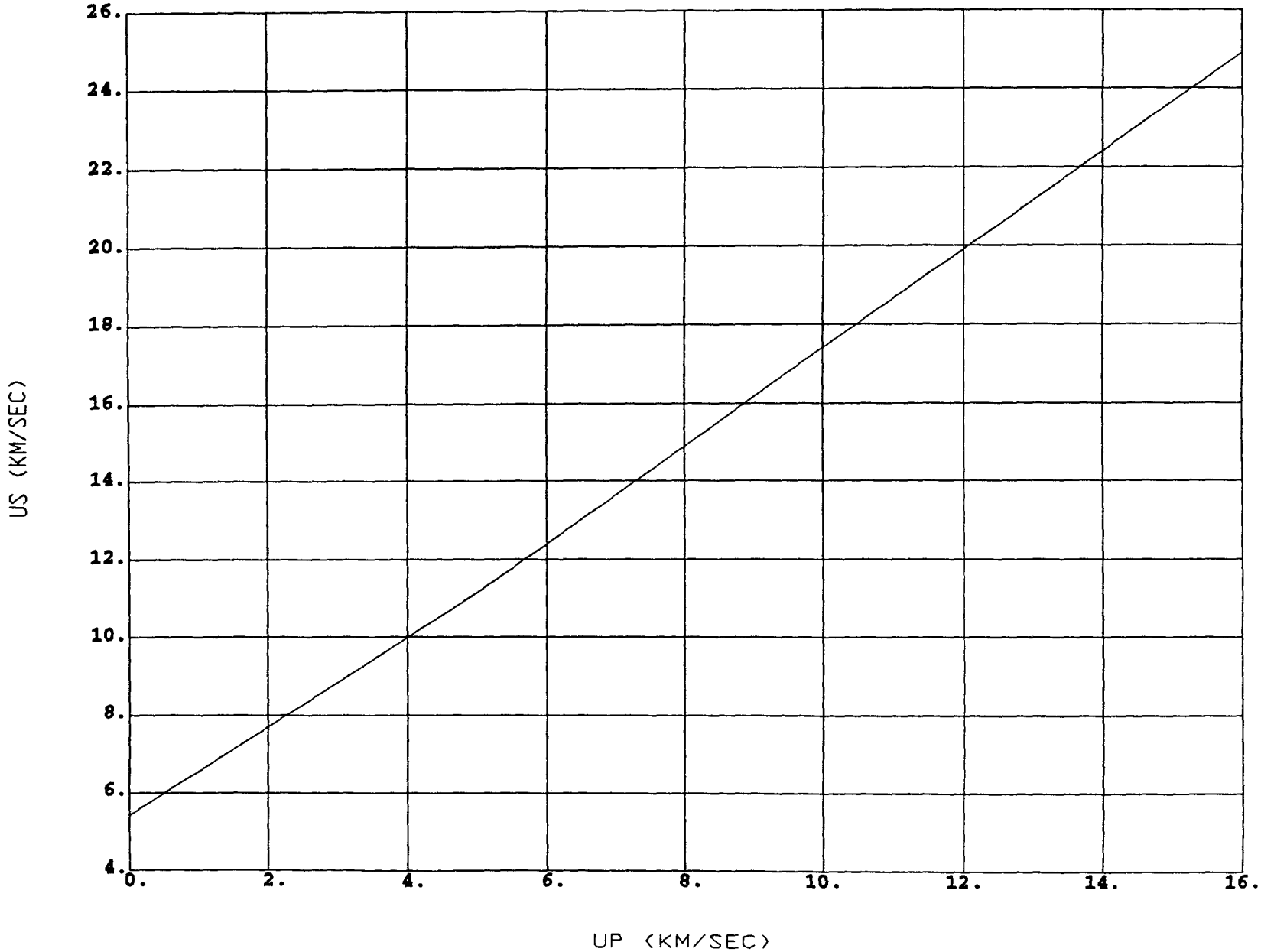
THURSDAY 4MAY 95 TABLE 301



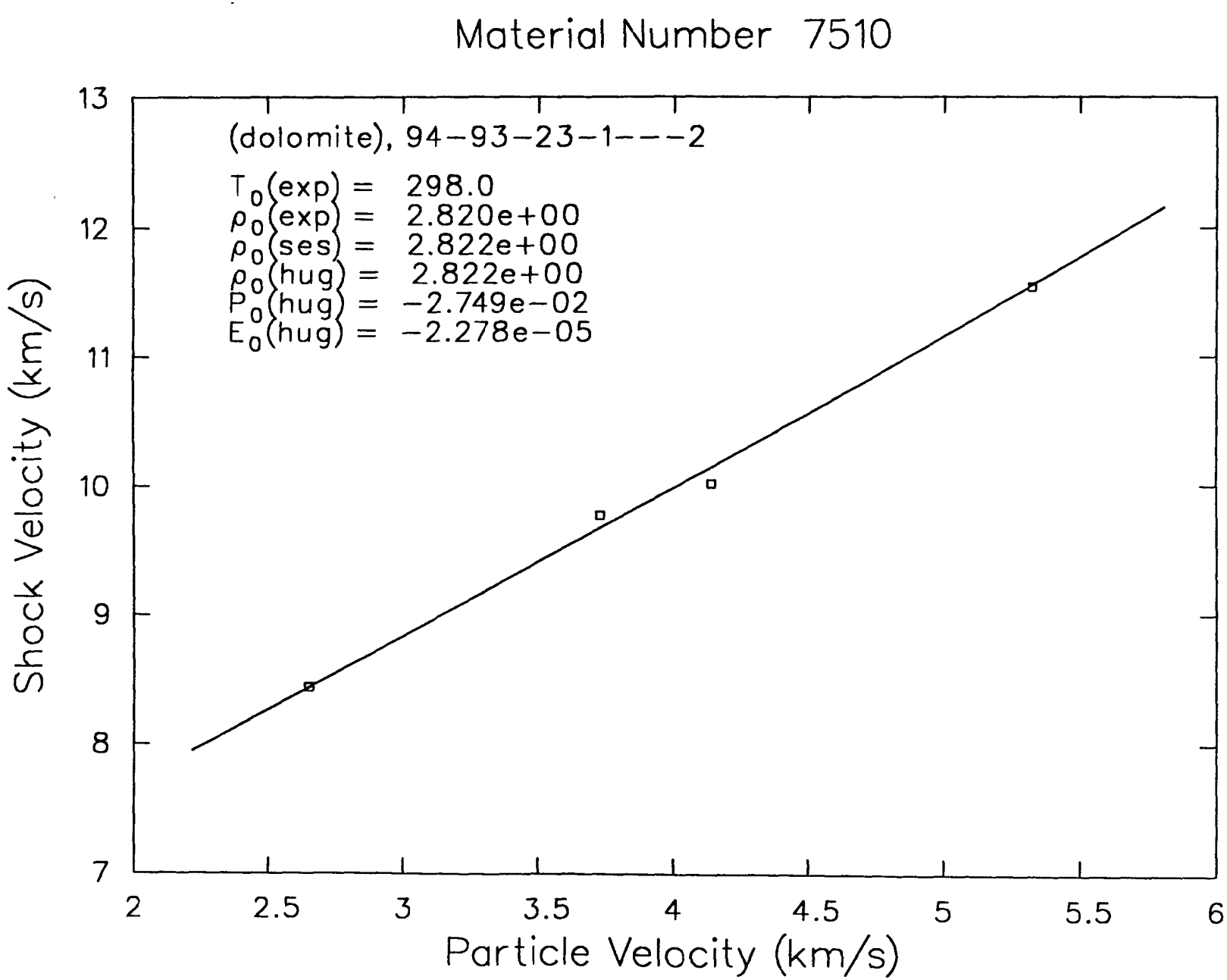
T1 SES2D CRAY 02

7510-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7510
(dolomite), 94-93-23-1---2
T_0(exp) = 298.0
ρ_0(exp) = 2.820e+00
ρ_0(ses) = 2.822e+00
ρ_0(hug) = 2.822e+00
P_0(hug) = -2.749e-02
E_0(hug) = -2.278e-05
Shock Velocity (km/s)
Particle Velocity (km/s)
13
12
11
10
9
8
7
2
2.5
3
3.5
4
4.5
5
5.5
6

MATERIAL NUMBER | SUMMARY

7520 MATERIAL. MICA

COMP. O 56.1 WT%, SI 16.7 WT%, MG 12.6 WT%, AL 7.6 WT%, FE 4.5 WT%, H 2.4 WT%
ATOMIC NUMBER. 6.8697E+00
ATOMIC MASS. 1.3524E+01
NORMAL DENSITY. 2.7000E+00

GAMMA(COMPUTED). 0.0398

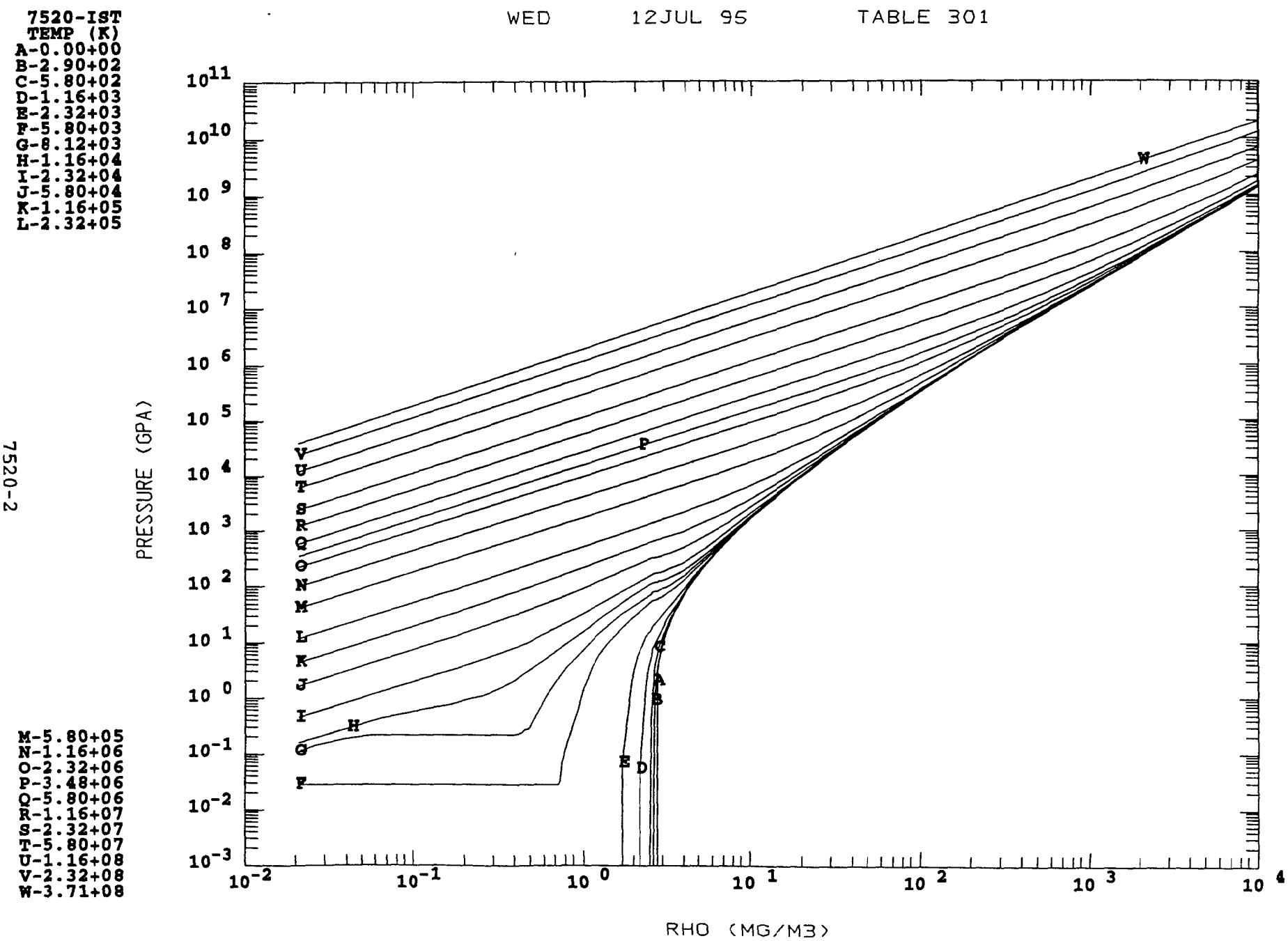
TABLE SUMMARY.

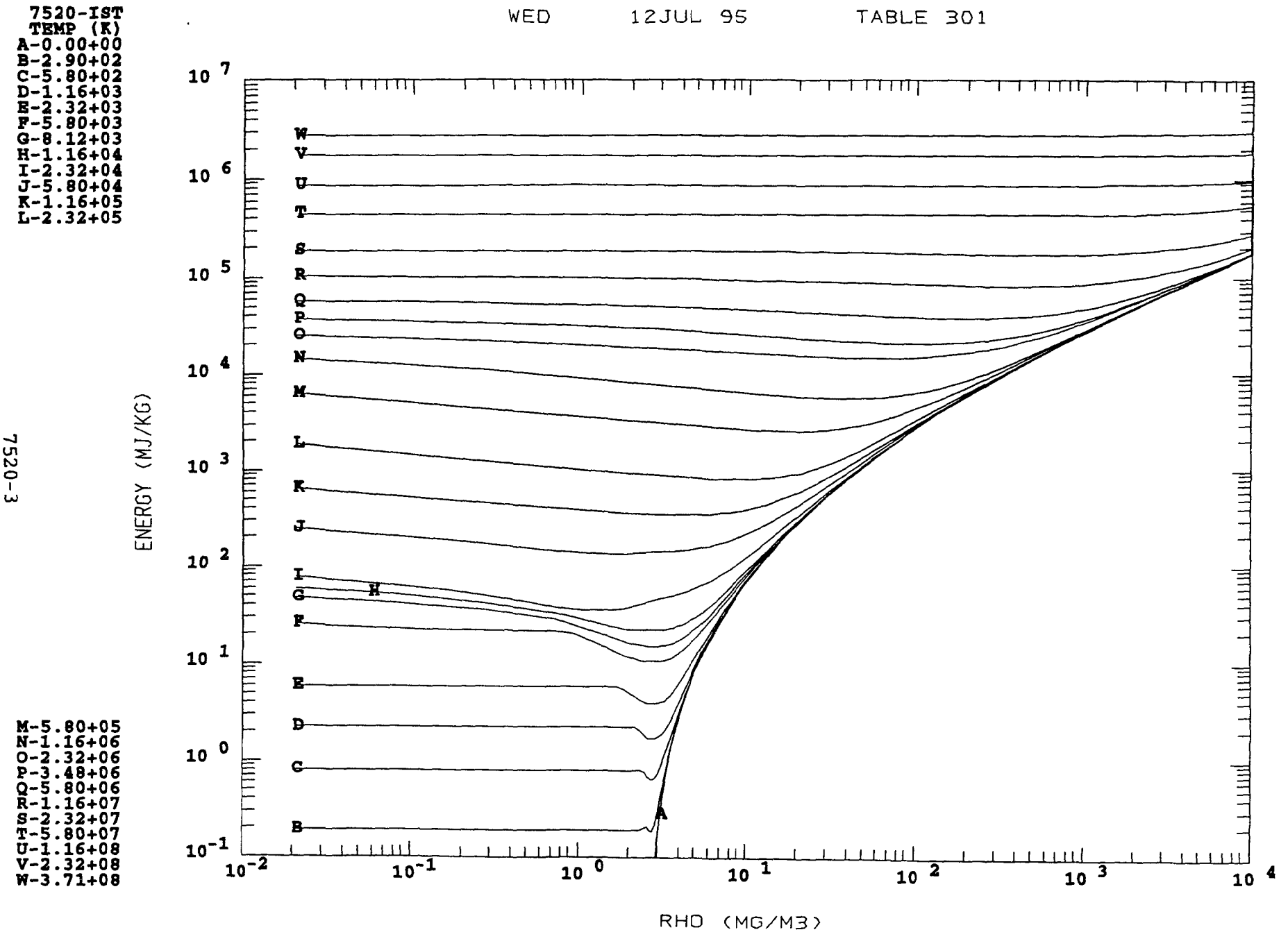
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	25					
102	65					
201	5					
301	4725	100	23	2.1094E-02	4.0246E-02	5.4000E+04
				0.0000E+00	2.5000E-02	3.2000E+04
303	4725	100	23	2.1094E-02	4.0246E-02	5.4000E+04
				0.0000E+00	2.5000E-02	3.2000E+04
304	4725	100	23	2.1094E-02	4.0246E-02	5.4000E+04
				0.0000E+00	2.5000E-02	3.2000E+04
305	4725	100	23	2.1094E-02	4.0246E-02	5.4000E+04
				0.0000E+00	2.5000E-02	3.2000E+04
306	303	100	1	2.1094E-02	4.0246E-02	5.4000E+04
				0.0000E+00	0.0000E+00	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. MAY 74, JAN 79
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 50274.
DATE OF LAST UPDATE. 101582.
SOURCE. J. BARNES, J. ROOD
REFS. NONE
CODES. SESAME I

COMMENTS. THE TWO TEMPERATURE TABLES FOR THIS MATERIAL (TABLES 303-306) ARE A VERY ROUGH APPROXIMATION AND WERE DERIVED FROM THE CODE TWOTEMP (AND NOT FROM THE ORIGINAL EOS CALCULATIONS, WHICH IN MOST CASES ARE NO LONGER REPRODUCIBLE). THE TABLES ARE VERY NOISY DUE BOTH TO NOISE IN THE ORIGINAL DATA (WHICH SHOWS UP WHEN THE COLD CURVE IS SUBTRACTED TO GENERATE THE THERMAL CONTRIBUTION) AND TO THE CONSTRAINT THAT NO CROSSING ISOTHERMS ARE ALLOWED. IF YOU HAVE ANY PROBLEMS USING THESE TABLES, CONTACT BOB ALBERS (T-4).

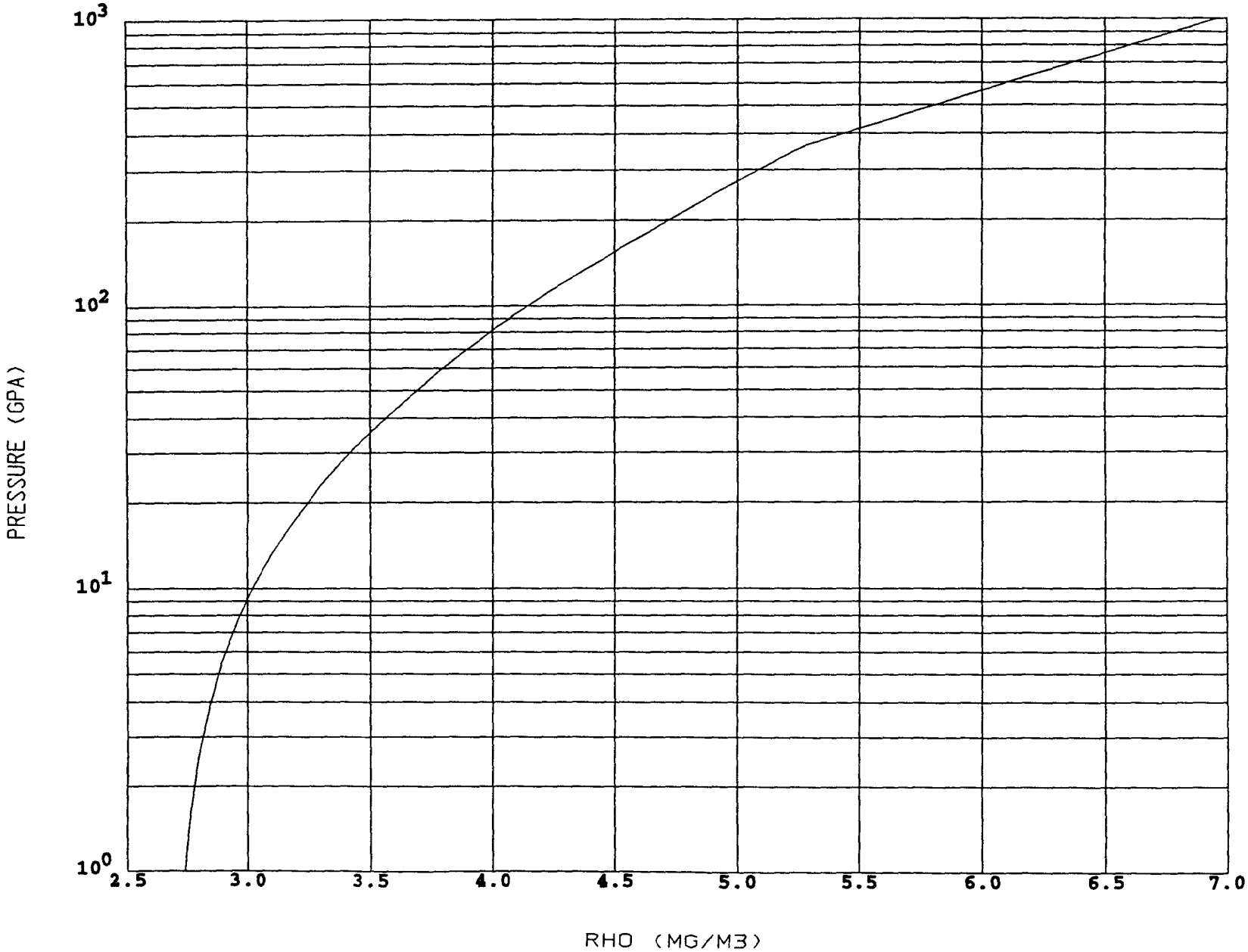

7520-IST
TEMP (K)
A-0.00+00
B-2.90+02
C-5.80+02
D-1.16+03
E-2.32+03
F-5.80+03
G-8.12+03
H-1.16+04
I-2.32+04
J-5.80+04
K-1.16+05
L-2.32+05
M-5.80+05
N-1.16+06
O-2.32+06
P-3.48+06
Q-5.80+06
R-1.16+07
S-2.32+07
T-5.80+07
U-1.16+08
V-2.32+08
W-3.71+08
WED 12JUL 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
10^11
10^10
10^9
10^8
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-3
10^-2
10^-1
10^0
10^1
10^2
10^3
10^4
W
P
V
U
T
S
R
Q
O
N
M
L
K
J
I
H
G
F
E
D
C
A
B



T1 SES2D CRAY 02

7520-HU1
E0 MJ/KG
0.00+00

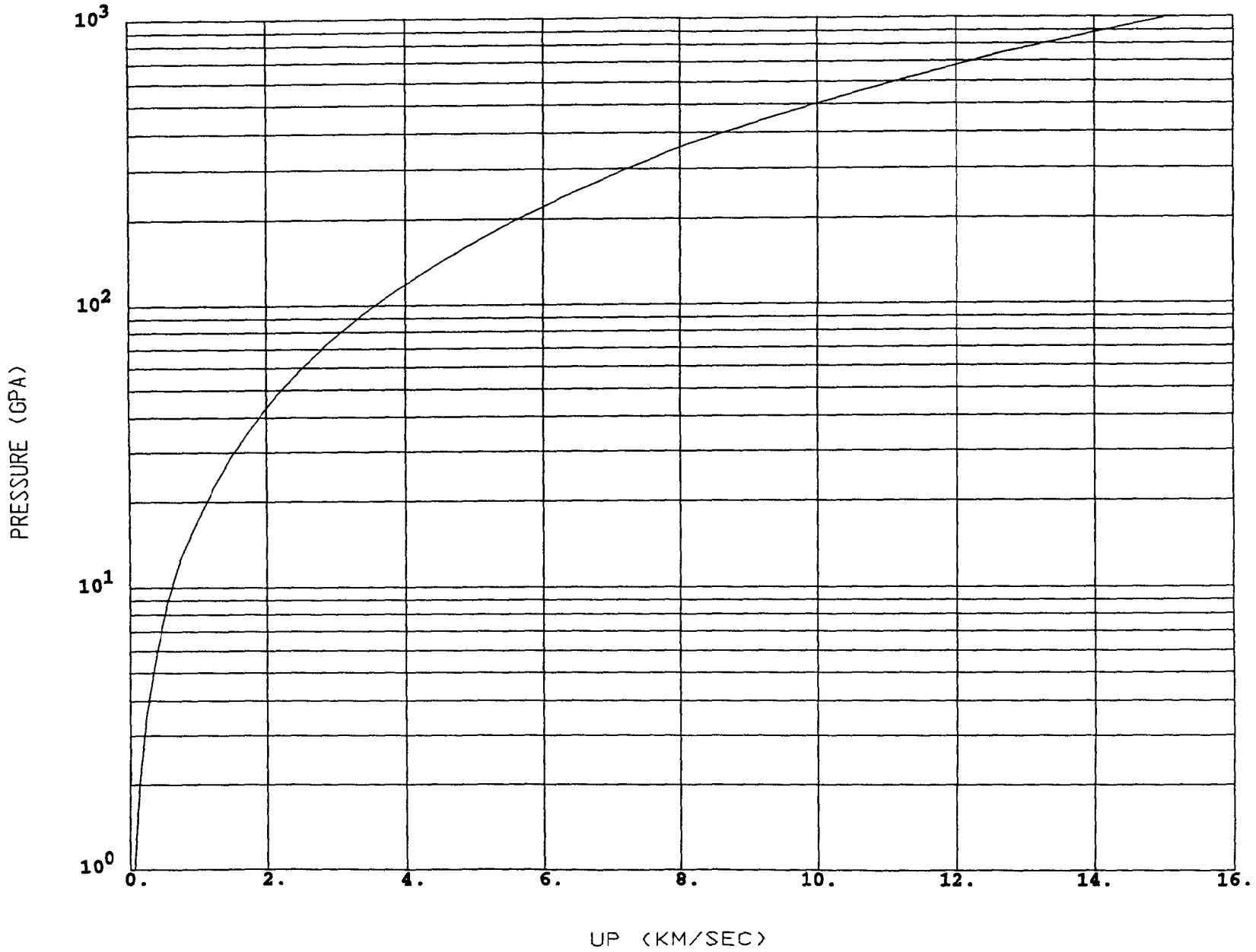
WED 12JUL 95 TABLE 301



T1 SES2D CRAY

7520-HU1
E0 MJ/KG
0.00+00

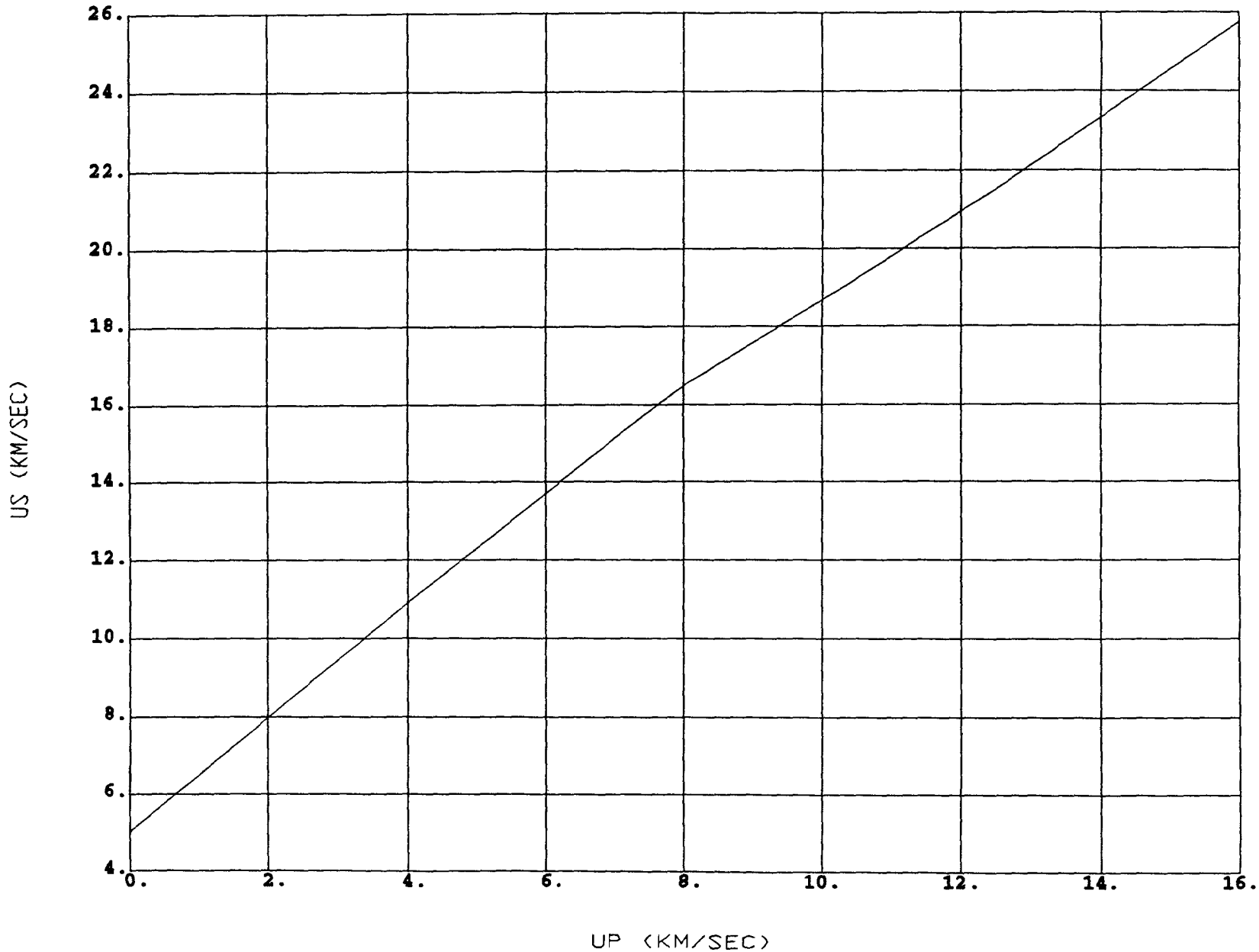
WED 12JUL 95 TABLE 301



T1 SES2D CRAY 02

7520-HU1
E0 MJ/KG
0.00+00

WED 12JUL 95 TABLE 301



T1 SES2D CRAY

MATERIAL NUMBER | SUMMARY

7521 MATERIAL. MUSCOVITE (MICA)

COMP. (K.92NA.08)AL3SI3O10(OH)2
ATOMIC NUMBER. 9.3987E+00
ATOMIC MASS. 1.8907E+01
NORMAL DENSITY. 2.8350E+00

GAMMA(COMPUTED). 0.7152

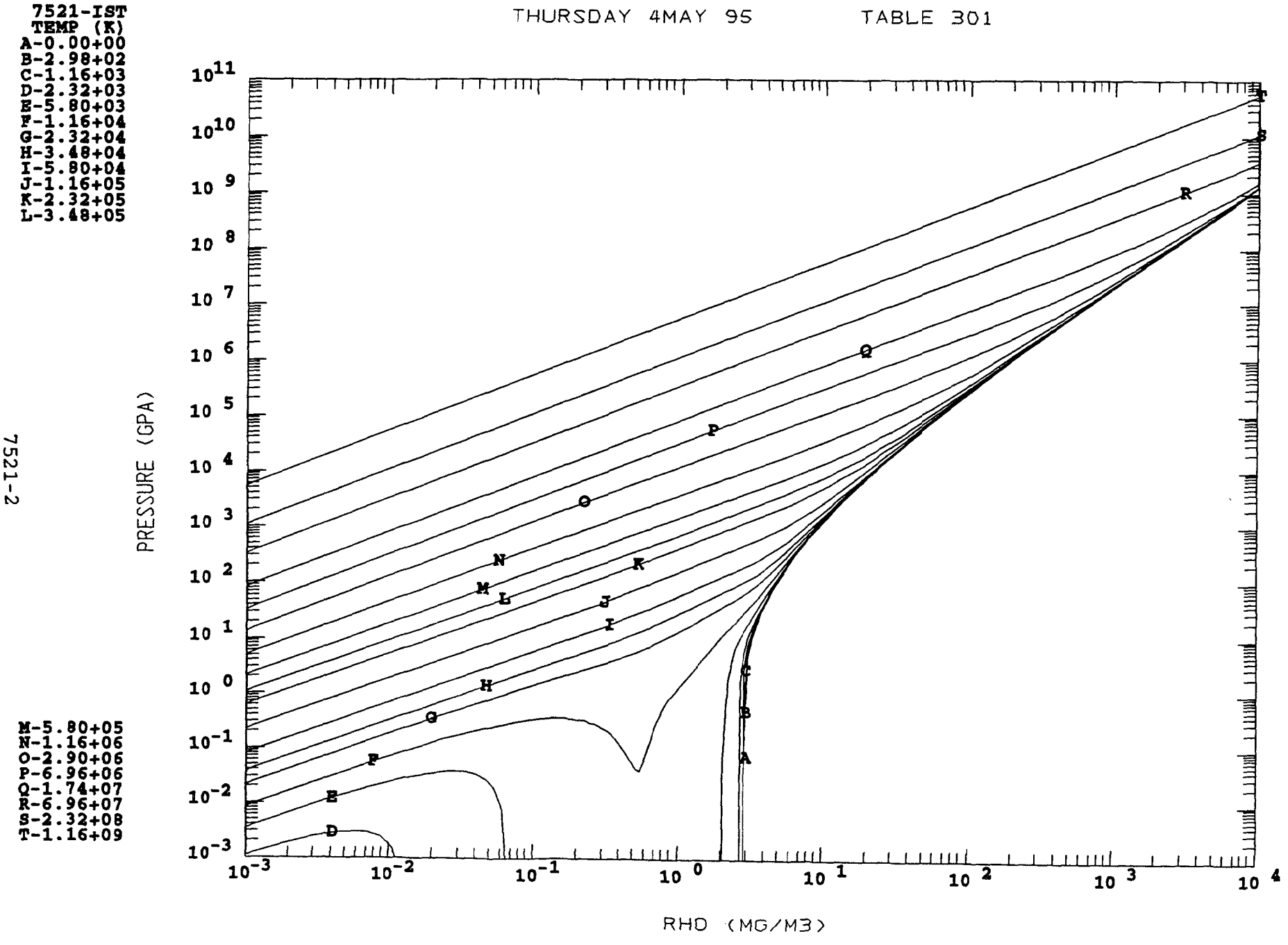
TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	19					
102	61					
201	5					
301	8773	74	39	0.0000E+00	2.8350E-06	2.8350E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	8773	74	39	0.0000E+00	2.8350E-06	2.8350E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	8773	74	39	0.0000E+00	2.8350E-06	2.8350E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8655	73	39	2.8350E-06	5.6700E-06	2.8350E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	295	73	1	2.8350E-06	5.6700E-06	2.8350E+04
				0.0000E+00	-1.0543E-12	0.0000E+00

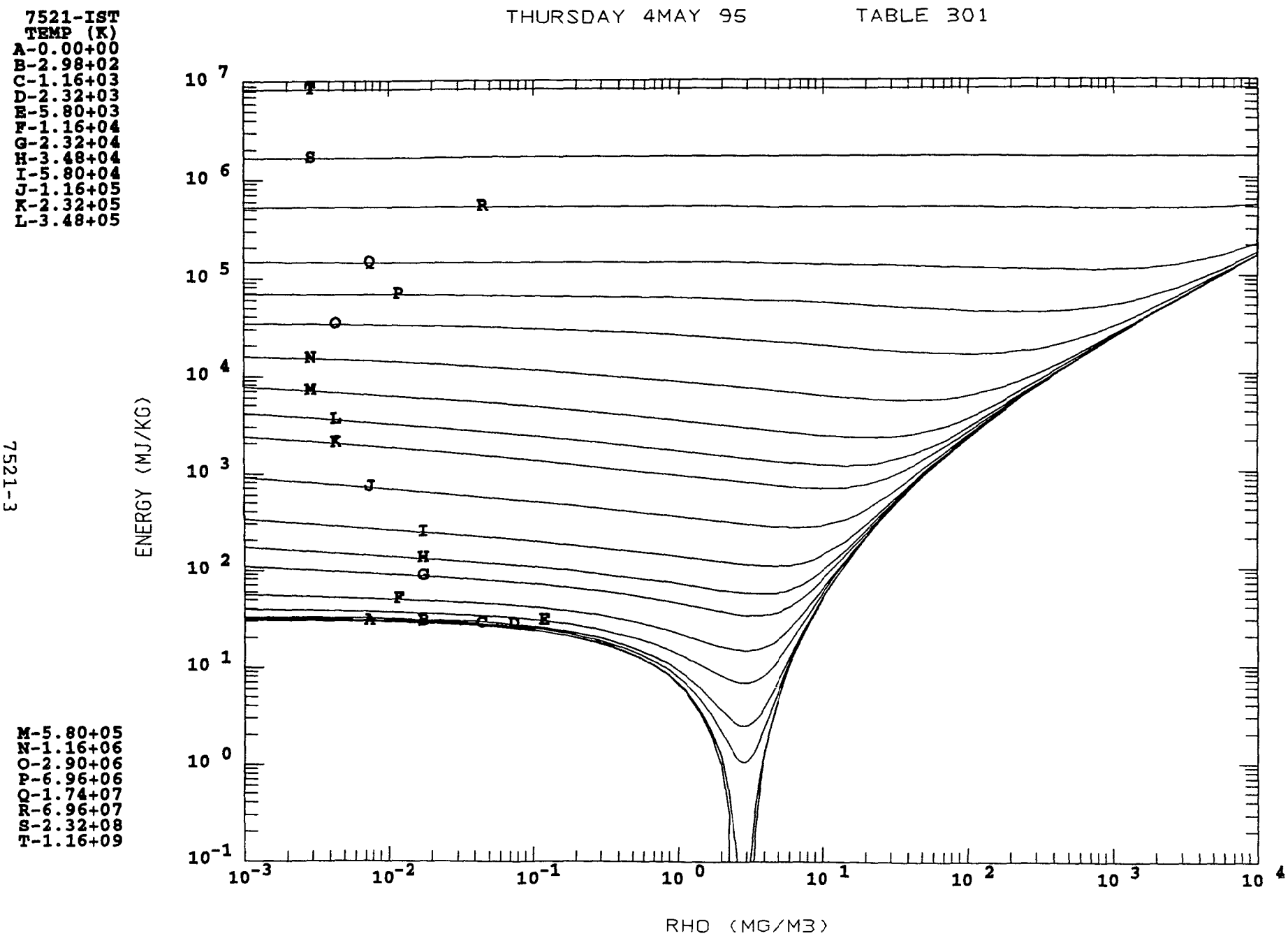
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUN 92
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 60892.
DATE OF LAST UPDATE. 11493.
SOURCE. J. BOETTGER
REFS. NONE
CODES. GRIZZLY

COMMENTS. ELECTRONIC THERMAL CONTRIBUTIONS AND THE HIGH PRESSURE COLD CURVE ARE FROM MIXED TFD. FOR COMPRESSIONS LESS THAN 2.0, THE COLD CURVE WAS DERIVED FROM A LINEAR FIT TO HUGONIOT DATA (CO=4.62 KM PER SEC, S=1.27). THE EXPANDED COLD CURVE USED A LENNARD-JONES FORM WITH FACLJ=1.0 AND ECOHKC=140. THE CHARTJD NUCLEAR MODEL WAS USED WITH DEBKEL=534, GAMREF=0.72, TMELT=2000, IGRUN=1. MOST OF THE DATA USED IS FROM T. SEKINE, A. M. RUBIN, AND T. J. AHRENS, J. GEOPHYS. RES. 96, 19675(1991).

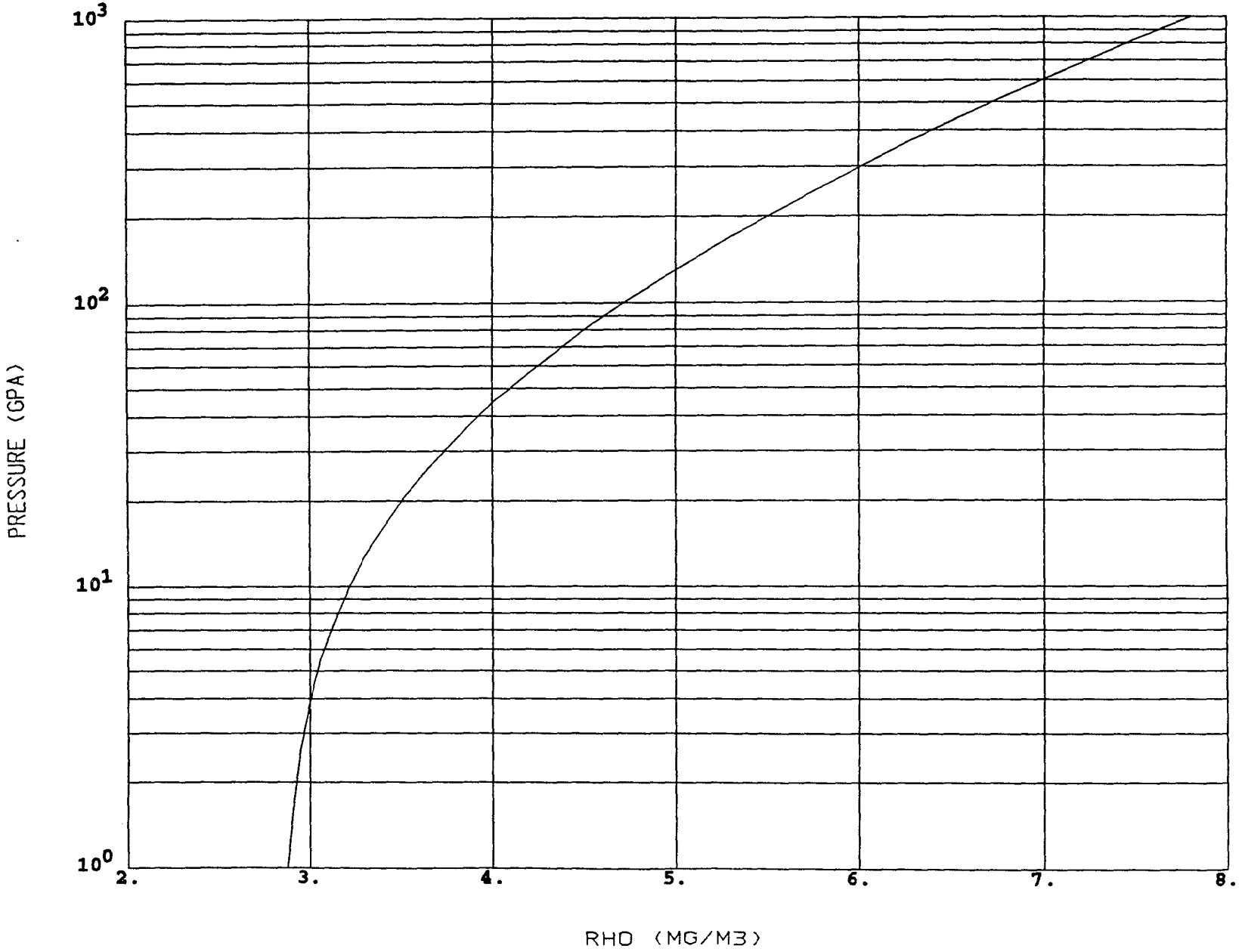

7521-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-2.32+03
E-5.80+03
F-1.16+04
G-2.32+04
H-3.48+04
I-5.80+04
J-1.16+05
K-2.32+05
L-3.48+05
M-5.80+05
N-1.16+06
O-2.90+06
P-6.96+06
Q-1.74+07
R-6.96+07
S-2.32+08
T-1.16+09
THURSDAY 4MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY

7521-2


7521-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-2.32+03
E-5.80+03
F-1.16+04
G-2.32+04
H-3.48+04
I-5.80+04
J-1.16+05
K-2.32+05
L-3.48+05
M-5.80+05
N-1.16+06
O-2.90+06
P-6.96+06
Q-1.74+07
R-6.96+07
S-2.32+08
T-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

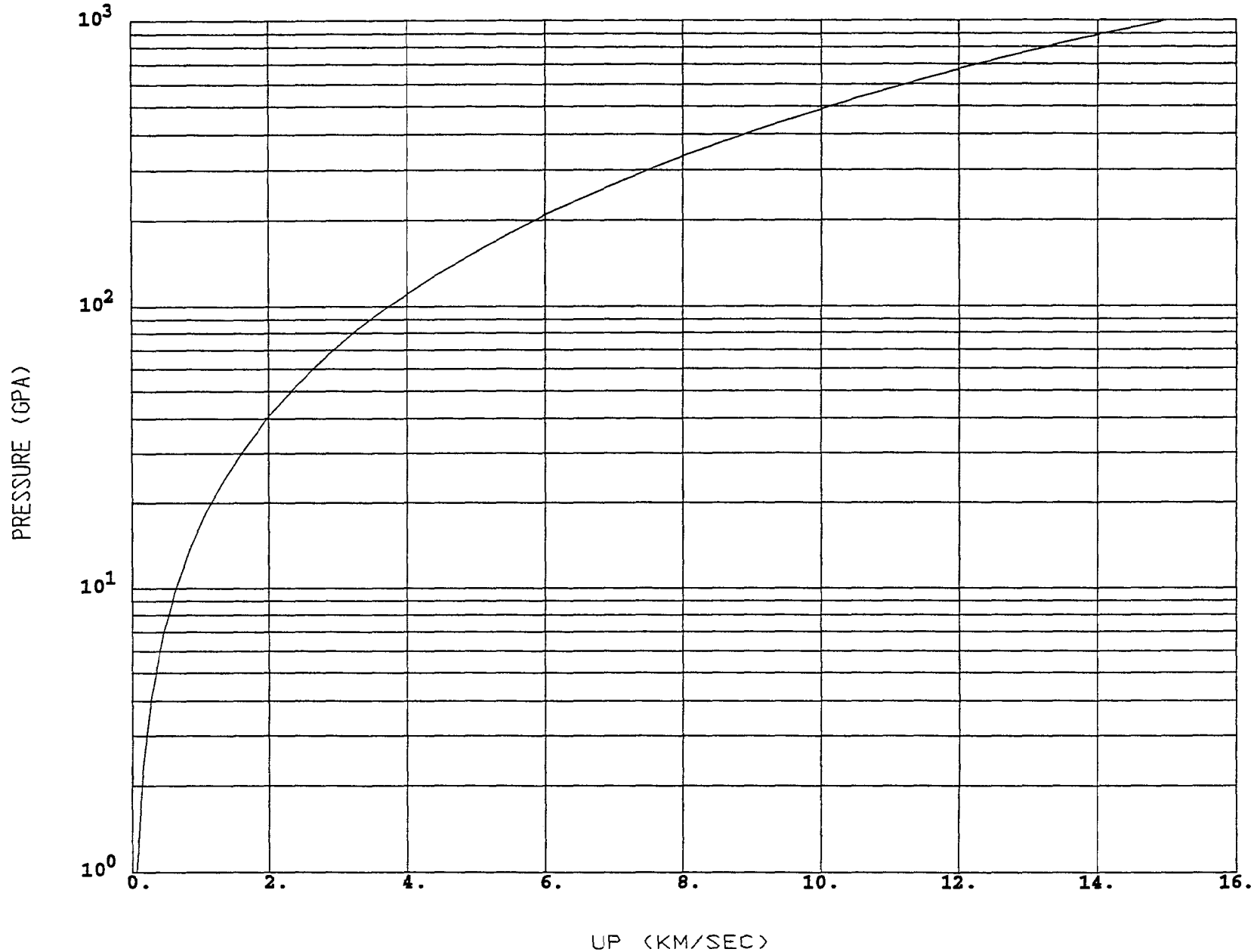
7521-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



7521-HU1
E0 MJ/KG
0.00+00

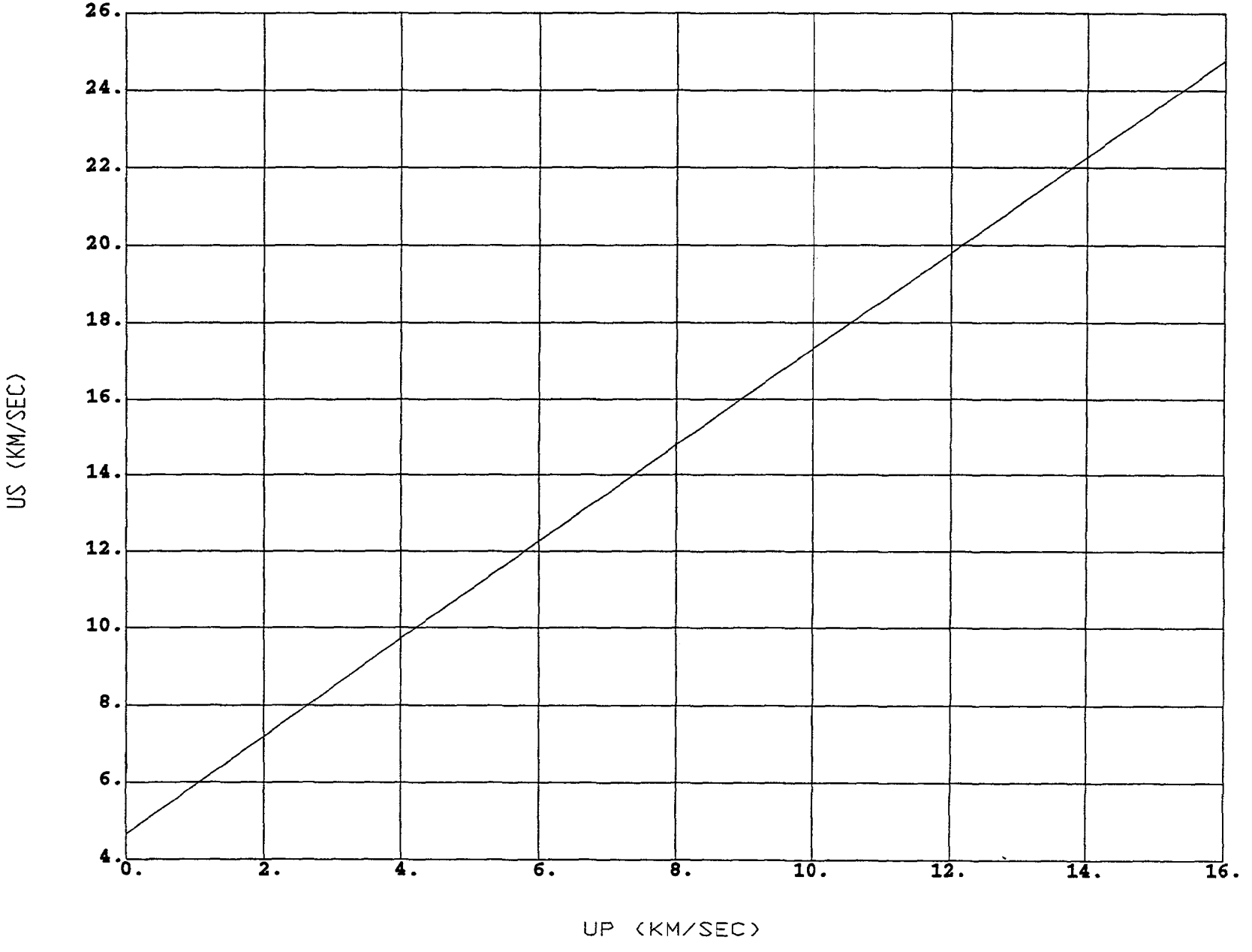
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY 02

7521-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY 02

MATERIAL NUMBER | SUMMARY

7530 MATERIAL. BASALT

COMP. 60.11% O, 18.26% SI, 5.96% AL, 4.01% CA, 3.48% FE, 3.39% M
G, 2.18% H, 1.56% NA, 0.55% TI, 0.38% K, 0.07% P, 0.06% MN BY NU
MBER
ATOMIC NUMBER. 1.0665E+01
ATOMIC MASS. 2.2574E+01
NORMAL DENSITY. 2.8680E+00

GAMMA(COMPUTED). 1.1089

TABLE SUMMARY.

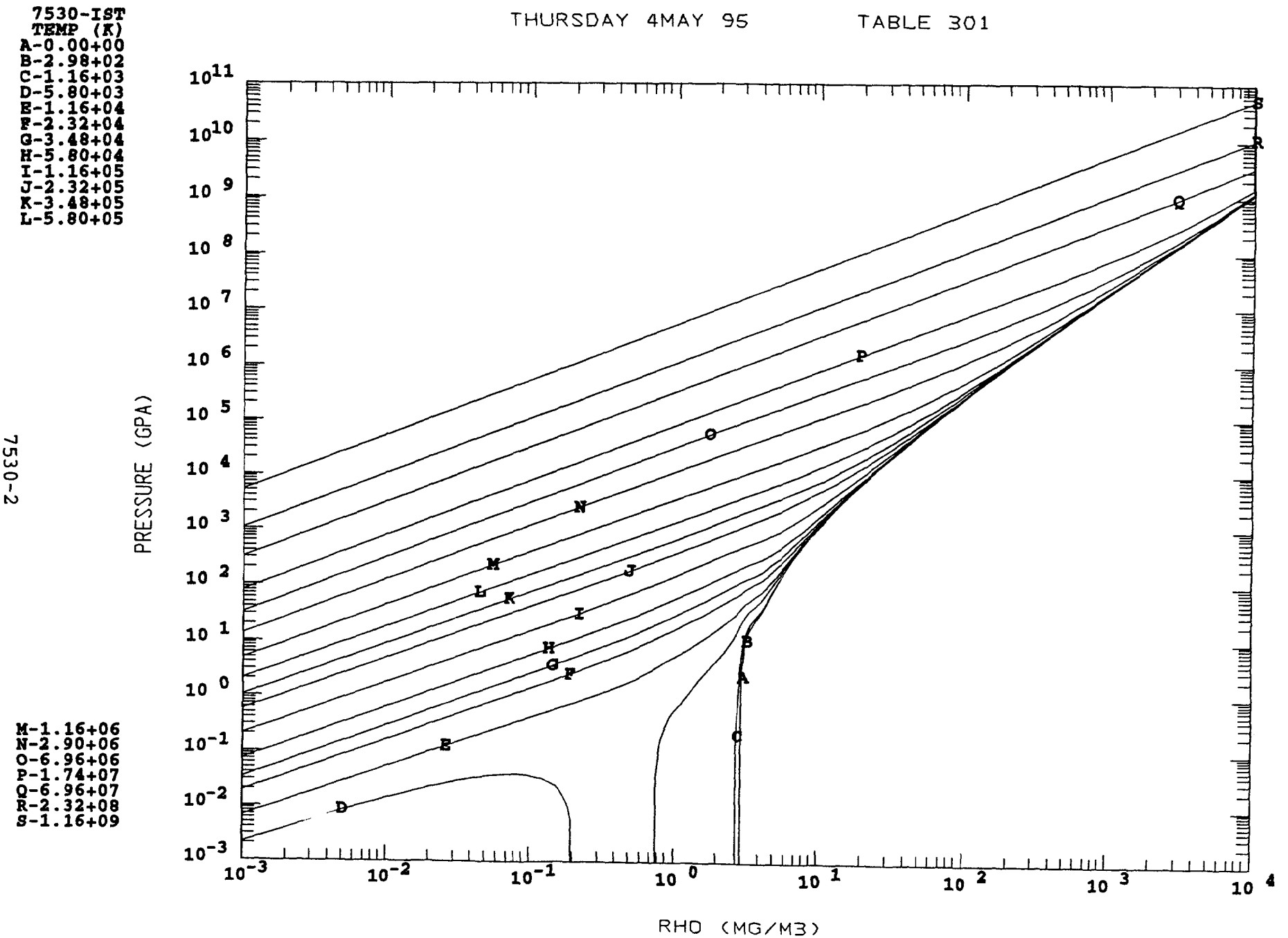
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	33					
102	90					
201	5					
301	7991	71	37	0.0000E+00	2.8680E-06	5.7360E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7543	67	37	2.9900E-06	5.9800E-06	5.9800E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7879	70	37	2.9900E-06	5.9800E-06	5.9800E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	283	70	1	2.9900E-06	5.9800E-06	5.9800E+04
				0.0000E+00	-9.7759E-11	0.0000E+00
401	65					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

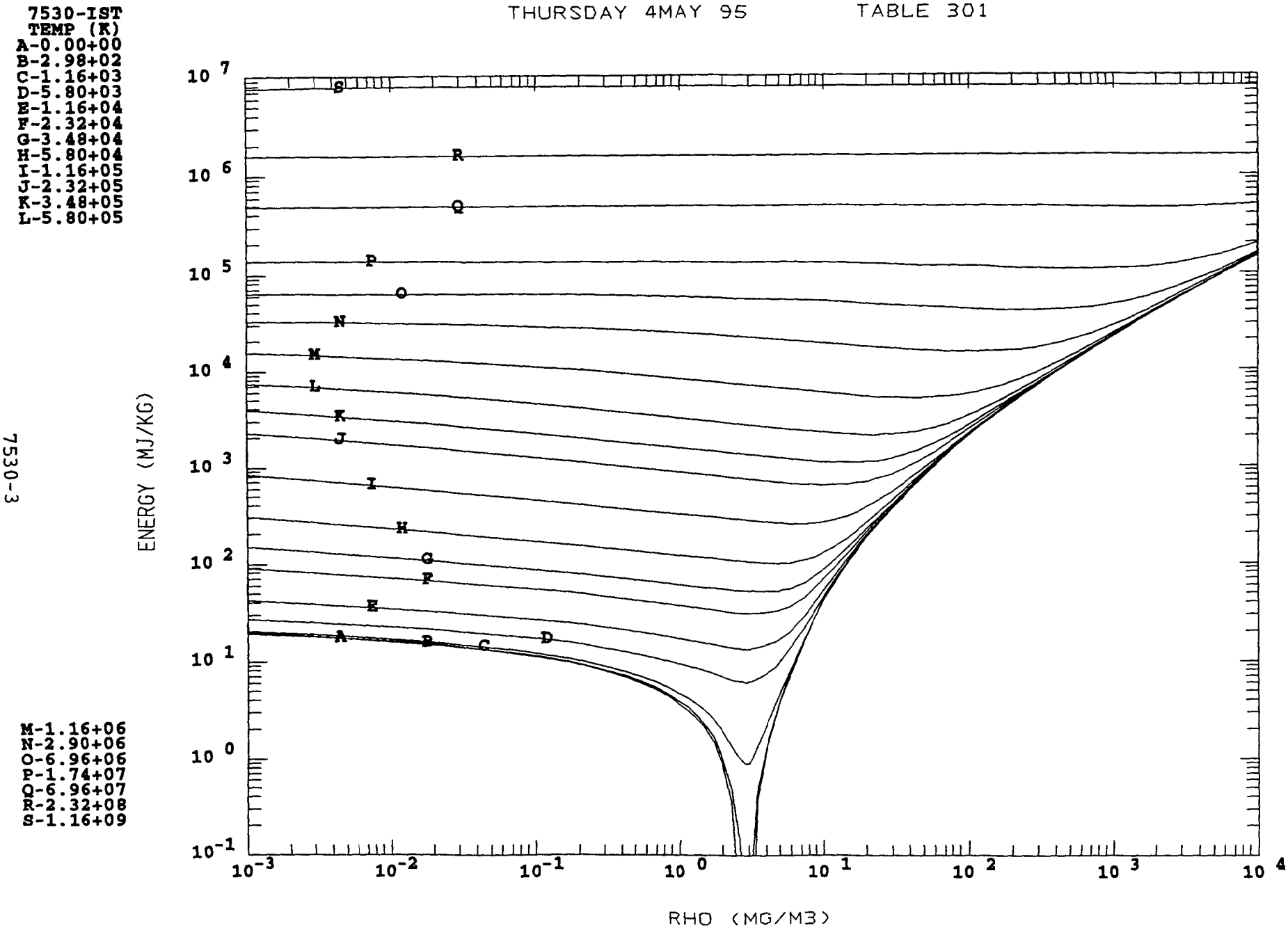
DATE. JAN 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 11488.
DATE OF LAST UPDATE. 20588.
SOURCE. J. BARNES, S. LYON
REFS. LAMS REPORT IN PROGRESS
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN = 1). GAMREF = 1.17, DEBKEL = 851, TMELT = 2158. COLD CURVE FROM SHOCK DATA. US-UP COMPOSED OF THREE STRAIGHT LINES (UP,US) = (0.0,5.21), (0.54,5.98), (1.75,5.98), (4.00,9.25). CMAT = 1.76, ECOHKC = 137, FACLJ = 0.185. THE REFERENCE GAMMA, DEBYE TEMPERATURE AND COHESIVE ENERGY FOR THE MIXTURE WERE TAKEN TO BE THE WEIGHTED SUM OF THE CORRESPONDING PARAMETER VALUES FOR EACH OF THE MAJOR MOLECULAR COMPONENTS. 301 TABLE HAS VAN DER WAALS LOOPS. CRITICAL TEMPERATURE IS 6675 K.

THURSDAY 4MAY 95 TABLE 301



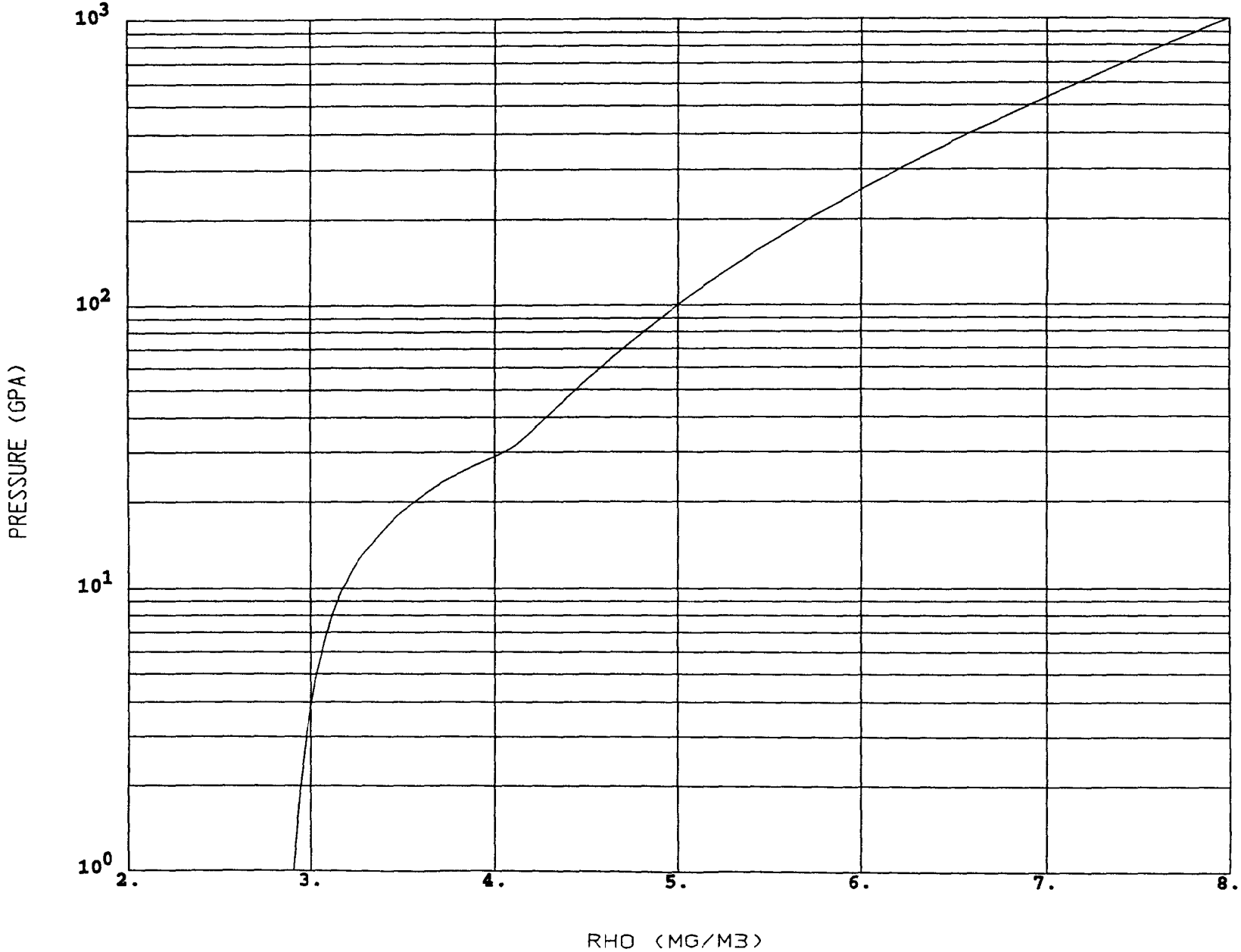
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY 02

7530-HU1
E0 MJ/KG
0.00+00

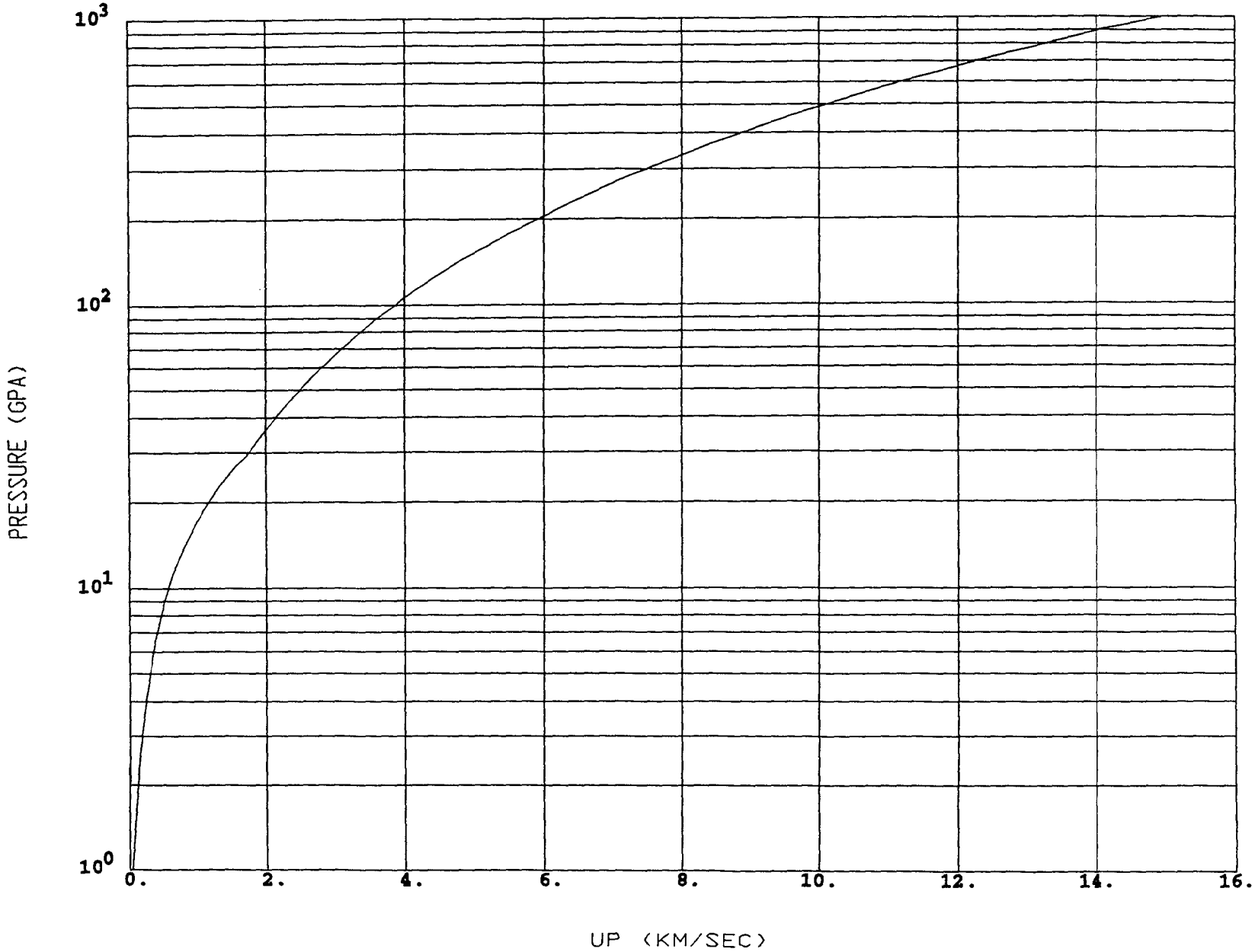
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY

7530-HU1
E0 MJ/KG
0.00+00

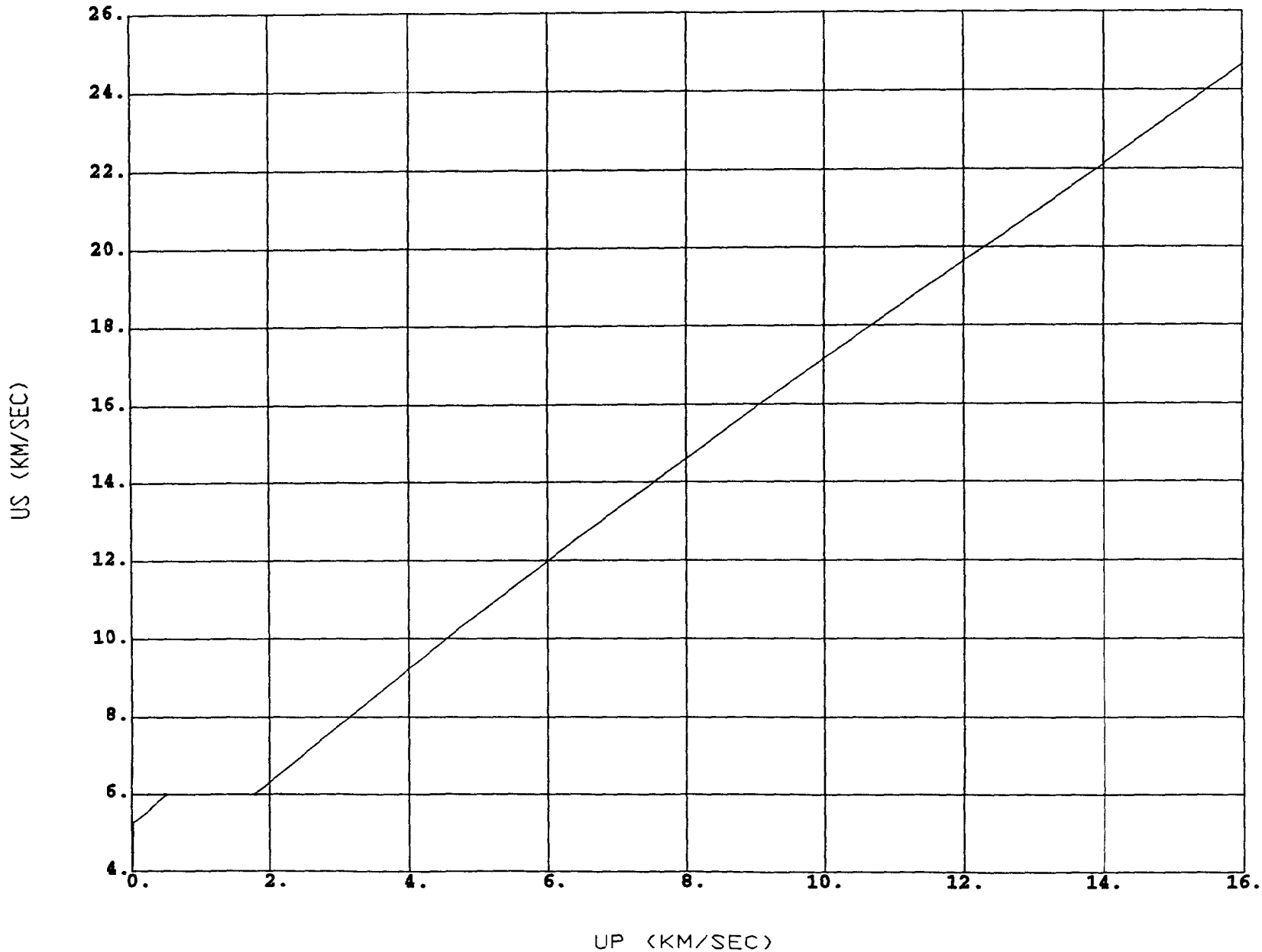
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY 02

7530-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA\

MATERIAL NUMBER	SUMMARY
7541	MATERIAL. CARBON PHENOLIC

COMP. C 64.18 MOLE%, H 29.50 MOLE%, O 5.98 MOLE%, N 0.34 MOLE%
ATOMIC NUMBER. 4.6480E+00
ATOMIC MASS. 9.0105E+00
NORMAL DENSITY. 1.4503E+00

GAMMA(COMPUTED). 0.5048

TABLE SUMMARY.

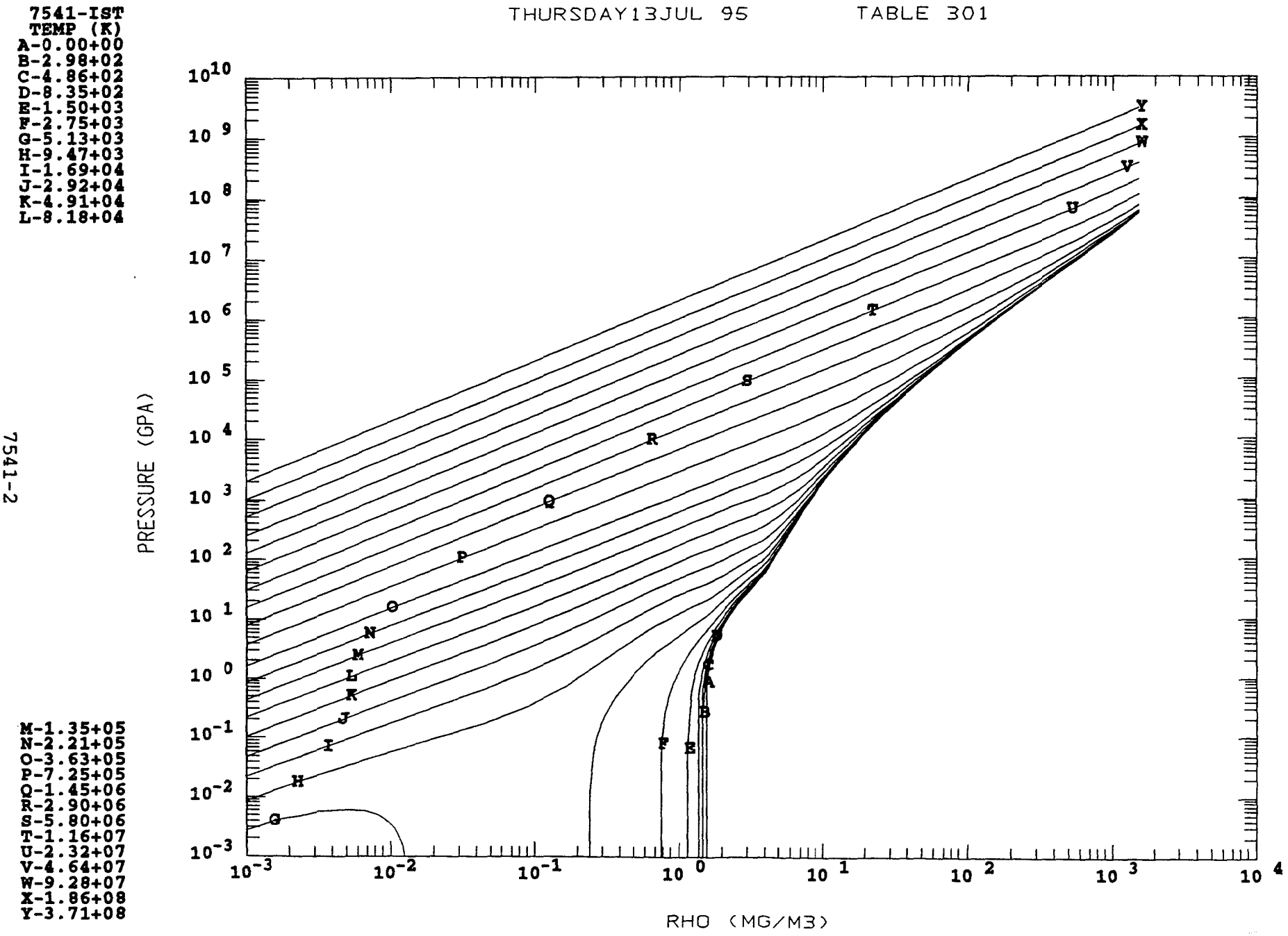
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	34					
102	65					
201	5					
301	2883	56	25	0.0000E+00	1.5160E-03	1.5160E+03
				0.0000E+00	2.5689E-02	3.1999E+04
303	2883	56	25	0.0000E+00	1.5160E-03	1.5160E+03
				0.0000E+00	2.5689E-02	3.1999E+04
304	2883	56	25	0.0000E+00	1.5160E-03	1.5160E+03
				0.0000E+00	2.5689E-02	3.1999E+04
305	2883	56	25	0.0000E+00	1.5160E-03	1.5160E+03
				0.0000E+00	2.5689E-02	3.1999E+04
306	171	56	1	0.0000E+00	1.5160E-03	1.5160E+03
				0.0000E+00	0.0000E+00	0.0000E+00

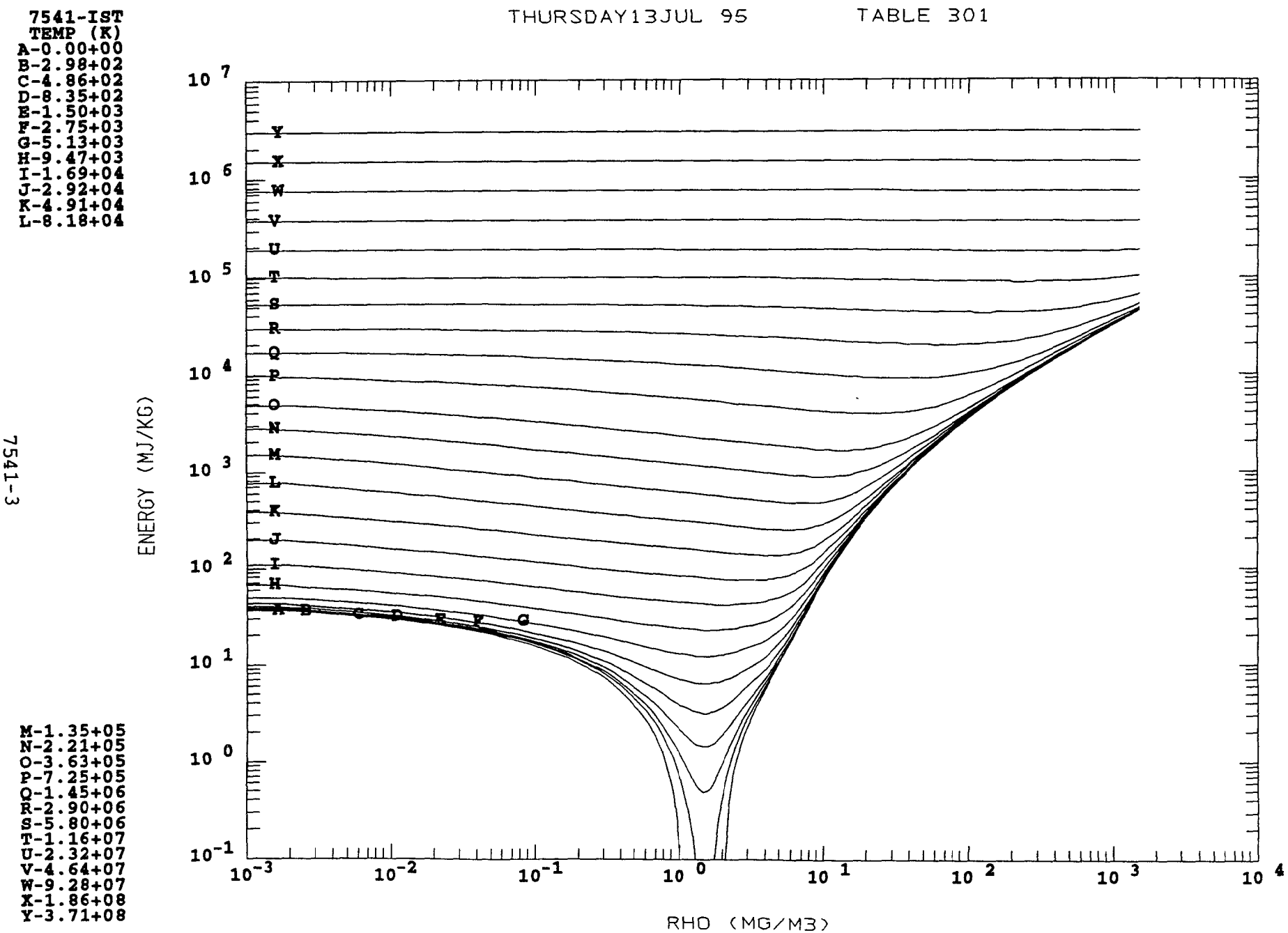
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. APR 81
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 42481.
DATE OF LAST UPDATE. 101582.
SOURCE. J.D. JOHNSON
REFS. LLL SHOCK COMPENDIUM, WX-3 MEMO (9-20-79), PRIVATE COMMUNICATION WITH F. MORTONSON (X-2)
CODES. EOSLTS, CANDIDE

COMMENTS. THE TWO TEMPERATURE TABLES FOR THIS MATERIAL (TABLES 303-306) ARE A VERY ROUGH APPROXIMATION AND WERE DERIVED FROM THE CODE TWOTEMP (AND NOT FROM THE ORIGIONAL EOS CALCULATIONS, WHICH IN MOST CASES ARE NO LONGER REPRODUCIBLE). THE TABLES ARE VERY NOISY DUE BOTH TO NOISE IN THE ORIGIONAL DATA (WHICH SHOWS UP WHEN THE COLD CURVE IS SUBTRACTED TO GENERATE THE THERMAL CONTRIBUTION) AND TO THE CONSTRAINT THAT NO CROSSING ISOTHERMS ARE ALLOWED. IF YOU HAVE ANY PROBLEMS USING THESE TABLES, CONTACT BOB ALBERS (T-4).

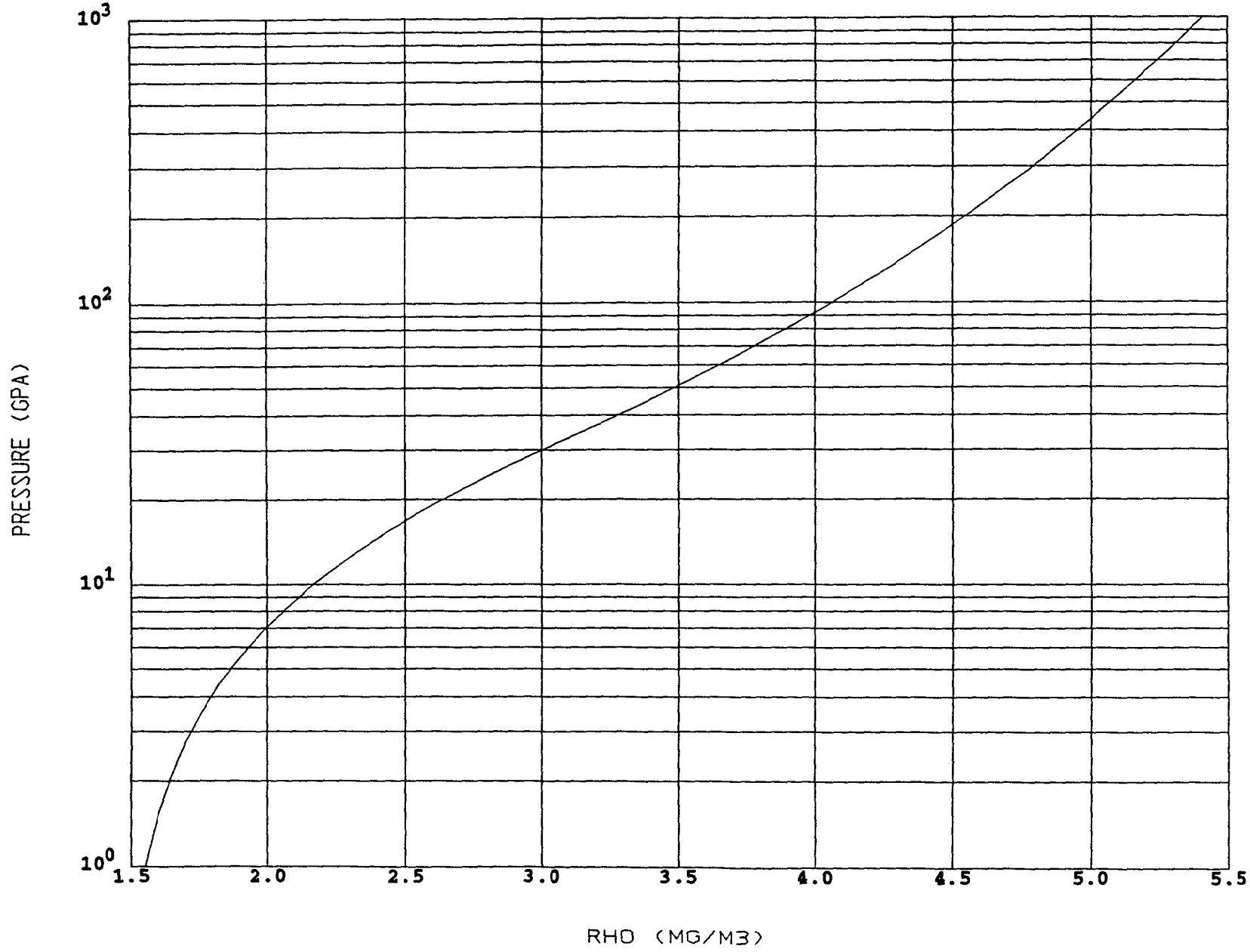
THURSDAY13JUL 95 TABLE 301




7541-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-4.86+02
D-8.35+02
E-1.50+03
F-2.75+03
G-5.13+03
H-9.47+03
I-1.69+04
J-2.92+04
K-4.91+04
L-8.18+04
M-1.35+05
N-2.21+05
O-3.63+05
P-7.25+05
Q-1.45+06
R-2.90+06
S-5.80+06
T-1.16+07
U-2.32+07
V-4.64+07
W-9.28+07
X-1.86+08
Y-3.71+08
THURSDAY13JUL 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

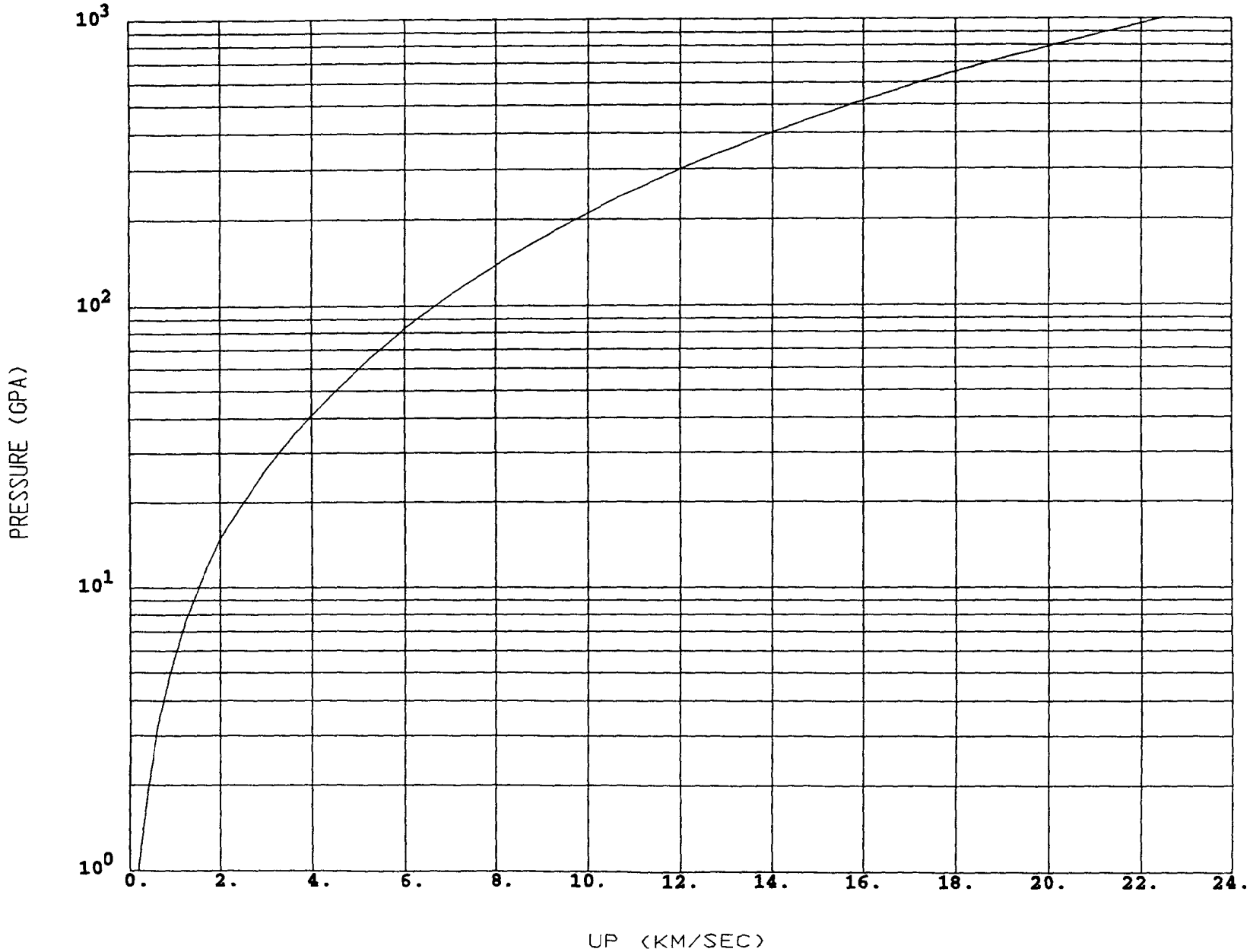
7541-HU1
E0 MJ/KG
0.00+00

THURSDAY13JUL 95 TABLE 301



7541-HU1
E0 MJ/KG
0.00+00

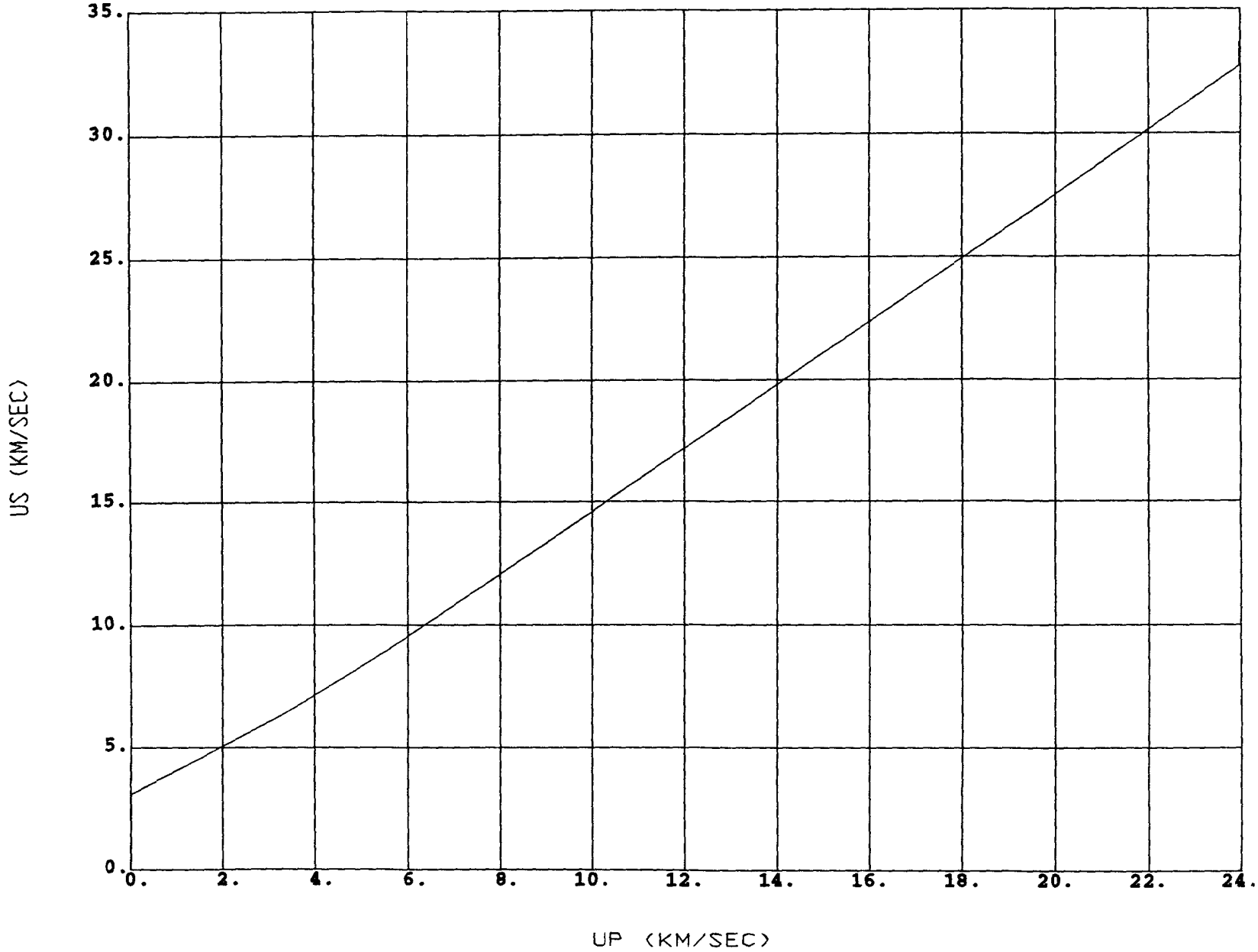
THURSDAY13JUL 95 TABLE 301



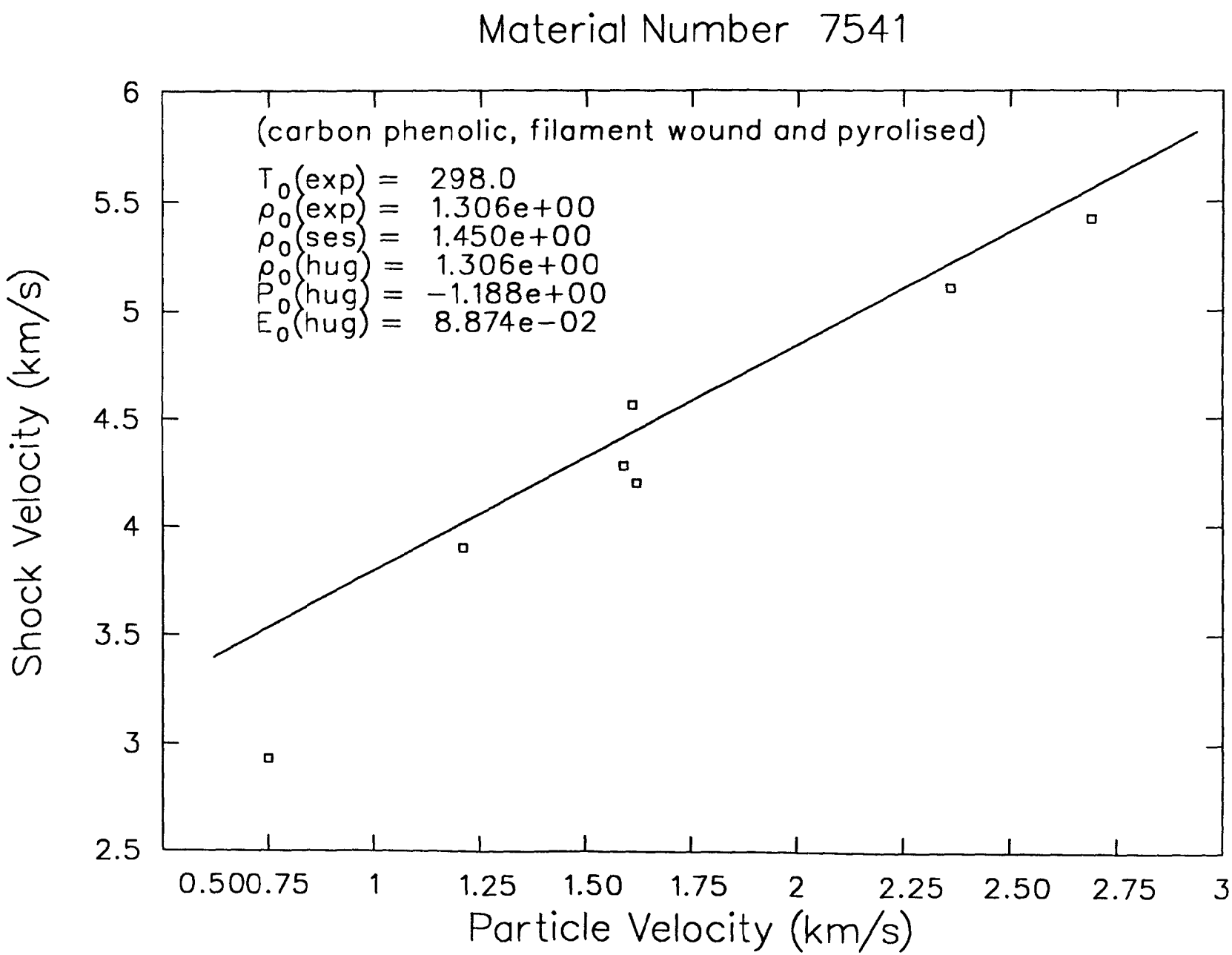
T1 SES2D CRAY 02

7541-HU1
E0 MJ/KG
0.00+00

THURSDAY13JUL 95 TABLE 301



T1 SRS2D CRAY


Material Number 7541
(carbon phenolic, filament wound and pyrolised)
T_0(exp) = 298.0
ρ_0(exp) = 1.306e+00
ρ_0(ses) = 1.450e+00
ρ_0(hug) = 1.306e+00
P_0(hug) = −1.188e+00
E_0(hug) = 8.874e−02
Shock Velocity (km/s)
Particle Velocity (km/s)
6
5.5
5
4.5
4
3.5
3
2.5
0.50
0.75
1
1.25
1.50
1.75
2
2.25
2.50
2.75
3

MATERIAL NUMBER	SUMMARY
7542	MATERIAL. CARBON PHENOLIC

COMP. C 66.00 MOLE%, H 26.93 MOLE%, N 3.58 MOLE%, O 3.49 MOLE%
ATOMIC NUMBER. 4.7591E+00
ATOMIC MASS. 9.2586E+00
NORMAL DENSITY. 1.5000E+00

GAMMA(COMPUTED). 0.5092

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	24					
102	65					
201	5					
301	7655	68	37	0.0000E+00	1.5000E-06	3.0000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7543	67	37	1.1049E-06	2.2098E-06	2.2098E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7543	67	37	1.5000E-06	3.0000E-06	3.0000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	271	67	1	1.5000E-06	3.0000E-06	3.0000E+04
				0.0000E+00	-1.0137E-10	0.0000E+00

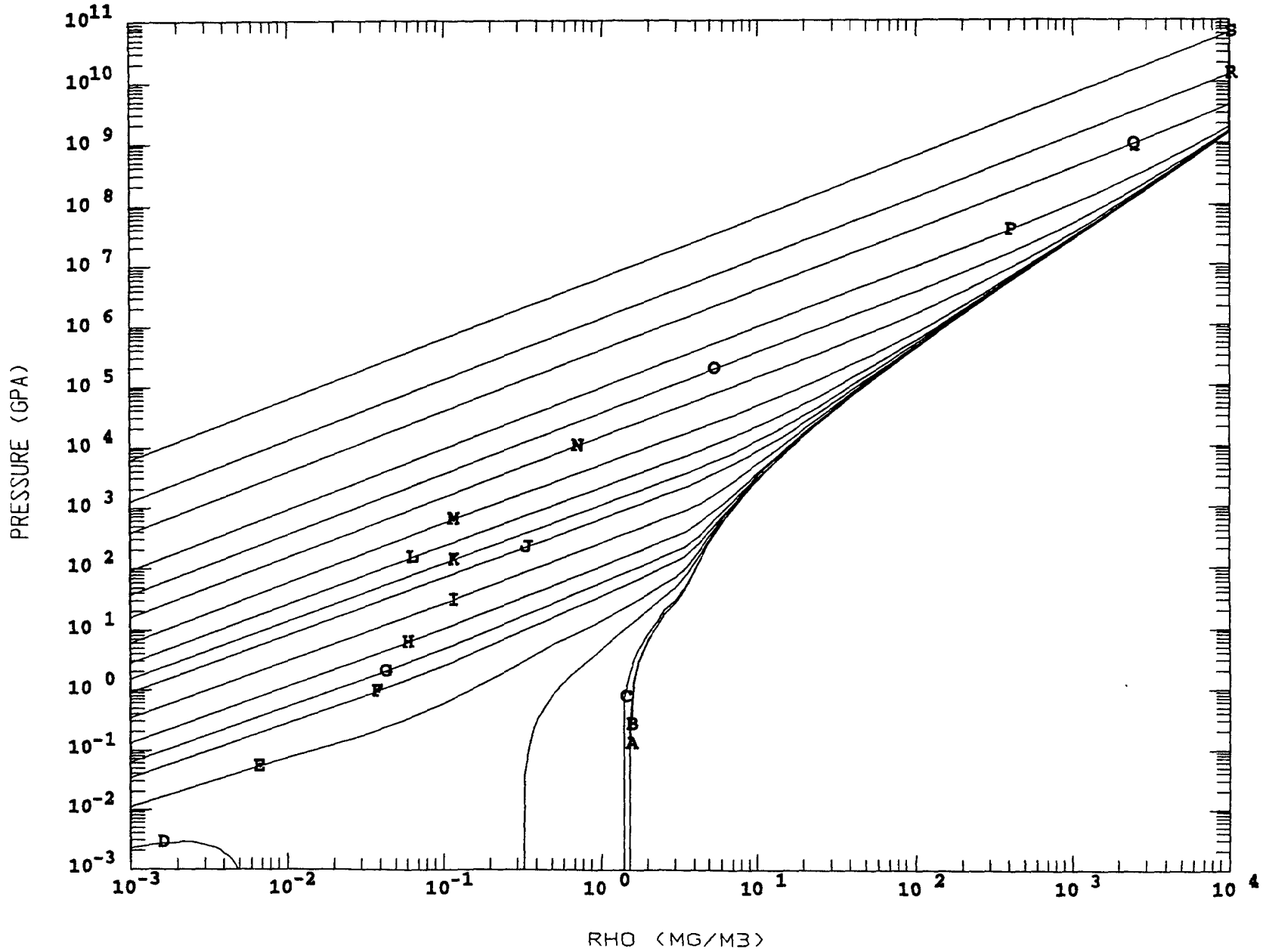
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. FEB 87
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 21387.
DATE OF LAST UPDATE. 22587.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. ELECTRONIC TABLE IS MIX OF THERMAL TFD FOR 4 ELEMENTS. NUCLEAR TABLE IS FROM FIRST VERSION OF CHARTJD (BEFORE DEBYE-HUCKEL). COLD CURVE COMES FROM SHOCK DATA PROCEDURE. US-UP INPUT IS UP = 0, 3.0 WITH US = 3.15, 6.15. ECOH = 150 KCAL PER AVERAGE ATOM MOLE, GAMREF = 0.5, AND DEBREF = 1000 K. WE USED IGRUN = 7 WITH GAMEPS = 0.5, 1.0 AND DGAMMA = 0., 0.. THE TFD MATCH COMPRESSION IS 2.0. THE DEFAULT TMELT IS USED. THE HUGONIOT IS COMPARED TO DATA IN THE COMPENDIA WHILE ALL OTHER INPUT NUMBERS ARE INTELLIGENT GUESSES.

7542-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05

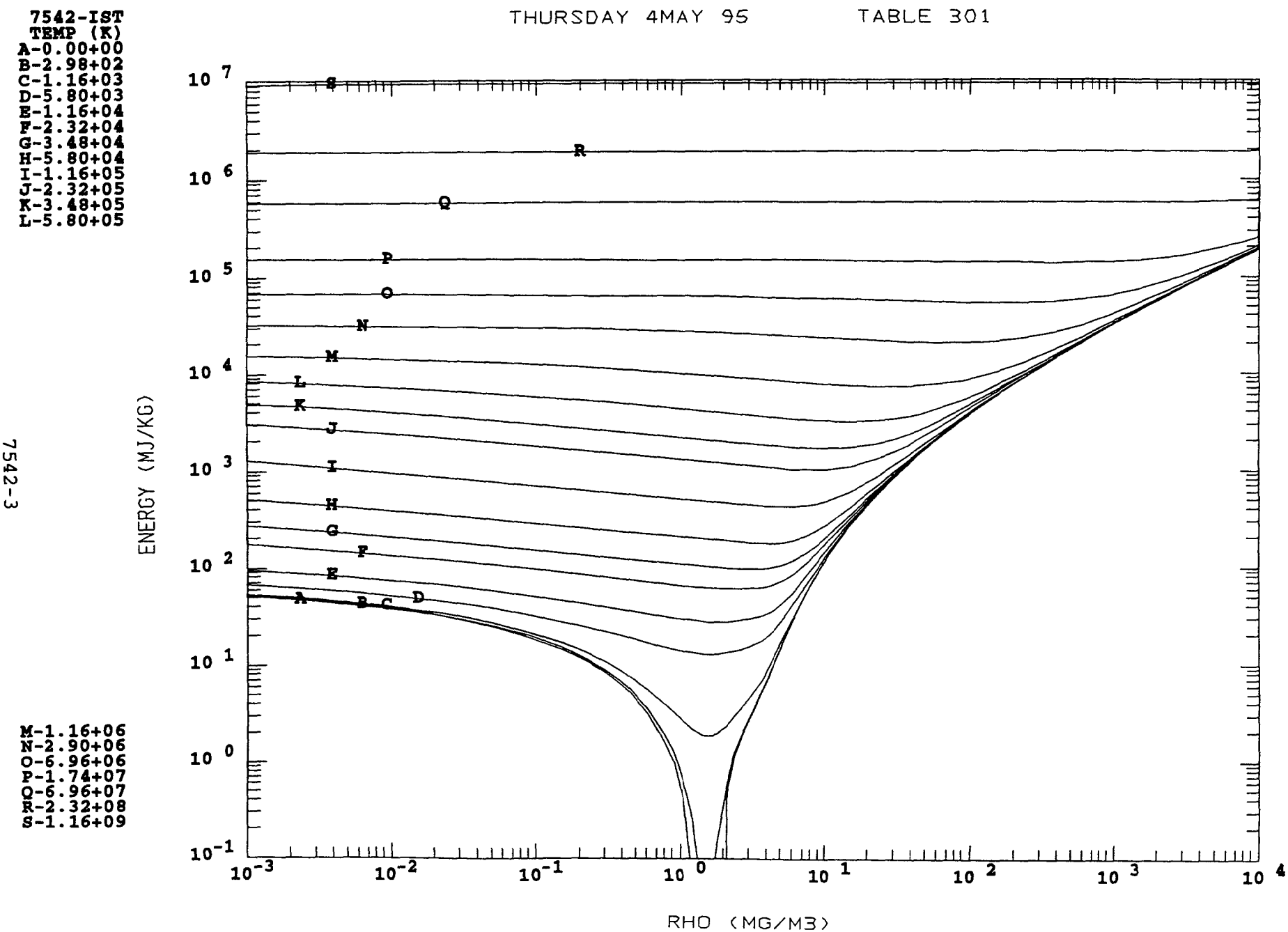
THURSDAY 4MAY 95 TABLE 301



M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09

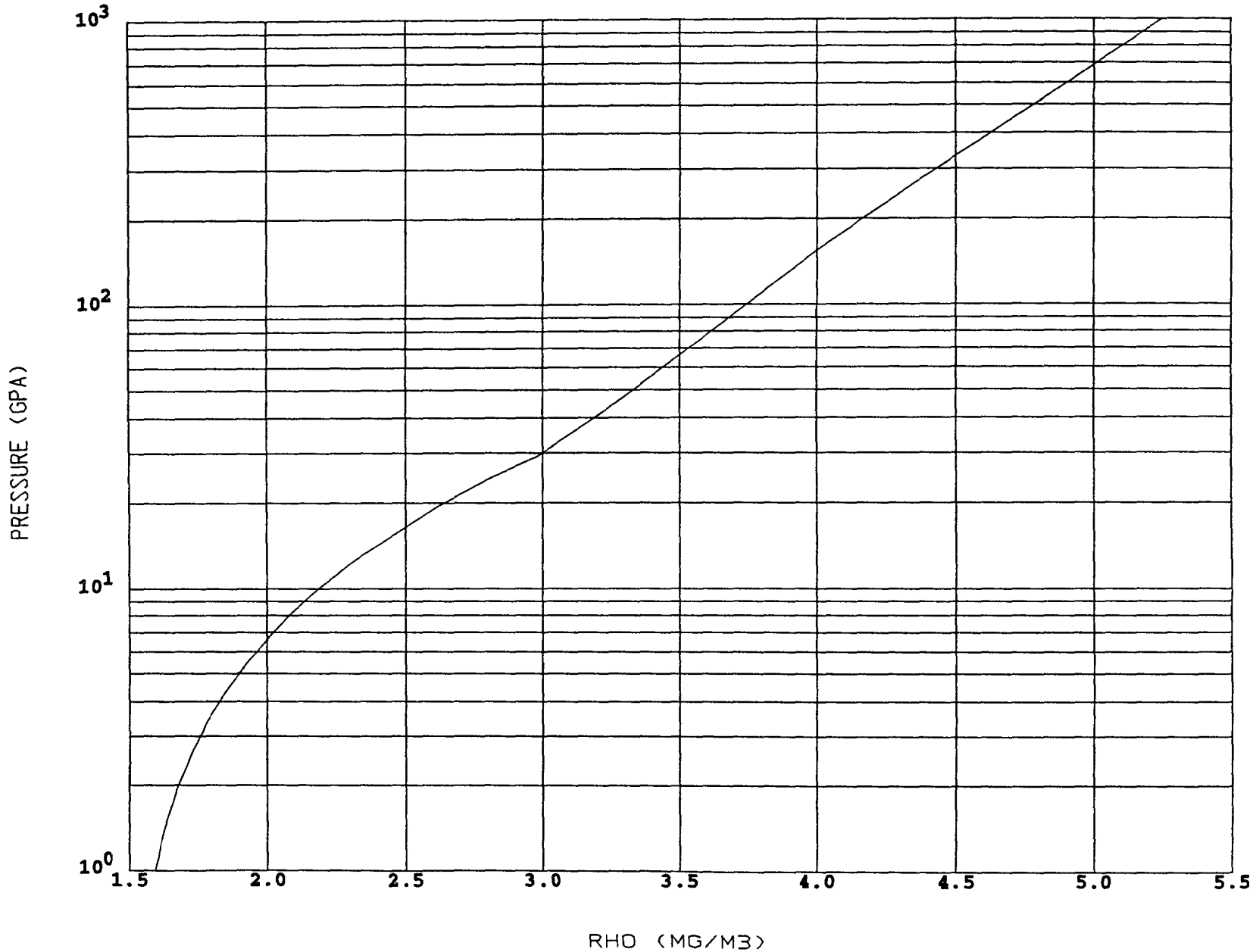
7542-2

T1 SES2D CRAY


7542-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7542-HU1
E0 MJ/KG
0.00+00

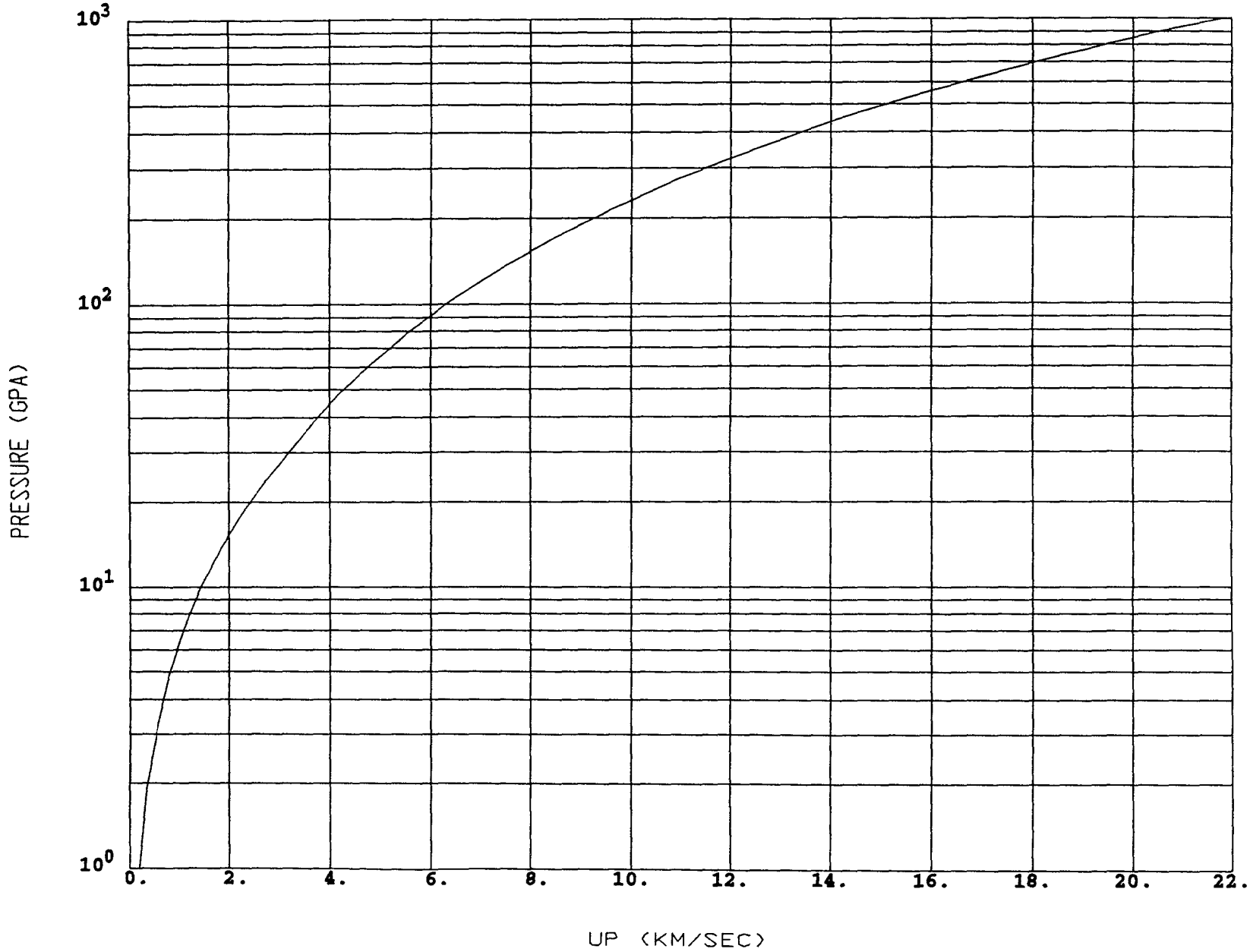
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CPN

7542-HU1
E0 MJ/KG
0.00+00

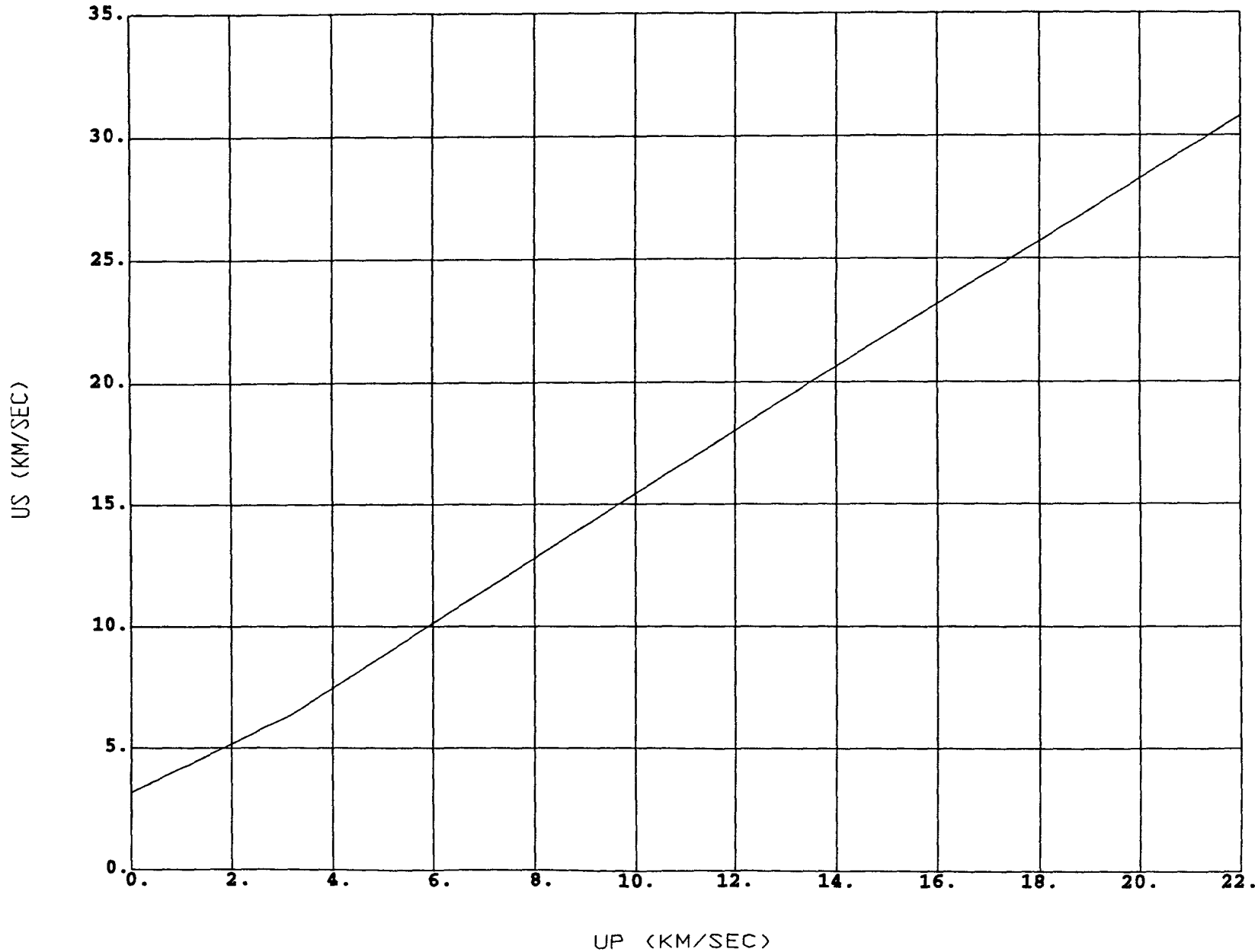
THURSDAY 4MAY 95 TABLE 301



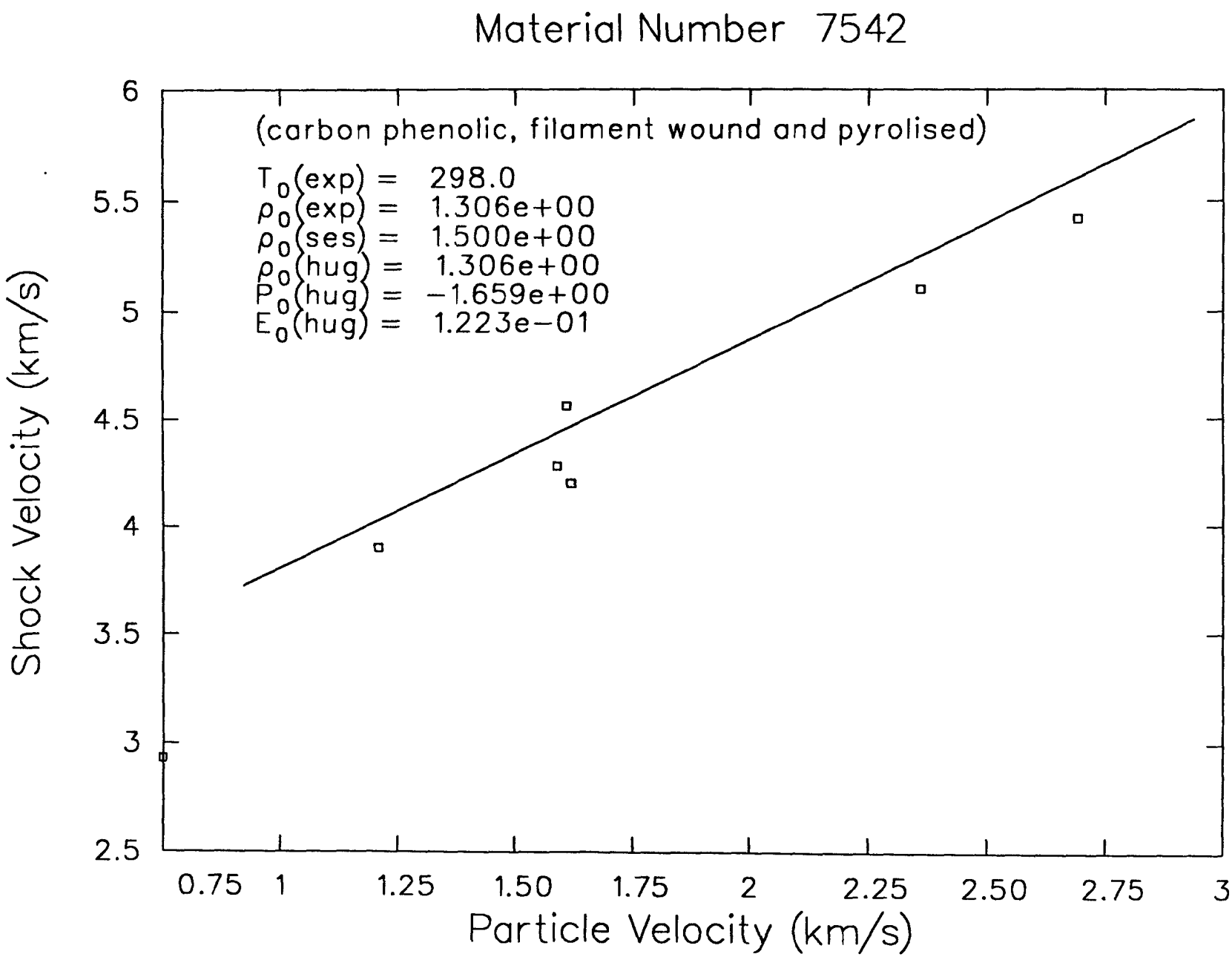
T1 SES2D CRAY 02

7542-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SRS2D CRA)


Material Number 7542
(carbon phenolic, filament wound and pyrolised)
T_0(exp) = 298.0
ρ_0(exp) = 1.306e+00
ρ_0(ses) = 1.500e+00
ρ_0(hug) = 1.306e+00
P_0(hug) = −1.659e+00
E_0(hug) = 1.223e−01
Shock Velocity (km/s)
Particle Velocity (km/s)
6
5.5
5
4.5
4
3.5
3
2.5
0.75
1
1.25
1.50
1.75
2
2.25
2.50
2.75
3

MATERIAL NUMBER | SUMMARY

7550 MATERIAL. MYLAR

COMP. (C10H8O4)N
ATOMIC NUMBER. 4.5450E+00
ATOMIC MASS. 8.7350E+00
NORMAL DENSITY. 1.3800E+00

GAMMA(COMPUTED). 0.9332

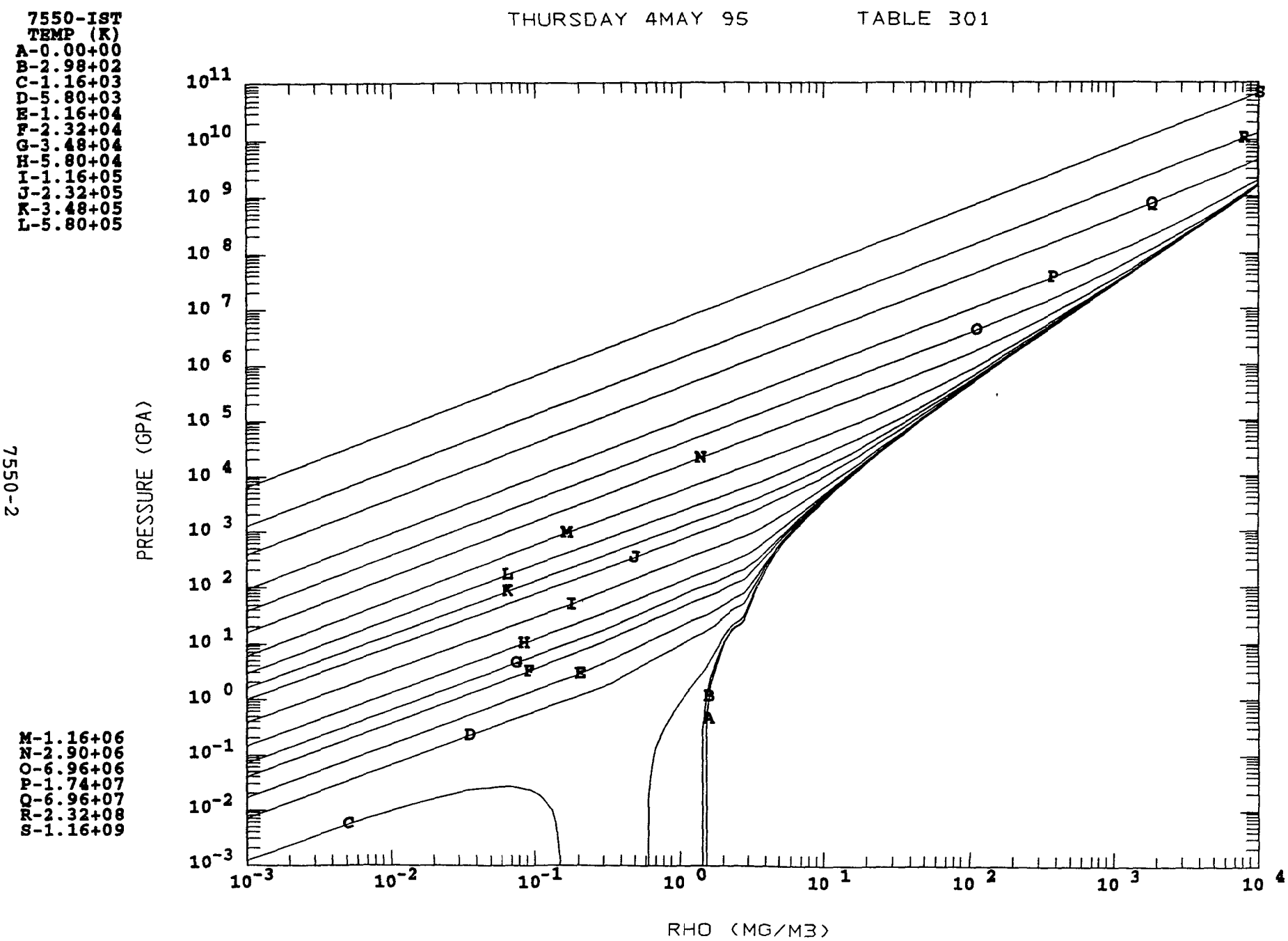
TABLE SUMMARY.

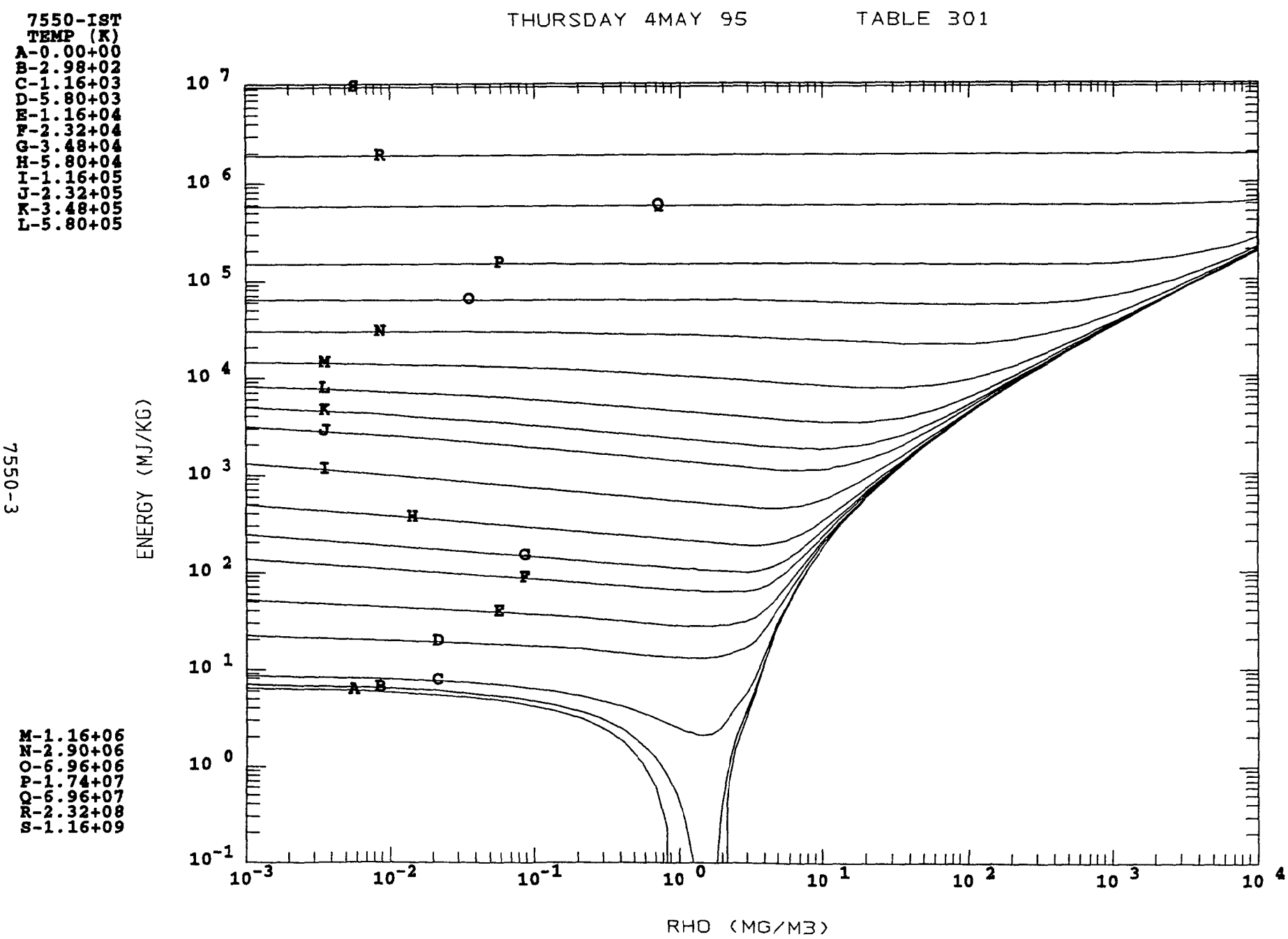
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	62					
201	5					
301	8215	73	37	0.0000E+00	1.3800E-06	2.7600E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7543	67	37	1.3800E-06	2.7600E-06	2.7600E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7655	68	37	1.3800E-06	2.7600E-06	2.7600E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	275	68	1	1.3800E-06	2.7600E-06	2.7600E+04
				0.0000E+00	-5.1603E-13	0.0000E+00
401	49					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. FEB 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 21888.
DATE OF LAST UPDATE. 91393.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN=1). GAMREF=1.0, DEBKEL=317, TMELT=538 KELVIN. COLD CURVE FROM SHOCK DATA AND SOUND VELOCITY. (UP,US) POINTS ARE (0.0,2.332), (0.65,3.64), (2.05,5.80), (3.40,6.56), (5.05,9.15). ECOHKC=15.0, FACLJ=2.0, CMAT=2.23. THE CRITICAL TEMPERATURE IS 1575 KELVIN.

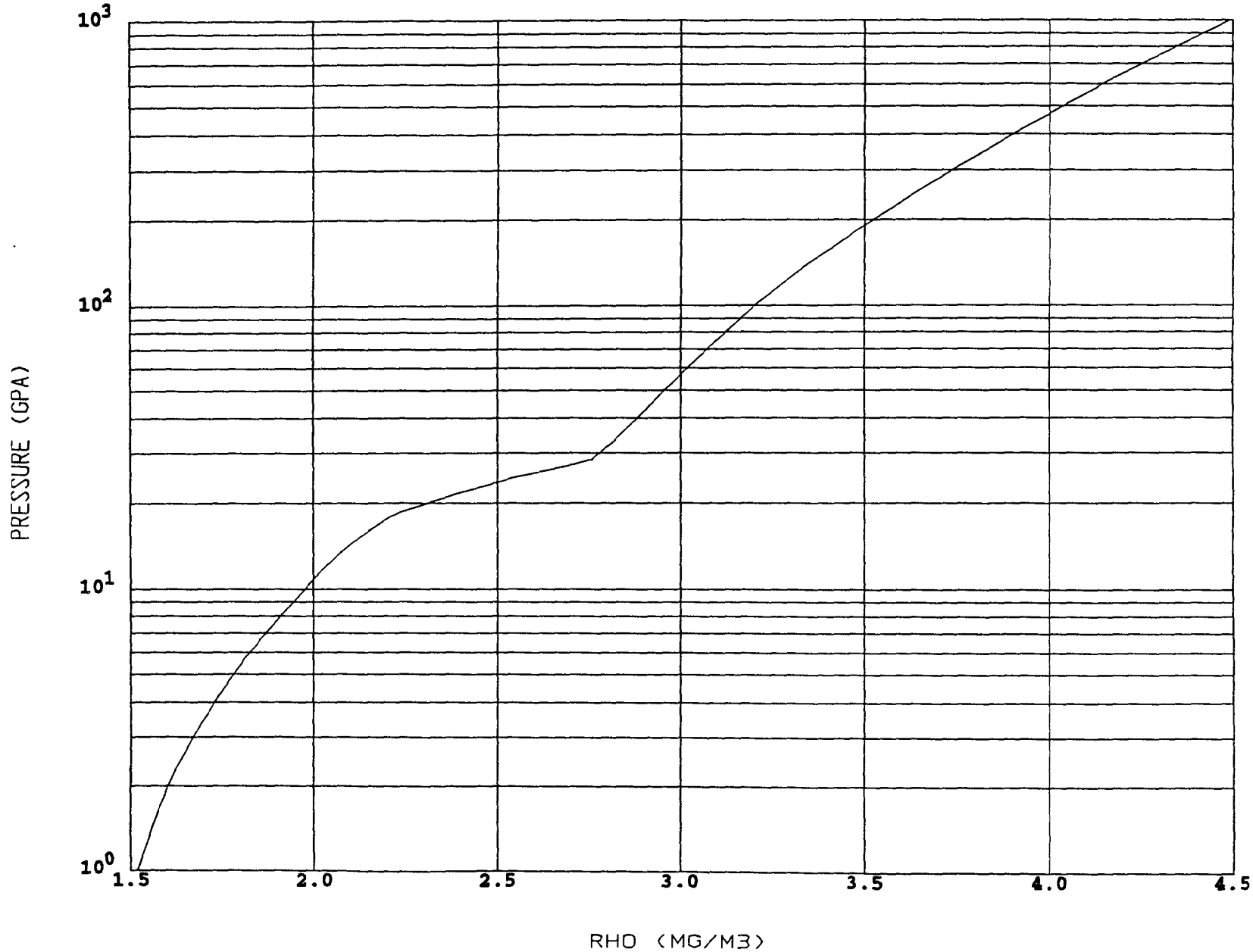

7550-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY 4MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY



T1 SES2D CRAY 02

7550-HU1
E0 MJ/KG
0.00+00

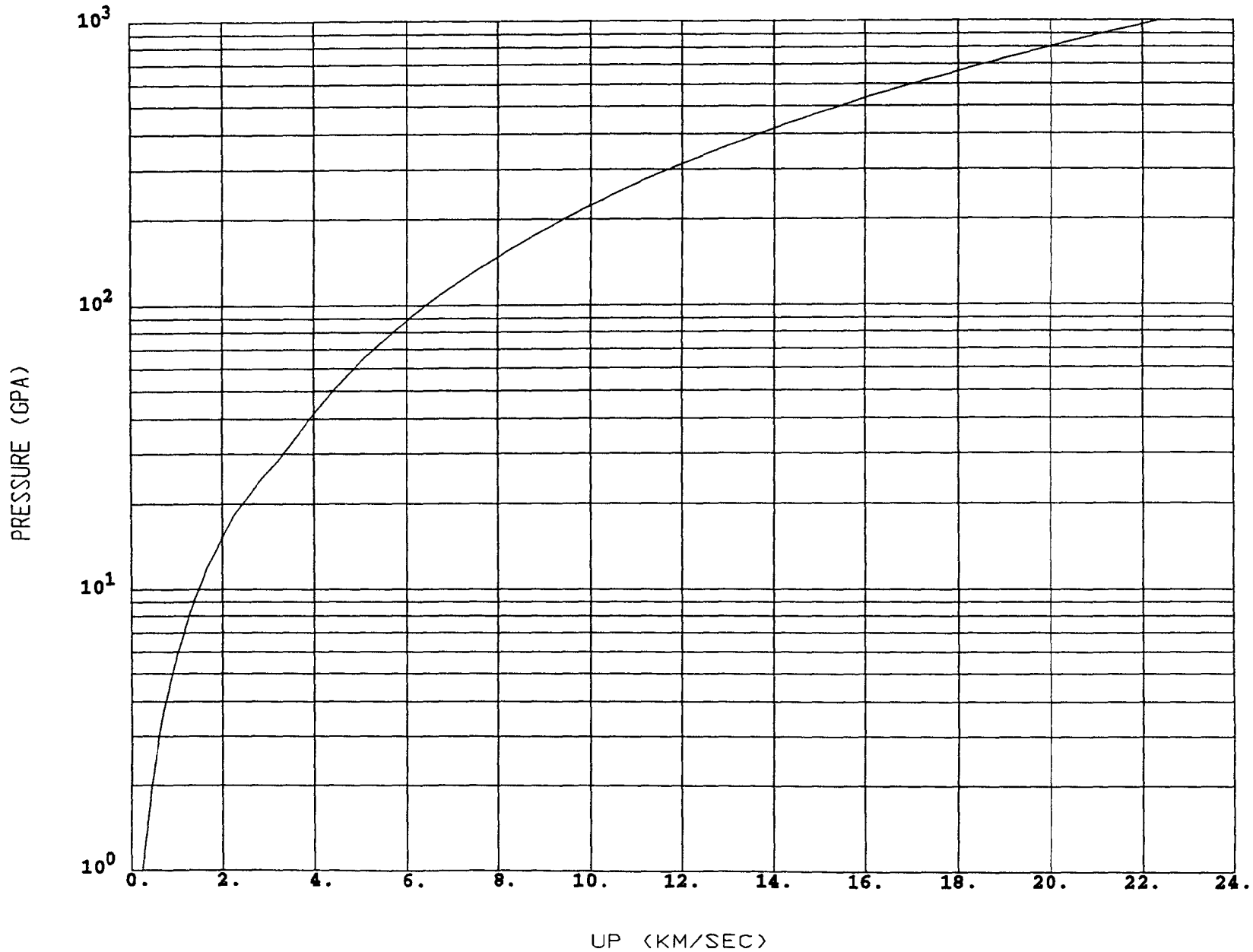
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA1

7550-HU1
E0 MJ/KG
0.00+00

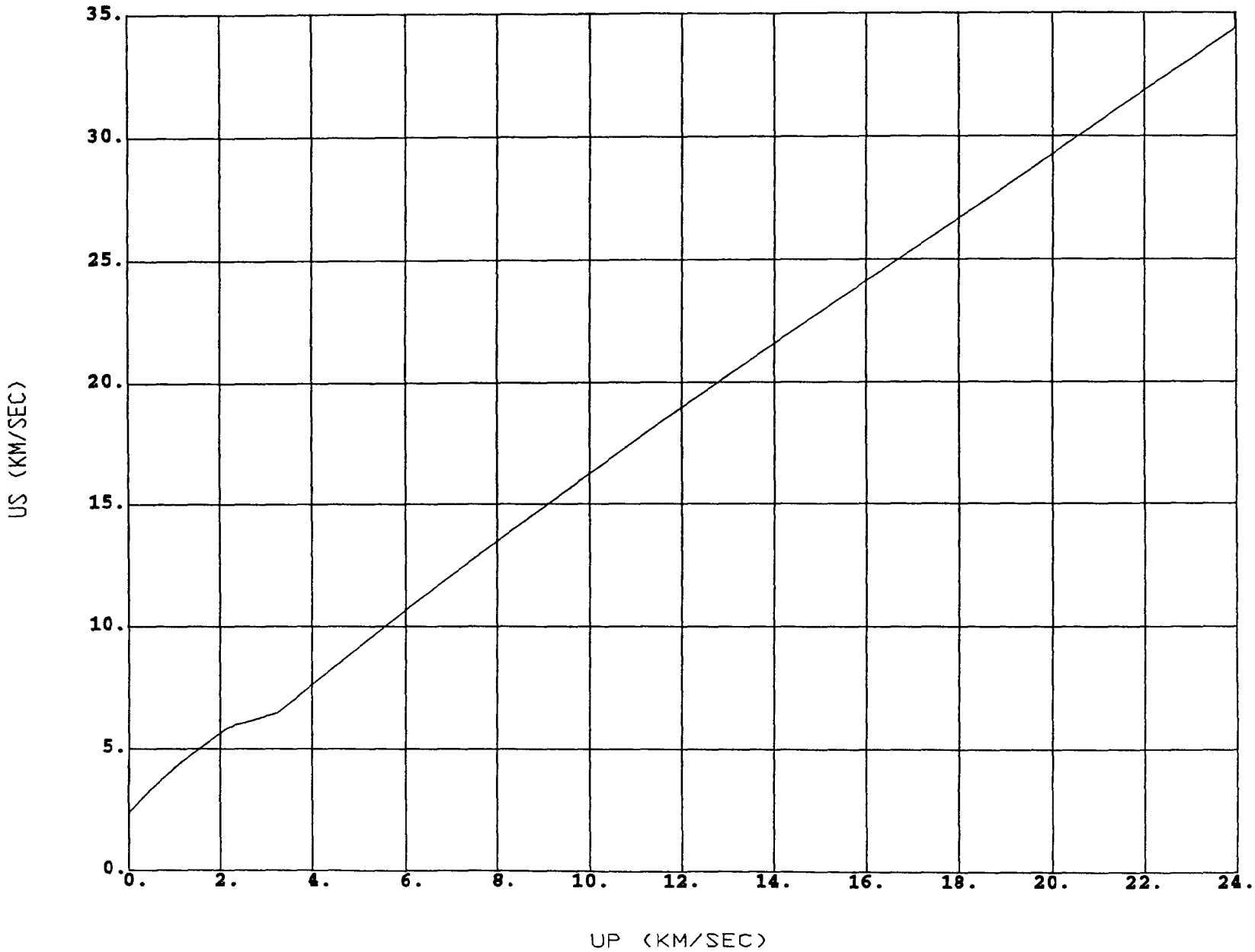
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY 02

7550-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA

MATERIAL NUMBER | SUMMARY

7560 MATERIAL. POLYURETHANE

COMP. C 62.3 WT%, O 23.3 WT%, N 7.3 WT%, H 7.1 WT%
ATOMIC NUMBER. 3.7629E+00
ATOMIC MASS. 7.0384E+00
NORMAL DENSITY. 1.2650E+00

GAMMA(COMPUTED). 0.0037

TABLE SUMMARY.

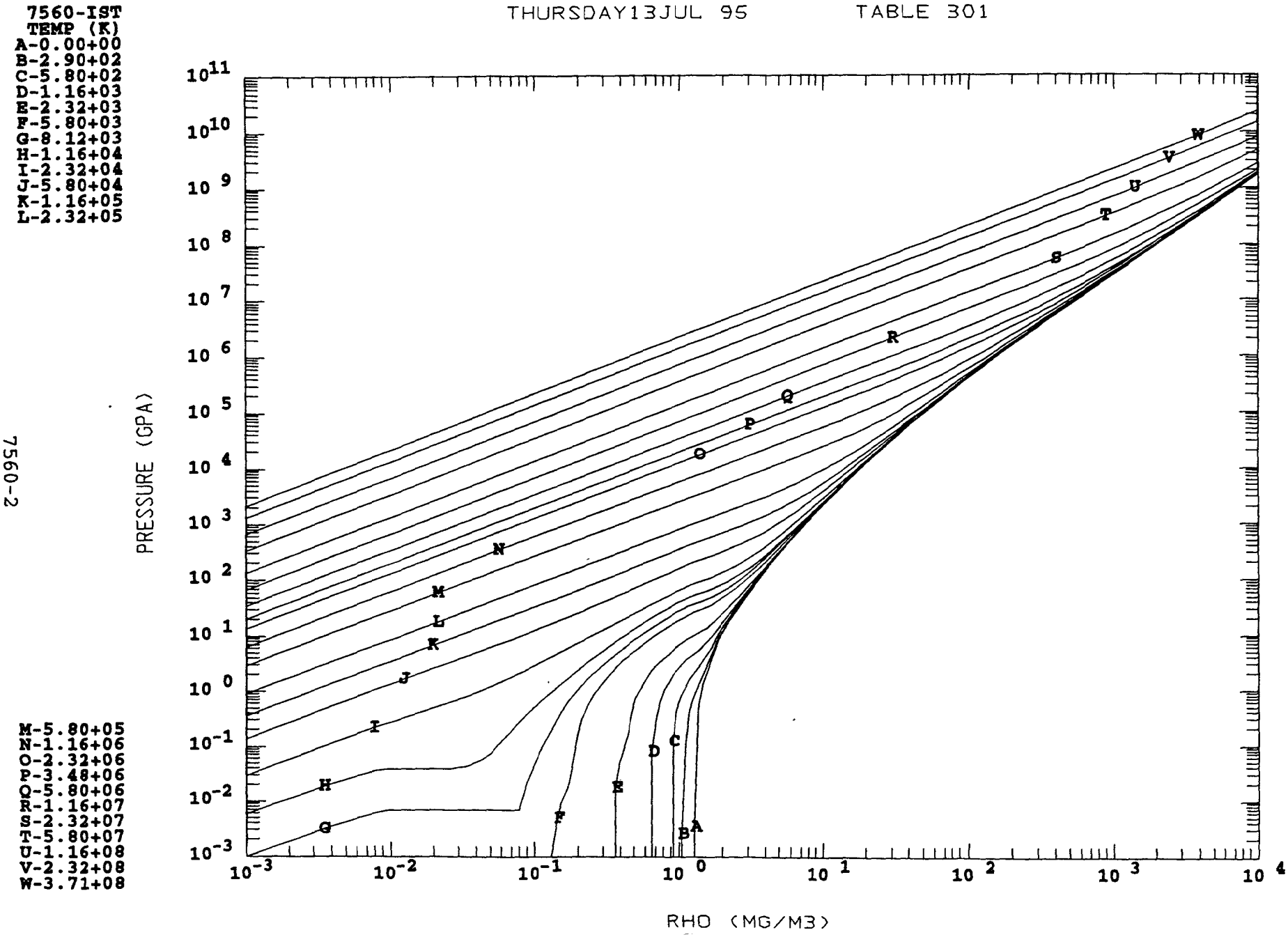
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	23					
102	65					
201	5					
301	4772	101	23	0.0000E+00	9.8828E-03	2.5300E+04
				0.0000E+00	2.5000E-02	3.2000E+04
303	4772	101	23	0.0000E+00	9.8828E-03	2.5300E+04
				0.0000E+00	2.5000E-02	3.2000E+04
304	4772	101	23	0.0000E+00	9.8828E-03	2.5300E+04
				0.0000E+00	2.5000E-02	3.2000E+04
305	4772	101	23	0.0000E+00	9.8828E-03	2.5300E+04
				0.0000E+00	2.5000E-02	3.2000E+04
306	306	101	1	0.0000E+00	9.8828E-03	2.5300E+04
				0.0000E+00	0.0000E+00	0.0000E+00

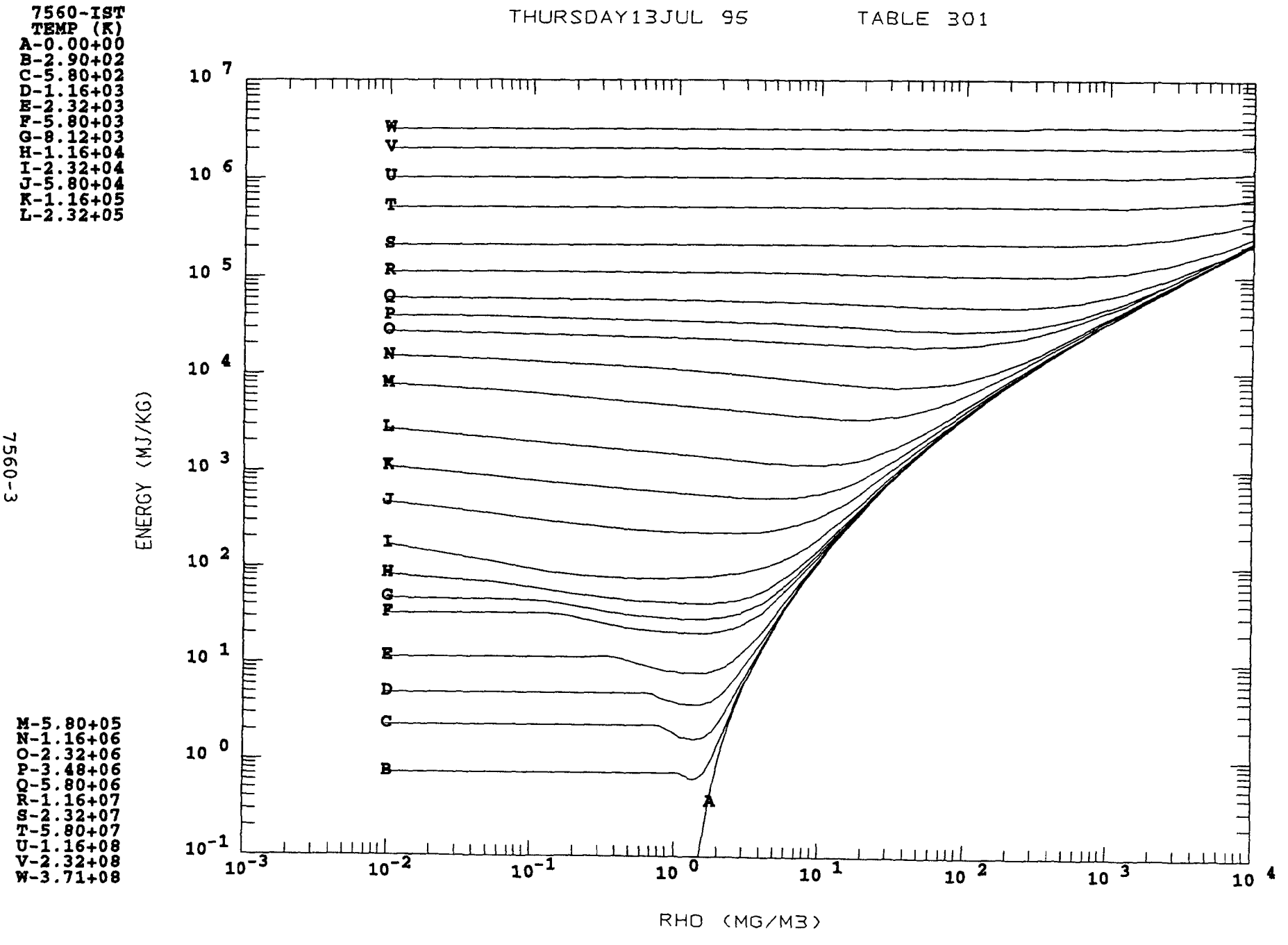
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. OCT 74, JAN 79
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 101874.
DATE OF LAST UPDATE. 101582.
SOURCE. J. BARNES, J. ROOD
REFS. NONE
CODES. SESAME I

COMMENTS. THE TWO TEMPERATURE TABLES FOR THIS MATERIAL (TABLES 303-306) ARE A VERY ROUGH APPROXIMATION AND WERE DERIVED FROM THE CODE TWOTEMP (AND NOT FROM THE ORIGINAL EOS CALCULATIONS, WHICH IN MOST CASES ARE NO LONGER REPRODUCIBLE). THE TABLES ARE VERY NOISY DUE BOTH TO NOISE IN THE ORIGINAL DATA (WHICH SHOWS UP WHEN THE COLD CURVE IS SUBTRACTED TO GENERATE THE THERMAL CONTRIBUTION) AND TO THE CONSTRAINT THAT NO CROSSING ISOTHERMS ARE ALLOWED. IF YOU HAVE ANY PROBLEMS USING THESE TABLES, CONTACT BOB ALBERS (T-4).

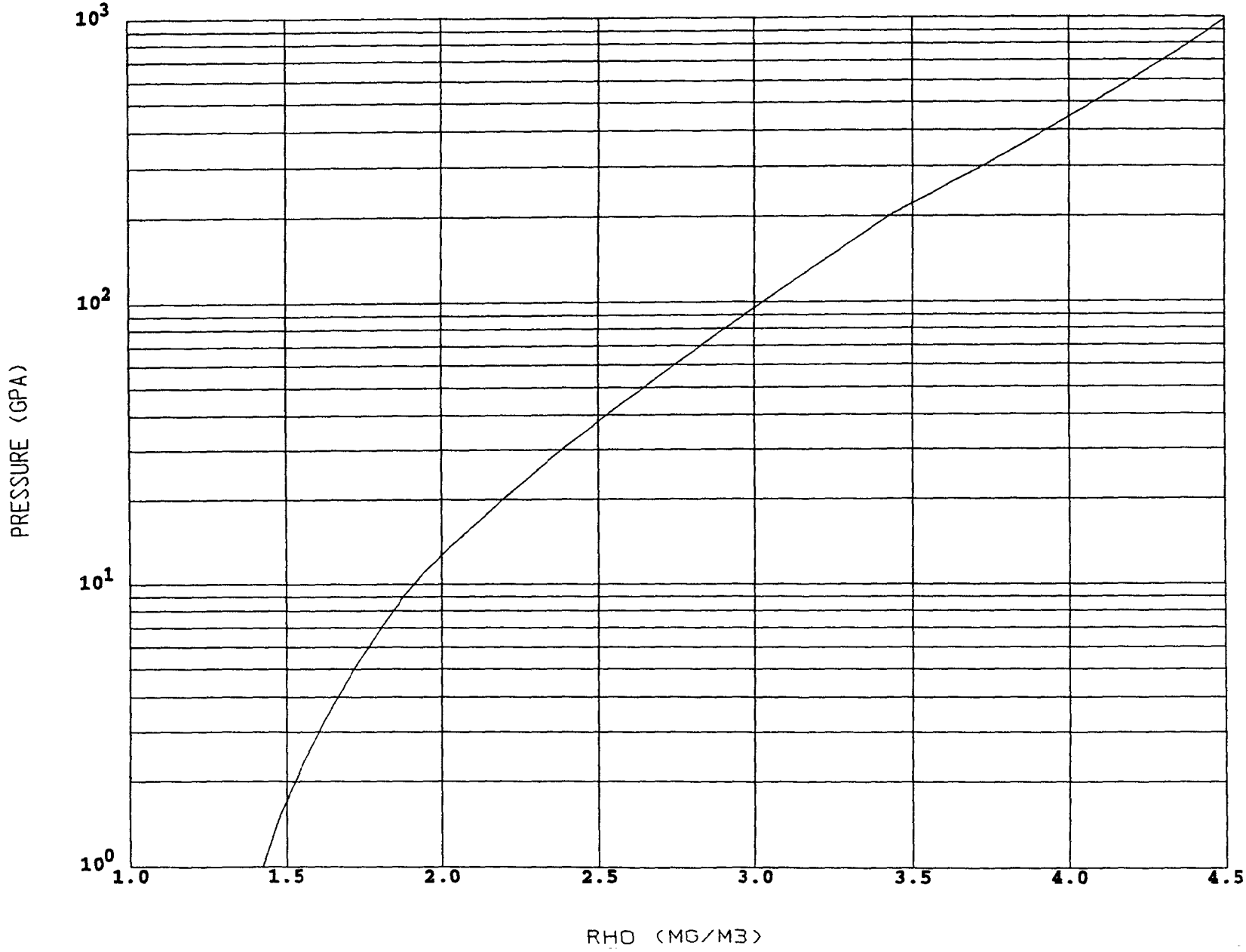
THURSDAY13JUL 95 TABLE 301




7560-IST
TEMP (K)
A-0.00+00
B-2.90+02
C-5.80+02
D-1.16+03
E-2.32+03
F-5.80+03
G-8.12+03
H-1.16+04
I-2.32+04
J-5.80+04
K-1.16+05
L-2.32+05
M-5.80+05
N-1.16+06
O-2.32+06
P-3.48+06
Q-5.80+06
R-1.16+07
S-2.32+07
T-5.80+07
U-1.16+08
V-2.32+08
W-3.71+08
THURSDAY13JUL 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)

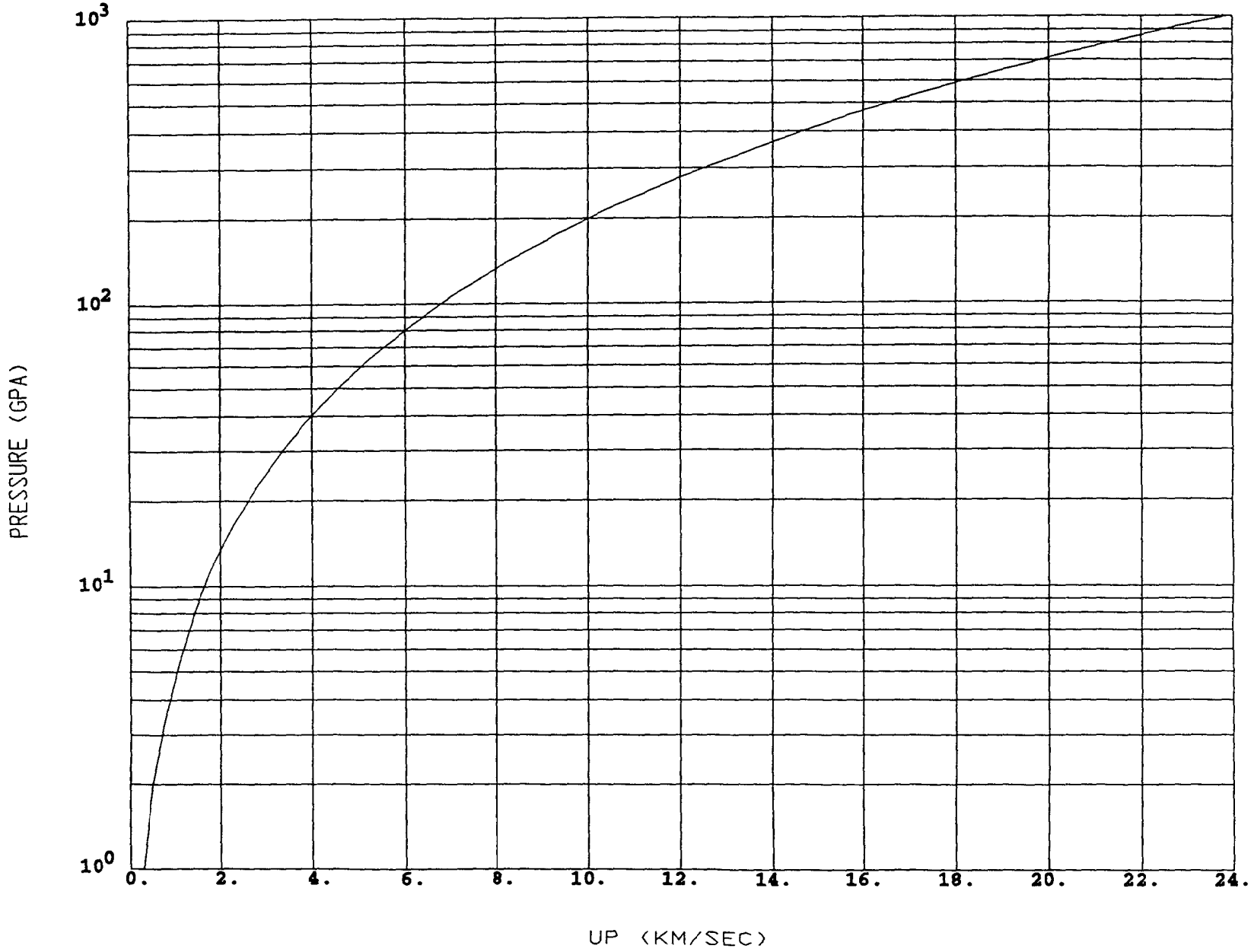
7560-HU1
E0 MJ/KG
0.00+00

THURSDAY13JUL 95 TABLE 301



7560-HU1
E0 MJ/KG
0.00+00

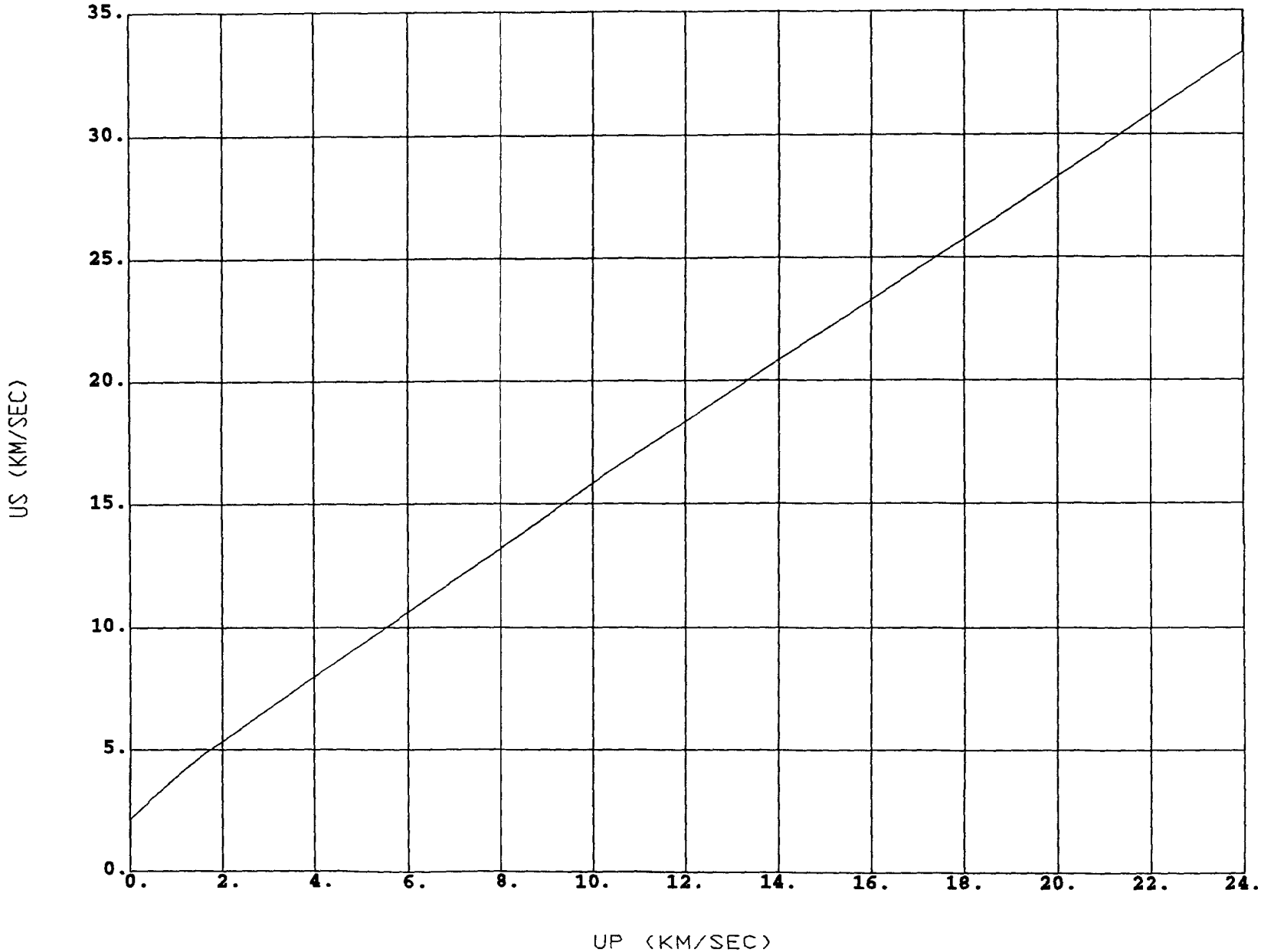
THURSDAY13JUL 95 TABLE 301



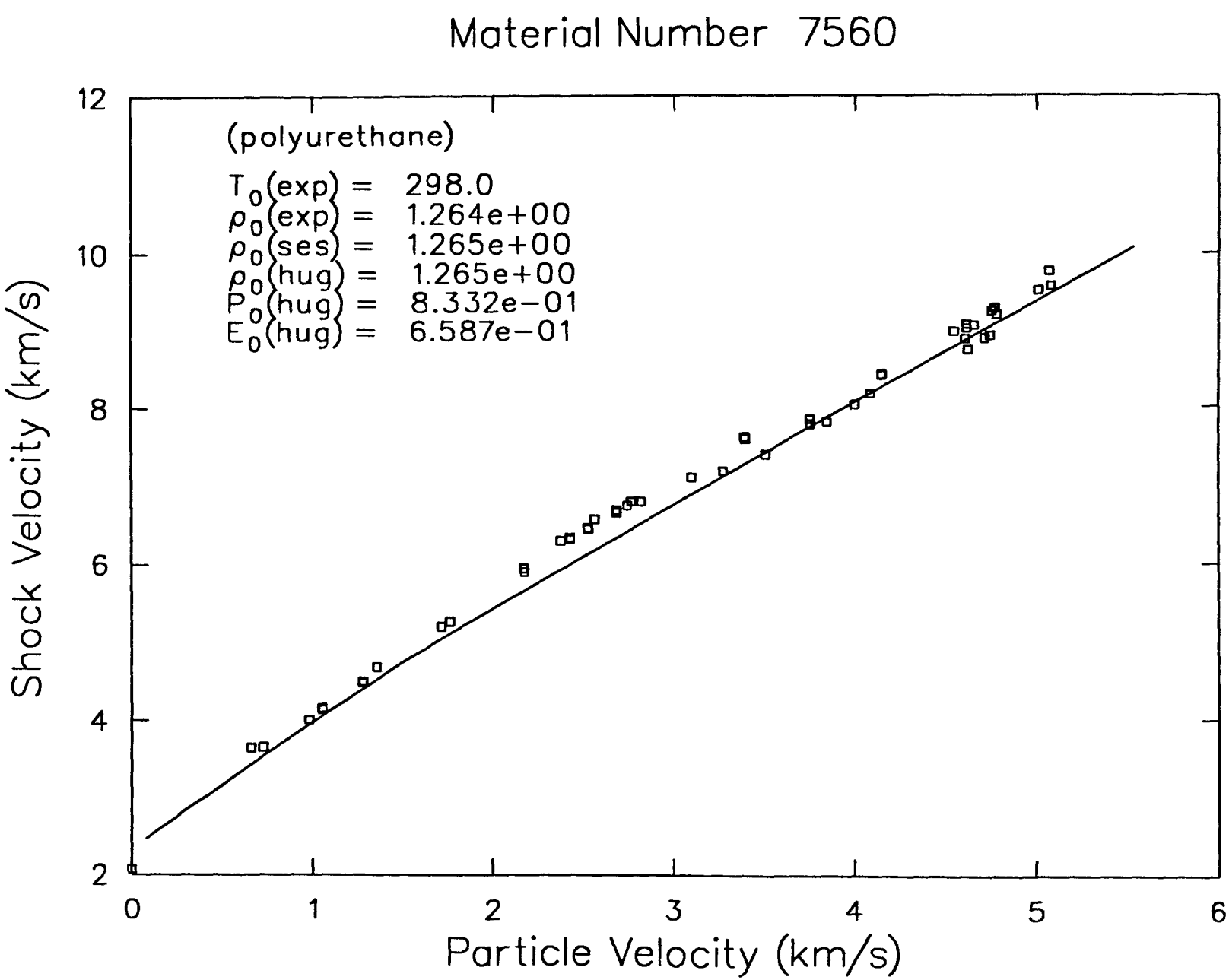
T1 SES2D CRAY 02

7560-HU1
E0 MJ/KG
0.00+00

THURSDAY13JUL 95 TABLE 301



T1 SES2D CRA


Material Number 7560
(polyurethane)
T_0(exp) = 298.0
ρ_0(exp) = 1.264e+00
ρ_0(ses) = 1.265e+00
ρ_0(hug) = 1.265e+00
P_0(hug) = 8.332e-01
E_0(hug) = 6.587e-01
Shock Velocity (km/s)
Particle Velocity (km/s)
0
1
2
3
4
5
6
2
4
6
8
10
12

7560-7

MATERIAL NUMBER SUMMARY

7561 MATERIAL. POLYURETHANE

COMP. C11H16NO3
ATOMIC NUMBER. 3.6450E+00
ATOMIC MASS. 6.7820E+00
NORMAL DENSITY. 1.2640E+00

GAMMA(COMPUTED). 0.0013

TABLE SUMMARY.

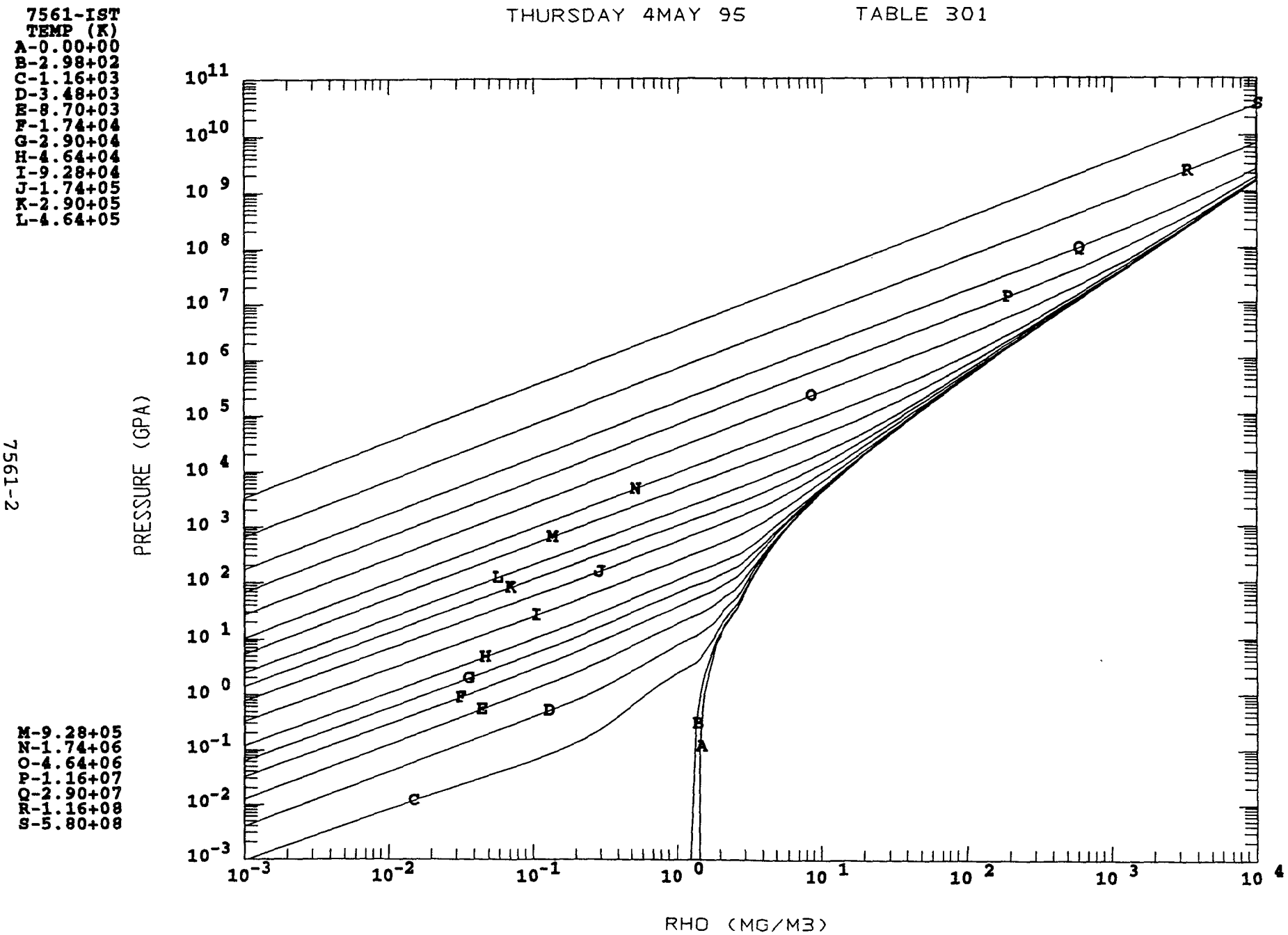
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	17					
102	87					
201	5					
301	8435	73	38	0.0000E+00	1.2640E-06	2.5280E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7319	65	37	1.2640E-06	2.5280E-06	2.5280E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7860	68	38	1.2640E-06	2.5280E-06	2.5280E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	275	68	1	1.3176E-06	2.6353E-06	2.6353E+04
				0.0000E+00	-2.3033E-11	0.0000E+00
401	41					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

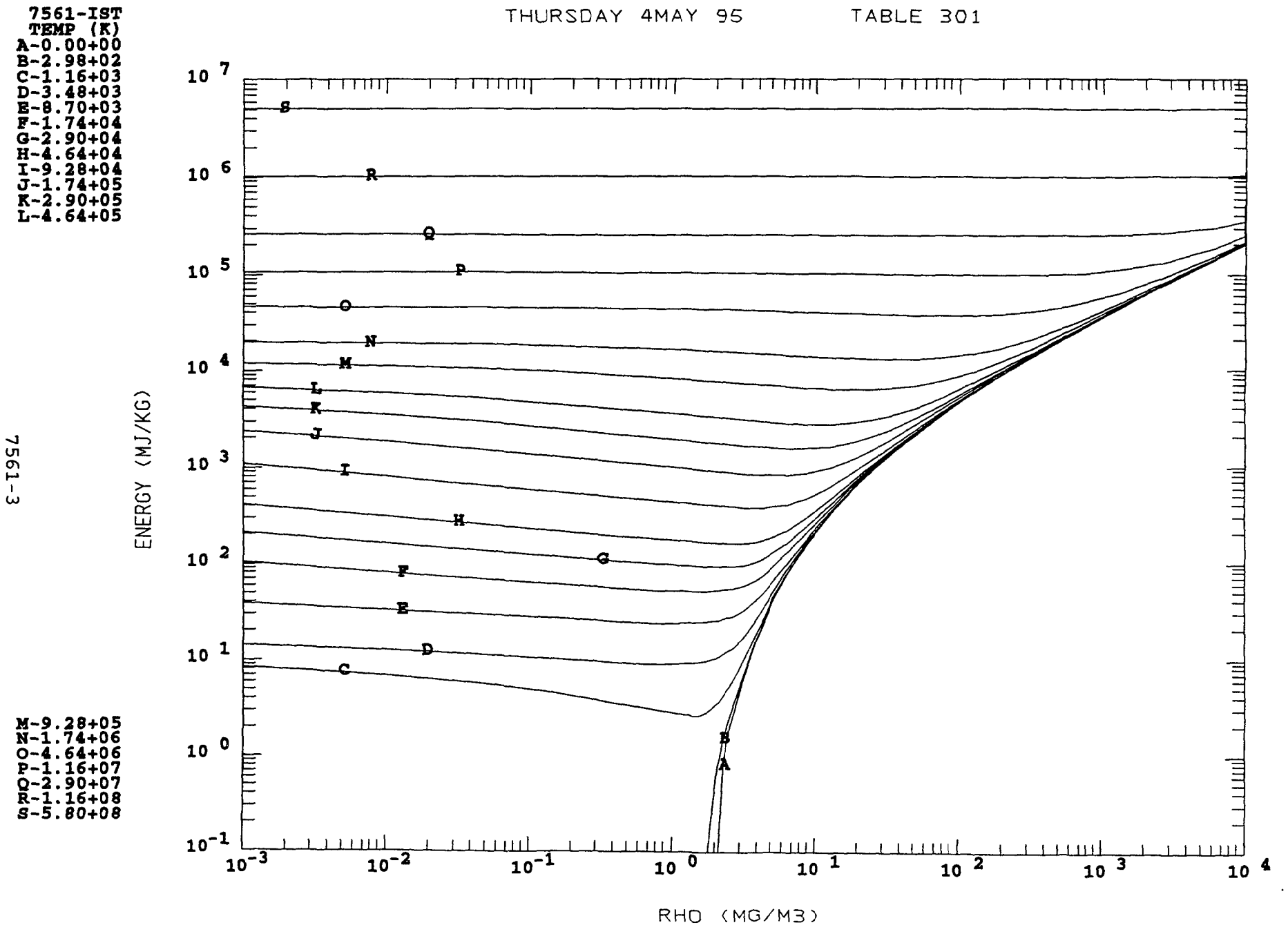
DATE. DEC 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 121588.
DATE OF LAST UPDATE. 121588.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN=1). GAMREF = 1.10, DEBKEL = 167, TMELT = 450. COLD CURVE FROM SHOCK DATA AND SOUND VELOCITY. (UP,US) POINTS ARE (0.0,2.068), (0.6,3.50), (2.69,6.78), (3.58,7.44), (5.13,9.75). INORDER TO MATCH THE CRITICAL POINT DATA, WE SET ECOHKC =17 AND FACLJ = 0.15. INORDER TO GET A TOTAL PRESSURE OF 1 BAR AT ROOM TEMPERATURE AND NORMAL DENSITY, WE RESCALED THE COLD CURVE USING RHOO = 1.31765. TFD MATCH COMPRESSION WAS 2.11. 301 TABLE HAS MAXWELL CONSTRUCTIONS.

THURSDAY 4MAY 95 TABLE 301



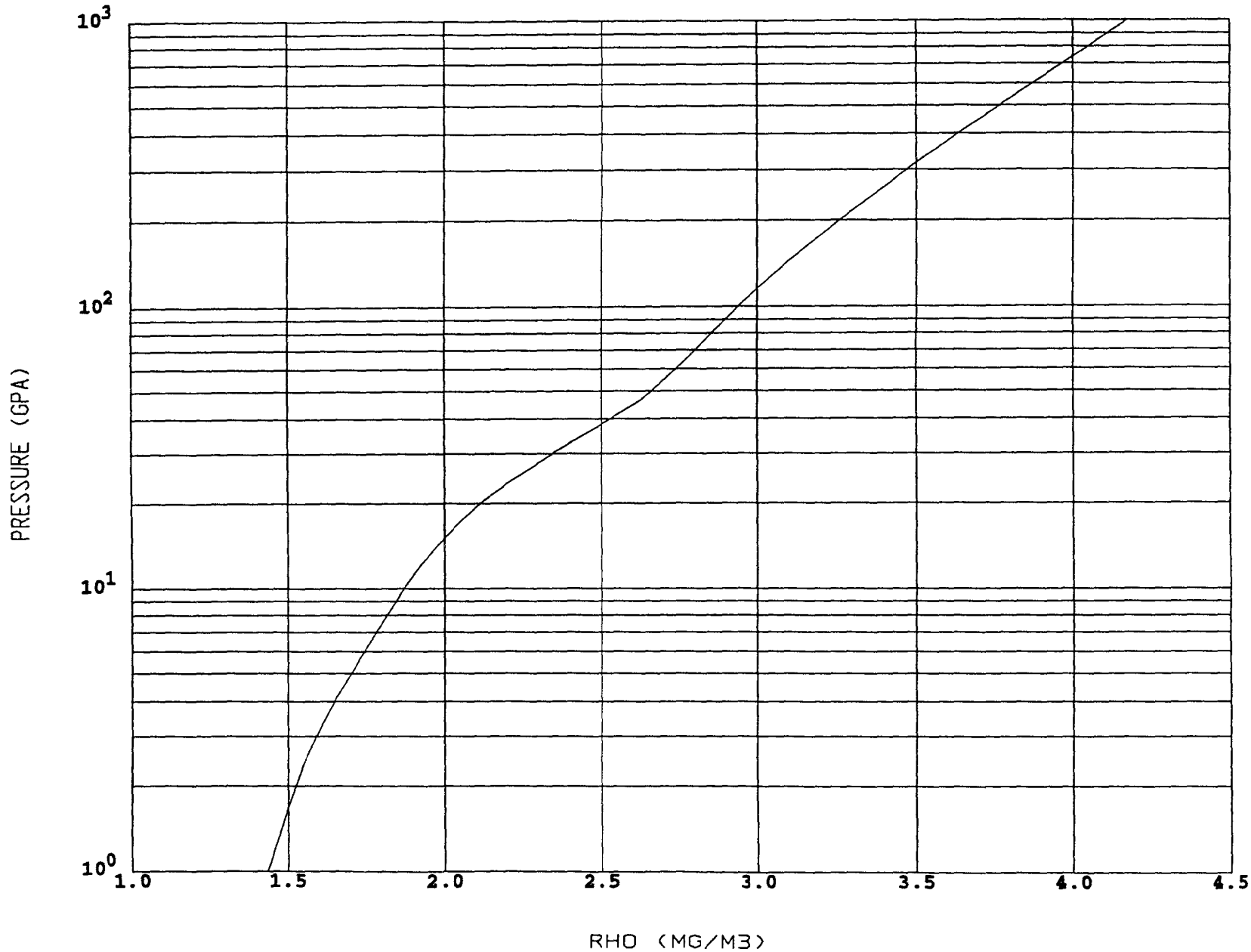
T1 SES2D GRAY



T1 SES2D CRAY 02

7561-HU1
E0 MJ/KG
0.00+00

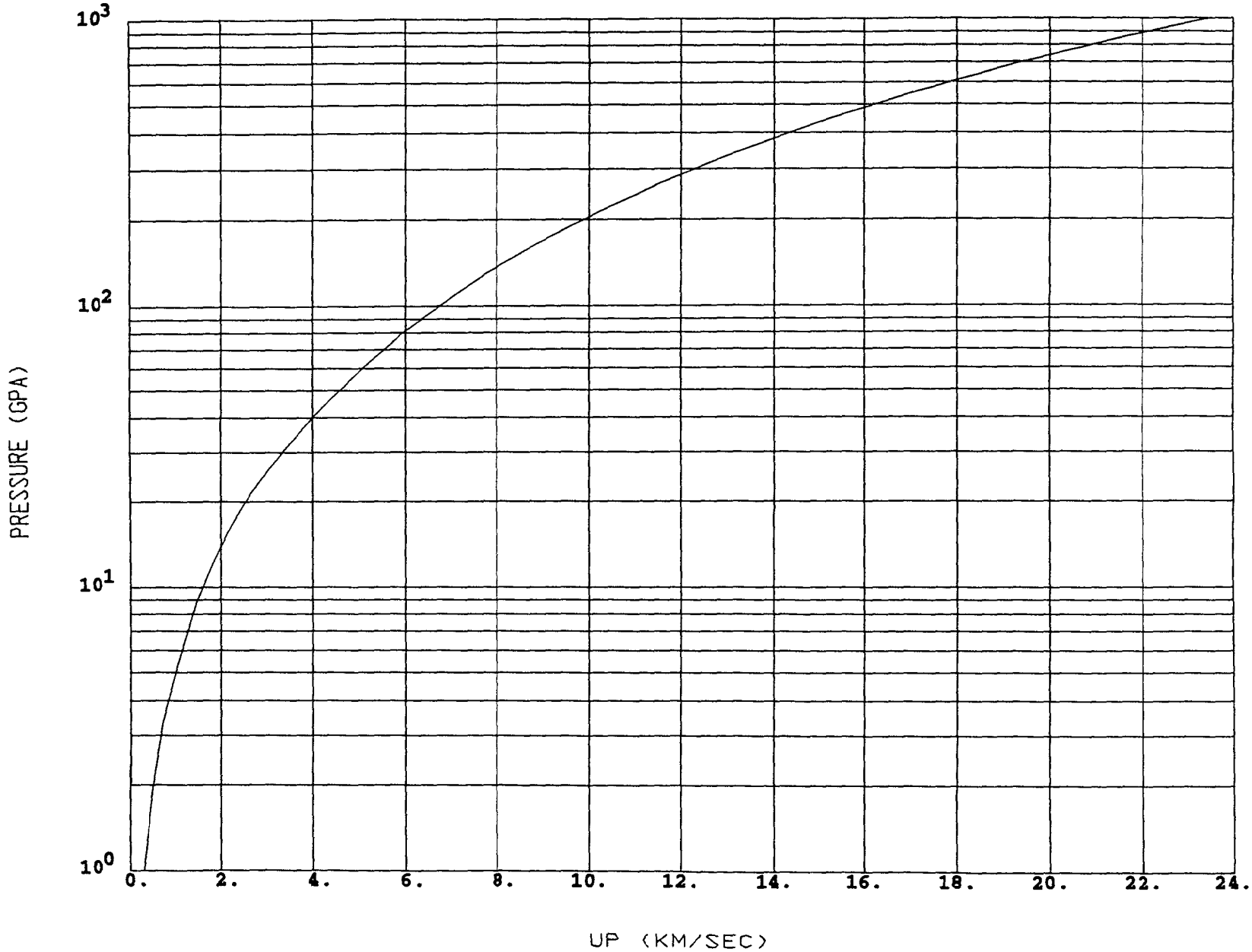
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY

7561-HU1
E0 MJ/KG
0.00+00

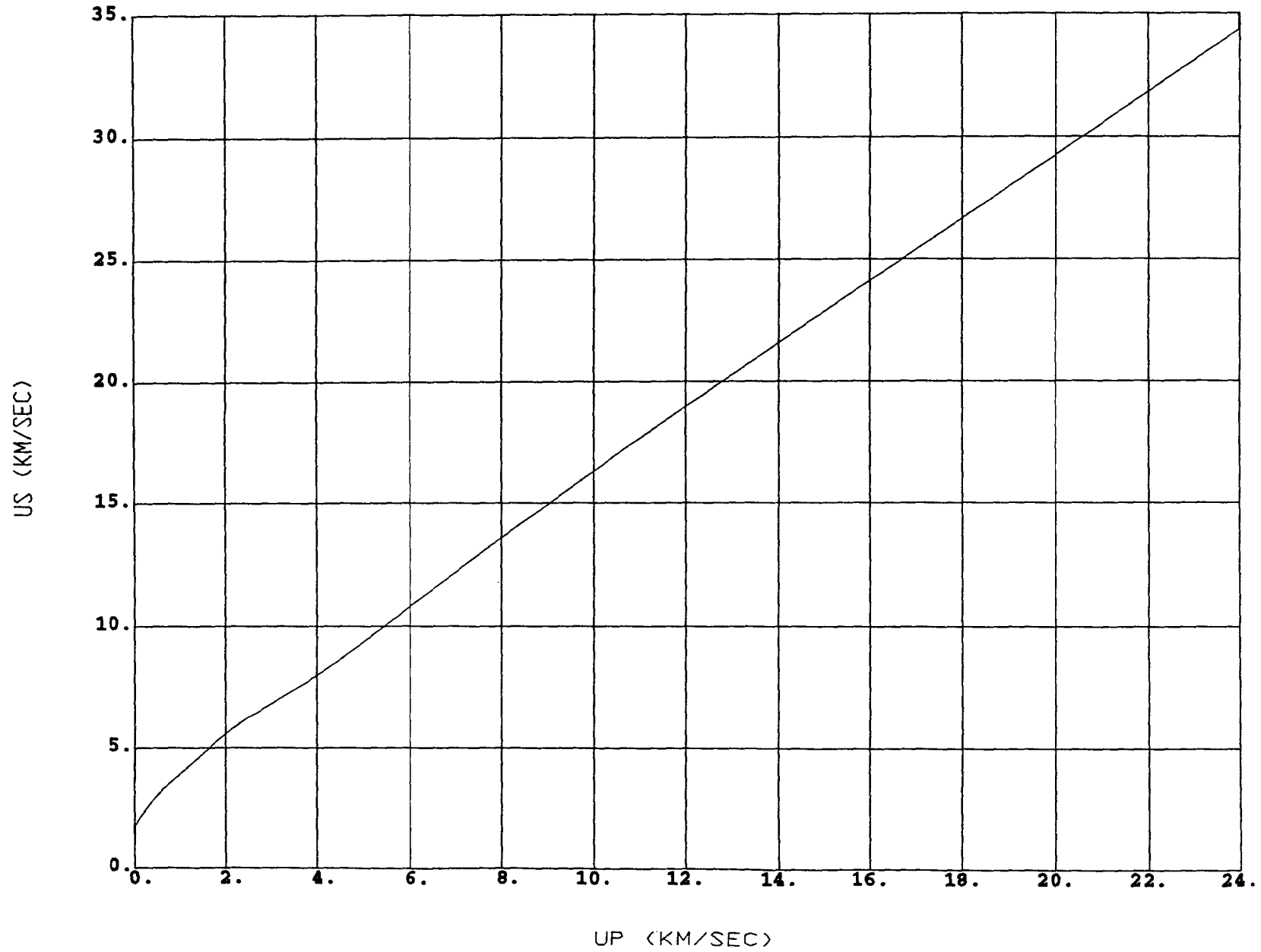
THURSDAY 4MAY 95 TABLE 301



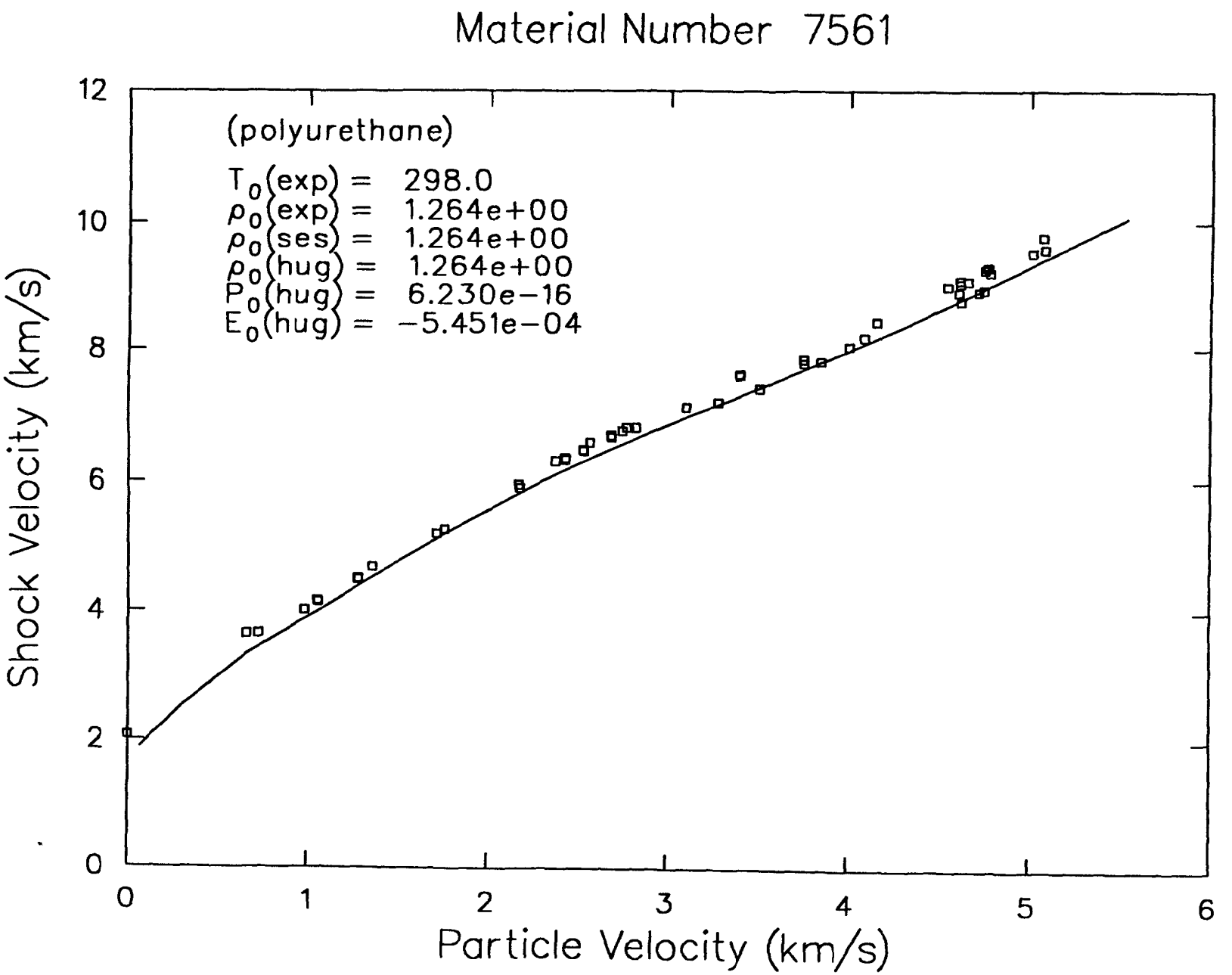
T1 SES2D CRAY 02

7561-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7561
(polyurethane)
T_0(exp) = 298.0
ρ_0(exp) = 1.264e+00
ρ_0(ses) = 1.264e+00
ρ_0(hug) = 1.264e+00
P_0(hug) = 6.230e−16
E_0(hug) = −5.451e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
12
0
1
2
3
4
5
6

MATERIAL NUMBER | SUMMARY

7570 MATERIAL. PHENOLIC

COMP. C 50.0 MOLE%, H 42.857 MOLE%, O 7.143 MOLE%
ATOMIC NUMBER. 4.0000E+00
ATOMIC MASS. 7.5798E+00
NORMAL DENSITY. 1.3850E+00

GAMMA(COMPUTED). 0.9608

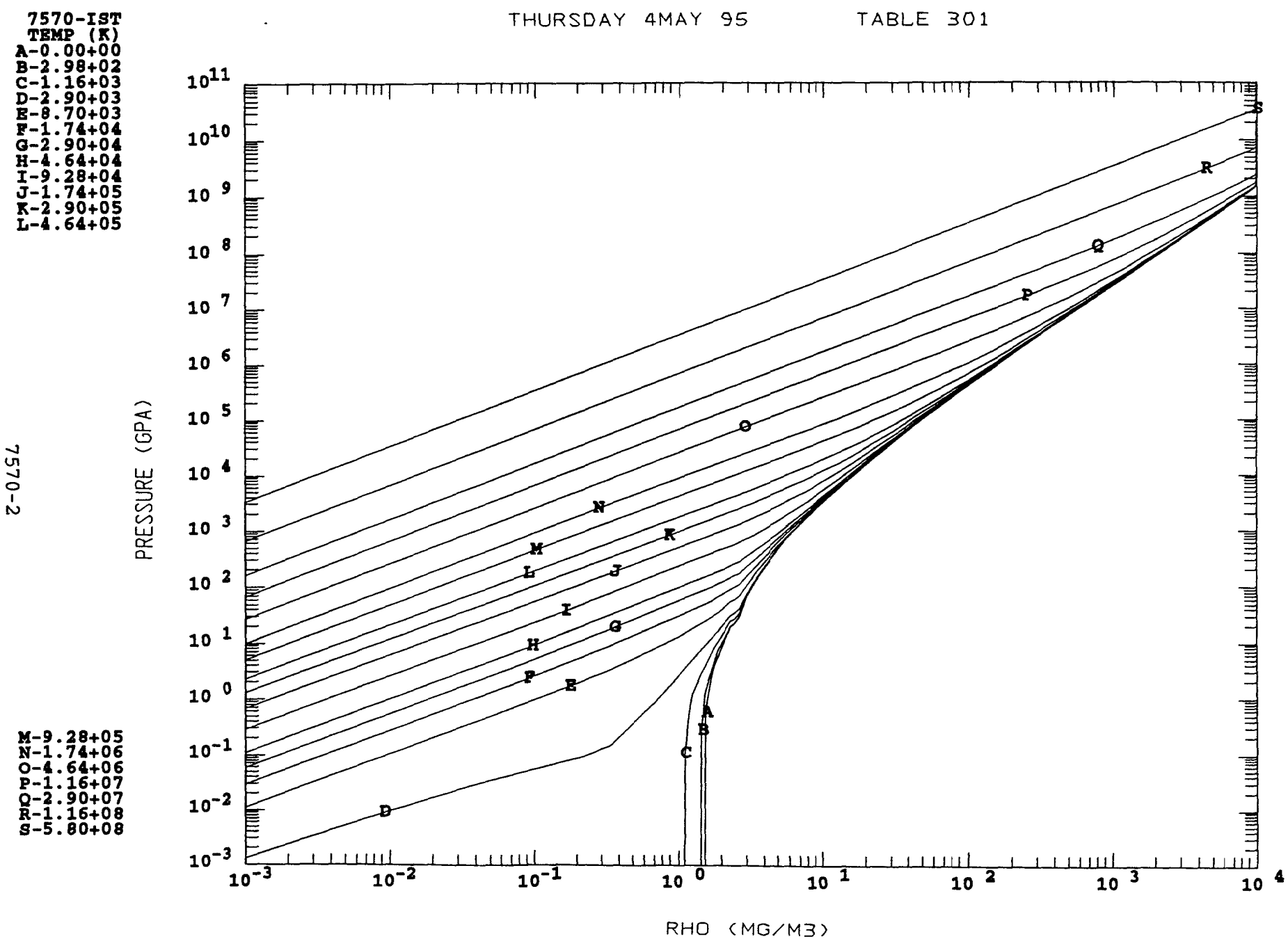
TABLE SUMMARY.

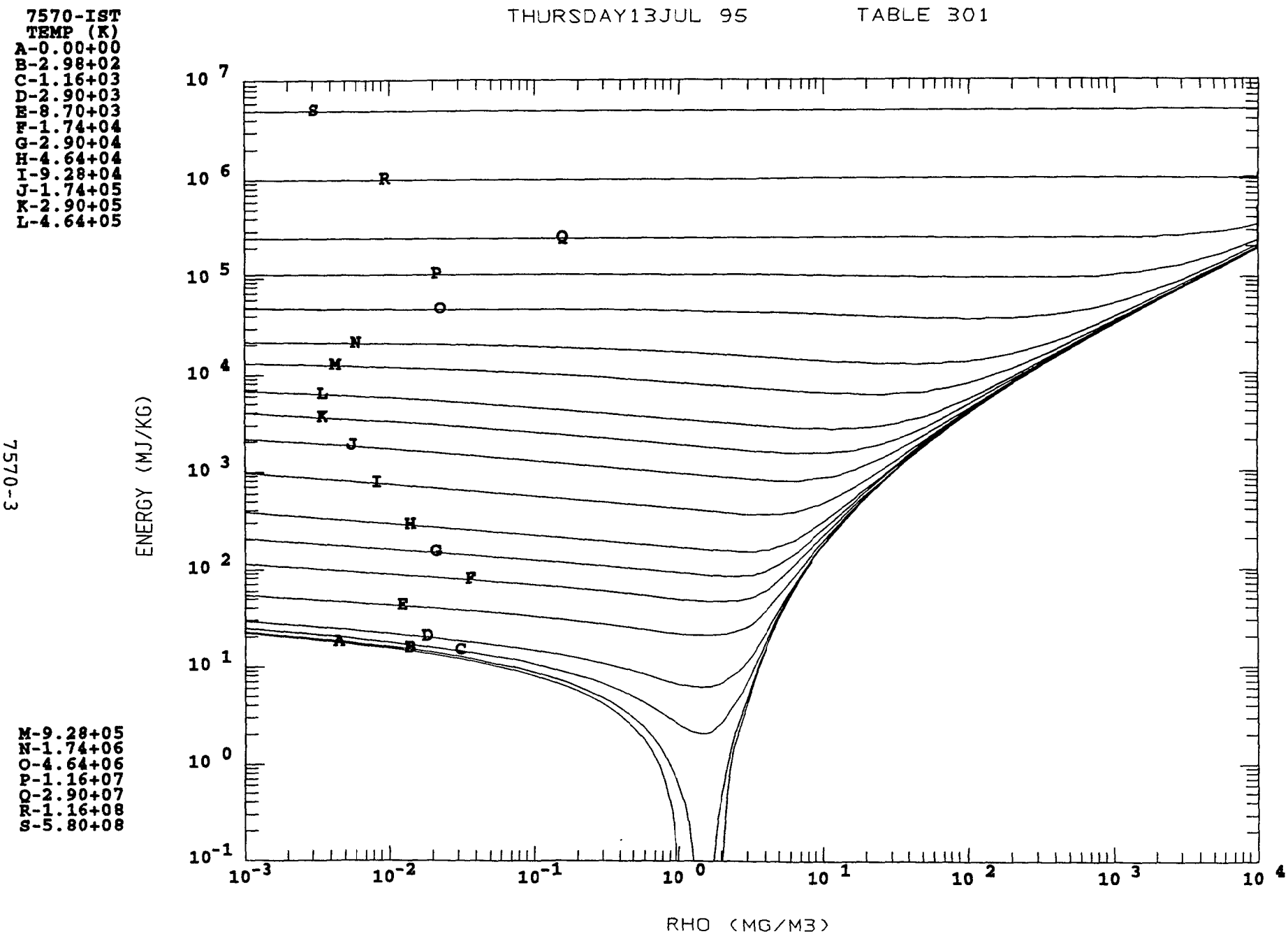
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	21					
102	54					
201	5					
301	8665	75	38	0.0000E+00	1.3850E-06	2.7700E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	8665	75	38	0.0000E+00	1.3850E-06	2.7700E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	8550	74	38	1.3850E-06	2.7700E-06	2.7700E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8550	74	38	1.3850E-06	2.7700E-06	2.7700E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	299	74	1	1.3850E-06	2.7700E-06	2.7700E+04
				0.0000E+00	-2.1086E-10	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JULY 88
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 70888.
DATE OF LAST UPDATE. 40891.
SOURCE. J. BOETTGER
REFS. LA-11512-MS
CODES. GRIZZLY

COMMENTS. THE COMPOSITION IS ASSUMED TO BE C7H6O. MIXED TFD WAS USED FOR THE ELECTRONIC TABLE. THE NUCLEAR MODEL IS CHARTJD WITH IGRUN = 1, GAMREF = 1.3, DEBREF = 255K AND TMELT = 600K. THE COLD CURVE WAS OBTAINED WITH THE CHUG MODEL USING CMAT ≐ 2.1, ECOH = 120 KCAL PER MOLE AND FACLJ = 3.0. A THREE LINE FIT TO EXPERIMENTAL US VS. UP DATA WAS USED AND IS DEFINED BY THE FOUR POINTS (0.00,2.98), (2.65,6.66), (2.975,6.66), (5.0,9.8).

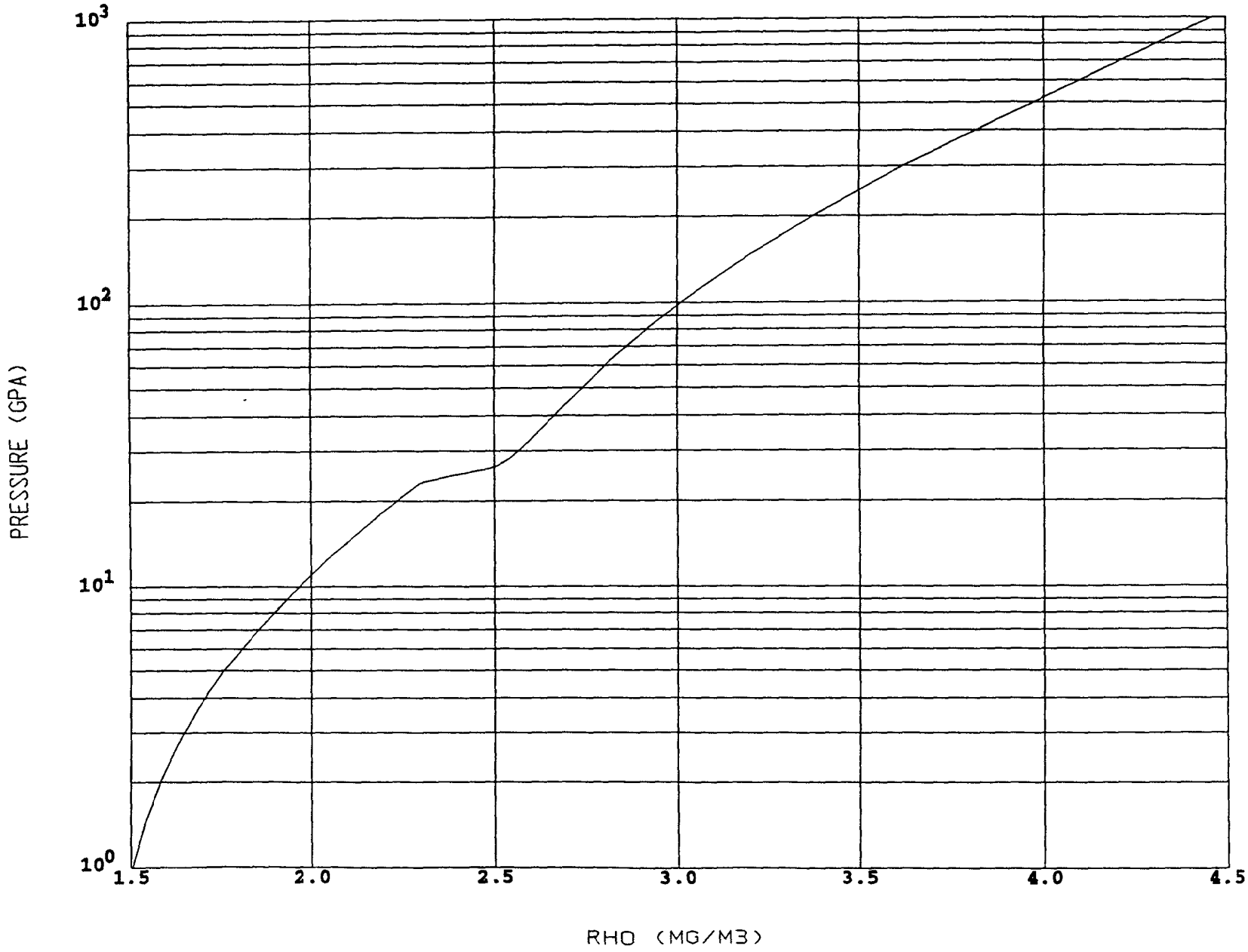

THURSDAY 4MAY 95 TABLE 301
7570-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-2.90+03
E-8.70+03
F-1.74+04
G-2.90+04
H-4.64+04
I-9.28+04
J-1.74+05
K-2.90+05
L-4.64+05
M-9.28+05
N-1.74+06
O-4.64+06
P-1.16+07
Q-2.90+07
R-1.16+08
S-5.80+08
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CPA



T1 SES2D CRAY 02

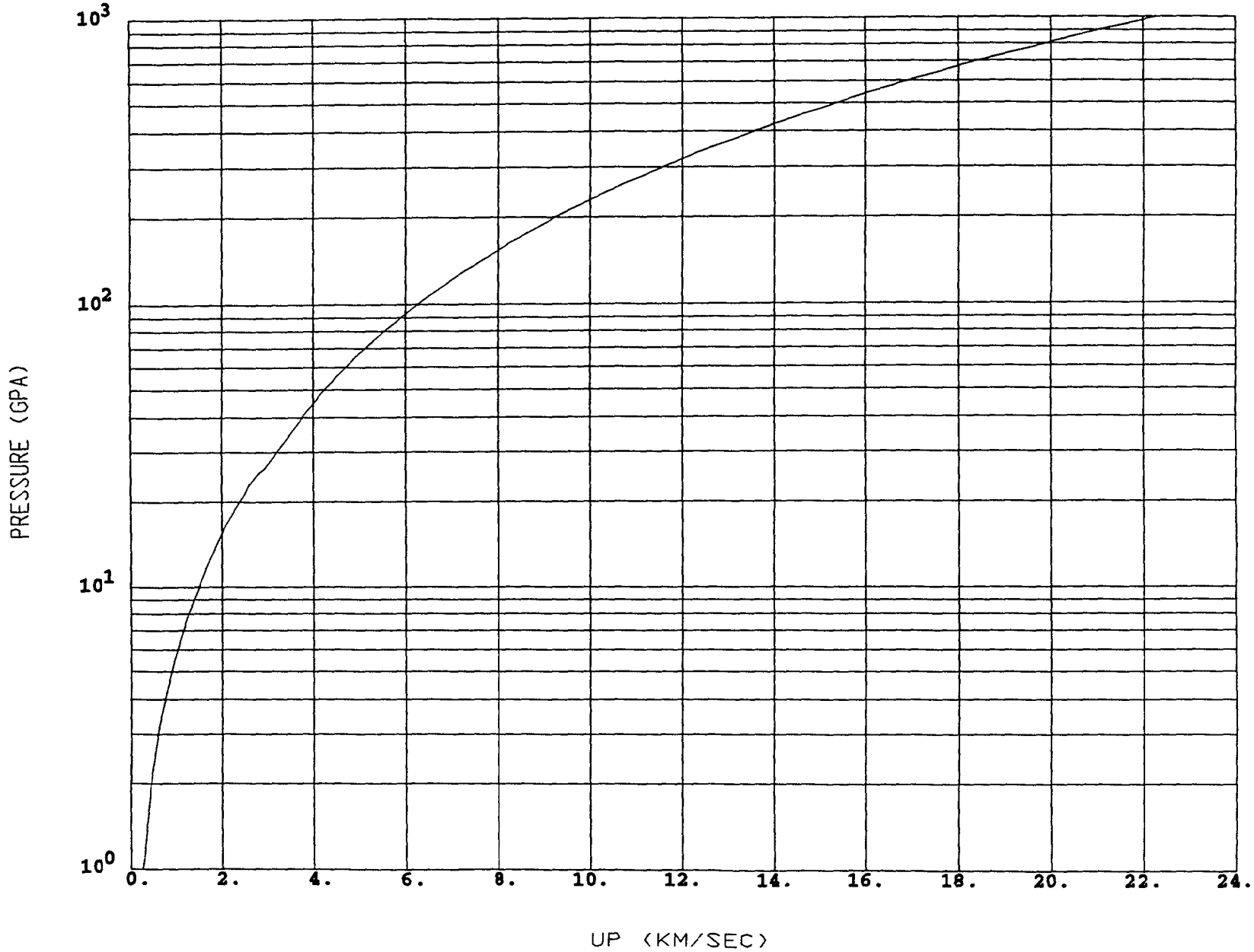
7570-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



7570-HU1
E0 MJ/KG
0.00+00

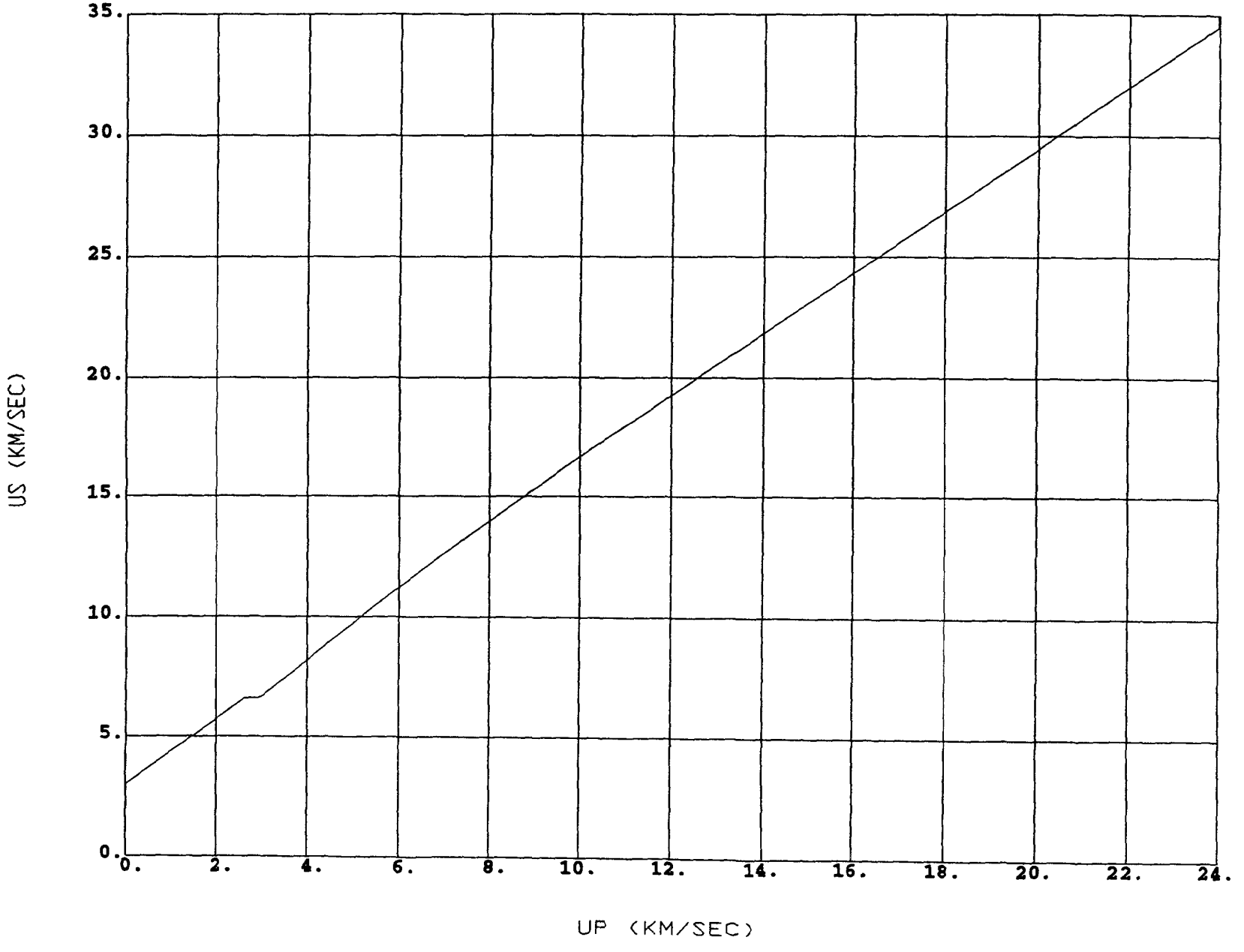
THURSDAY 4MAY 95 TABLE 301



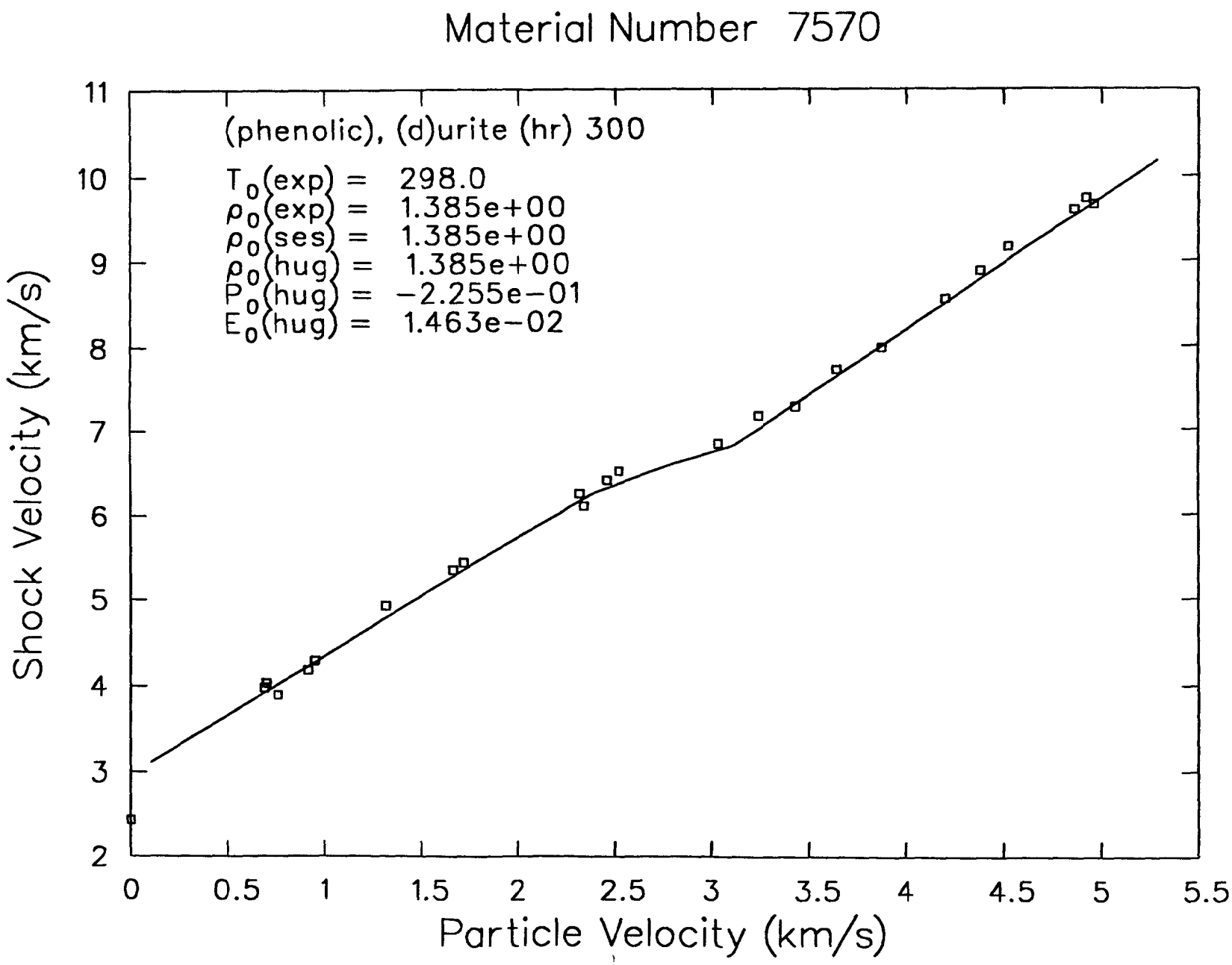
T1 SES2D CRAY 02

7570-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA


Material Number 7570
(phenolic), (d)urite (hr) 300
T_0(exp) = 298.0
ρ_0(exp) = 1.385e+00
ρ_0(ses) = 1.385e+00
ρ_0(hug) = 1.385e+00
P_0(hug) = −2.255e−01
E_0(hug) = 1.463e−02
Shock Velocity (km/s)
Particle Velocity (km/s)
11
10
9
8
7
6
5
4
3
2
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5

MATERIAL NUMBER | SUMMARY

7580 MATERIAL. PHENOLIC REFRASIL

COMP. C 26.55 MOLE%, O 35.06 MOLE%, H 22.76 MOLE%, SI 15.63 MOLE%
ATOMIC NUMBER. 6.8137E+00
ATOMIC MASS. 1.3417E+01
NORMAL DENSITY. 1.7000E+00

GAMMA(COMPUTED). 0.9165

TABLE SUMMARY.

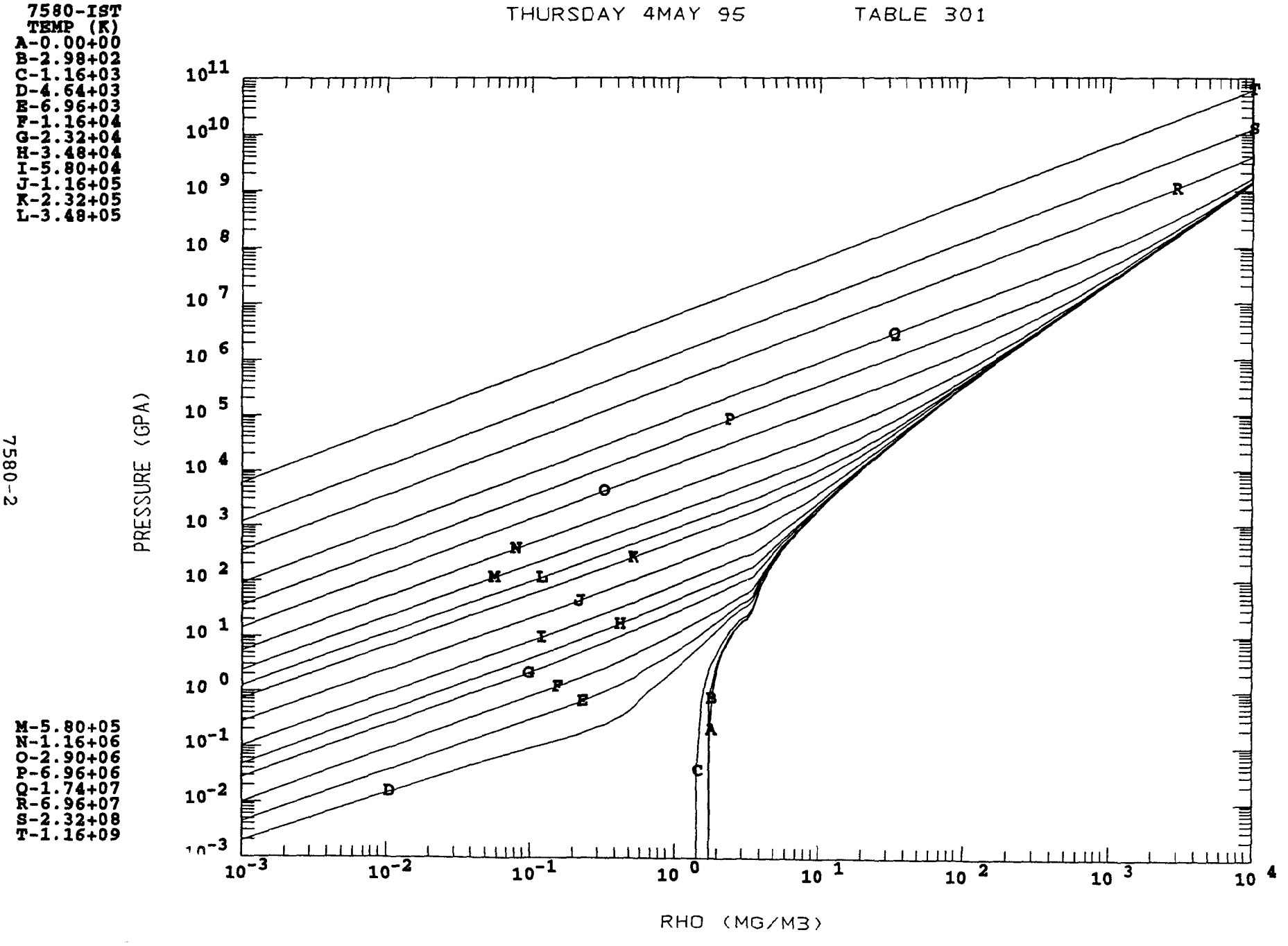
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	24					
102	57					
201	5					
301	8891	75	39	0.0000E+00	1.7000E-06	3.4000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	8891	75	39	0.0000E+00	1.7000E-06	3.4000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	8891	75	39	0.0000E+00	1.7000E-06	3.4000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8773	74	39	1.7000E-06	3.4000E-06	3.4000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	299	74	1	1.7000E-06	3.4000E-06	3.4000E+04
				0.0000E+00	-1.6285E-10	0.0000E+00

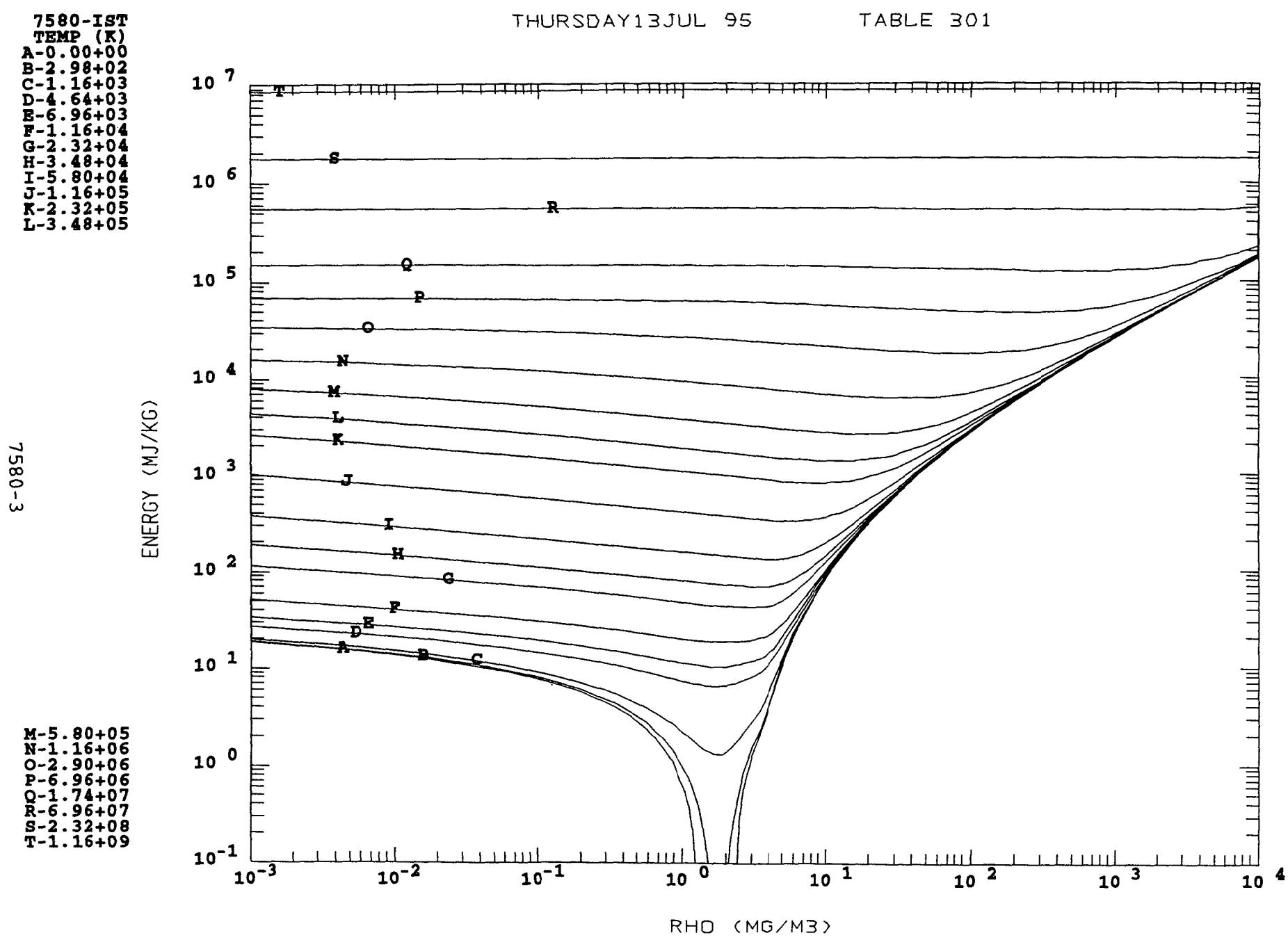
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JULY 88
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 71588.
DATE OF LAST UPDATE. 40891.
SOURCE. J. BOETTGER
REFS. LA-11512-MS
CODES. GRIZZLY

COMMENTS. THE COMPOSITION IS ASSUMED TO BE 70% SILICA AND 30% PHENOLIC BY MASS. THE ELECTRONIC TABLE IS MIXED TFD. THE NUCLEAR MODEL IS CHARTJD WITH IGRUN = 1, GAMREF = 1.0, DEBREF = 300K AND TMELT = 600K. THE COLD CURVE WAS OBTAINED WITH THE CHUG MODEL USING CMAT = 2.1, ECOH = 132 KCAL PER MOLE AND FACLJ = 3.0. A THREE LINE FIT TO EXPERIMENTAL US VS. UP DATA WAS USED AND IS DEFINED BY THE FOUR POINTS (0.0,3.0), (2.279,5.325), (2.627,5.325), (4.381,8.170).

THURSDAY 4MAY 95 TABLE 301

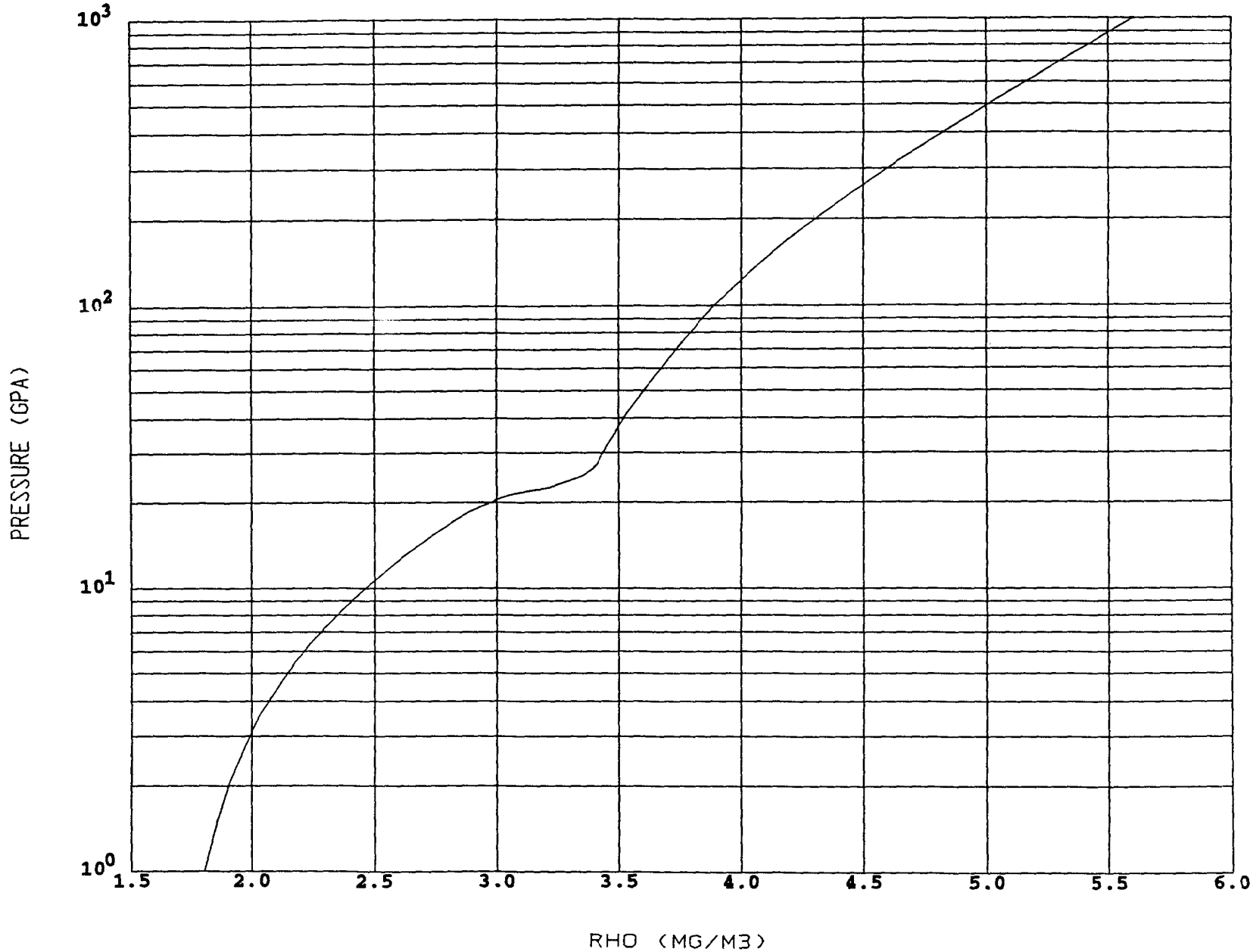




T1 SES2D CRAY 02

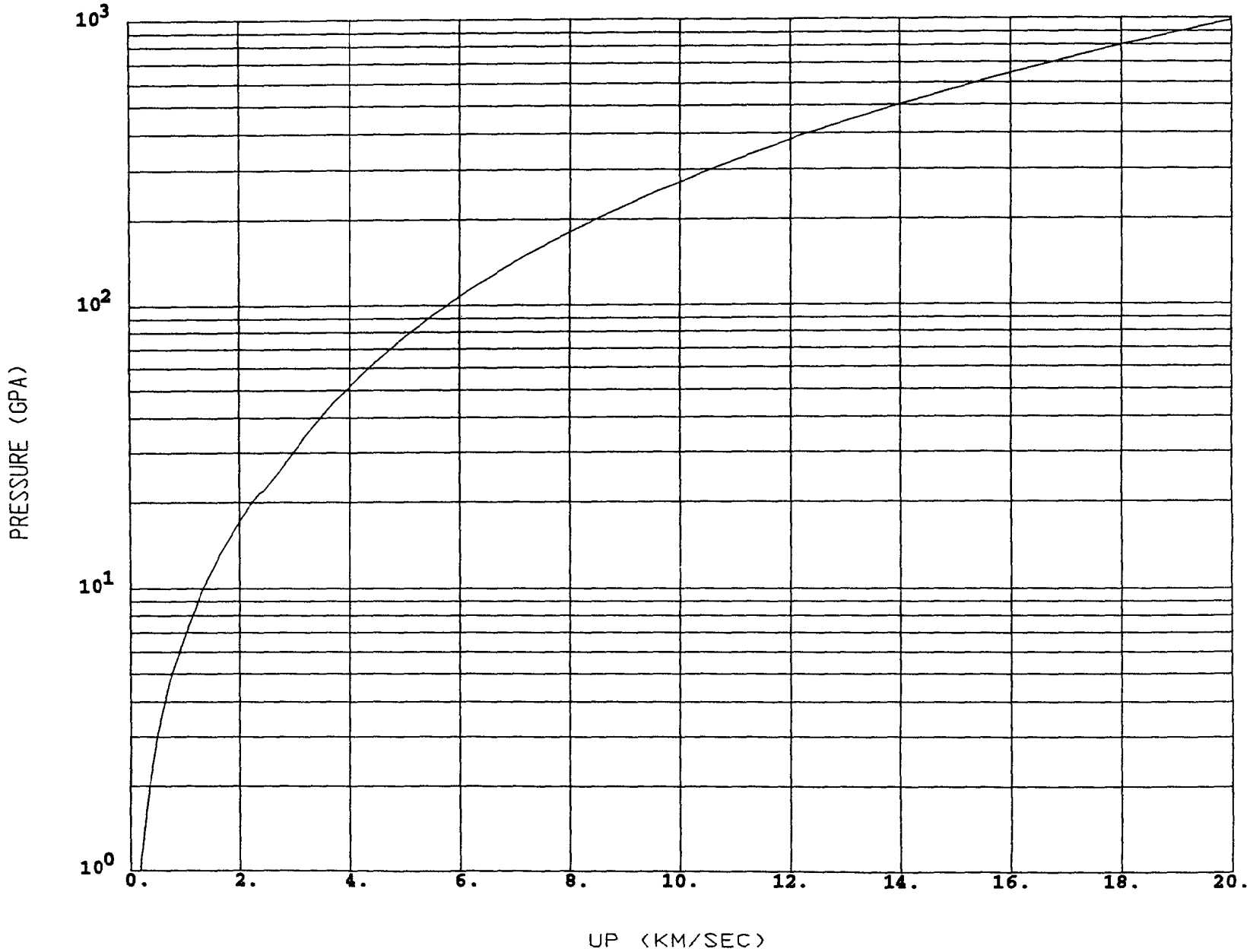
7580-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



7580-HU1
E0 MJ/KG
0.00+00

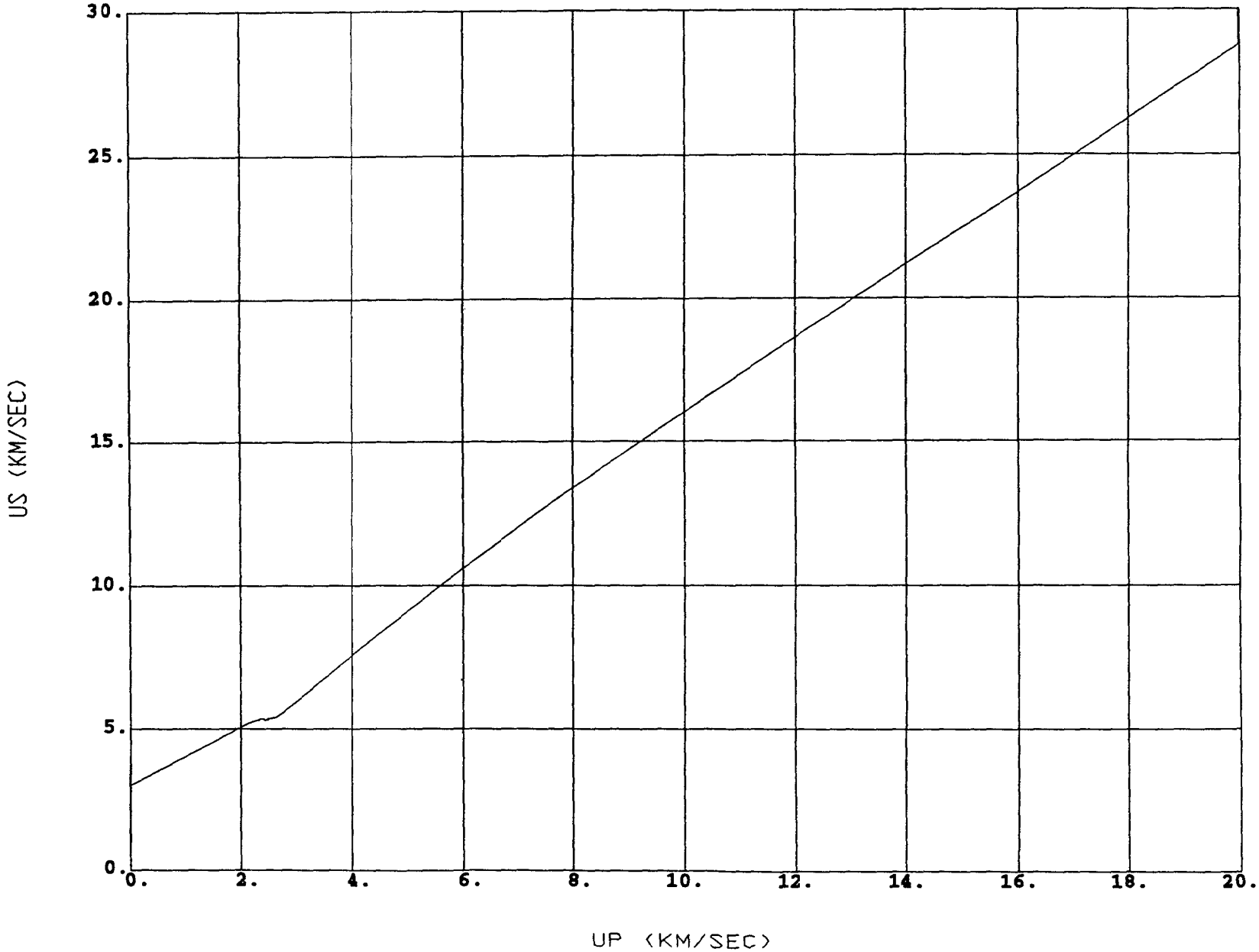
THURSDAY 4MAY 95 TABLE 301



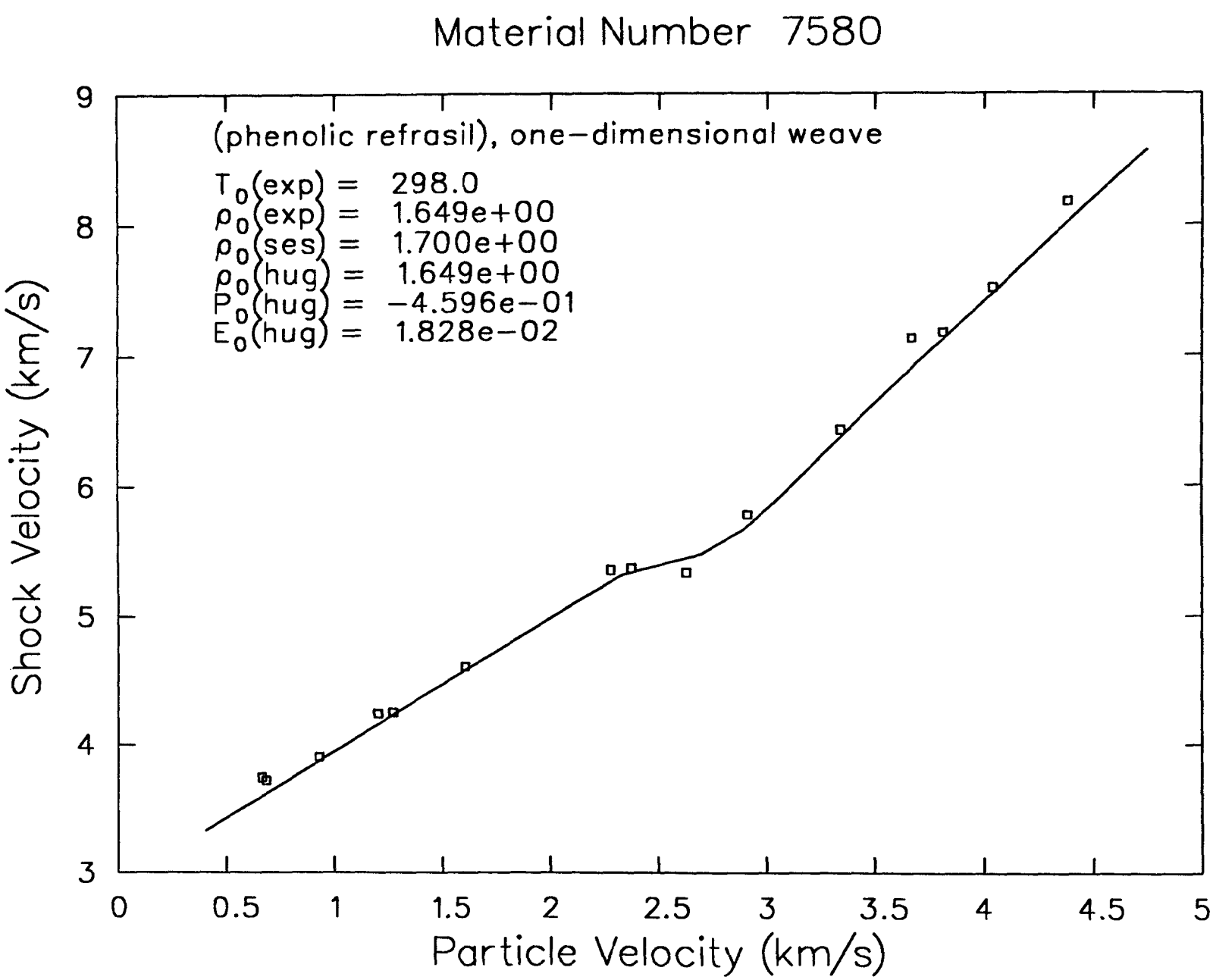
T1 SES2D CRAY 02

7580-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA


Material Number 7580
(phenolic refrasil), one-dimensional weave
T_0(exp) = 298.0
ρ_0(exp) = 1.649e+00
ρ_0(ses) = 1.700e+00
ρ_0(hug) = 1.649e+00
P_0(hug) = -4.596e-01
E_0(hug) = 1.828e-02
Shock Velocity (km/s)
Particle Velocity (km/s)
9
8
7
6
5
4
3
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

MATERIAL NUMBER | SUMMARY

7590 MATERIAL. POLYSTYRENE

COMP. CH
ATOMIC NUMBER. 3.5000E+00
ATOMIC MASS. 6.5100E+00
NORMAL DENSITY. 1.0440E+00

GAMMA(COMPUTED). 0.0055

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	19					
102	45					
103	65					
201	5					
301	4772	101	23	0.0000E+00	8.1562E-03	2.0880E+04
				0.0000E+00	2.5000E-02	3.2000E+04
303	4772	101	23	0.0000E+00	8.1562E-03	2.0880E+04
				0.0000E+00	2.5000E-02	3.2000E+04
304	4772	101	23	0.0000E+00	8.1562E-03	2.0880E+04
				0.0000E+00	2.5000E-02	3.2000E+04
305	4772	101	23	0.0000E+00	8.1562E-03	2.0880E+04
				0.0000E+00	2.5000E-02	3.2000E+04
306	306	101	1	0.0000E+00	8.1562E-03	2.0880E+04
				0.0000E+00	0.0000E+00	0.0000E+00

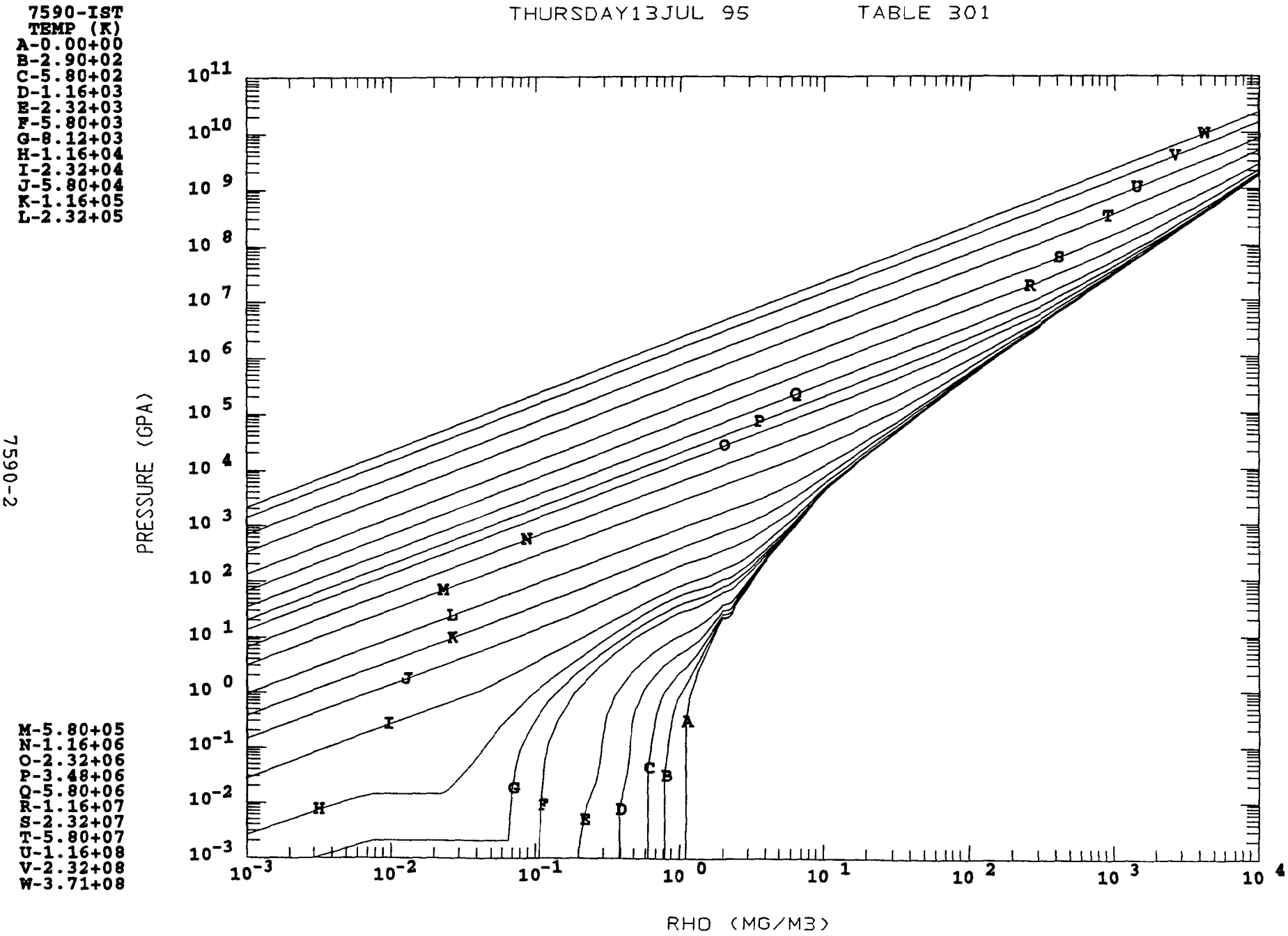
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

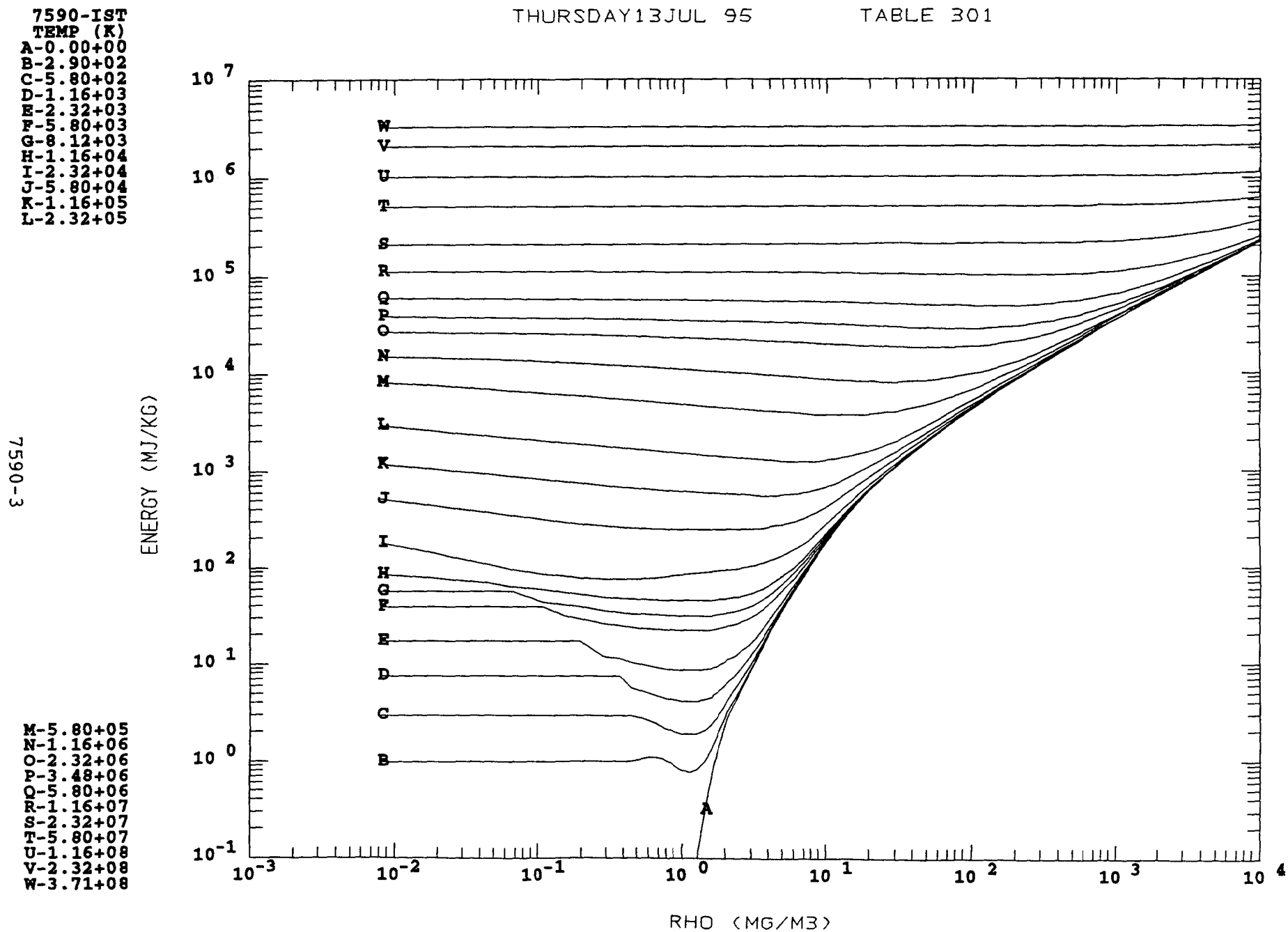
DATE. JAN 76
VERSION NUMBER. 6
DATE ADDED TO LIBRARY. 10576.
DATE OF LAST UPDATE. 101582.
SOURCE. J. BARNES, A. LINDSTROM
REFS. T-4 NOTEBOOK
CODES. SESAME I, MAPLE, MAXWELL

COMMENTS. THE EXISTING 7590 TABLE HAS BEEN UPDATED USING FIXTAB3. THE ONLY CHANGE INVOLVED FIXING 5 ENERGY POINTS BY A FEW PERCENT TO PREVENT CROSSING ISOTHERMS AND NEGATIVE SPECIFIC HEATS. THE RANGE FIXED WAS AT DENSITIES BETWEEN 5.22E3 AND 2.088E4 (THE 3 HIGHEST DENSITIES) AND TEMPERATURES BETWEEN 2.32E6 AND 5.80E6. FOR FURTHER INFORMATION, CONTACT BOB ALBERS (T-4).

COMMENTS. THE TWO TEMPERATURE TABLES FOR THIS MATERIAL (TABLES 303-306) ARE A VERY ROUGH APPROXIMATION AND WERE DERIVED FROM THE CODE TWOTEMP (AND NOT FROM THE ORIGINAL EOS CALCULATIONS, WHICH IN MOST CASES ARE NO LONGER REPRODUCIBLE). THE TABLES ARE VERY NOISY DUE BOTH TO NOISE IN THE ORIGINAL DATA (WHICH SHOWS UP WHEN THE COLD CURVE IS SUBTRACTED TO GENERATE THE THERMAL CONTRIBUTION) AND TO THE CONSTRAINT THAT NO CROSSING ISOTHERMS ARE ALLOWED. IF YOU HAVE ANY PROBLEMS USING THESE TABLES, CONTACT BOB ALBERS (T-4).

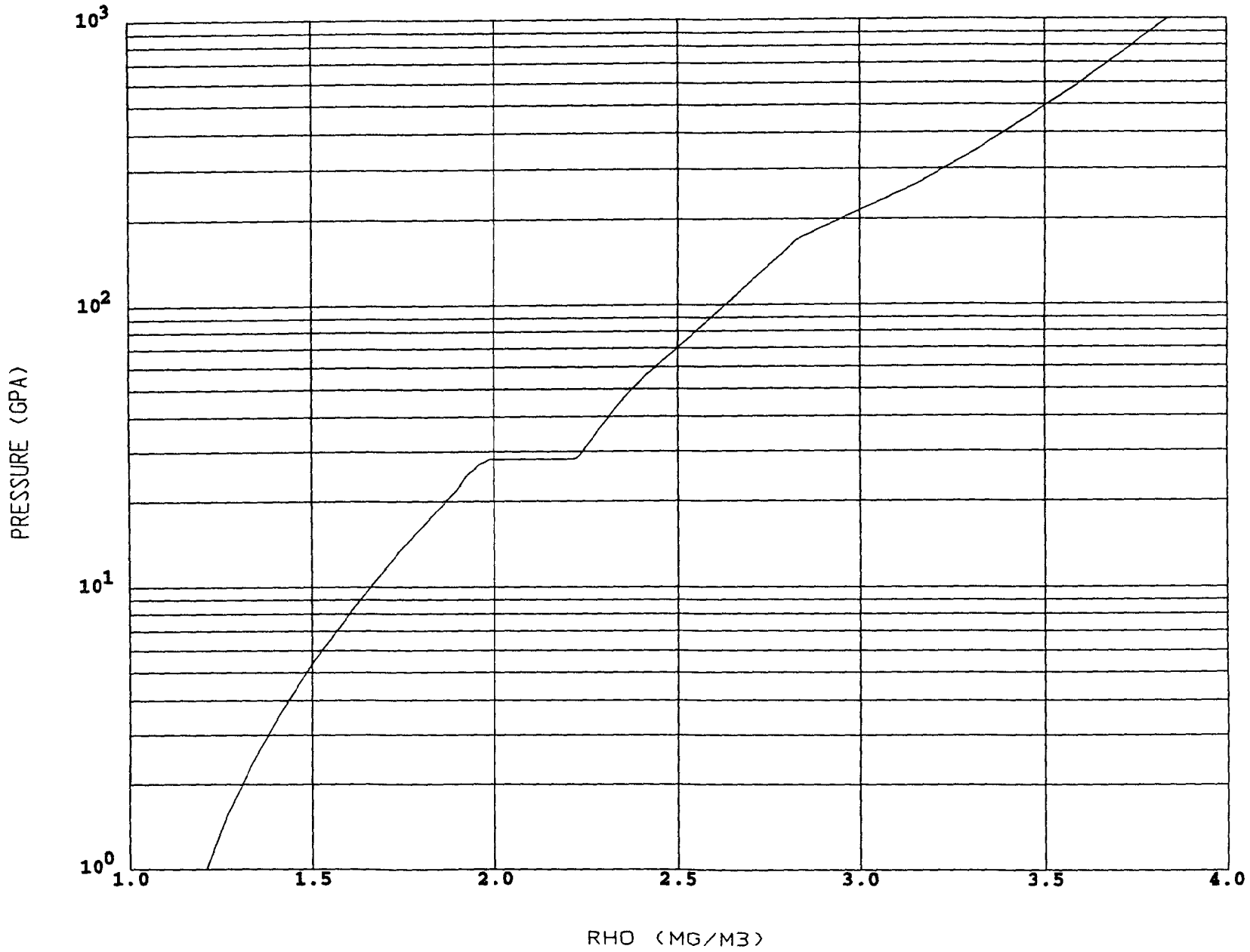
THURSDAY13JUL 95 TABLE 301




7590-IST
TEMP (K)
A-0.00+00
B-2.90+02
C-5.80+02
D-1.16+03
E-2.32+03
F-5.80+03
G-8.12+03
H-1.16+04
I-2.32+04
J-5.80+04
K-1.16+05
L-2.32+05
M-5.80+05
N-1.16+06
O-2.32+06
P-3.48+06
Q-5.80+06
R-1.16+07
S-2.32+07
T-5.80+07
U-1.16+08
V-2.32+08
W-3.71+08
THURSDAY13JUL 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7590-HU1
E0 MJ/KG
0.00+00

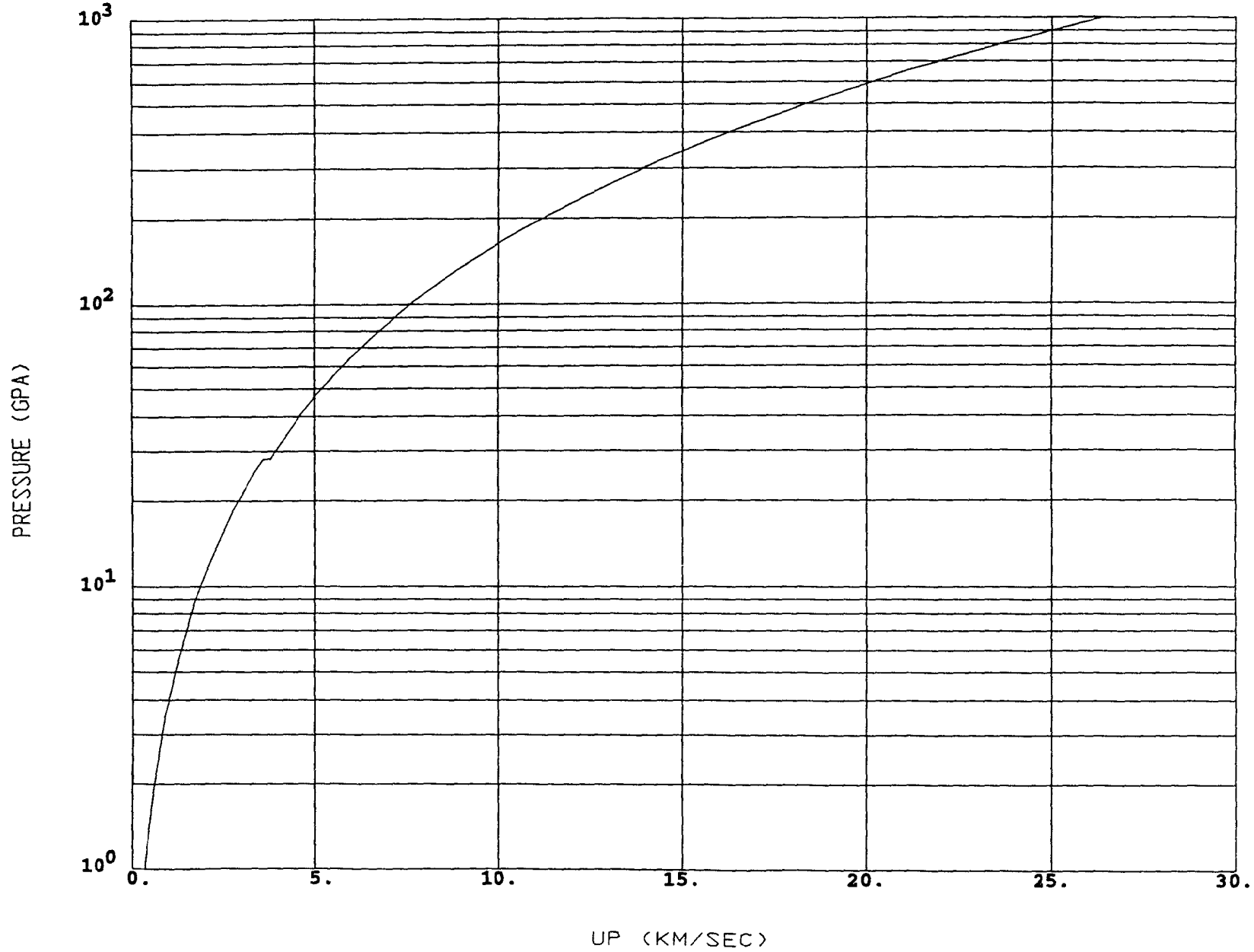
THURSDAY13JUL 95 TABLE 301



T1 SES2D CRA

7590-HU1
E0 MJ/KG
0.00+00

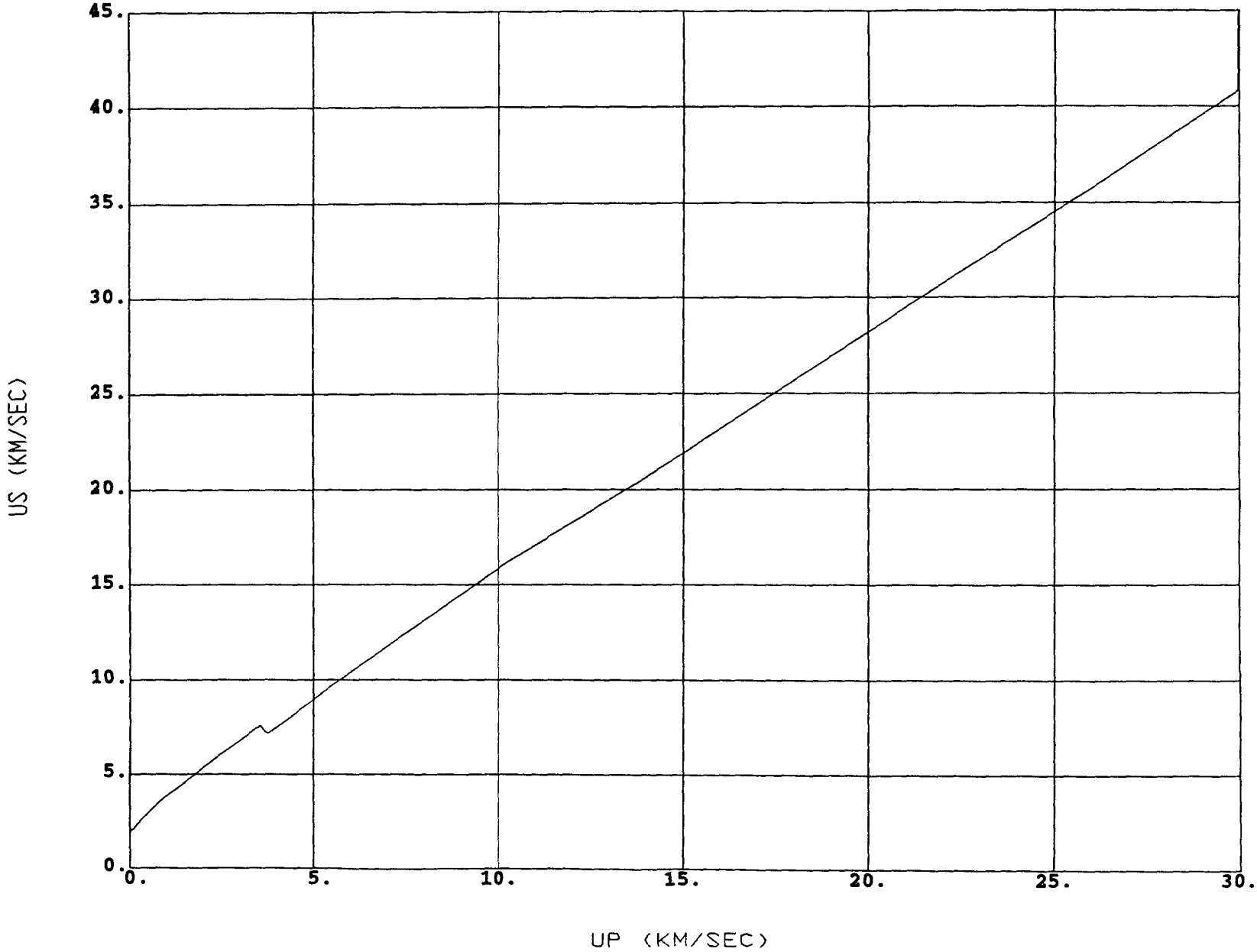
THURSDAY13JUL 95 TABLE 301



T1 SES2D CRAY 02

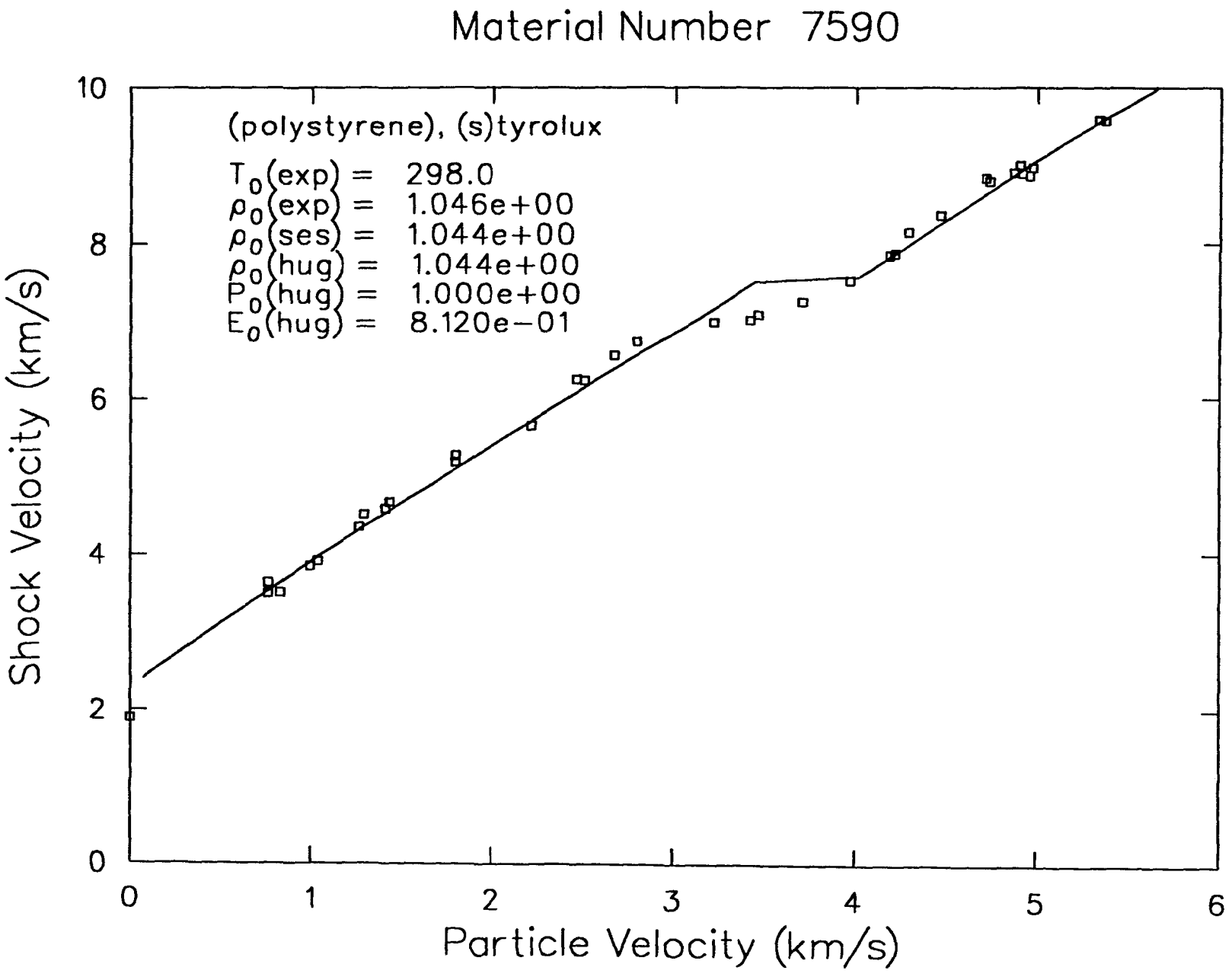
7590-HU1
E0 MJ/KG
0.00+00

THURSDAY13JUL 95 TABLE 301



T1 SES2D CRA. 4

7590-6


Material Number 7590
(polystyrene), (s)tyrolux
T_0(exp) = 298.0
ρ_0(exp) = 1.046e+00
ρ_0(ses) = 1.044e+00
ρ_0(hug) = 1.044e+00
P_0(hug) = 1.000e+00
E_0(hug) = 8.120e-01
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
0
1
2
3
4
5
6

MATERIAL NUMBER SUMMARY

7591 MATERIAL. POLYSTYRENE

COMP. CH
ATOMIC NUMBER. 3.5000E+00
ATOMIC MASS. 6.5100E+00
NORMAL DENSITY. 1.0440E+00

GAMMA(COMPUTED). 0.0462

TABLE SUMMARY.

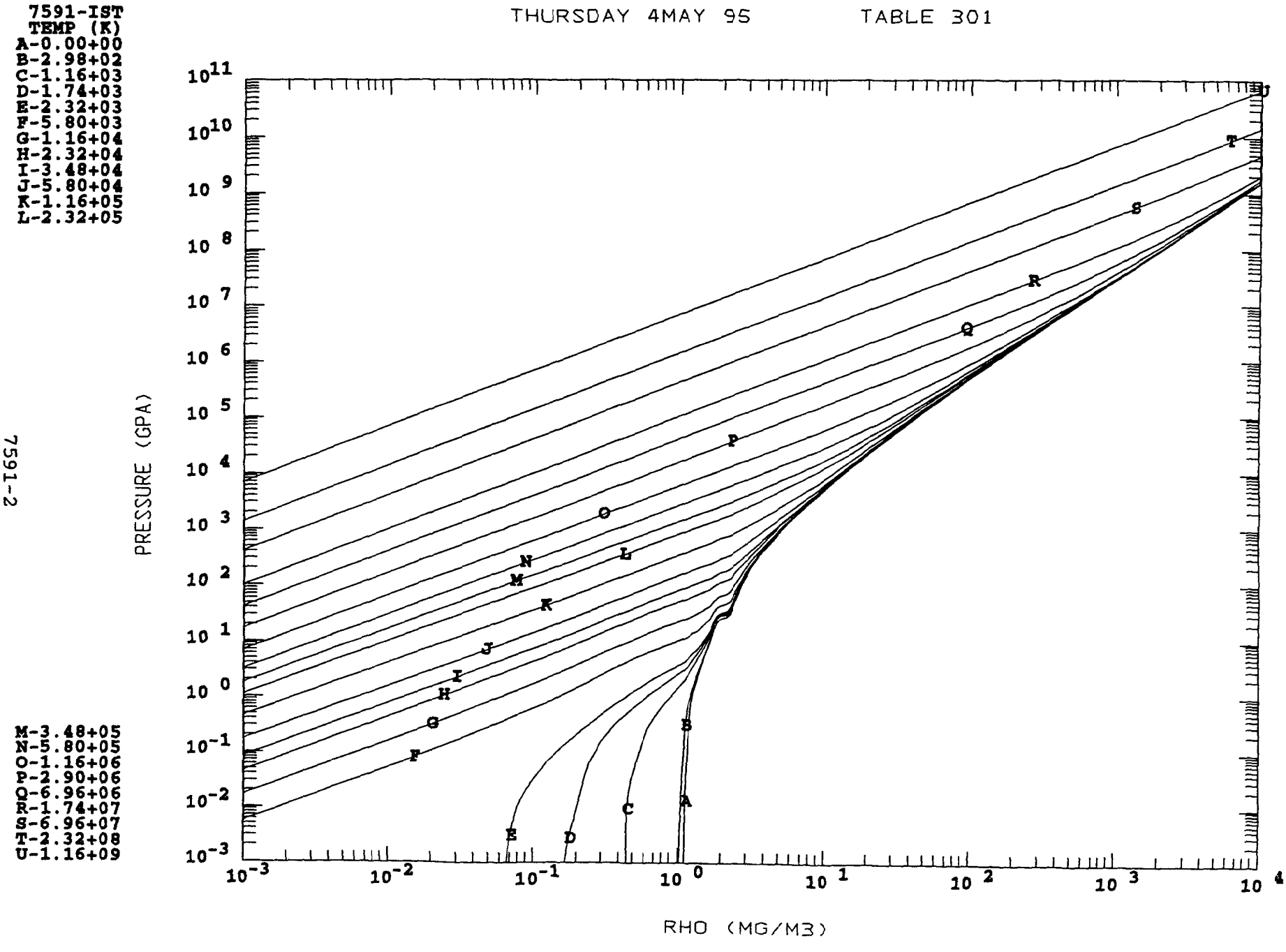
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	19					
102	92					
201	5					
301	8723	70	41	0.0000E+00	1.0440E-06	2.0880E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6335	63	33	1.0440E-06	2.0880E-06	2.0880E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	8599	69	41	1.0440E-06	2.0880E-06	2.0880E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	279	69	1	1.0440E-06	2.0880E-06	2.0880E+04
				0.0000E+00	-1.8391E-10	0.0000E+00
401	73					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. AUG 86
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 82686.
DATE OF LAST UPDATE. 82986.
SOURCE. J. BARNES, S. LYON
REFS. LAMS REPORT IN PROGRESS
CODES. GRIZZLY

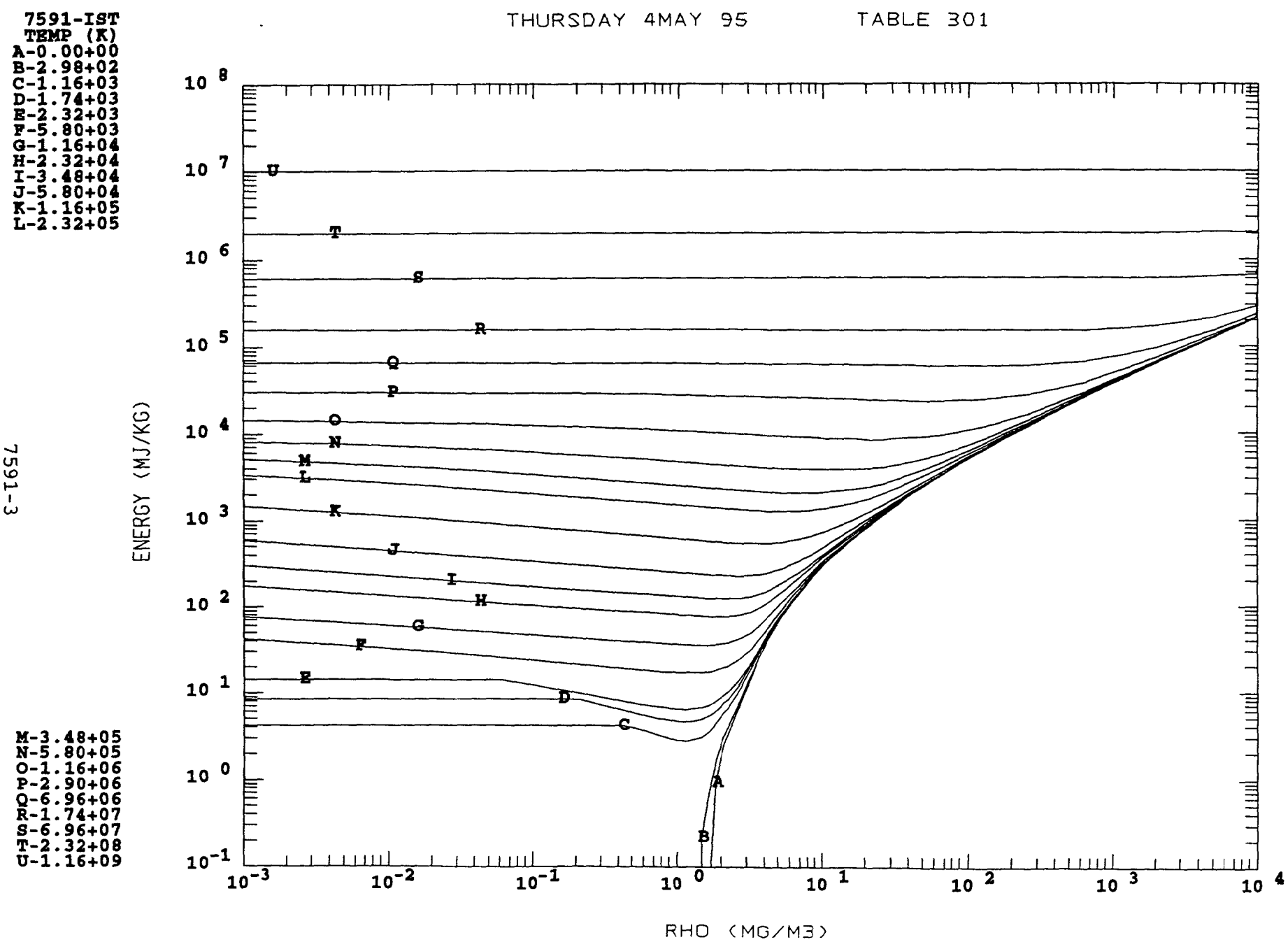
COMMENTS. AVERAGE ATOM MODELING THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN=1). GAMREF ADJUSTED TO 0.5 TO REPRODUCE SHOCK DATA FOR FOAMED POLYSTYRENE AT INITIAL DENSITY OF 0.3. DEBKEL=258, TMELT=600. COLD CURVE FROM SHOCK DATA AND SOUND VELOCITY. USED US-UP COMPOSED OF 3 STRAIGHT LINES WITH UP = 0.0, 3.25, 4.0, 7.15 AND US = 2.0, 7.5, 7.5, 12.0 RESPECTIVELY. DATA FROM LASL SHOCK COMPENDIUM. TFD MATCH MADE AT COMPRESSION OF 2.47. ECOH=112 CALCULATED FROM HEAT OF VAPORIZATION OF CARBON AND DISSOCIATION ENERGY OF HYDROGEN. FACLJ=1.0. 301 TABLE HAS MAXWELL CONSTRUCTIONS.

THURSDAY 4MAY 95 TABLE 301



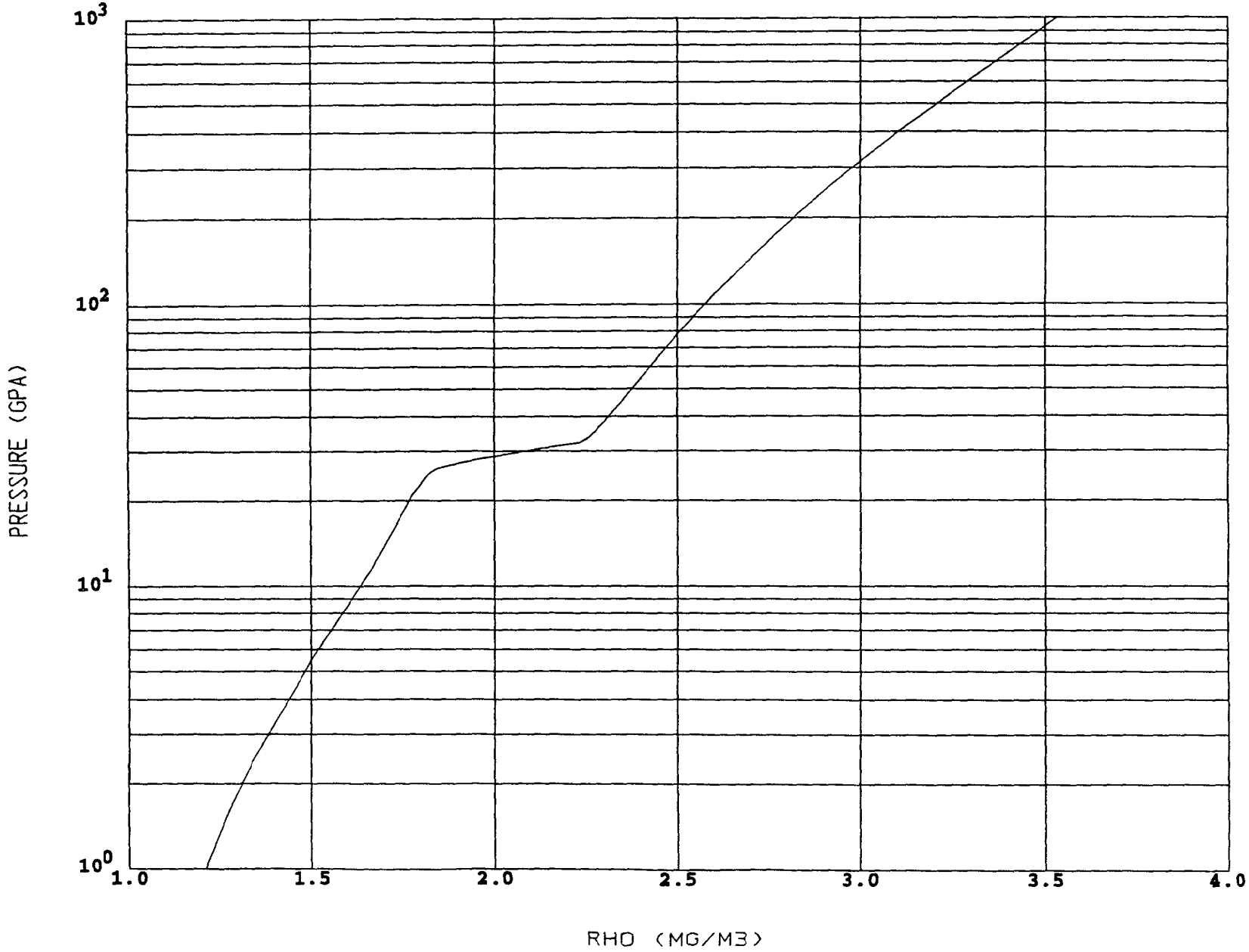
7591-2

T1 SES2D CRA1


7591-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-1.74+03
E-2.32+03
F-5.80+03
G-1.16+04
H-2.32+04
I-3.48+04
J-5.80+04
K-1.16+05
L-2.32+05
M-3.48+05
N-5.80+05
O-1.16+06
P-2.90+06
Q-6.96+06
R-1.74+07
S-6.96+07
T-2.32+08
U-1.16+09
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7591-HU1
E0 MJ/KG
0.00+00

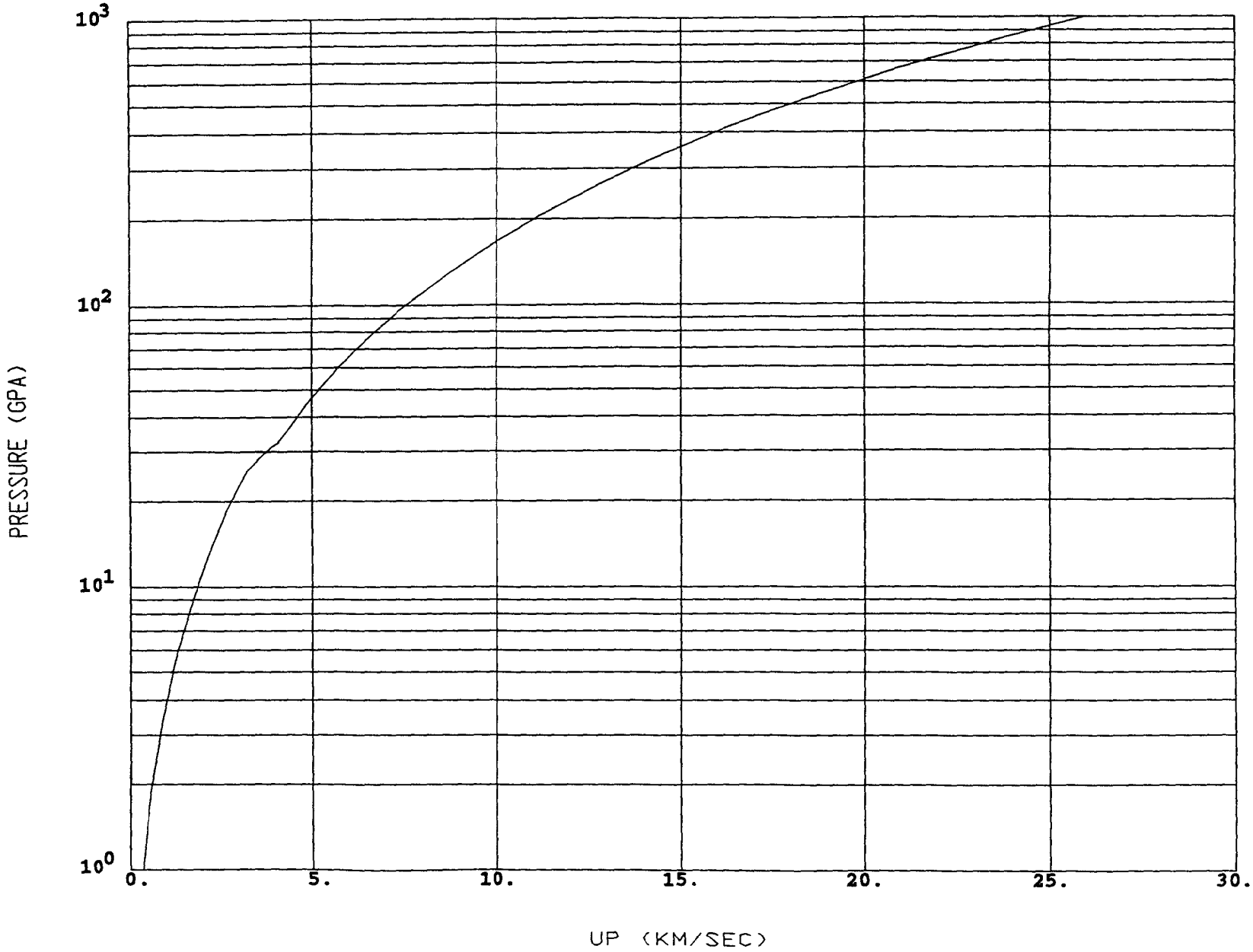
THURSDAY 4MAY 95 TABLE 301



T1 SES2D GPA\

7591-HU1
E0 MJ/KG
0.00+00

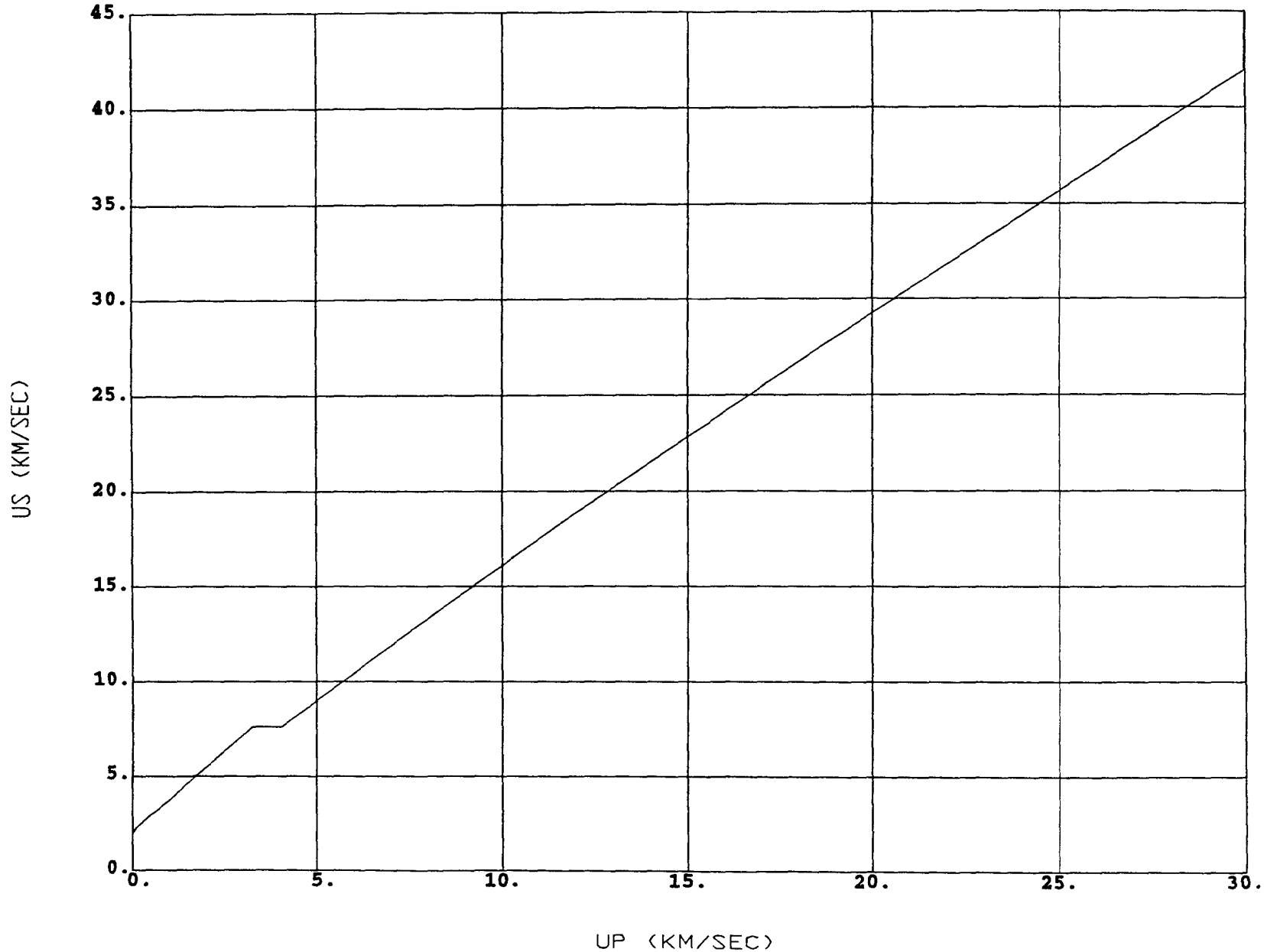
THURSDAY 4MAY 95 TABLE 301



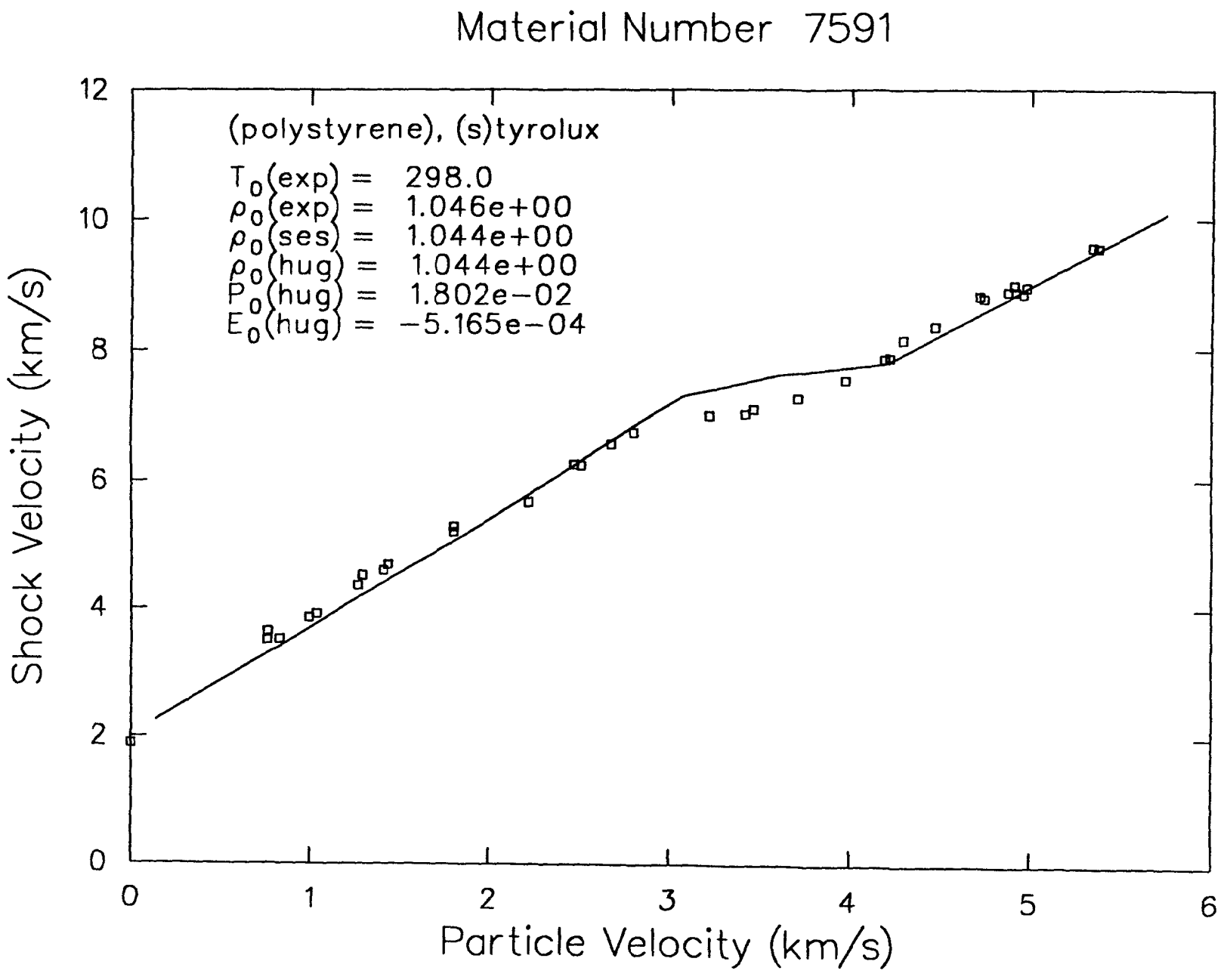
T1 SES2D CRAY 02

7591-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRA)


Material Number 7591
(polystyrene), (s)tyrolux
T_0(exp) = 298.0
ρ_0(exp) = 1.046e+00
ρ_0(ses) = 1.044e+00
ρ_0(hug) = 1.044e+00
P_0(hug) = 1.802e−02
E_0(hug) = −5.165e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
12
0
1
2
3
4
5
6

MATERIAL NUMBER SUMMARY

7592 MATERIAL. POLYSTYRENE

COMP. CH
ATOMIC NUMBER. 3.5000E+00
ATOMIC MASS. 6.5100E+00
NORMAL DENSITY. 1.0440E+00

GAMMA(COMPUTED). 0.6649

TABLE SUMMARY.

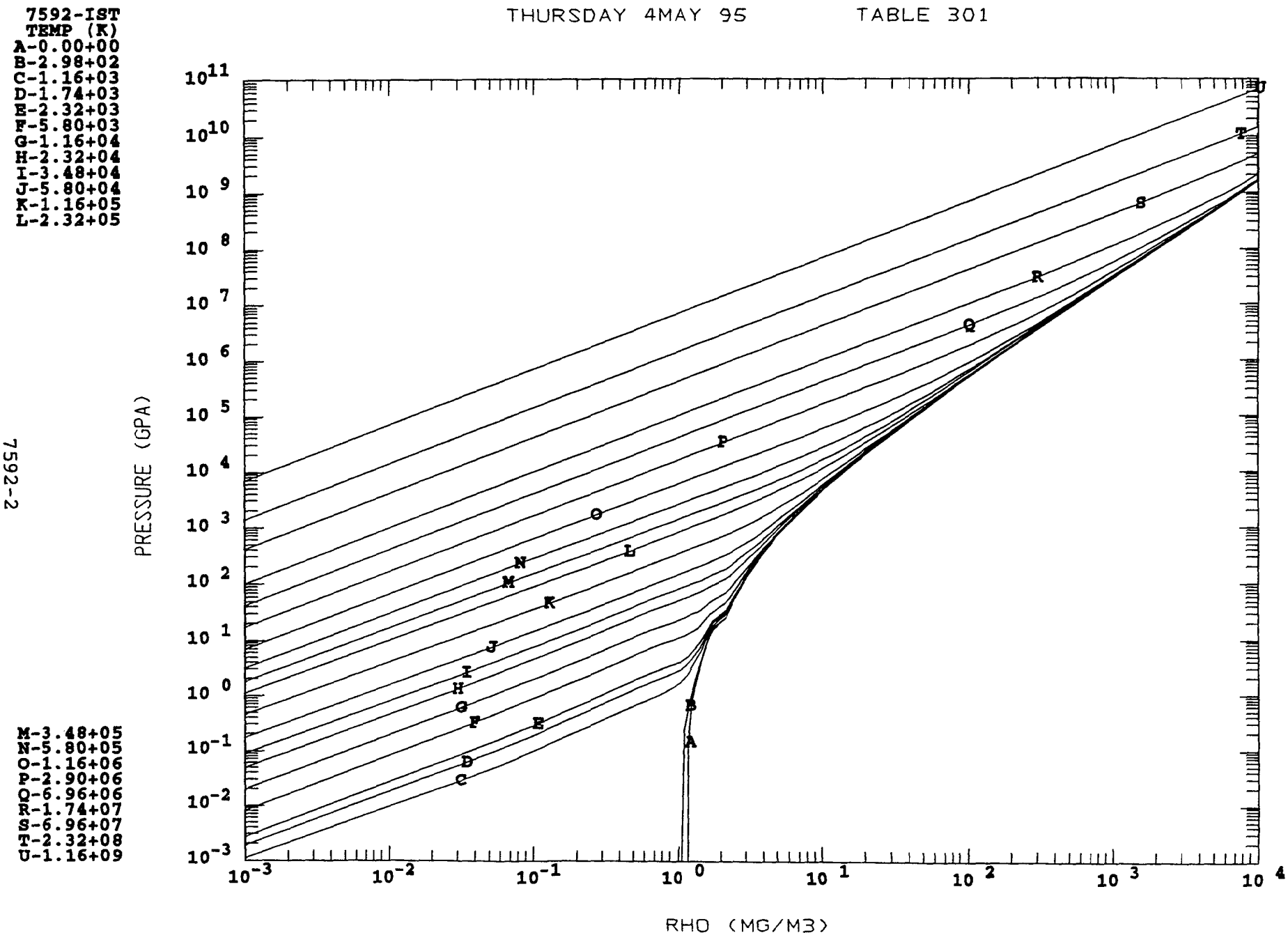
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	86					
201	5					
301	9095	73	41	0.0000E+00	1.0440E-06	2.0880E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6335	63	33	1.0440E-06	2.0880E-06	2.0880E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	8475	68	41	1.0440E-06	2.0880E-06	2.0880E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	275	68	1	1.0710E-06	2.1420E-06	2.1420E+04
				0.0000E+00	-1.2224E-11	0.0000E+00
401	41					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. NOV 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 121488.
DATE OF LAST UPDATE. 121588.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

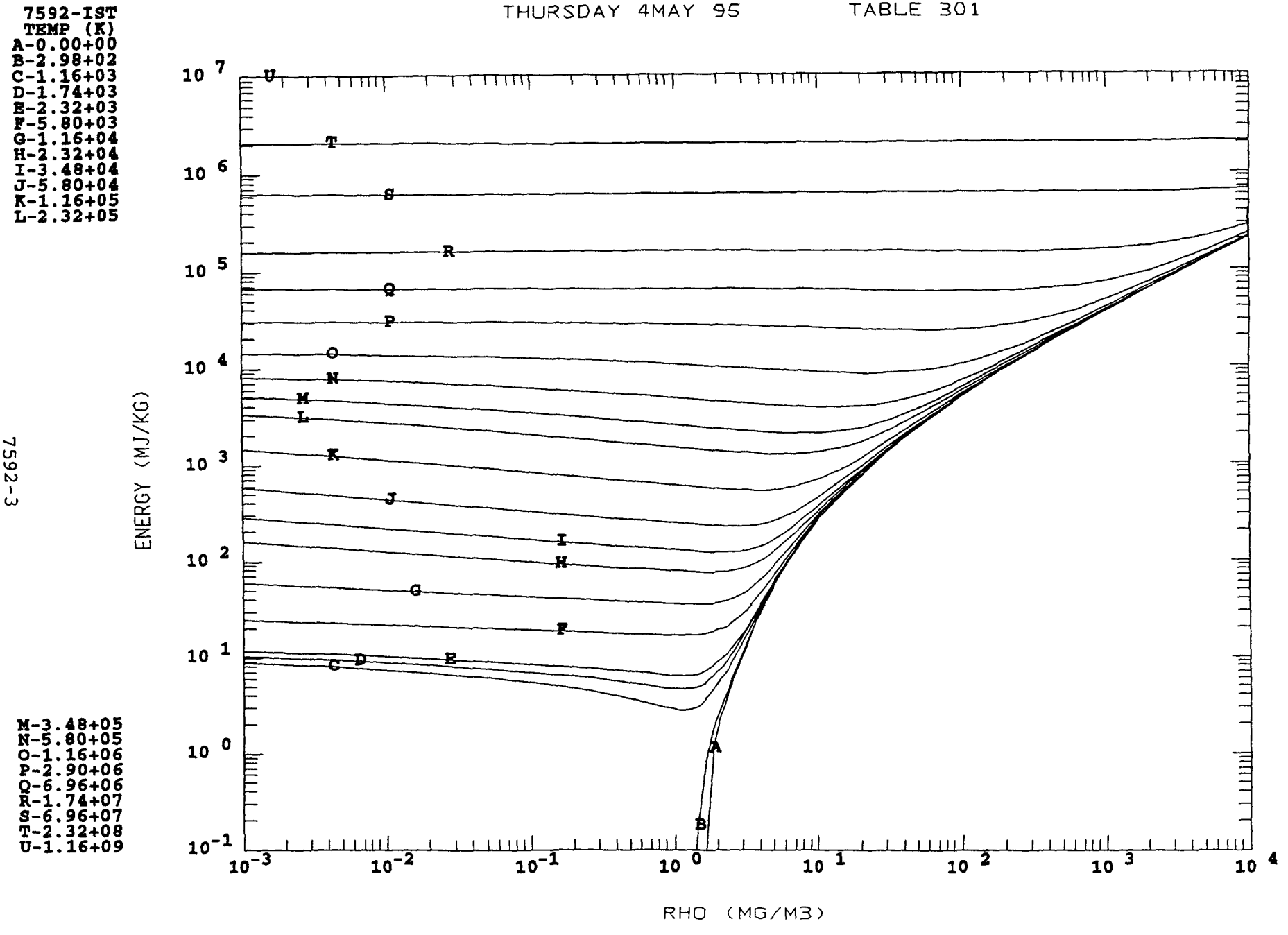
COMMENTS. AVERAGE ATOM MODELING THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN=1). GAMREF = 0.565, DEBKEL = 222, TMELT = 510. COLD CURVE FROM SHOCK DATA AND SOUND VELOCITY. (US,UP) DATA POINTS (0.0,1.898), (0.77,3.47), (2.30,6.29), (3.80,7.35), (5.35,9.57). INORDER TO MATCH CRITICAL POINT DATA, WE SET ECOHKC = 15 AND FACLJ = 0.20. INORDER TO GET A TOTAL PRESSURE OF 1 BAR AT ROOM TEMPERATURE AND NORMAL DENSITY, WE RESCALED THE COLD CURVE WITH RHOO = 1.071. TFD MATCH COMPRESSION WAS 2.268. 301 TABLE HAS MAXWELL CONSTRUCTIONS.

THURSDAY 4MAY 95 TABLE 301



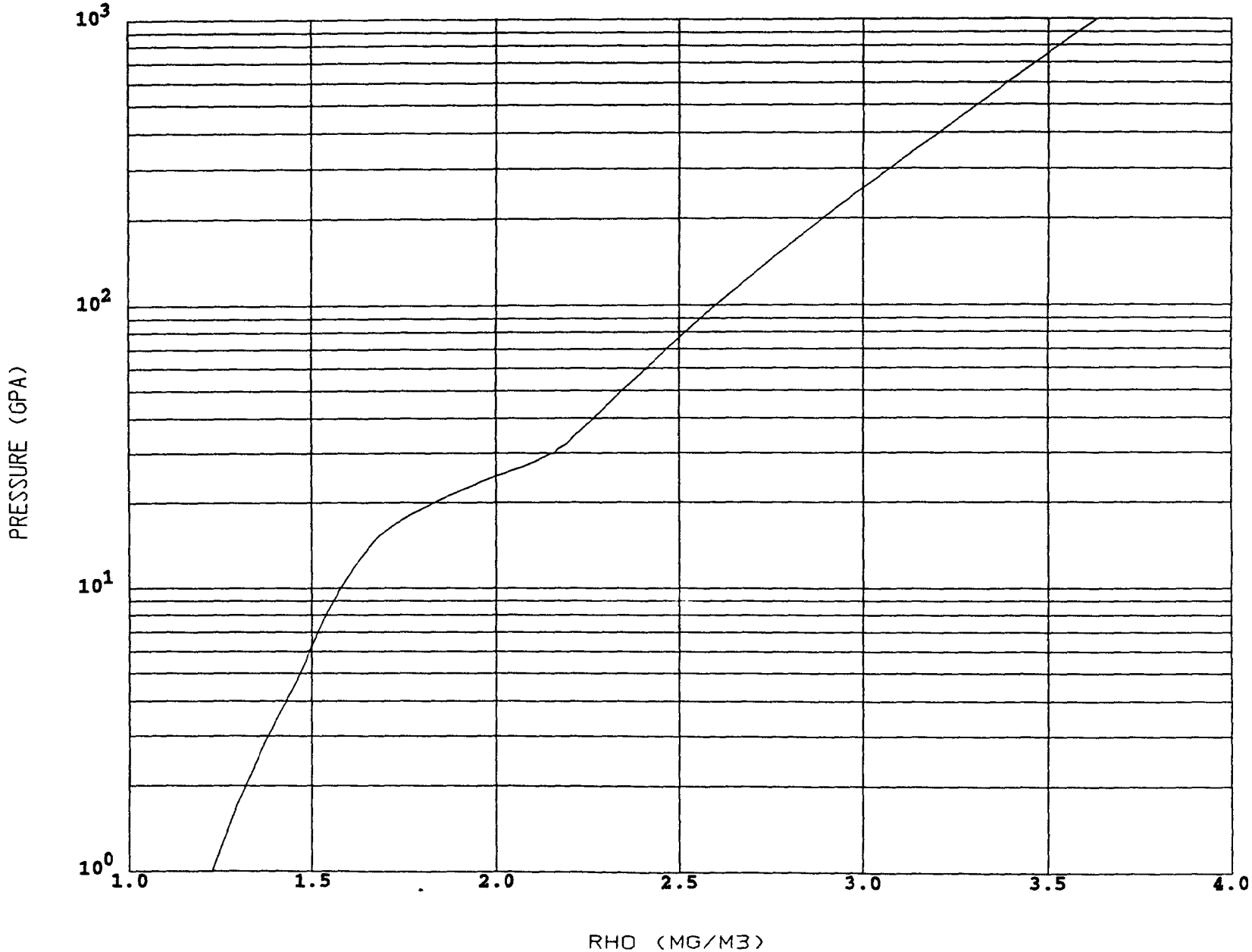
T1 SES2D CRA\

THURSDAY 4MAY 95 TABLE 301



7592-HU1
E0 MJ/KG
0.00+00

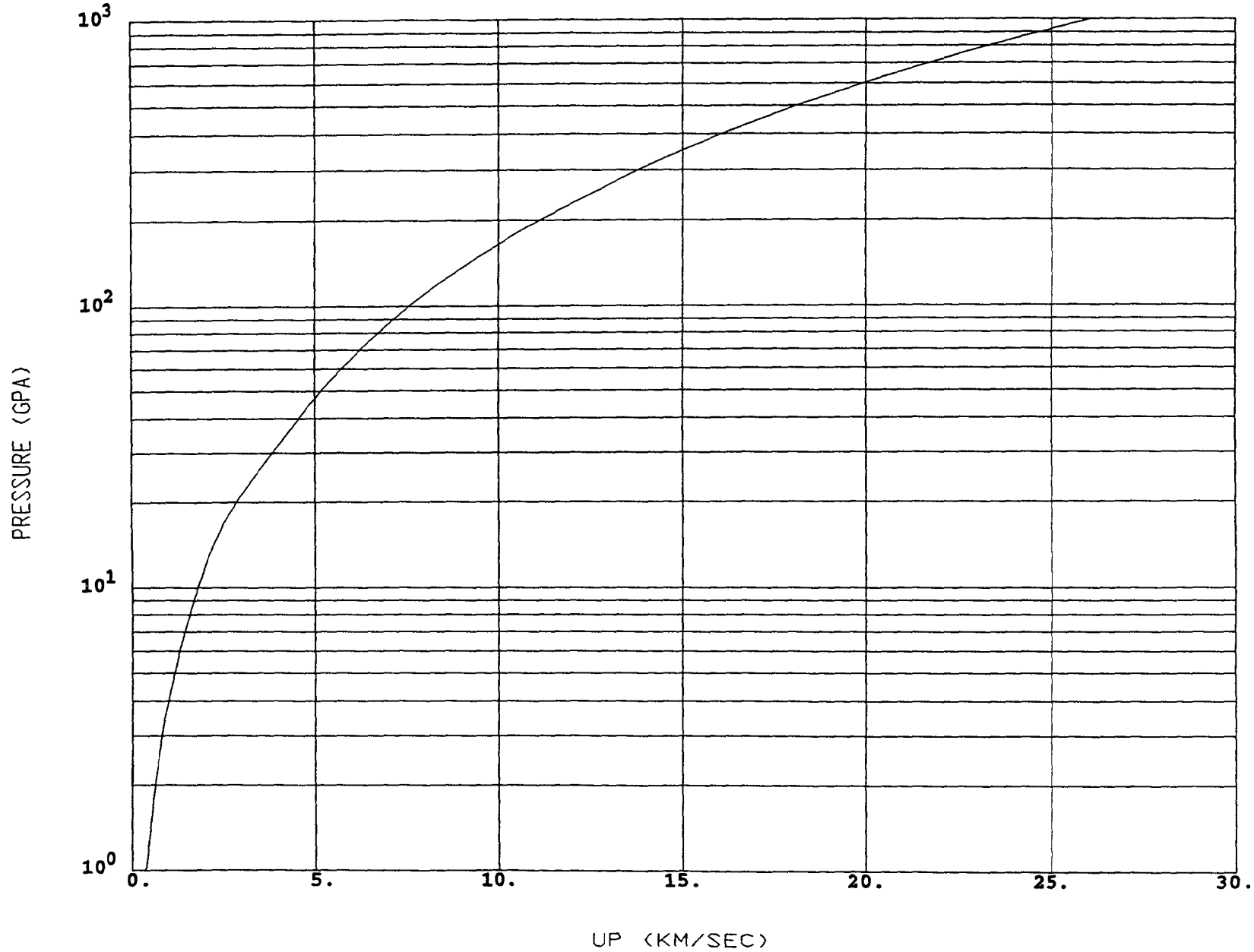
THURSDAY 4MAY 95 TABLE 301



T1 SRS2D CRAY

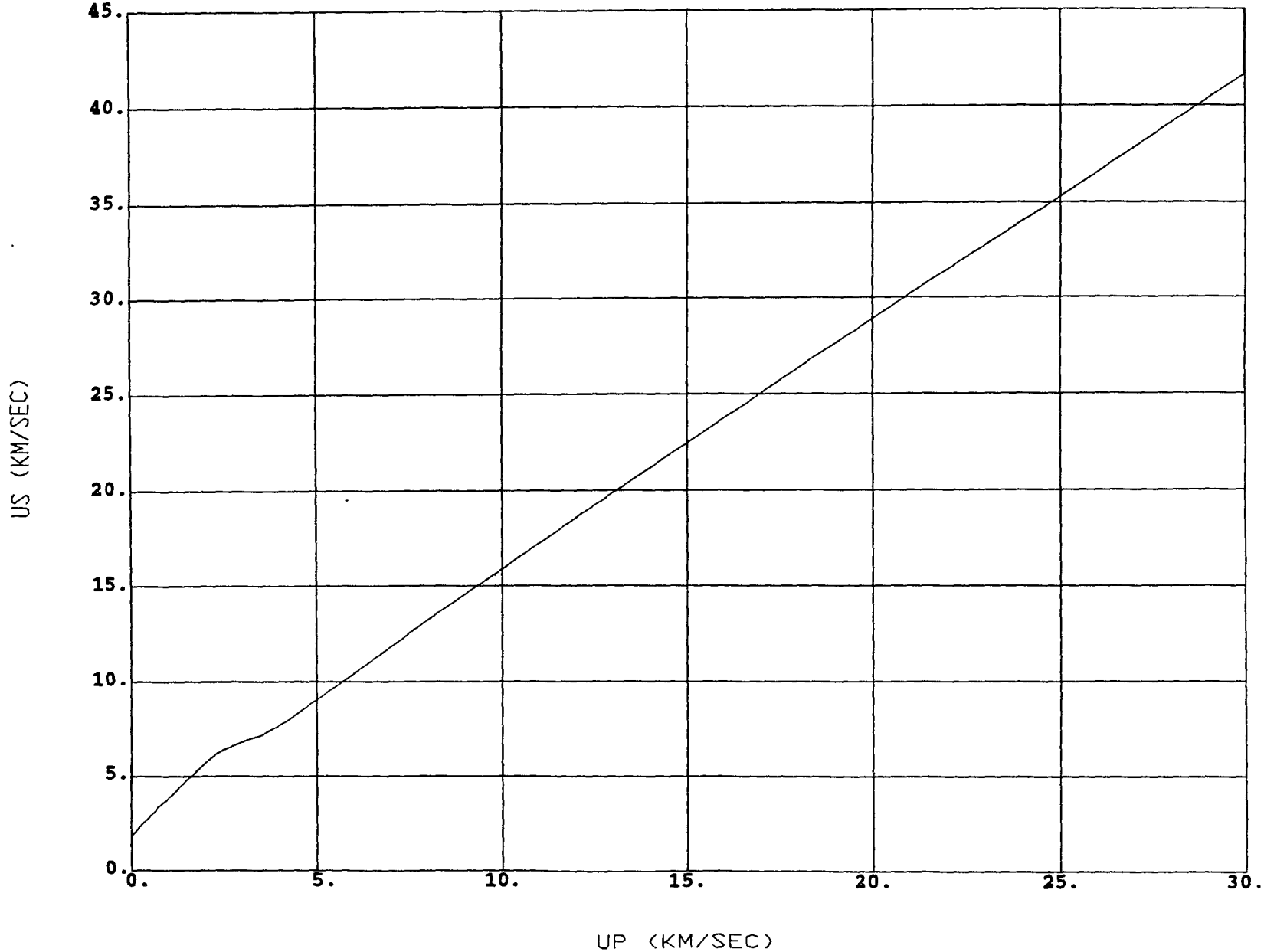
7592-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301

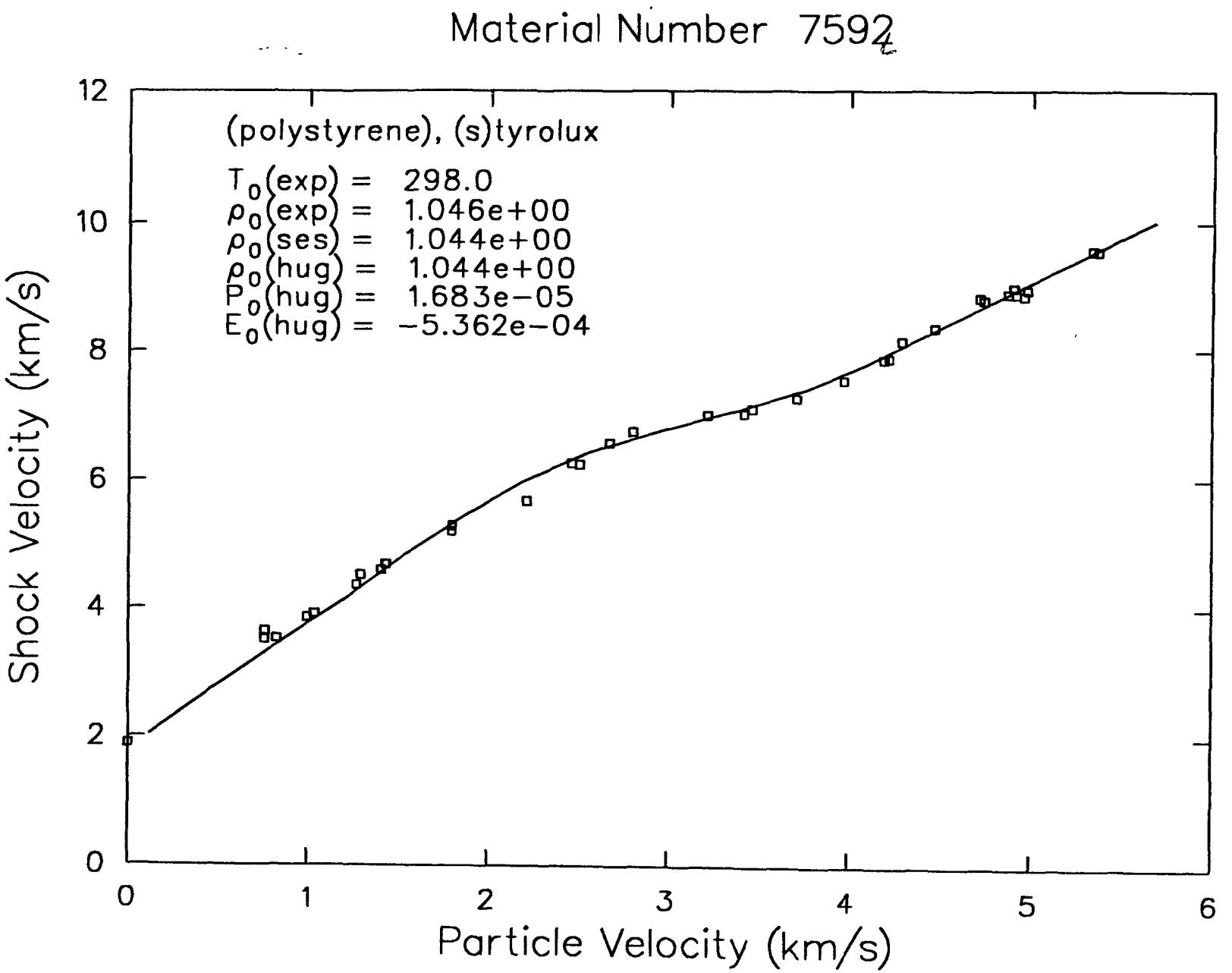


7592-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7592
(polystyrene), (s)tyrolux
T_0(exp) = 298.0
ρ_0(exp) = 1.046e+00
ρ_0(ses) = 1.044e+00
ρ_0(hug) = 1.044e+00
P_0(hug) = 1.683e−05
E_0(hug) = −5.362e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
12
0
1
2
3
4
5
6

MATERIAL NUMBER | SUMMARY

7601 MATERIAL. EPOXY (EPON 828)

COMP. NUMBER FRACTION 0.347 C, 0.048 O, 0.577 H, 0.028 N
ATOMIC NUMBER. 3.2407E+00
ATOMIC MASS. 5.9134E+00
NORMAL DENSITY. 1.1850E+00

GAMMA(COMPUTED). 0.7916

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	22					
102	40					
201	5					
301	7767	69	37	0.0000E+00	1.1850E-06	2.3700E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	7767	69	37	0.0000E+00	1.1850E-06	2.3700E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	6735	67	33	1.1850E-06	2.3700E-06	2.3700E+04
				0.0000E+00	2.5000E-01	9.9999E+04
305	7655	68	37	1.1850E-06	2.3700E-06	2.3700E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	275	68	1	1.1850E-06	2.3700E-06	2.3700E+04
				0.0000E+00	-1.2738E-10	0.0000E+00

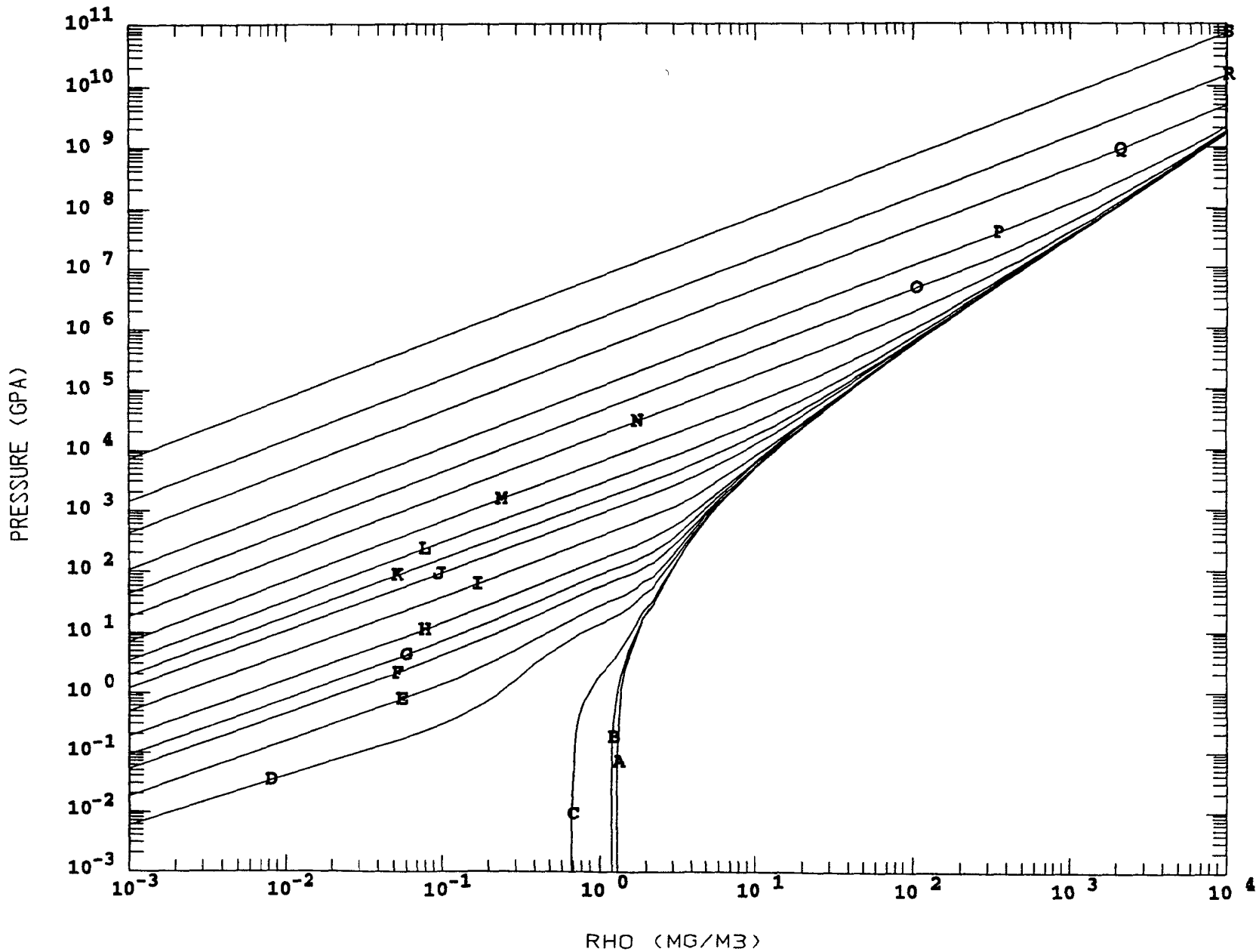
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JULY 84
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 72084.
DATE OF LAST UPDATE. 72084.
SOURCE. J.D. JOHNSON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING THROUGHOUT. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR ELECTRONIC CONTRIBUTION. COLD CURVE OBTAINED FROM SHOCK DATA IN LASL COMPENDIUM. TFD MATCH SHIFTED TO COMPRESSION OF 1.9 AND ECOH = 57 MJ PER KG. CHARTD NUCLEAR AND GAM MODELS WITH GAMMAO = 0.8. THETAO FOUND FROM POISSON = 0.333.

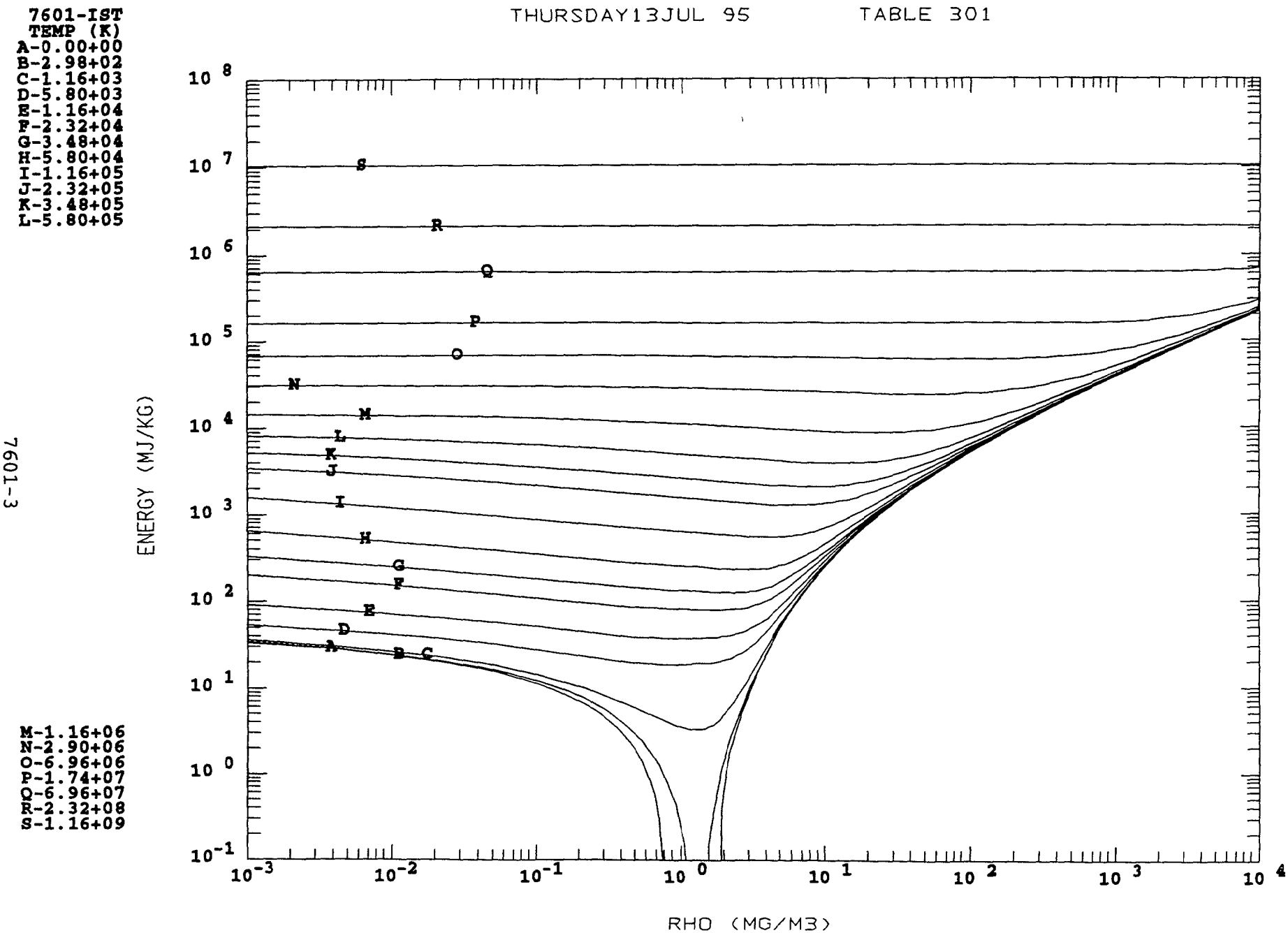
7601-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05

THURSDAY 4MAY 95 TABLE 301



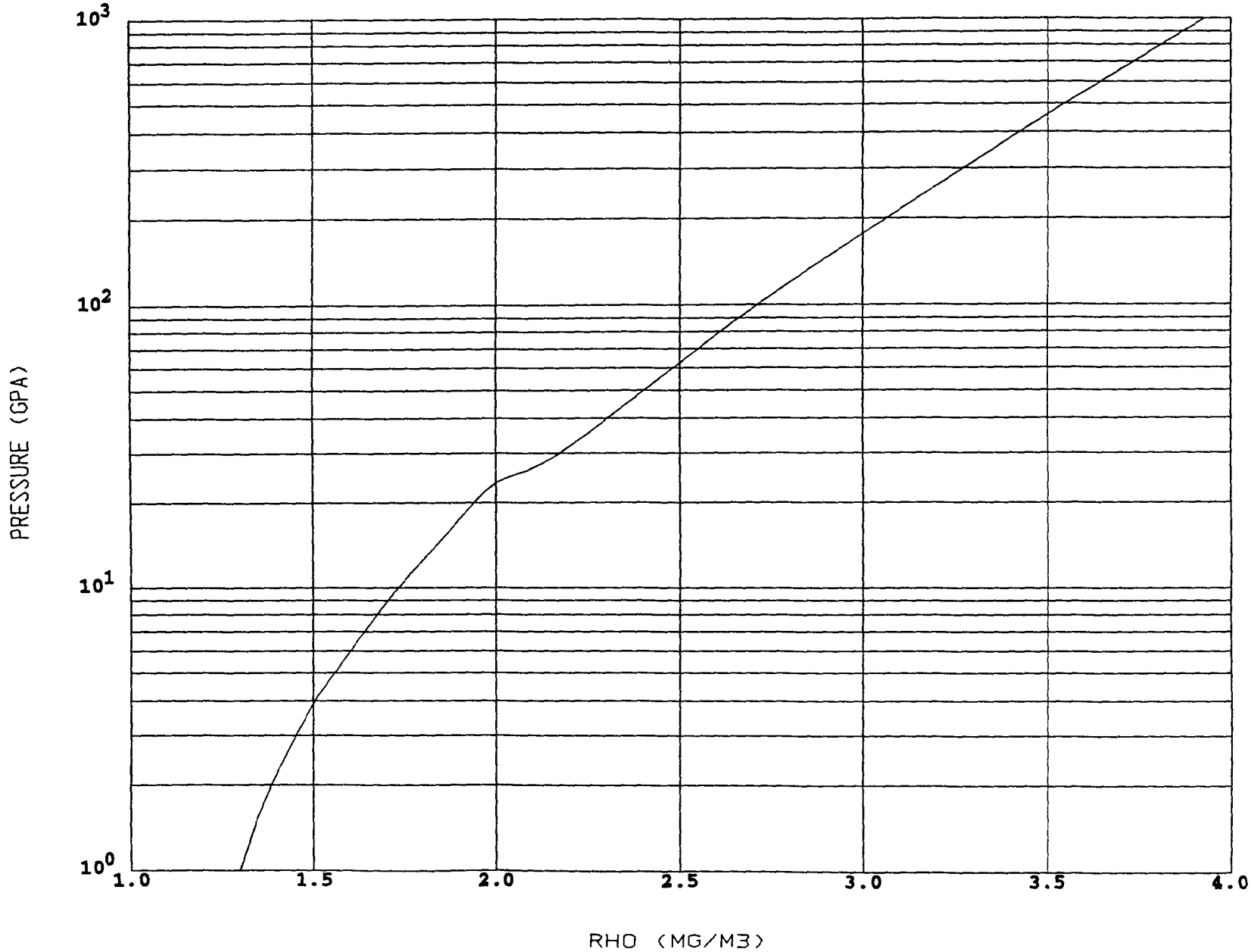
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09

T1 SES2D CRAY


7601-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
THURSDAY13JUL 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7601-HU1
E0 MJ/KG
0.00+00

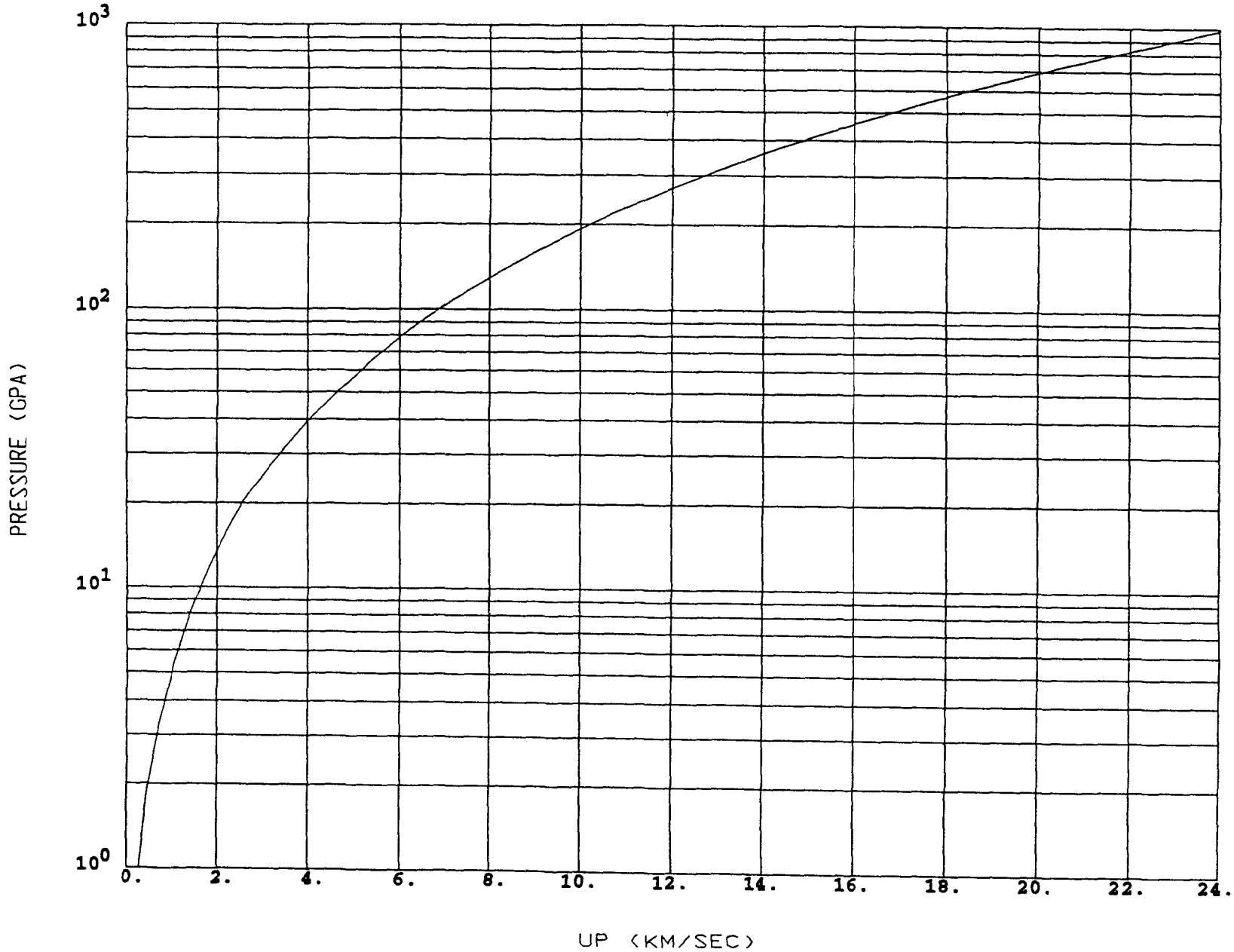
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY

7601-HU1
E0 MJ/KG
0.00+00

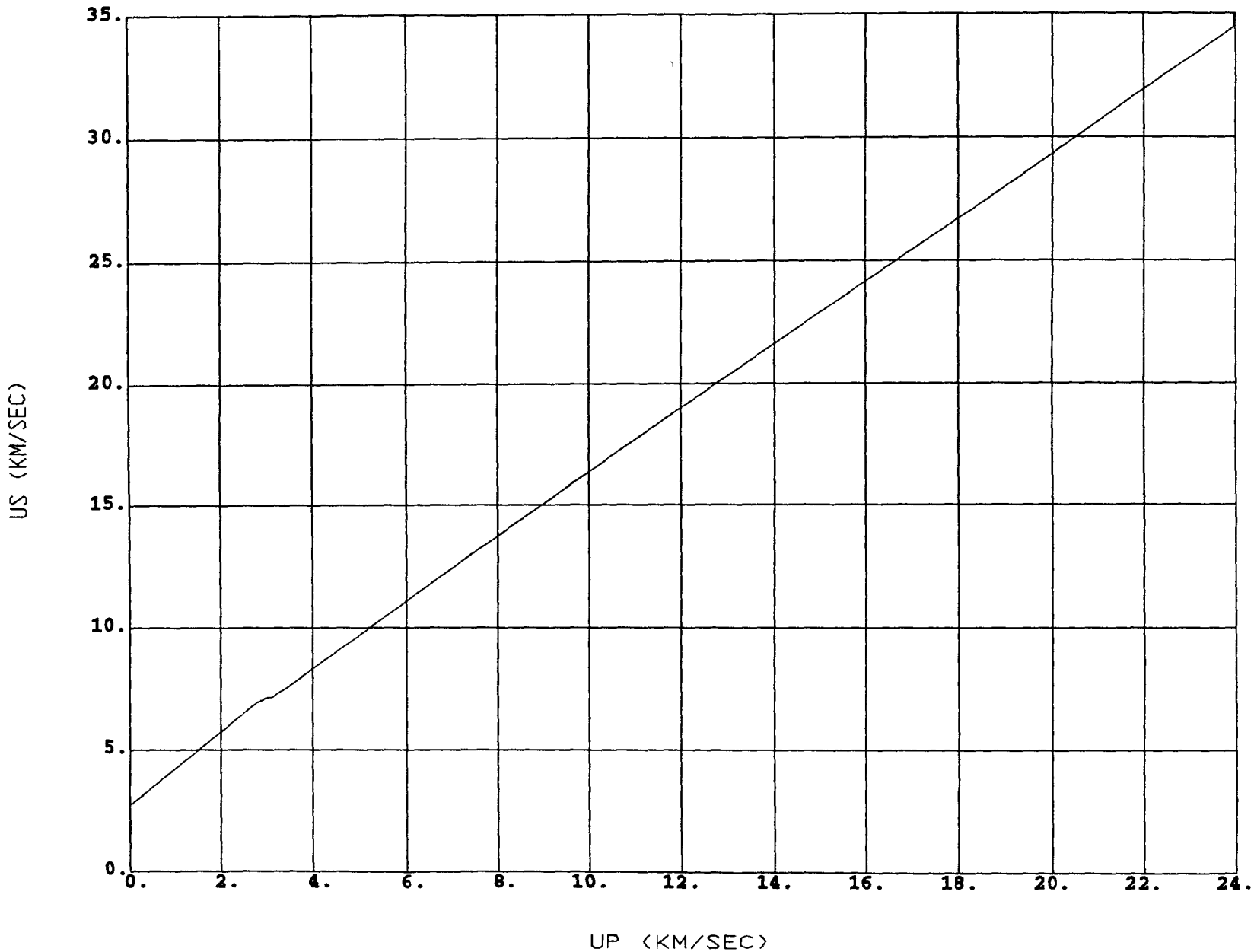
THURSDAY 4MAY 95 TABLE 301



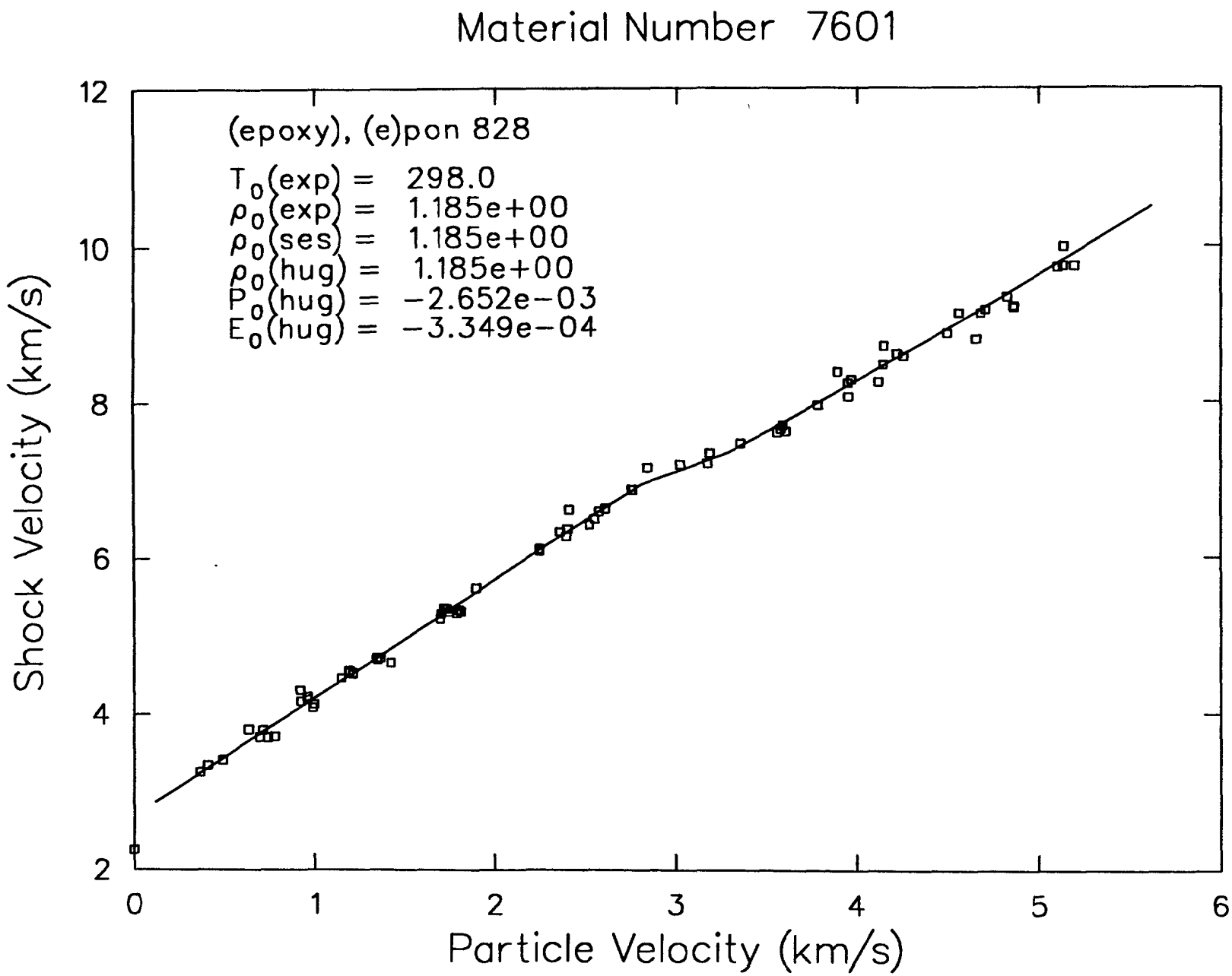
T1 SES2D CRAY 02

7601-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7601
(epoxy), (e)pon 828
T_0(exp) = 298.0
ρ_0(exp) = 1.185e+00
ρ_0(ses) = 1.185e+00
ρ_0(hug) = 1.185e+00
P_0(hug) = −2.652e−03
E_0(hug) = −3.349e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
12
10
8
6
4
2
0
1
2
3
4
5
6

MATERIAL NUMBER	SUMMARY
7602	MATERIAL. EPOXY (EPON 828)

COMP. NUMBER FRACTION 0.347 C, 0.577 H, 0.048 O, 0.028 N
ATOMIC NUMBER. 3.2407E+00
ATOMIC MASS. 5.9134E+00
NORMAL DENSITY. 1.1850E+00

GAMMA(COMPUTED). 0.3852

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	23					
102	39					
201	5					
301	3659	66	27	0.0000E+00	1.3232E-06	1.3232E+03
				0.0000E+00	1.2500E-02	9.9999E+04

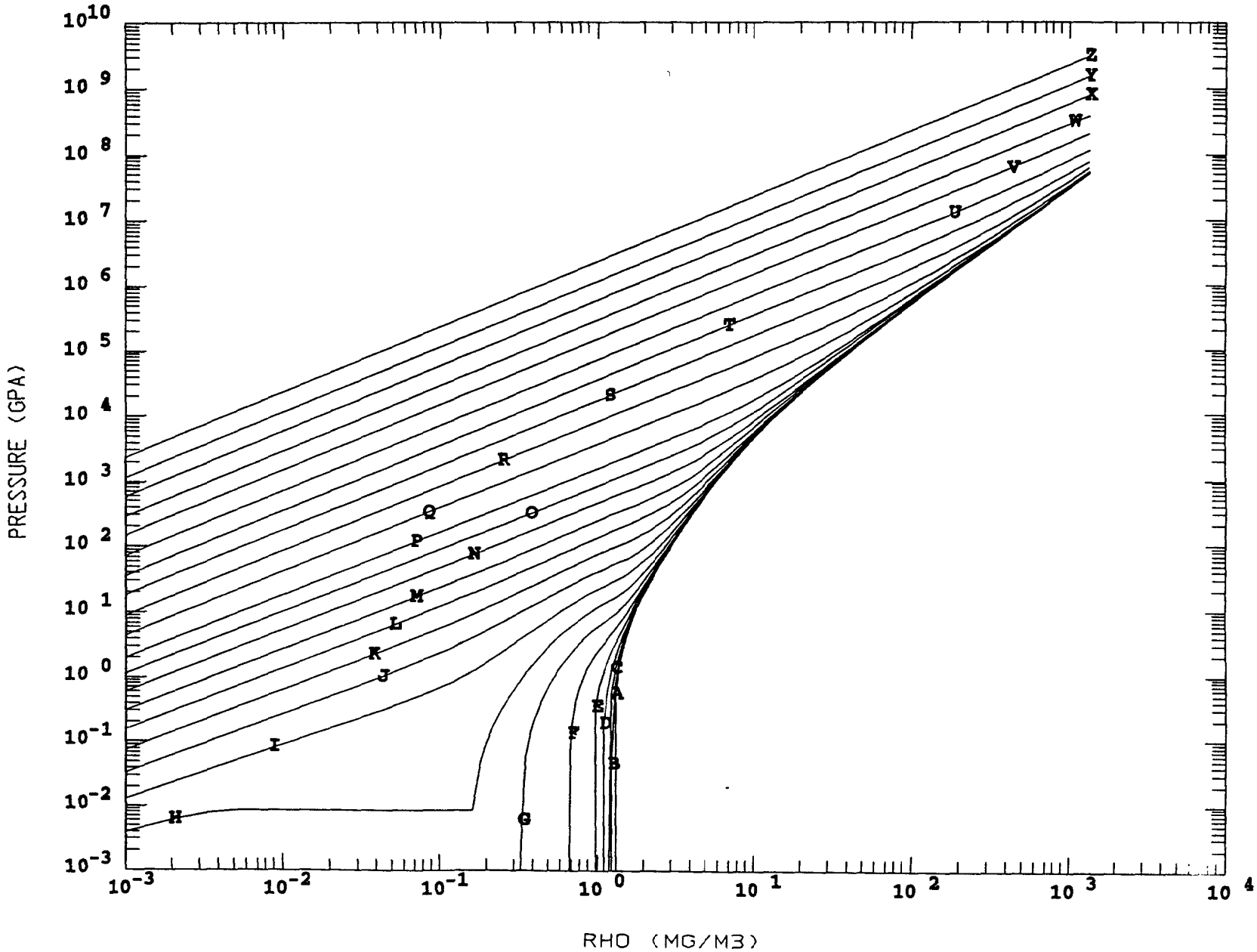
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. NOV 84
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 112784.
DATE OF LAST UPDATE. 112884.
SOURCE. J.D. JOHNSON
REFS. NONE
CODES. EOSCRAY, CANDIDE

COMMENTS. THIS EOS IS THE SAME MODELING AS 7601 EXCEPT MAXWELL CONSTRUCTIONS WERE MADE. BECAUSE WE HAD TO SWITCH CODES TO DO THE MAXWELL CONSTRUCTIONS, SMALL DIFFERENCES BETWEEN THE TWO EOS'S ARE TO BE EXPECTED. IF TWO-TEMPERATURE TABLES ARE NEEDED FOR THIS MATERIAL, THE TWO-TEMPERATURE TABLES FROM 7601 MAY BE USED.

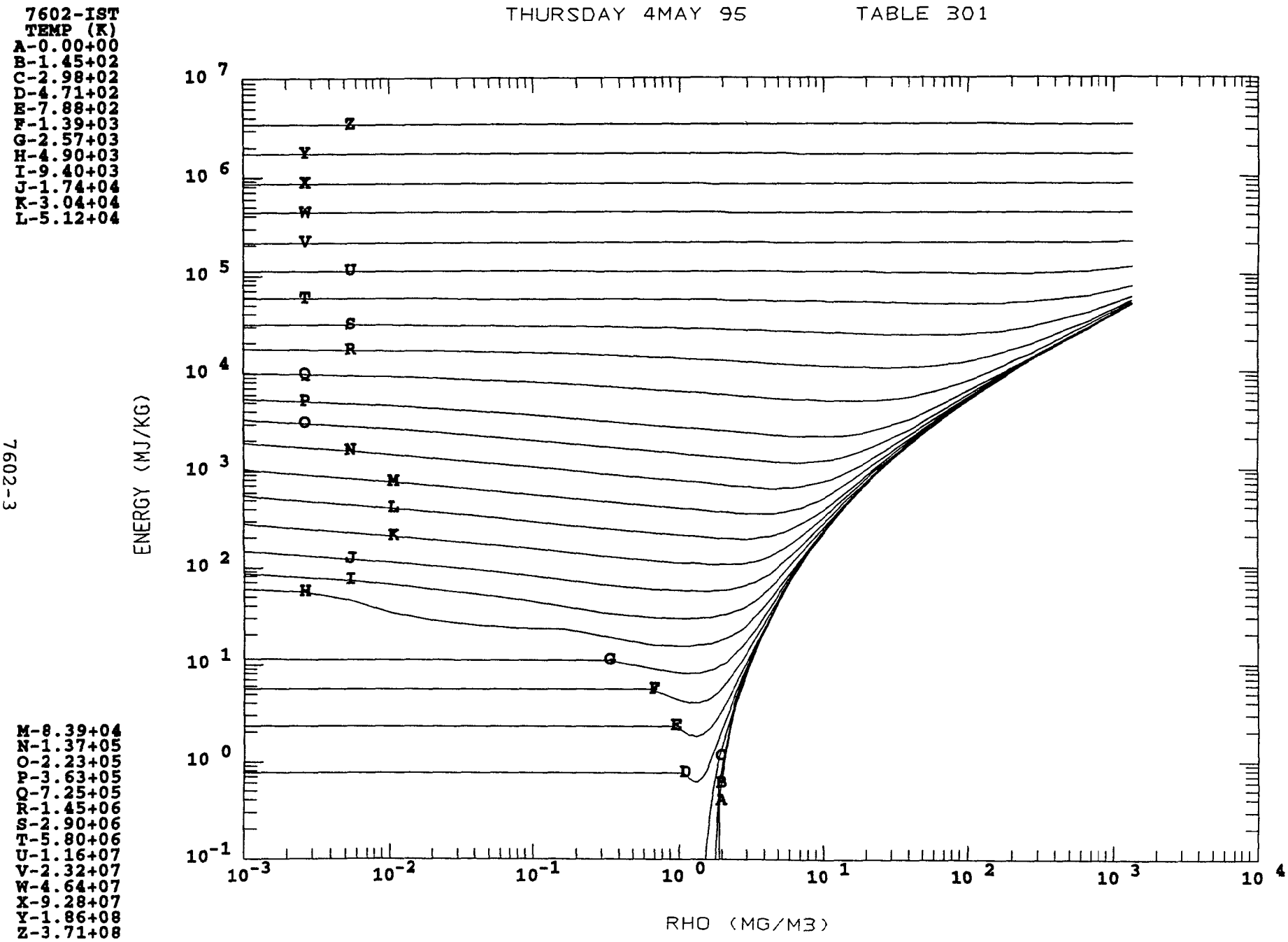
7602-IST
TEMP (K)
A-0.00+00
B-1.45+02
C-2.98+02
D-4.71+02
E-7.88+02
F-1.39+03
G-2.57+03
H-4.90+03
I-9.40+03
J-1.74+04
K-3.04+04
L-5.12+04

THURSDAY 4MAY 95 TABLE 301



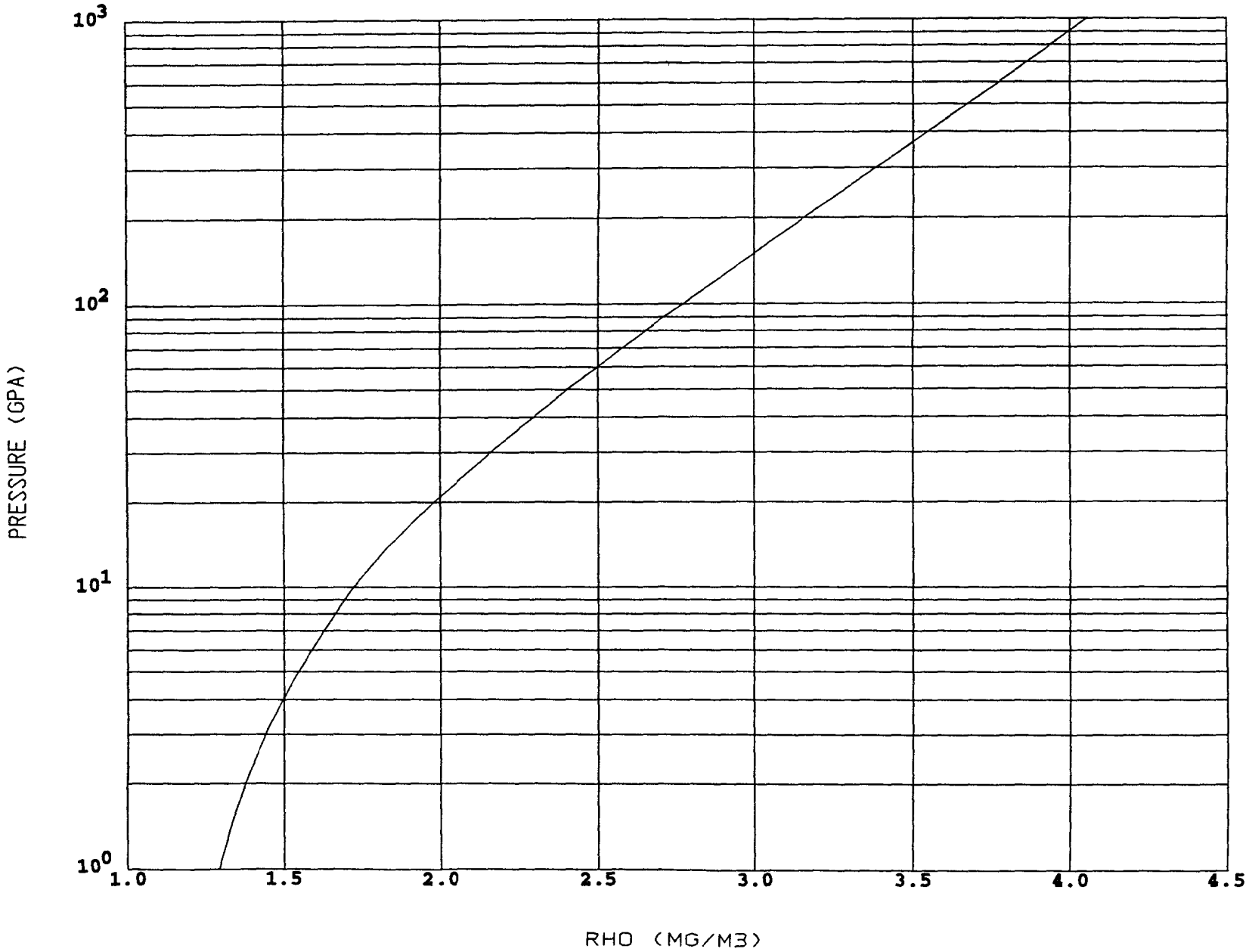
M-8.39+04
N-1.37+05
O-2.23+05
P-3.63+05
Q-7.25+05
R-1.45+06
S-2.90+06
T-5.80+06
U-1.16+07
V-2.32+07
W-4.64+07
X-9.28+07
Y-1.86+08
Z-3.71+08

T1 SES2D CRAY


7602-IST
TEMP (K)
A-0.00+00
B-1.45+02
C-2.98+02
D-4.71+02
E-7.88+02
F-1.39+03
G-2.57+03
H-4.90+03
I-9.40+03
J-1.74+04
K-3.04+04
L-5.12+04
M-8.39+04
N-1.37+05
O-2.23+05
P-3.63+05
Q-7.25+05
R-1.45+06
S-2.90+06
T-5.80+06
U-1.16+07
V-2.32+07
W-4.64+07
X-9.28+07
Y-1.86+08
Z-3.71+08
THURSDAY 4MAY 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7602-HU1
E0 MJ/KG
0.00+00

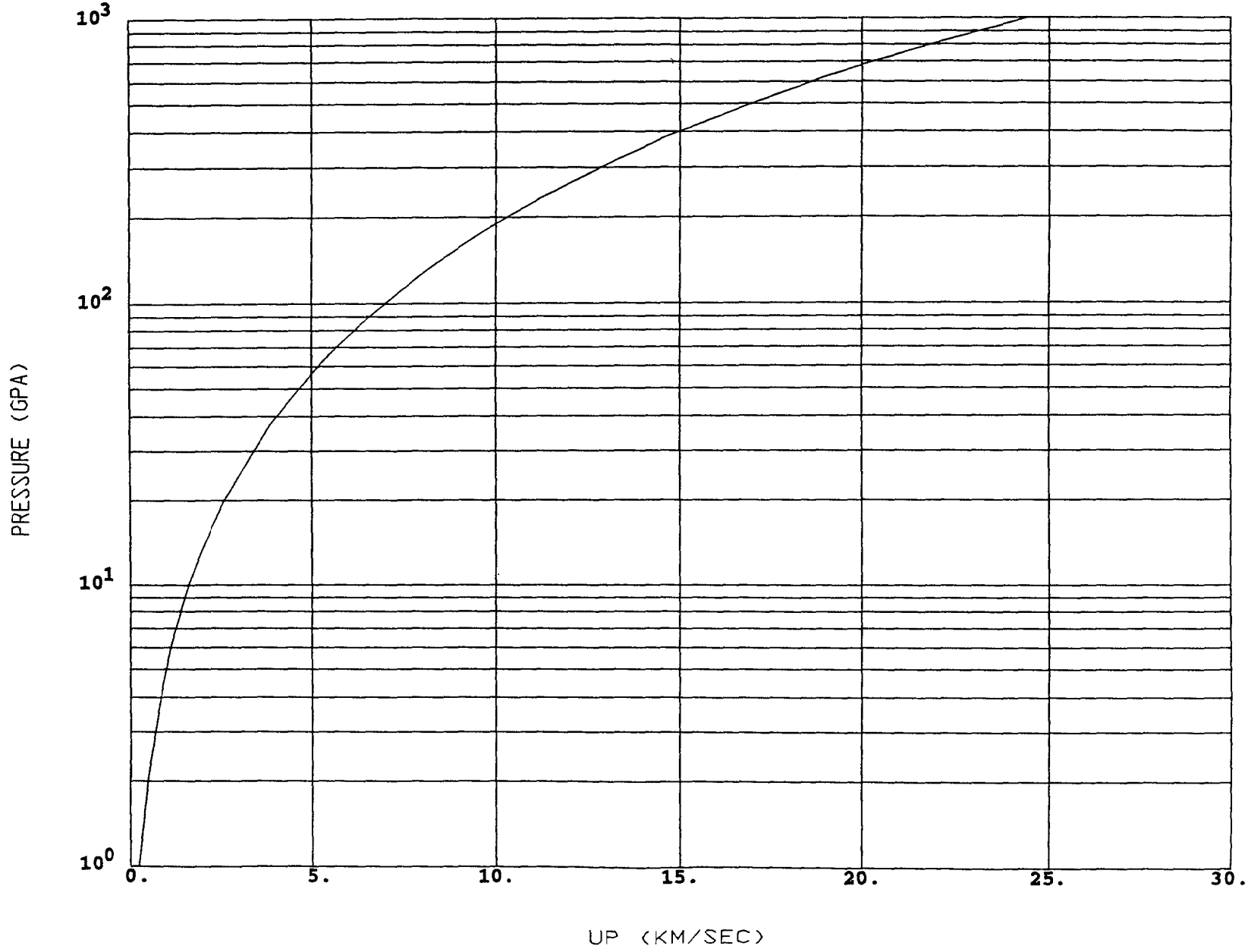
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY

7602-HU1
E0 MJ/KG
0.00+00

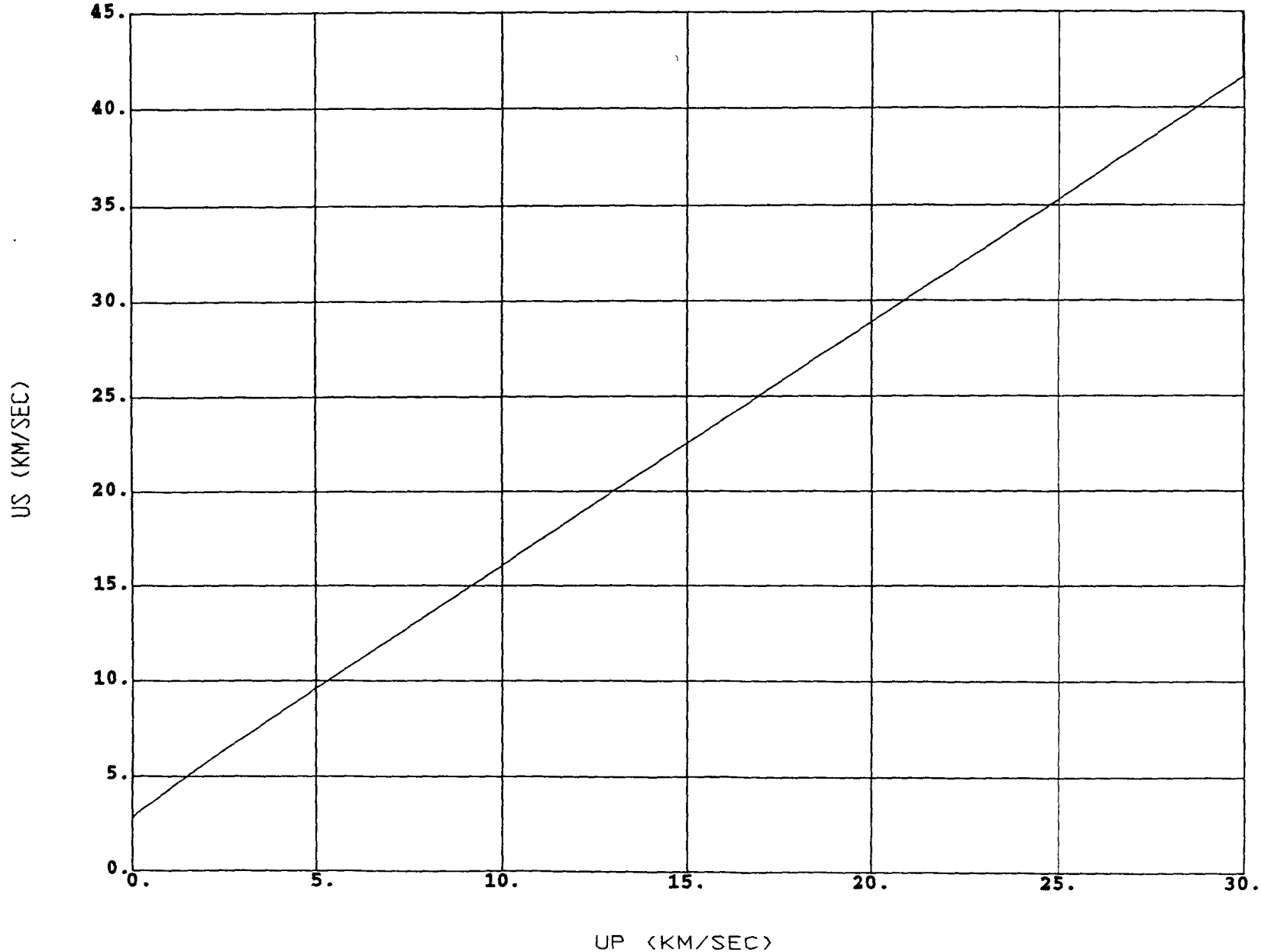
THURSDAY 4MAY 95 TABLE 301



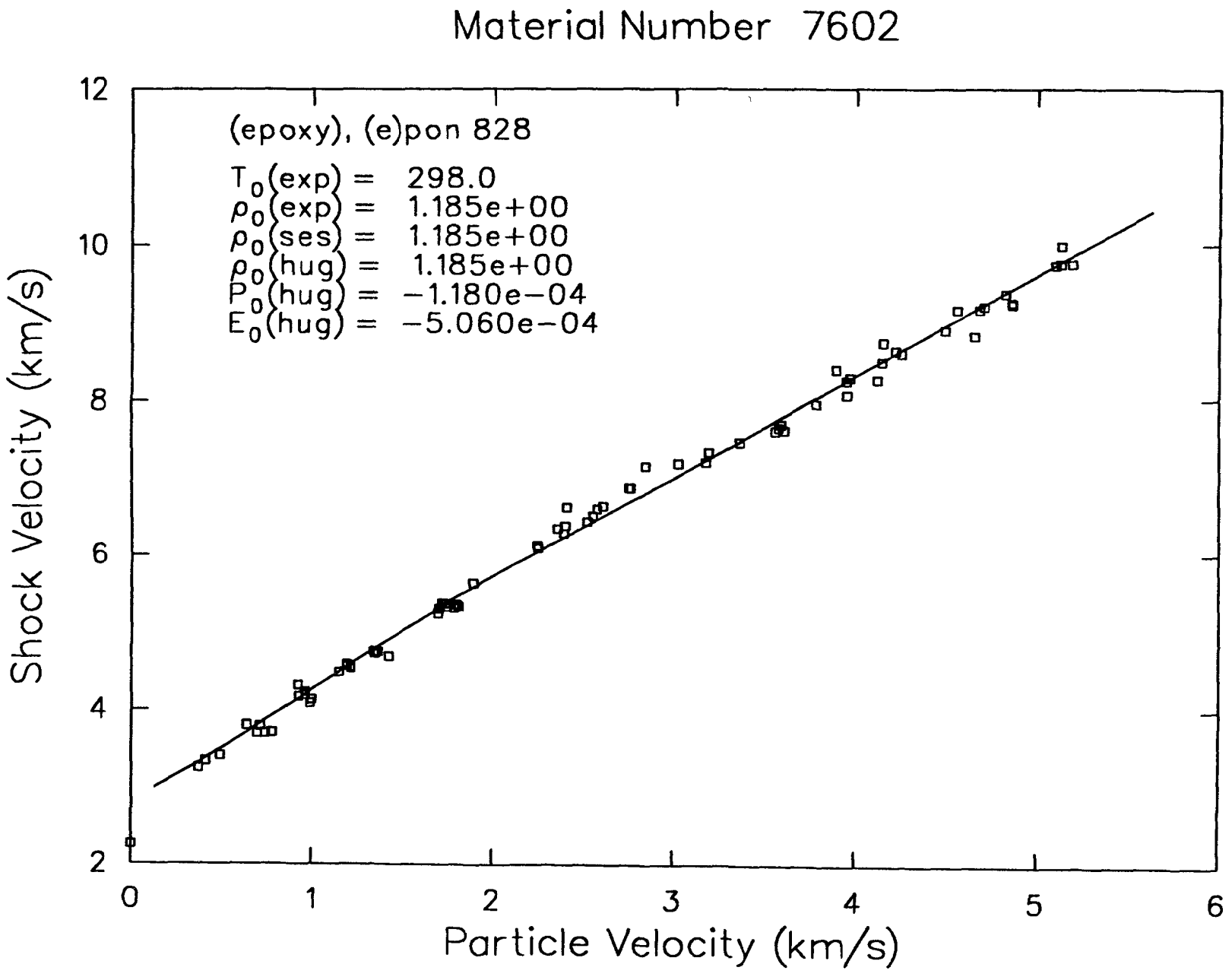
T1 SES2D CRAY 02

7602-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7602
(epoxy), (e)pon 828
T_0(exp) = 298.0
ρ_0(exp) = 1.185e+00
ρ_0(ses) = 1.185e+00
ρ_0(hug) = 1.185e+00
P_0(hug) = −1.180e−04
E_0(hug) = −5.060e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
12
10
8
6
4
2
0
1
2
3
4
5
6

MATERIAL NUMBER | SUMMARY

7603 MATERIAL. EPOXY

COMP. WEIGHT FRACTION: 0.6984 C, 0.1895 O, 0.0833 H, 0.0288 N
ATOMIC NUMBER. 3.4953E+00
ATOMIC MASS. 6.4645E+00
NORMAL DENSITY. 1.1540E+00

GAMMA(COMPUTED). 0.7931

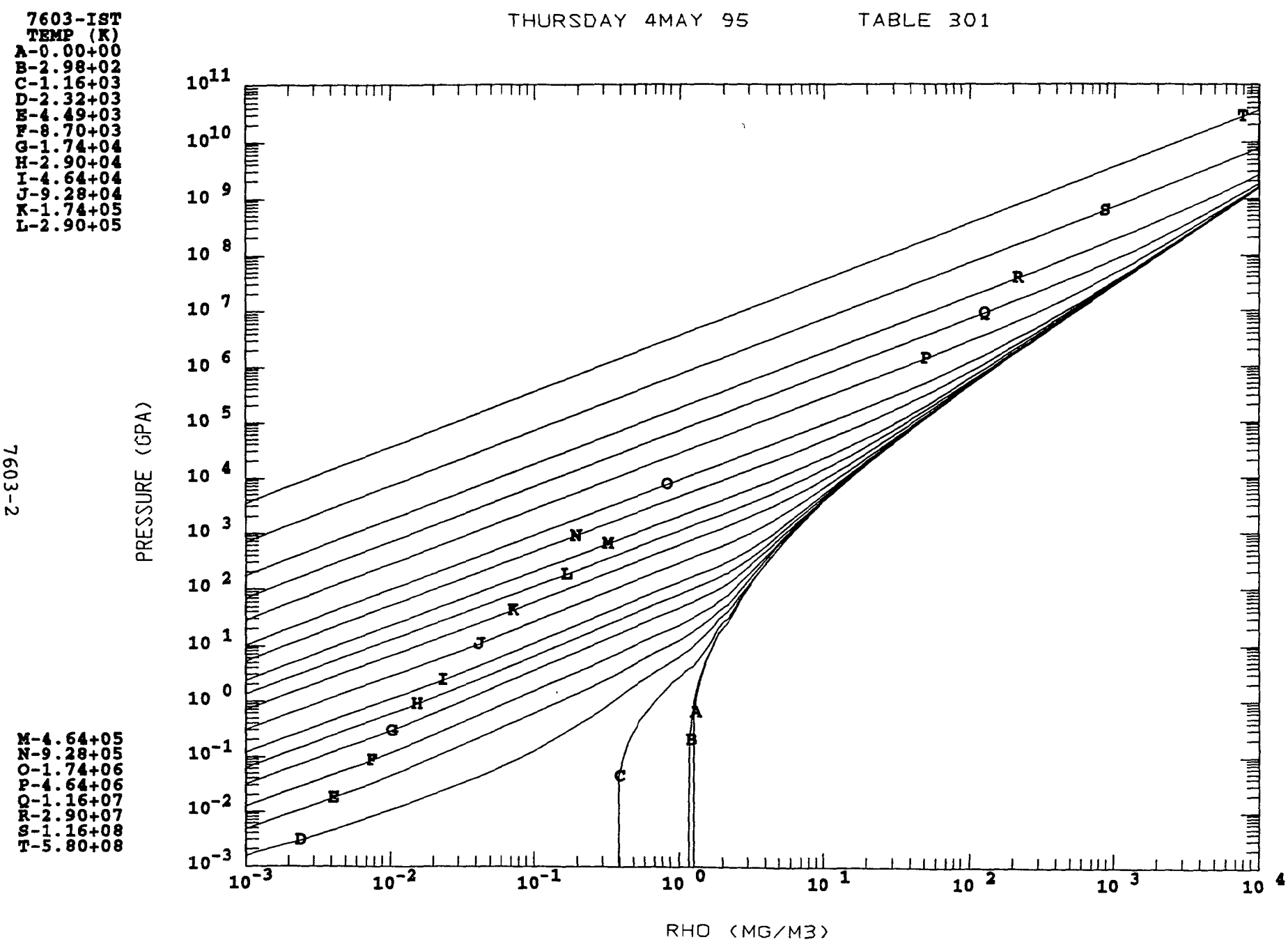
TABLE SUMMARY.

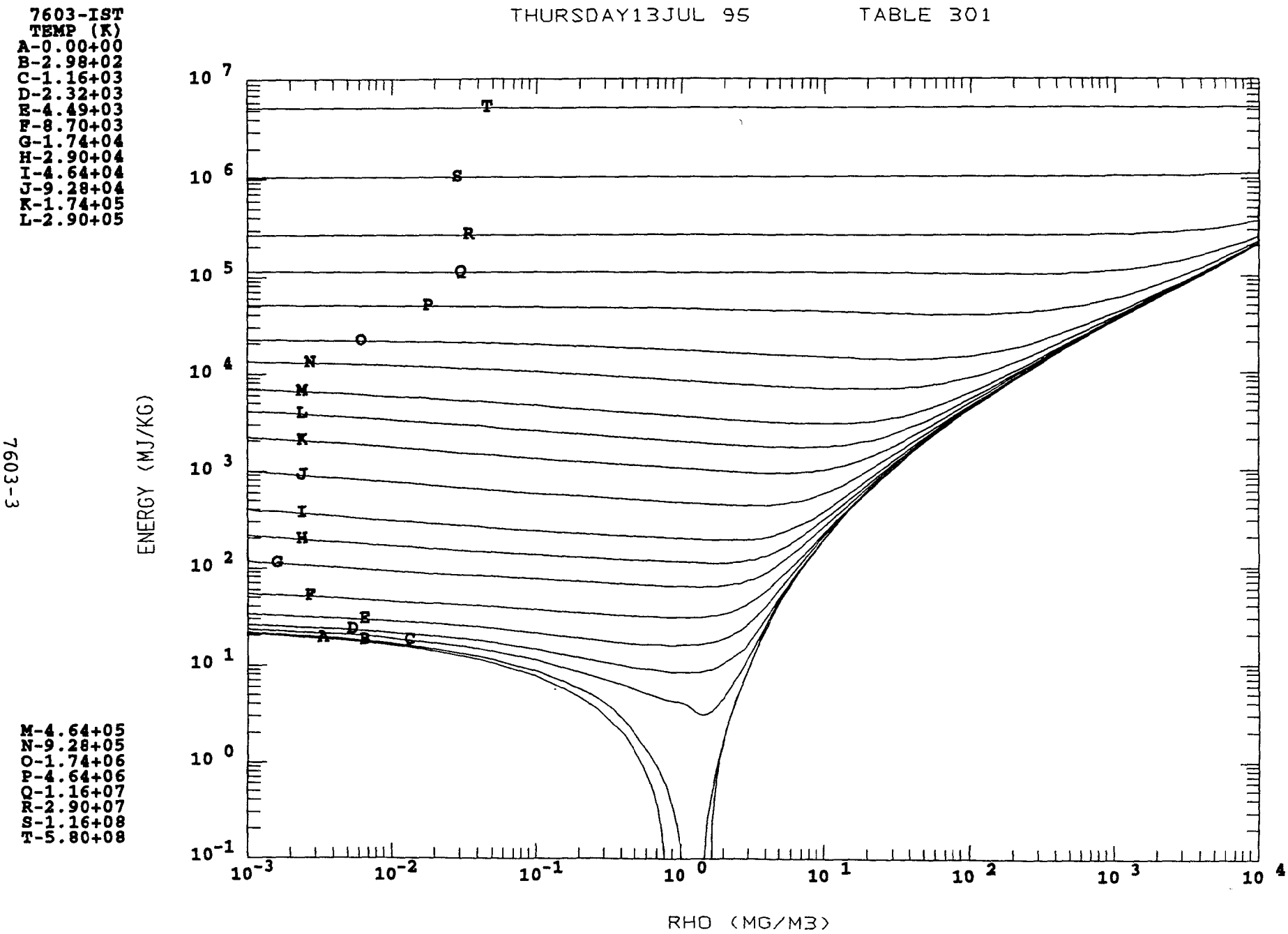
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	23					
102	64					
201	5					
301	4519	37	40	0.0000E+00	2.3080E-06	2.3080E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	4519	37	40	0.0000E+00	2.3080E-06	2.3080E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	9117	75	40	0.0000E+00	1.1540E-06	5.7700E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8996	74	40	1.1540E-06	2.3080E-06	5.7700E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	299	74	1	1.1540E-06	2.3080E-06	5.7700E+04
				0.0000E+00	-1.5167E-11	0.0000E+00
401	57					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JUNE 94
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 10694.
DATE OF LAST UPDATE. 60994.
SOURCE. J. C. BOETTGER
REFS. LA-12755-MS
CODES. GRIZZLY

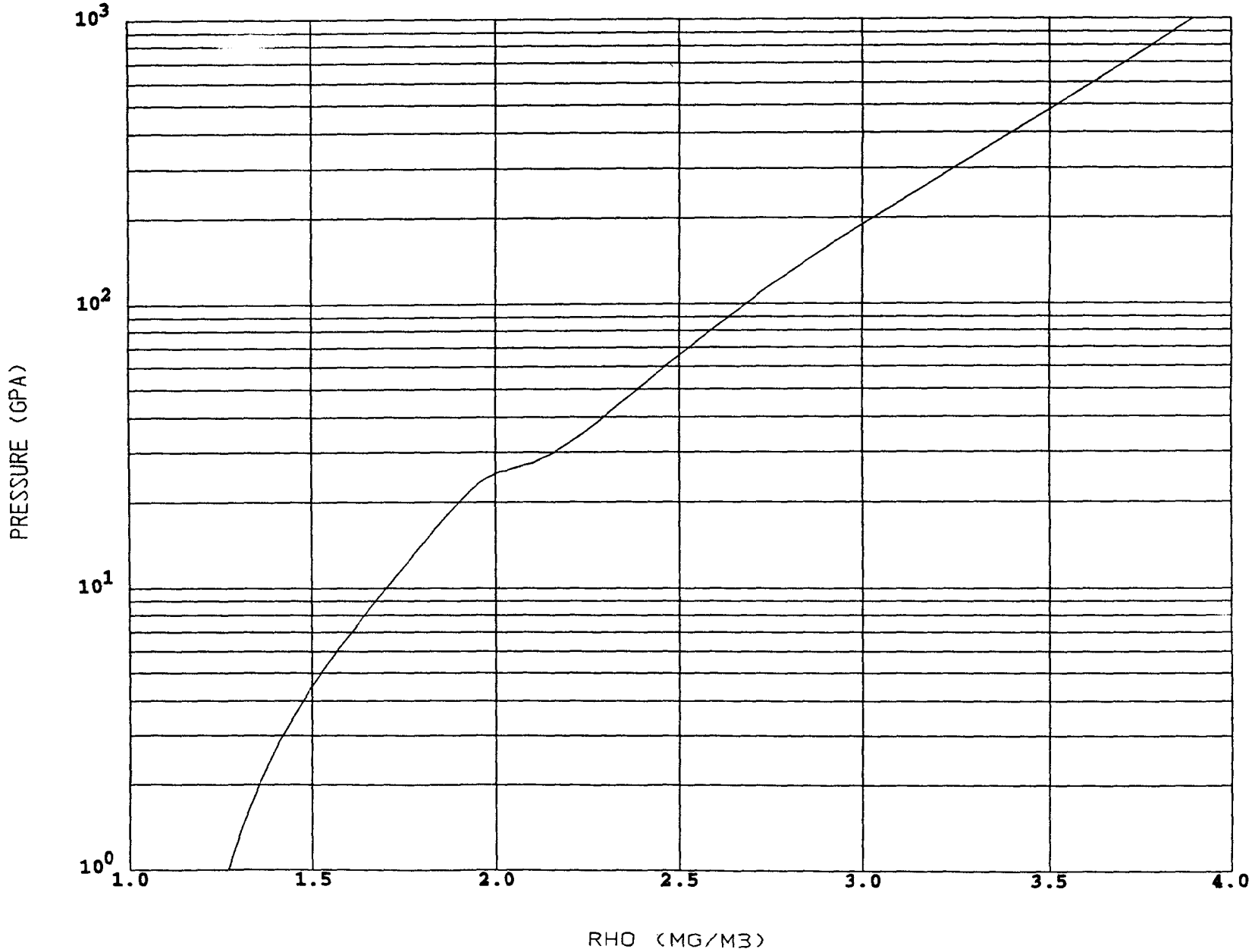
COMMENTS. THIS EOS ASSUMES THAT THE EPOXY IS FORMED BY MIXING EPON828 RESIN (70% BY WEIGHT) WITH JEFFAMINE T-403 CUVING AGENT (30% BY WEIGHT). THE ELECTRONIC TABLE IS MIXED TFD. THE NUCLEAR TABLE WAS OBTAINED WITH THE JDJNUC MODEL WITH TMELT=1000 KELVIN, IGRUN=7, GAMREF=0.8, AND DGAMMA=-0.05. THE CHUG MODEL WAS USED FOR THE COLD CURVE WITH ECOHKC=40, CMAT=2.0 AND FACLJ=0.5. THE HUGONIOT WAS FITTED WITH SIX (UP,US) POINTS; (0.000,2.263), (0.185,2.865), (0.370,3.250), (2.995,7.195), (3.215,7.195), (5.500,10.237).


7603-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-2.32+03
E-4.49+03
F-8.70+03
G-1.74+04
H-2.90+04
I-4.64+04
J-9.28+04
K-1.74+05
L-2.90+05
M-4.64+05
N-9.28+05
O-1.74+06
P-4.64+06
Q-1.16+07
R-2.90+07
S-1.16+08
T-5.80+08
THURSDAY 4MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA\


7603-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-2.32+03
E-4.49+03
F-8.70+03
G-1.74+04
H-2.90+04
I-4.64+04
J-9.28+04
K-1.74+05
L-2.90+05
M-4.64+05
N-9.28+05
O-1.74+06
P-4.64+06
Q-1.16+07
R-2.90+07
S-1.16+08
T-5.80+08
THURSDAY13JUL 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7603-HU1
E0 MJ/KG
0.00+00

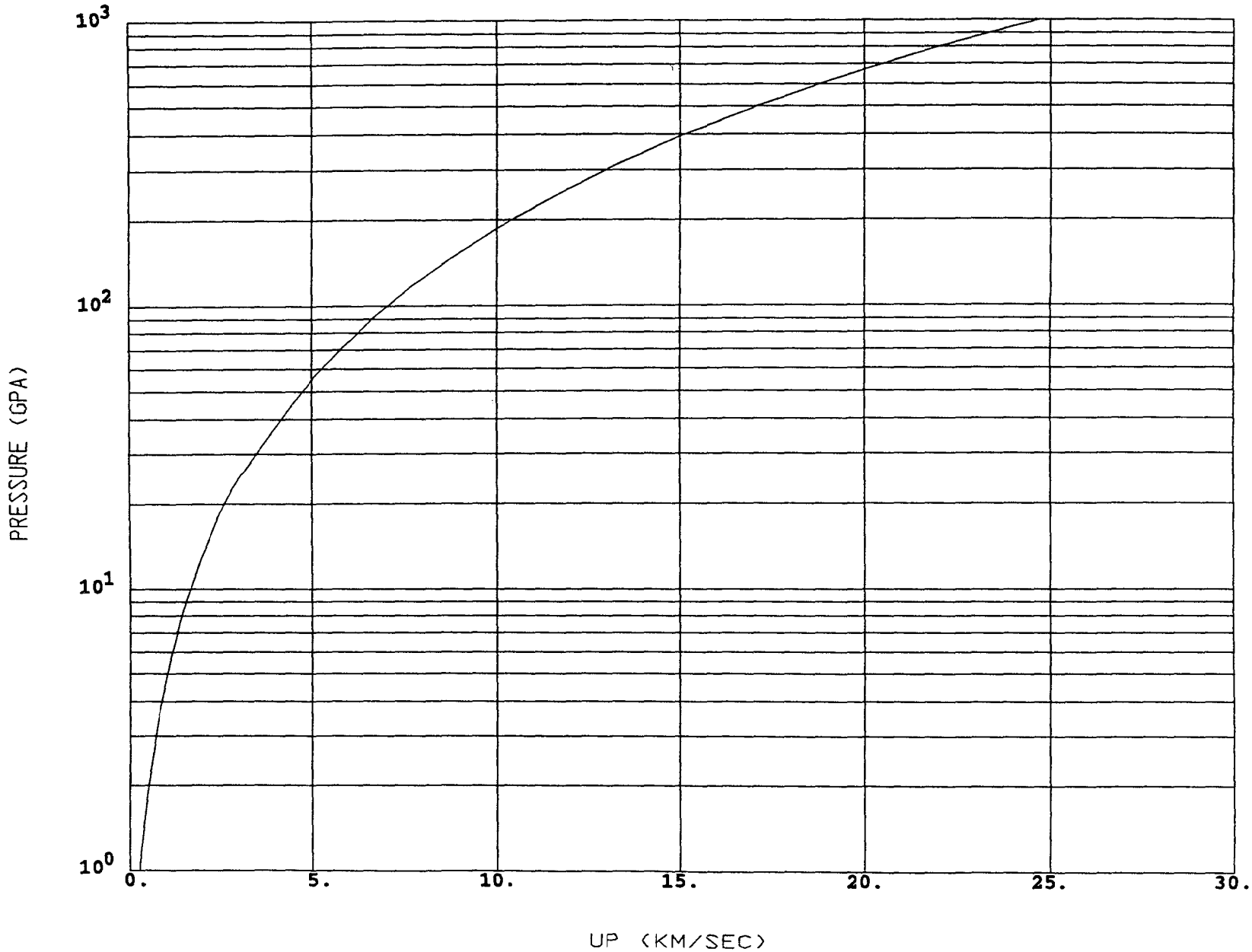
THURSDAY 4MAY 95 TABLE 301



T1 SES2D CRAY

7603-HU1
E0 MJ/KG
0.00+00

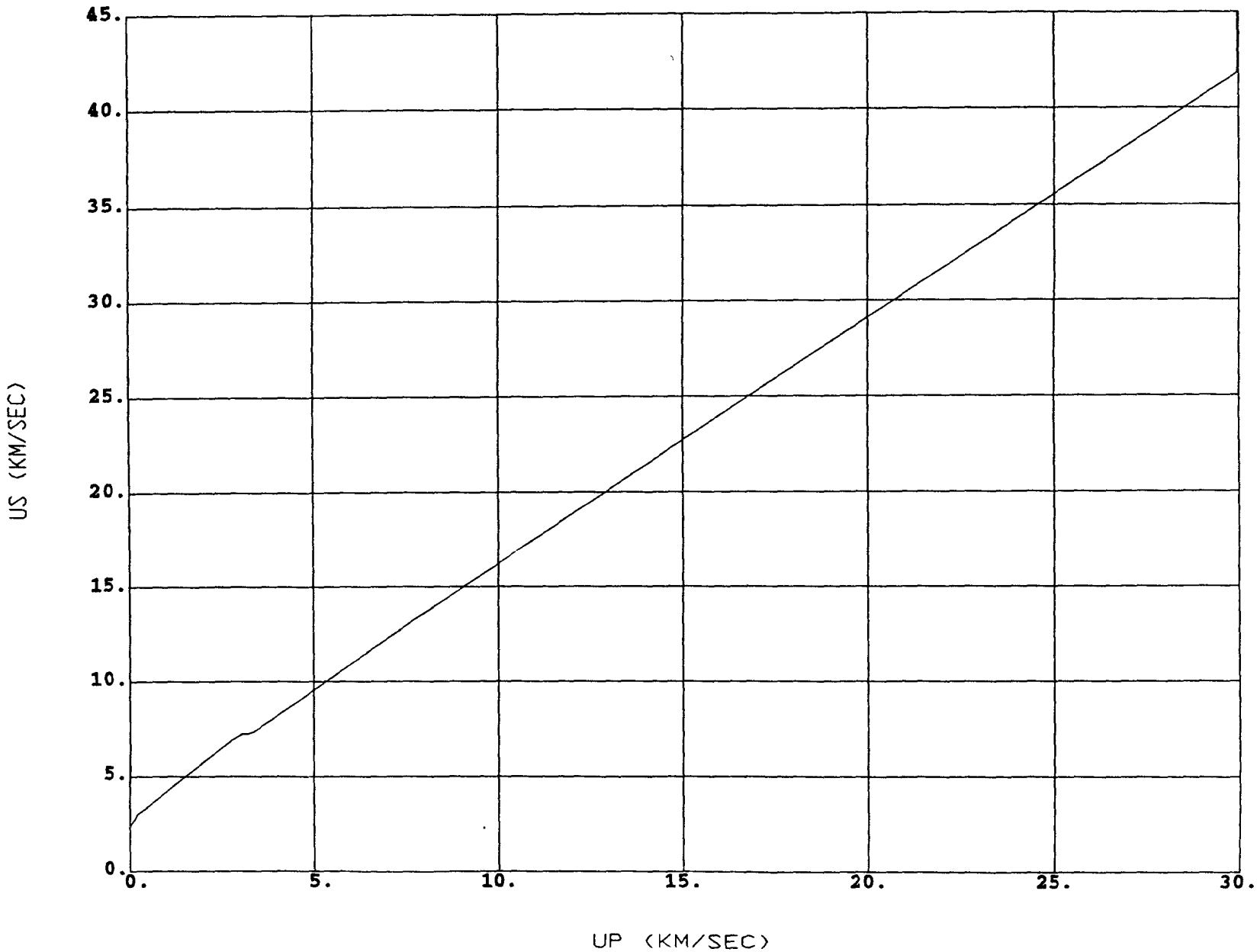
THURSDAY 4MAY 95 TABLE 301



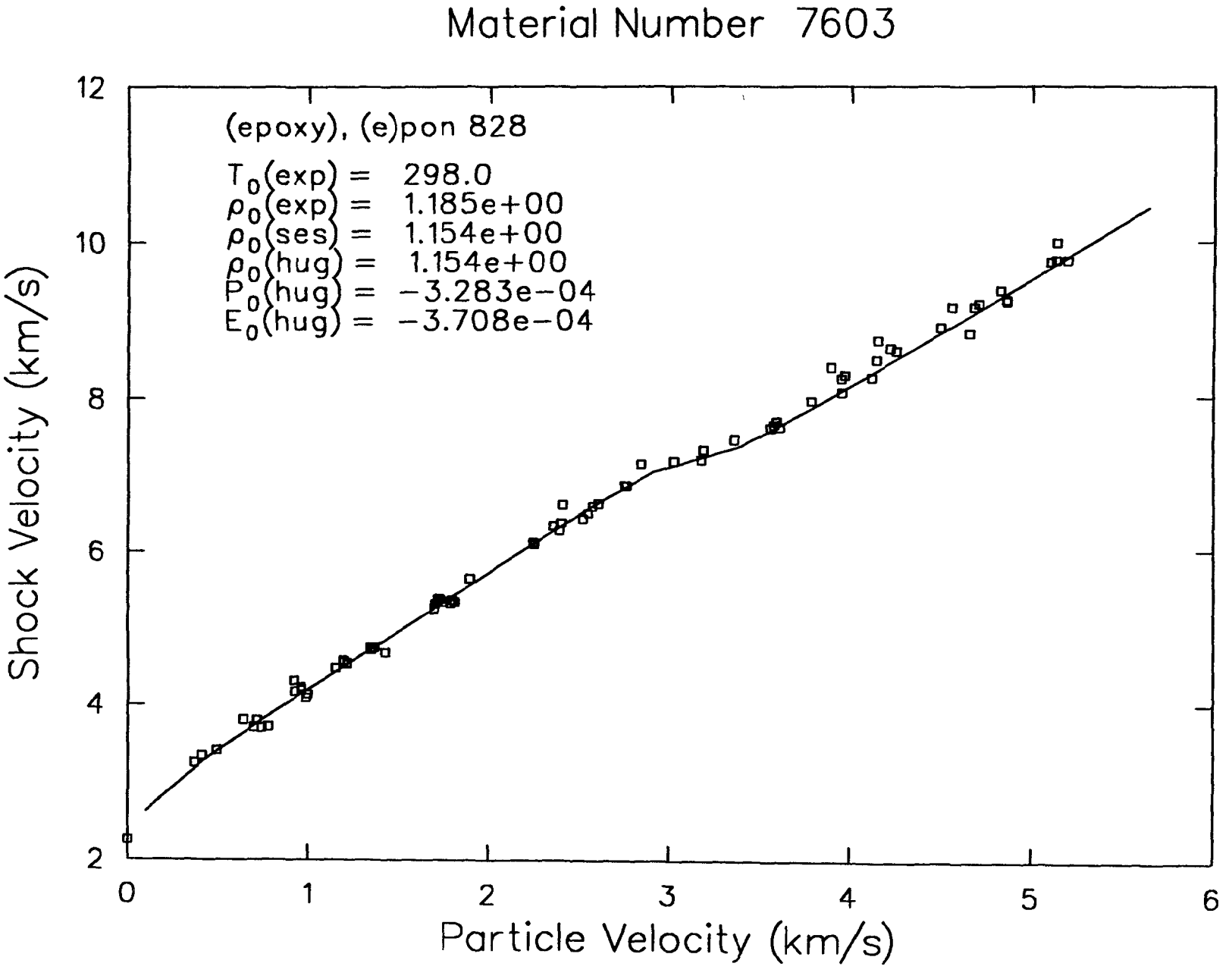
T1 SES2D CRAY 02

7603-HU1
E0 MJ/KG
0.00+00

THURSDAY 4MAY 95 TABLE 301

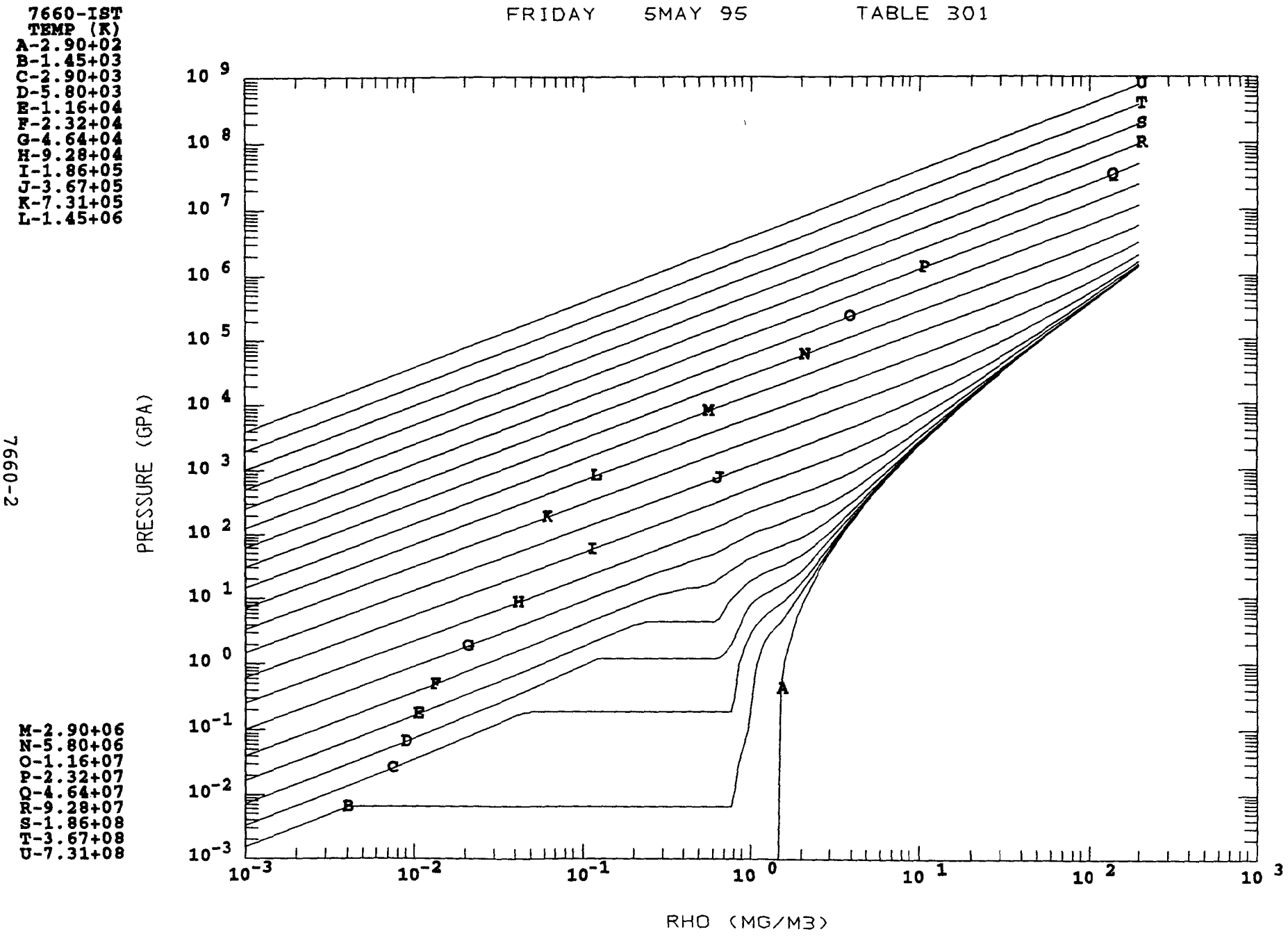


T1 SES2D CRAY


Material Number 7603
(epoxy), (e)pon 828
T_0(exp) = 298.0
ρ_0(exp) = 1.185e+00
ρ_0(ses) = 1.154e+00
ρ_0(hug) = 1.154e+00
P_0(hug) = −3.283e−04
E_0(hug) = −3.708e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
12
10
8
6
4
2
0
1
2
3
4
5
6

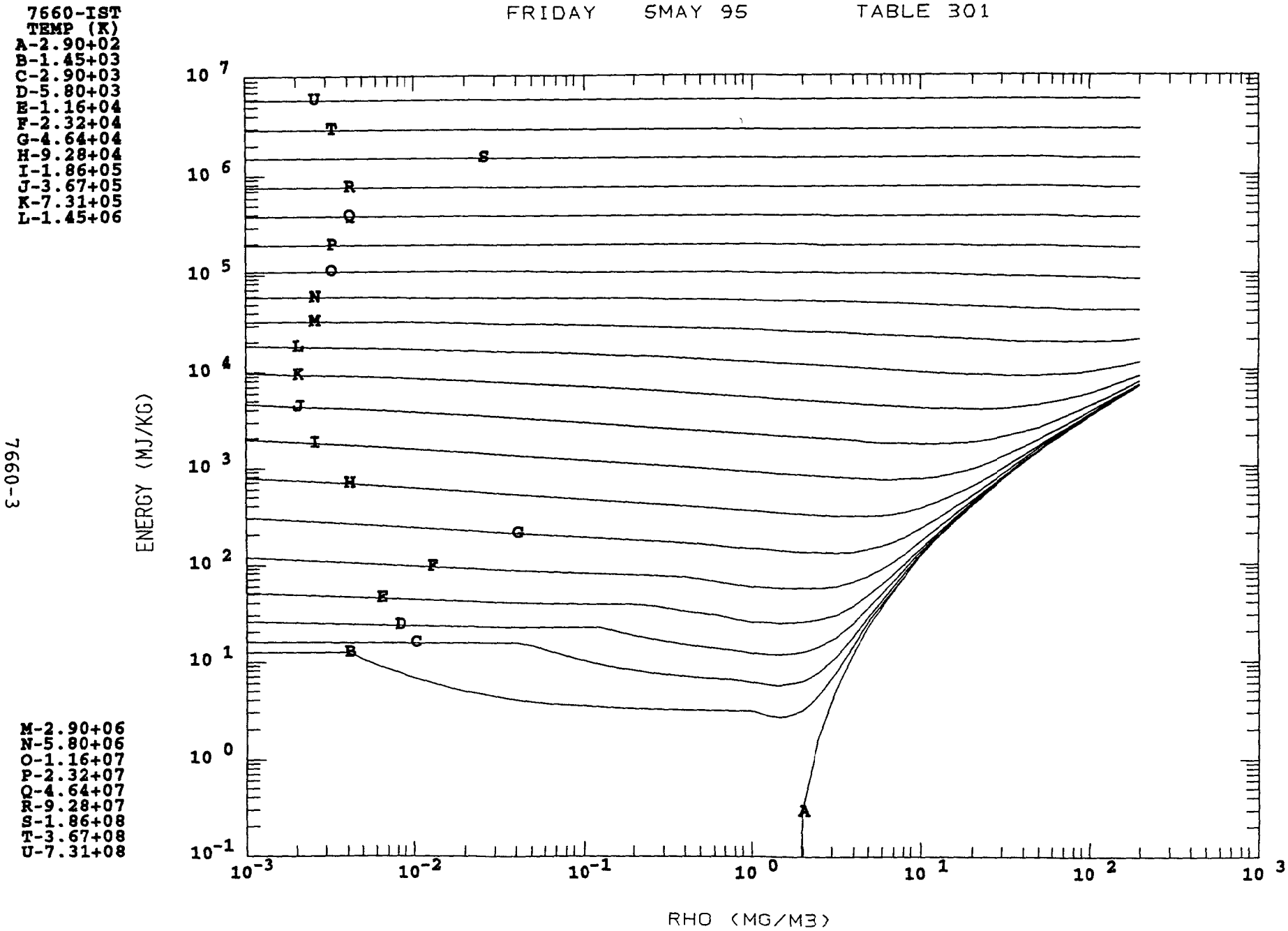
MATERIAL NUMBER	SUMMARY
7660	MATERIAL. PERYPHENYLENE SULFIDE

```
COMP. NUMBER FRACTION C .545, H .364, S .091
ATOMIC NUMBER.   5.0900E+00
ATOMIC MASS.     9.8307E+00
NORMAL DENSITY.  1.4400E+00

GAMMA(COMPUTED).     0.0037

TABLE SUMMARY.
TID    NW  NR  NT    R1/T1      R2/T2      RN/TN
101    23
201     5
301 14505  76  63 0.0000E+00 1.0000E-05 2.0000E+02
                  2.5000E-02 8.0000E-02 1.0000E+05
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. OCT 90
VERSION NUMBER.     2
DATE ADDED TO LIBRARY.   102290.
DATE OF LAST UPDATE.      50692.
SOURCE. DAVID YOUNG (LIVERMORE)
REFS. NONE
CODES. LIVERMORE CODES
```



T1 SES2D CRAY

FRIDAY 5MAY 95 TABLE 301

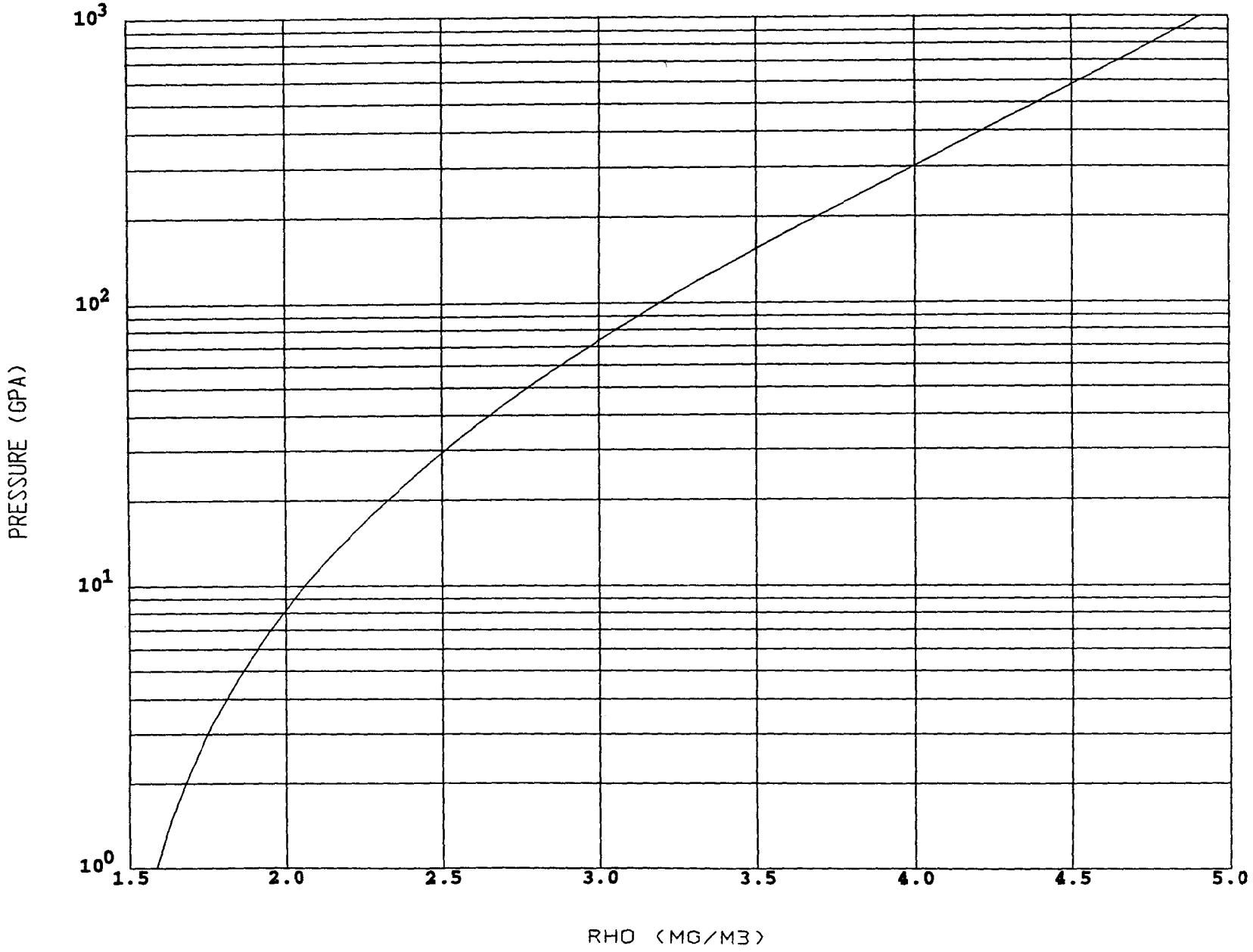


7660-3

T1 SES2D CRAY 02

7660-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301

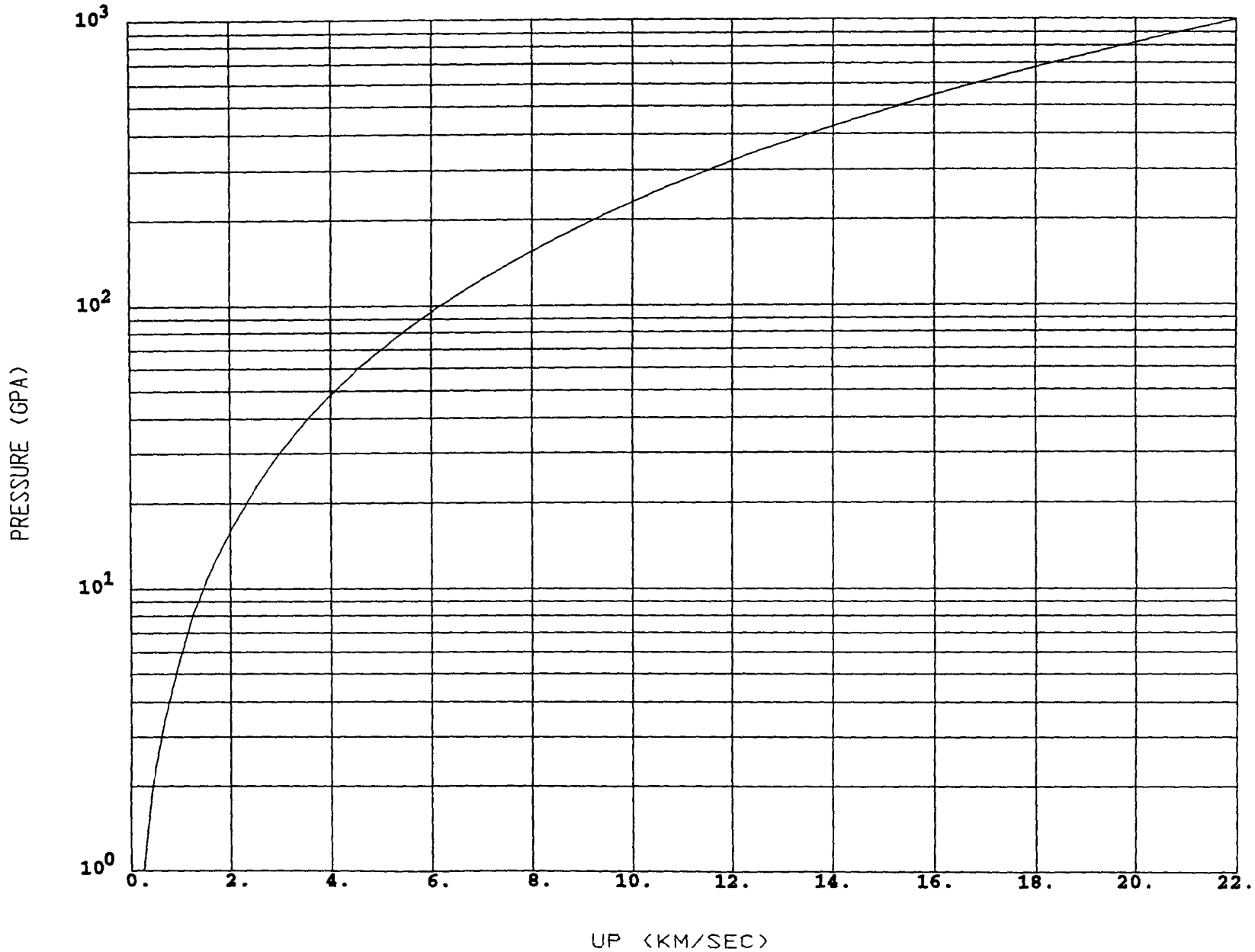


T1 SES2D CRAY

7660-4

7660-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301

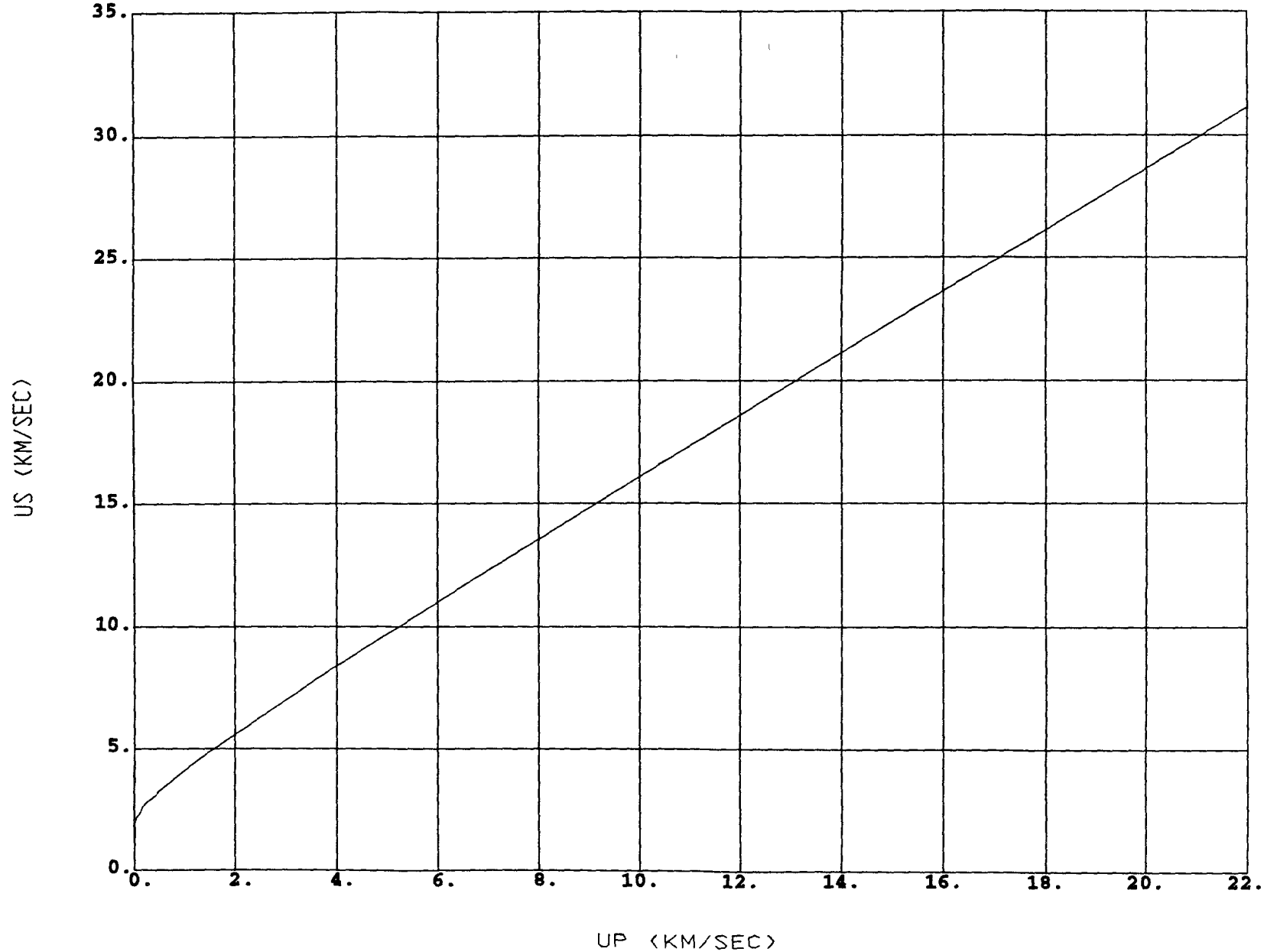


7660-5

T1 SES2D CRAY 02

7660-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7660-6

MATERIAL NUMBER | SUMMARY

7740 MATERIAL. POLYCARBONATE

COMP. C16H1403
ATOMIC NUMBER. 4.0606E+00
ATOMIC MASS. 7.7052E+00
NORMAL DENSITY. 1.1960E+00

GAMMA(COMPUTED). 0.8426

TABLE SUMMARY.

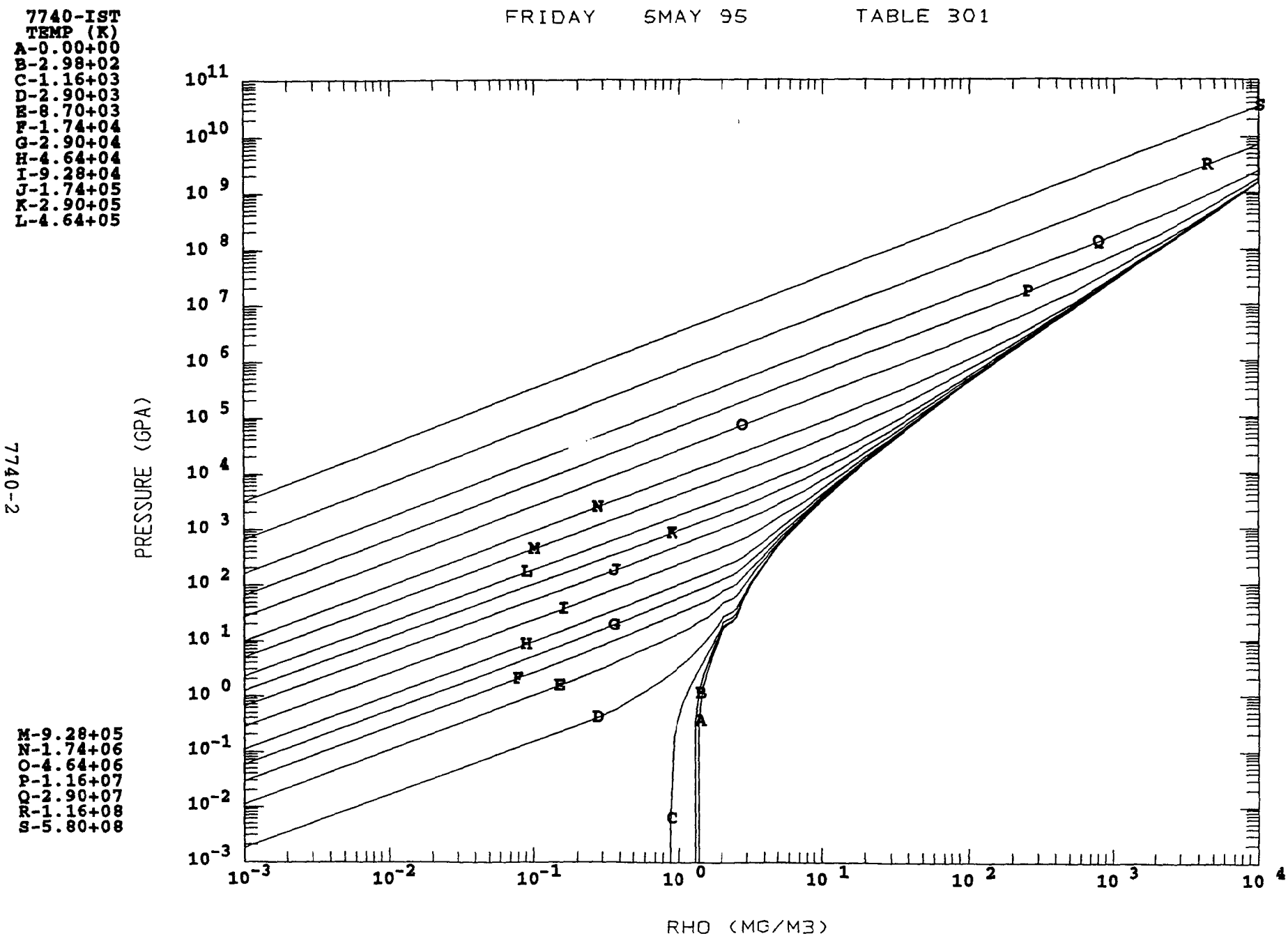
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	17					
102	53					
201	5					
301	8665	75	38	0.0000E+00	1.1960E-06	2.3920E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	8665	75	38	0.0000E+00	1.1960E-06	2.3920E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	8550	74	38	1.1960E-06	2.3920E-06	2.3920E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8550	74	38	1.1960E-06	2.3920E-06	2.3920E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	299	74	1	1.1960E-06	2.3920E-06	2.3920E+04
				0.0000E+00	-1.5863E-10	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

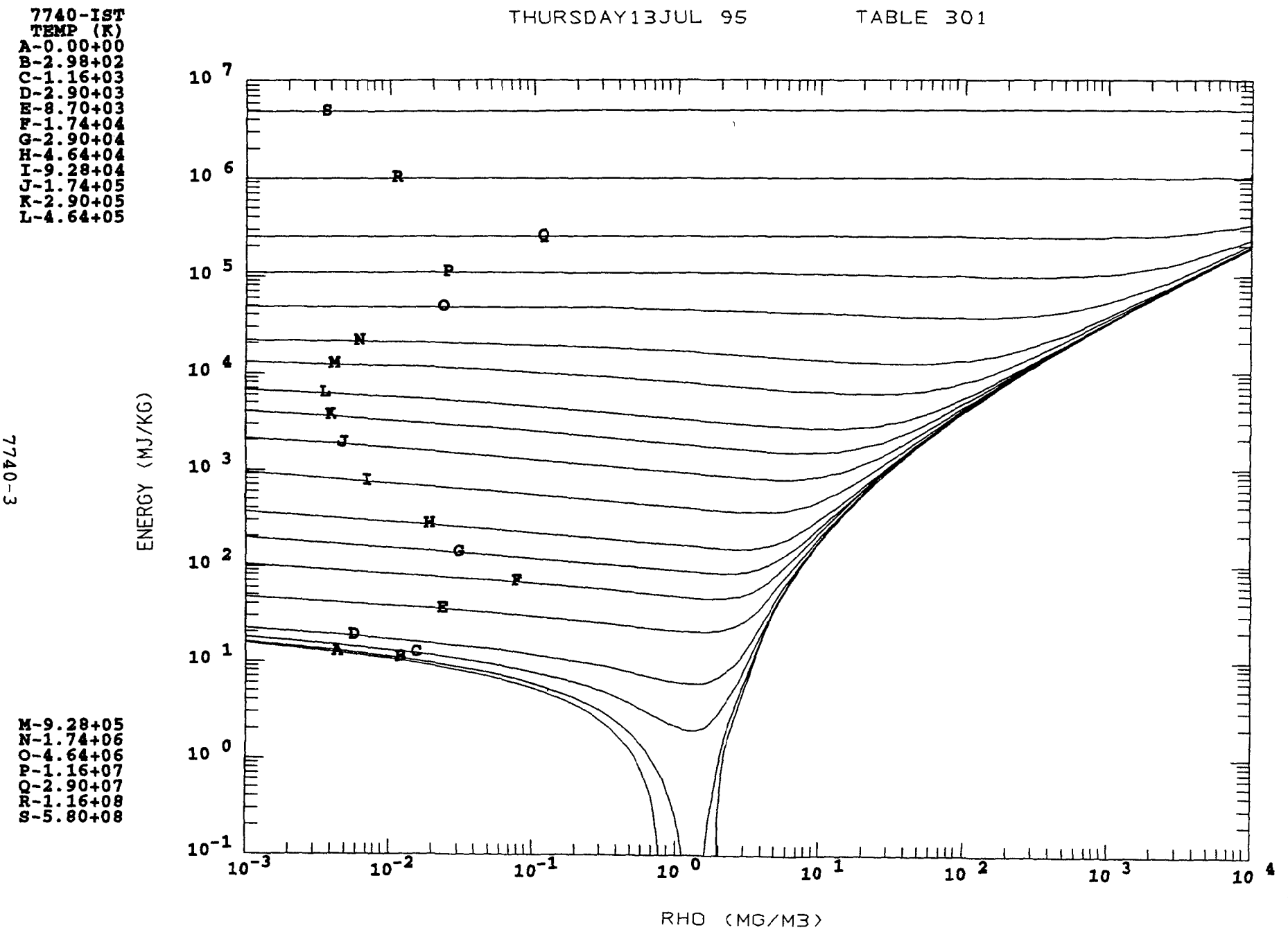
DATE. JUNE 91
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 40291.
DATE OF LAST UPDATE. 30292.
SOURCE. J. BOETTGER
REFS. LA-12120-MS
CODES. GRIZZLY

COMMENTS. THE COMPOSITION IS ASSUMED TO BE C16H1403. MIXED TFD WAS USED FOR THE ELECTRONIC TABLE. THE NUCLEAR MODEL IS CHARTJD WITH IGRUN=1, GAMREF=1.33, DEBREF=136 KELVIN, AND TMELT=600 KELVIN. THE COLD CURVE WAS OBTAINED WITH THE CHUG MODEL USING CMAT=2.3, ECOH=120 KCAL PER MOLE AND FACLJ=3.0. A THREE LINE FIT TO EXPERIMENTAL US VS UP DATA WAS USED AND IS DEFINED BY THE 4 POINTS (0.0,2.33), (2.7,6.569), (3.7,7.15), (5.2,9.47).

FRIDAY 5MAY 95 TABLE 301



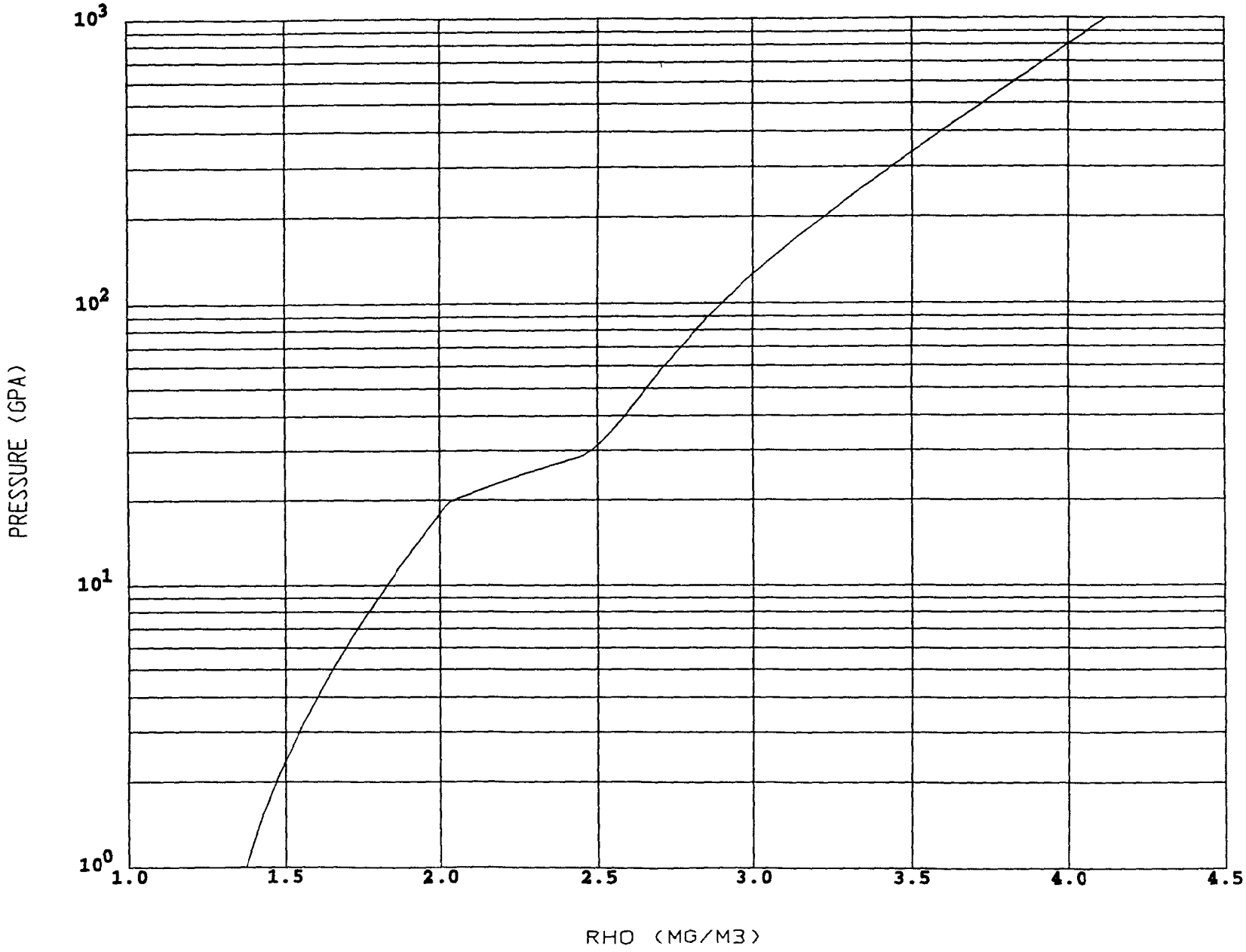
T1 SES2D CRAY



T1 SES2D CRAY 02

7740-HU1
E0 MJ/KG
0.00+00

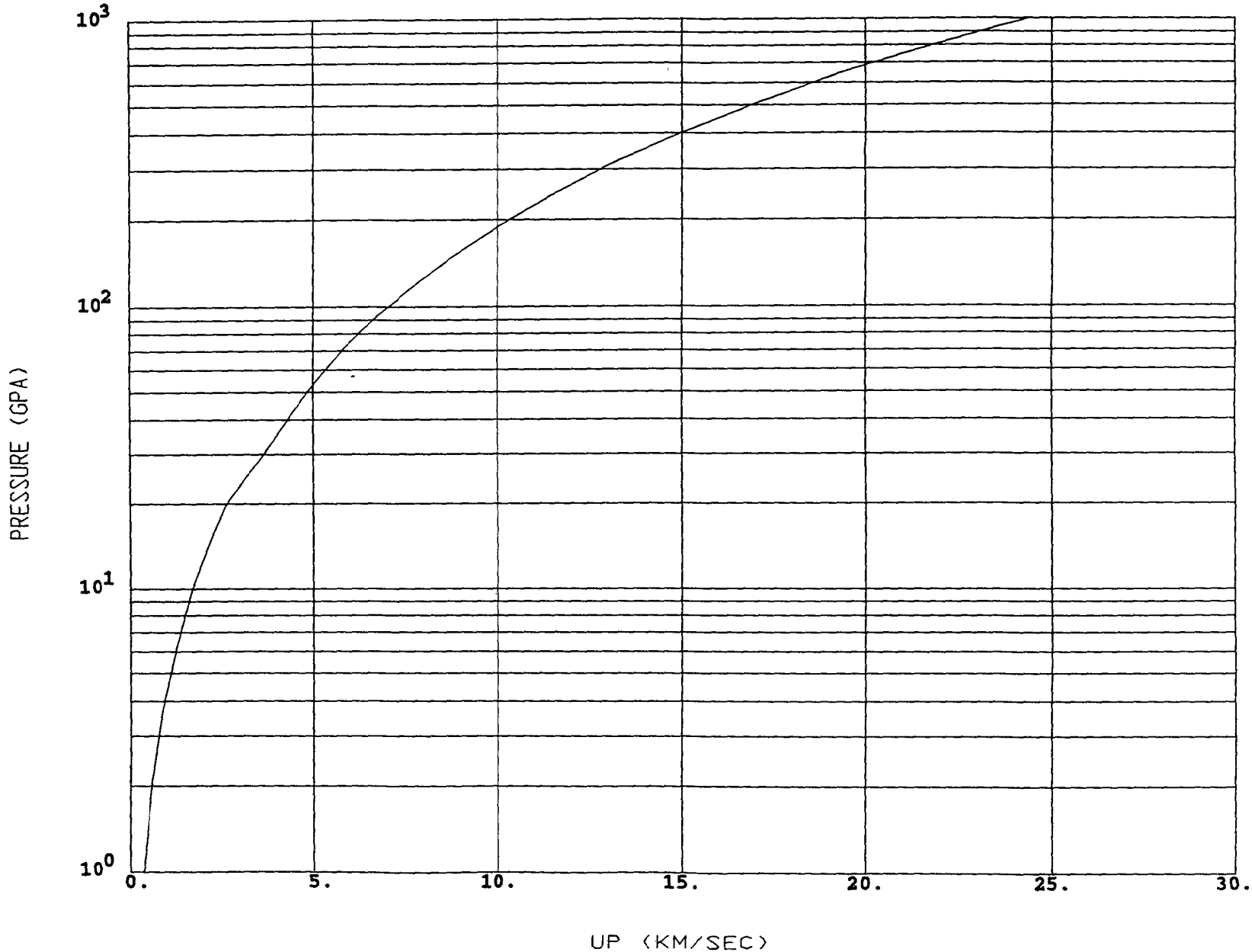
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7740-HU1
E0 MJ/KG
0.00+00

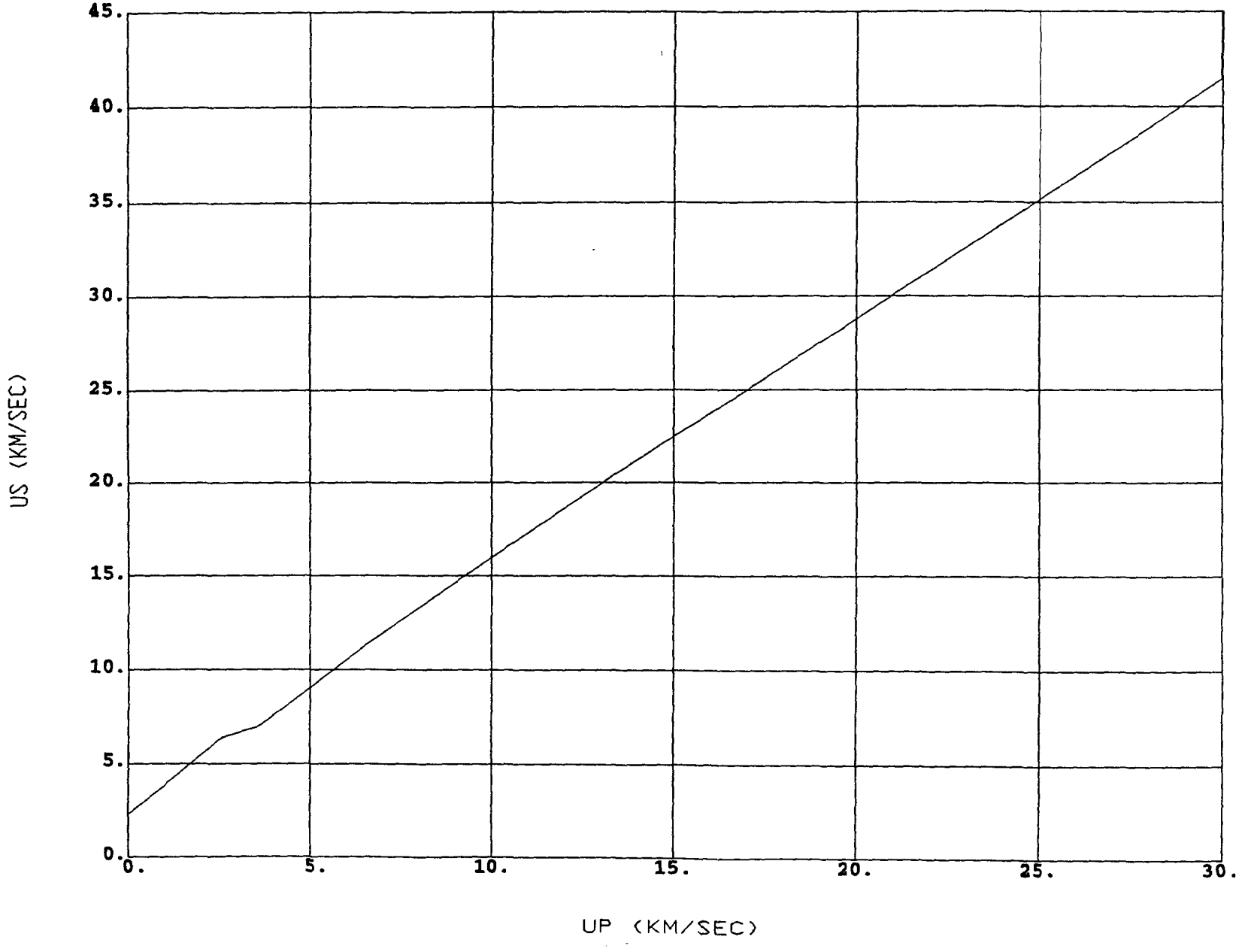
FRIDAY 5MAY 95 TABLE 301

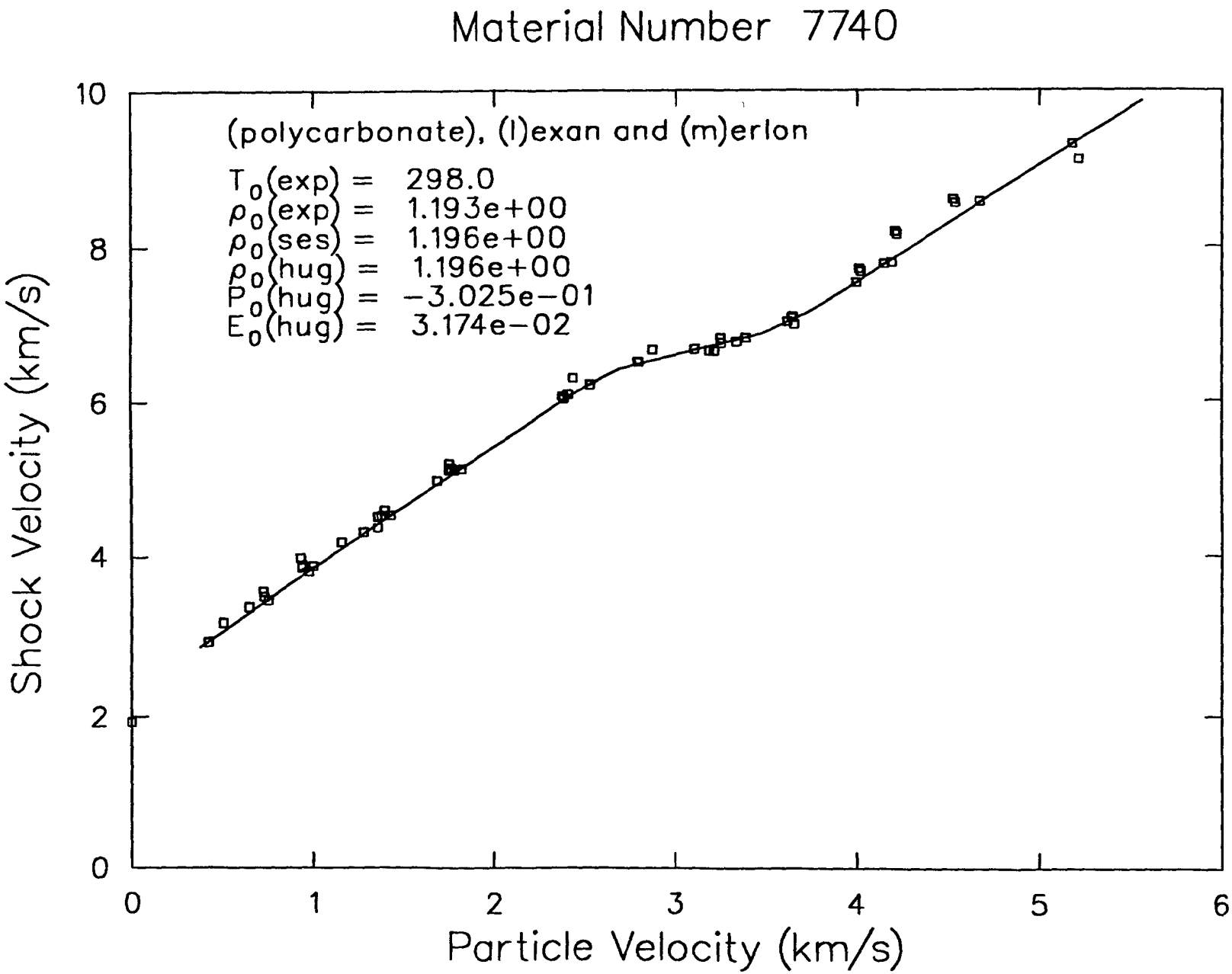


T1 SES2D CRAY 02

7740-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301




Material Number 7740
(polycarbonate), (l)exan and (m)erlon
T_0(exp) = 298.0
ρ_0(exp) = 1.193e+00
ρ_0(ses) = 1.196e+00
ρ_0(hug) = 1.196e+00
P_0(hug) = −3.025e−01
E_0(hug) = 3.174e−02
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
0
1
2
3
4
5
6

MATERIAL NUMBER | SUMMARY

7741 MATERIAL. POLYCARBONATE (LEXAN)

COMP. NUMBER FRACTION: C 0.4848, H 0.4242, O 0.0910
ATOMIC NUMBER. 4.0606E+00
ATOMIC MASS. 7.7051E+00
NORMAL DENSITY. 1.1960E+00

GAMMA(COMPUTED). 0.2485

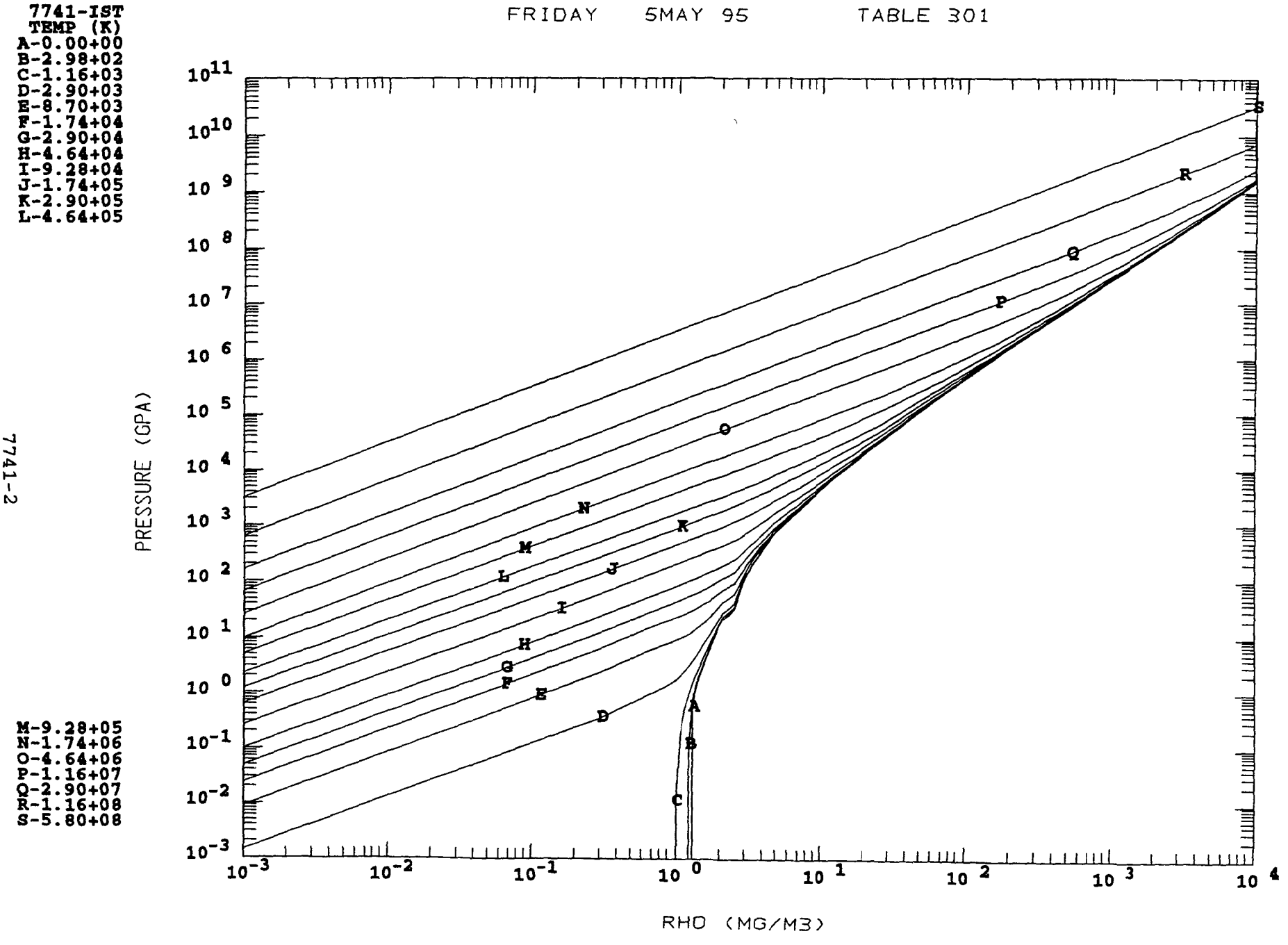
TABLE SUMMARY.

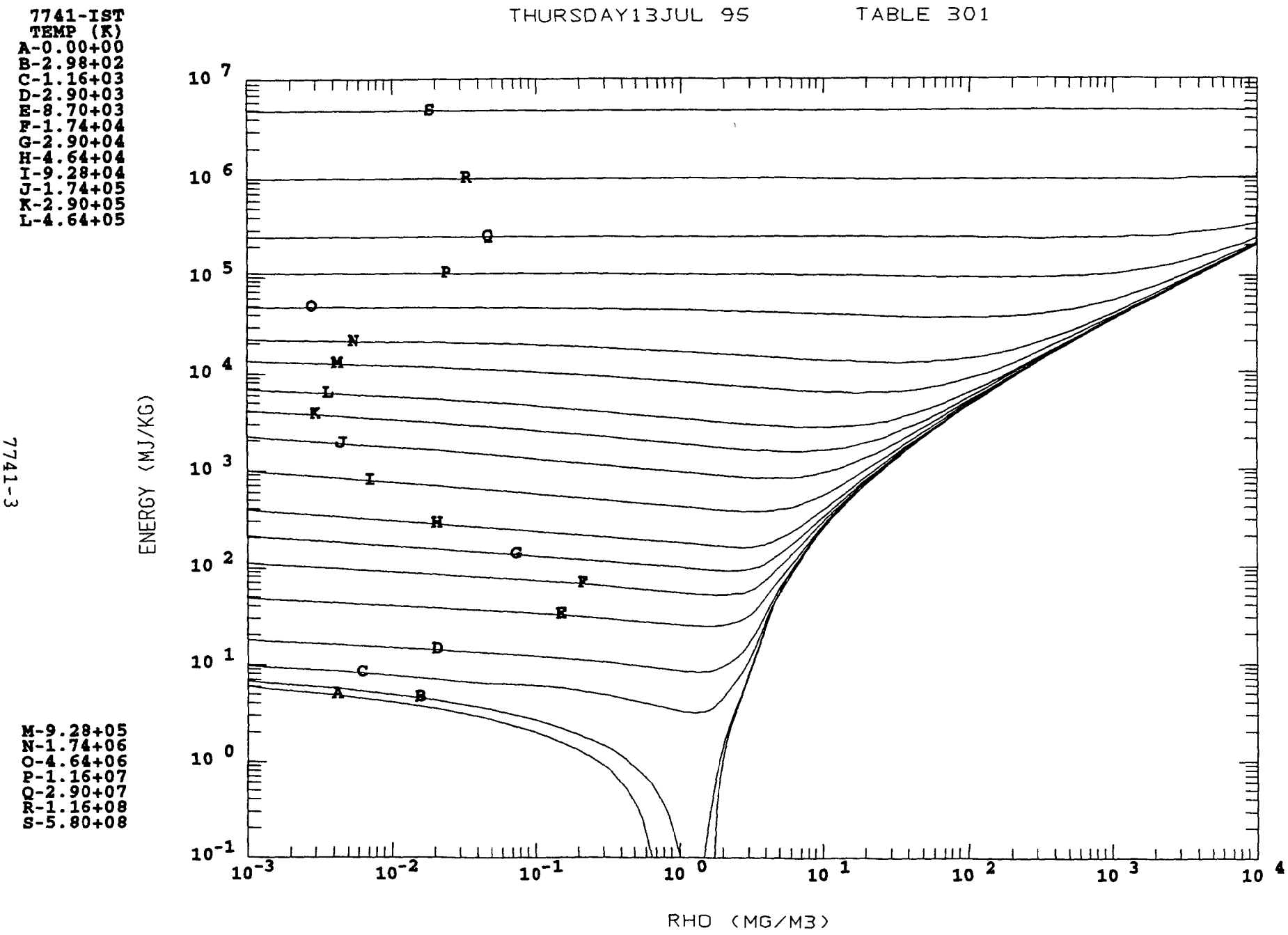
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	23					
102	68					
201	5					
301	8205	71	38	0.0000E+00	1.1960E-06	2.3920E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7319	65	37	0.0000E+00	1.1960E-06	2.3920E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8090	70	38	1.1960E-06	2.3920E-06	2.3920E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	283	70	1	1.1960E-06	2.3920E-06	2.3920E+04
				0.0000E+00	-4.7170E-11	0.0000E+00
401	49					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. APR 93
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 40793.
DATE OF LAST UPDATE. 91393.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. JDJNUC NUCLEAR MODEL WITH CHARTJD GAMMA (IGRUN=7). GAMREF=0.25, DGAMMA=(0.0,0.0), GAMEPS=(0.66667,0.25), TMELT=670 KELVIN. COLD CURVE FROM SHOCK DATA AND SOUND VELOCITY. (UP,US) POINTS (0.0,2.33), (2.7,6.569), (3.7,7.15), (5.2,9.4). ECOHKC=30.0, FACLJ=0.075, CMAT=2.3. THE CRITICAL TEMPERATURE IS 1600 KELVIN. THE 301 TABLE HAS VAN DER WAAL LOOPS.


7741-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-2.90+03
E-8.70+03
F-1.74+04
G-2.90+04
H-4.64+04
I-9.28+04
J-1.74+05
K-2.90+05
L-4.64+05
M-9.28+05
N-1.74+06
O-4.64+06
P-1.16+07
Q-2.90+07
R-1.16+08
S-5.80+08
FRIDAY 5MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRA

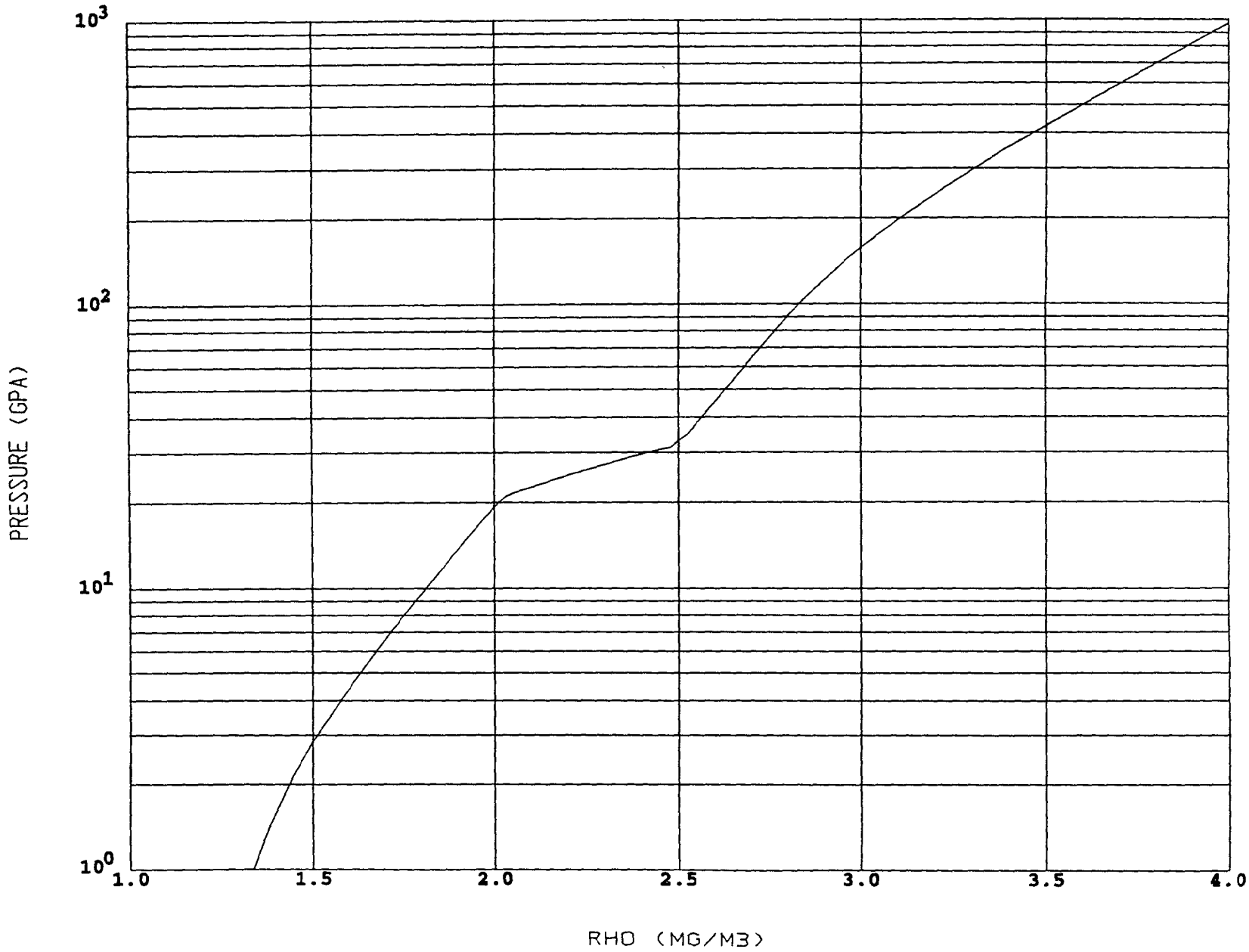


7741-3

T1 SES2D CRAY 02

7741-HU1
E0 MJ/KG
0.00+00

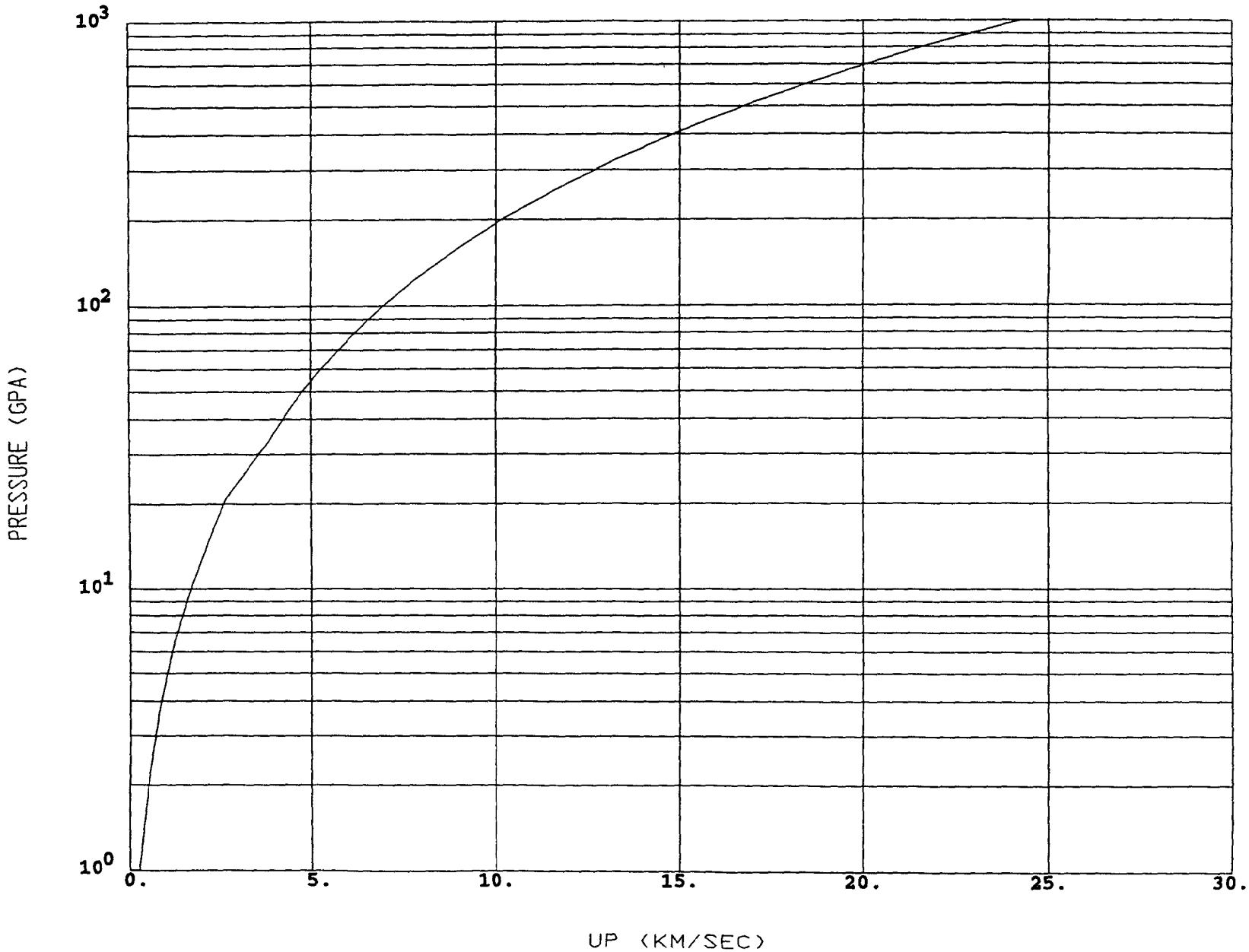
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRA1

7741-HU1
E0 MJ/KG
0.00+00

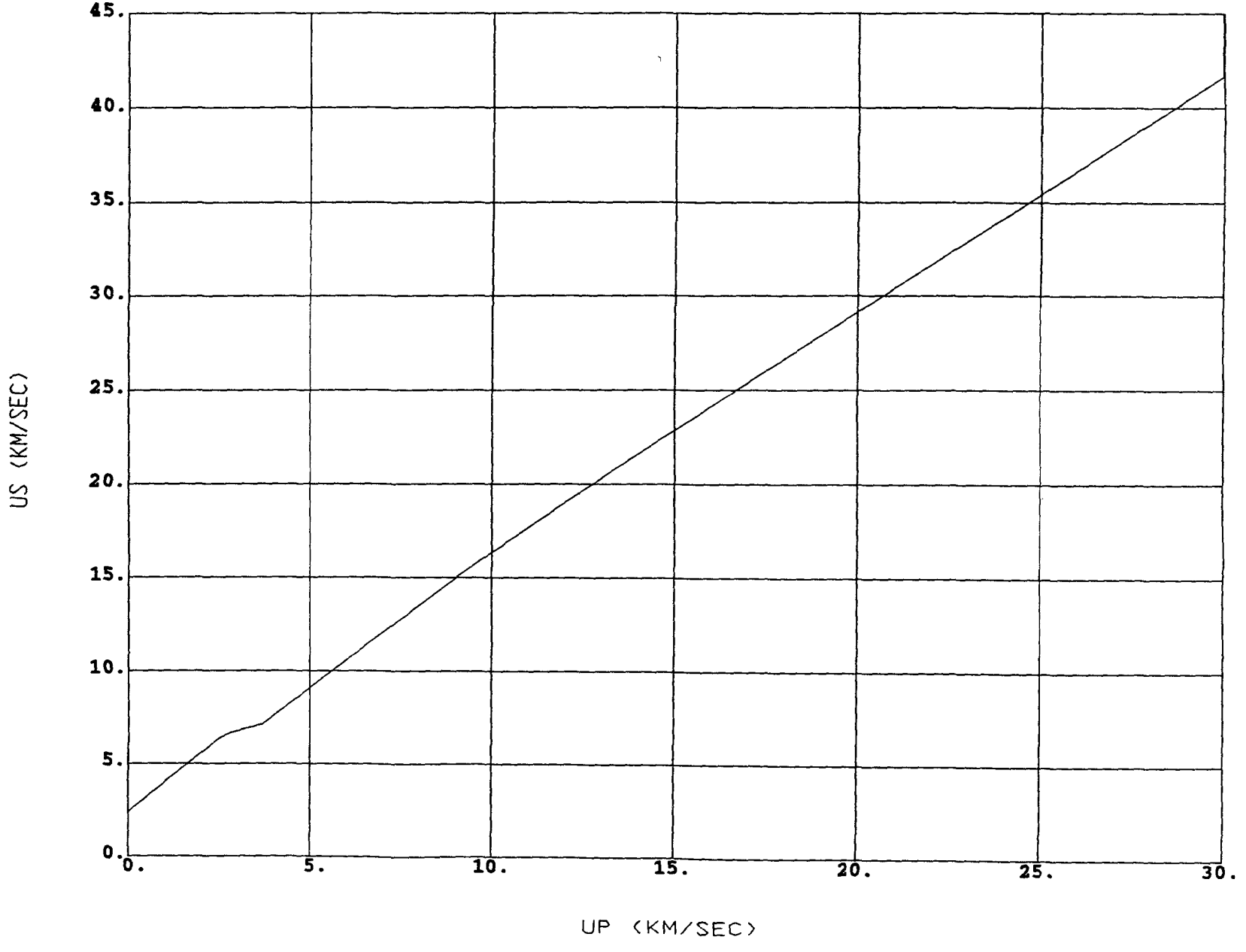
FRIDAY 5MAY 95 TABLE 301



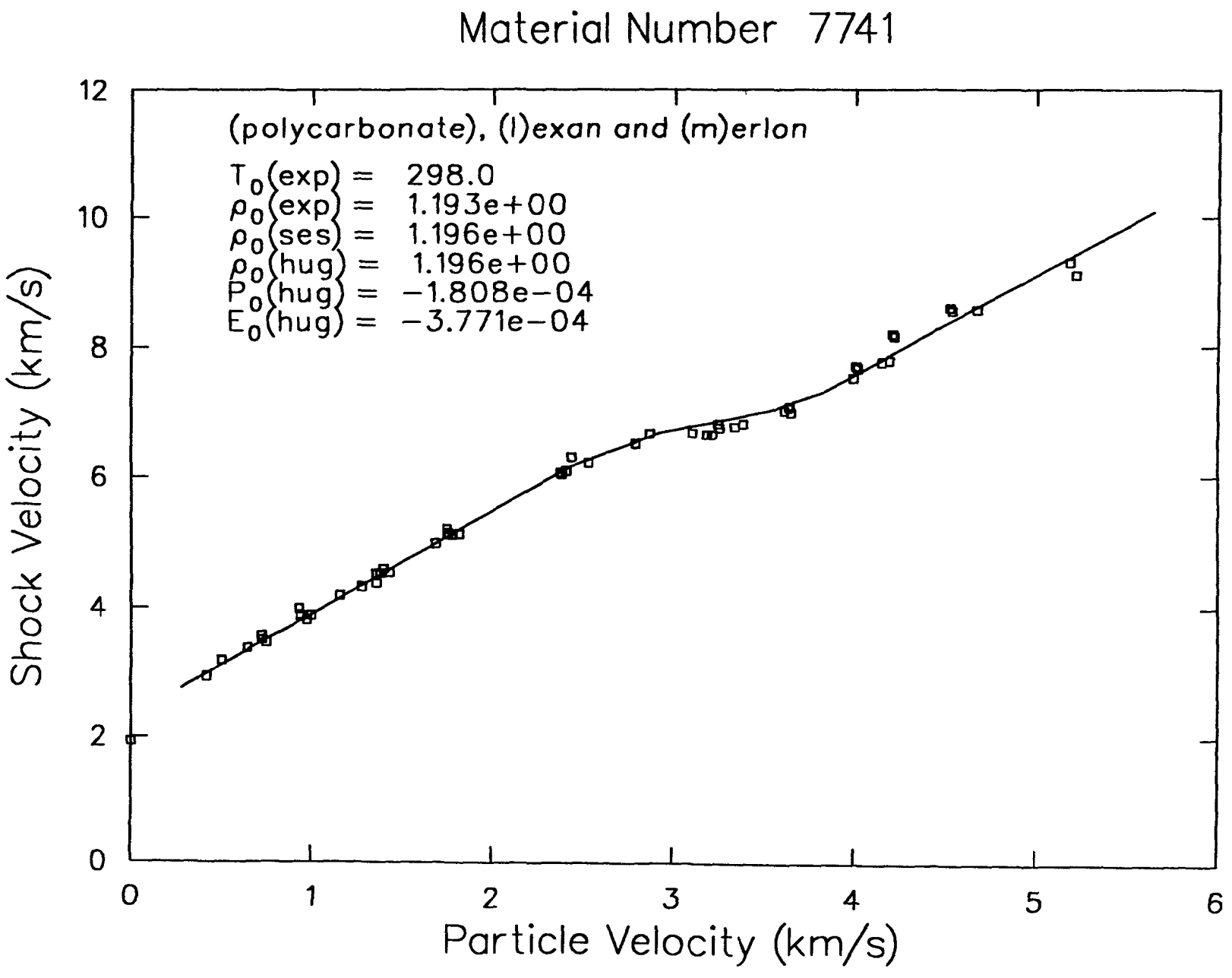
T1 SES2D CRAY 02

7741-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRA


Material Number 7741
(polycarbonate), (l)exan and (m)erlon
T_0(exp) = 298.0
ρ_0(exp) = 1.193e+00
ρ_0(ses) = 1.196e+00
ρ_0(hug) = 1.196e+00
P_0(hug) = −1.808e−04
E_0(hug) = −3.771e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
0
2
4
6
8
10
12
0
1
2
3
4
5
6

MATERIAL NUMBER SUMMARY

7750 MATERIAL. LUCITE

COMP. C5H8O2
ATOMIC NUMBER. 3.6000E+00
ATOMIC MASS. 6.6740E+00
NORMAL DENSITY. 1.1860E+00

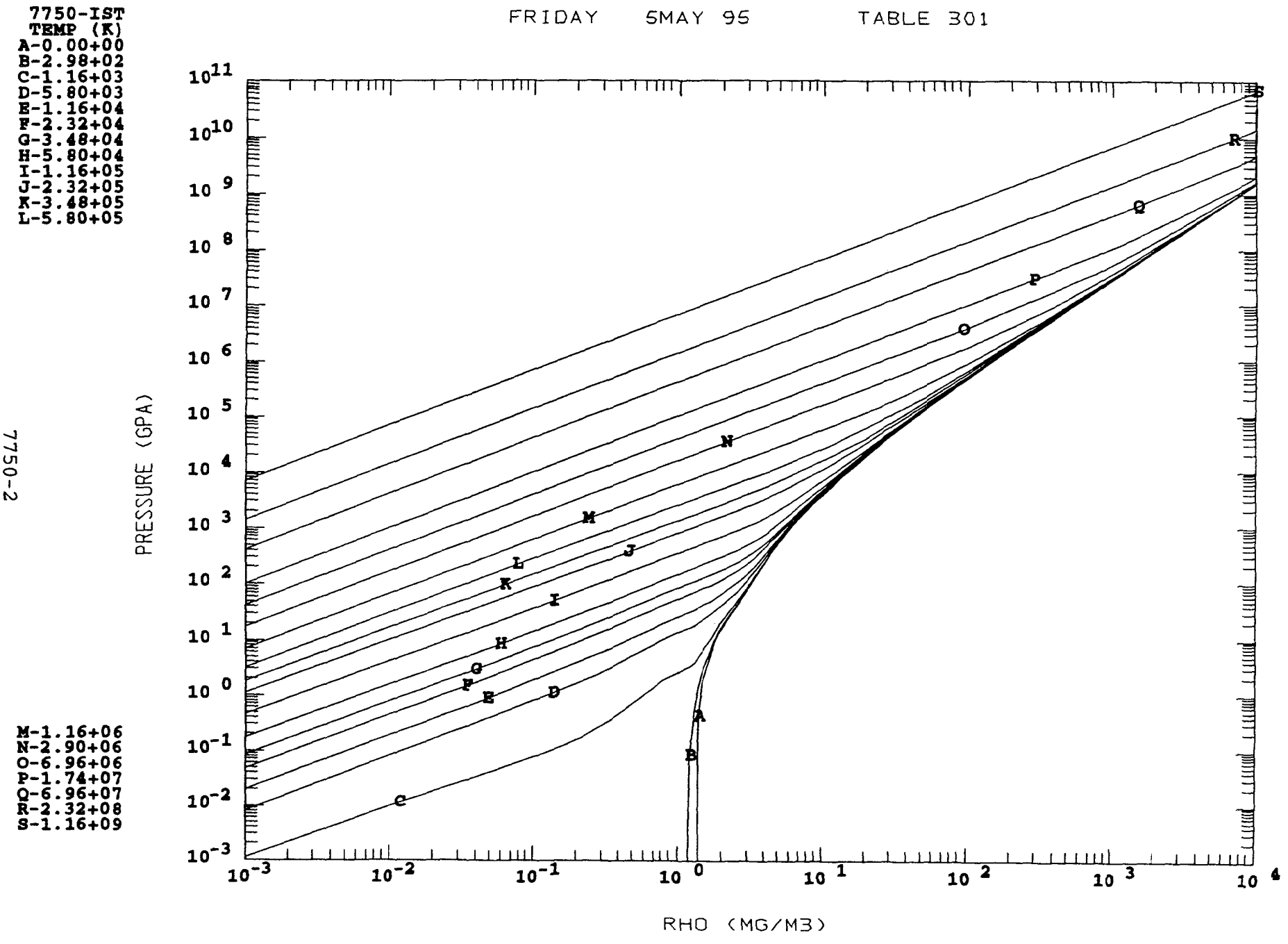
TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	87					
201	5					
301	8215	73	37	0.0000E+00	1.1860E-06	2.3720E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7543	67	37	1.1860E-06	2.3720E-06	2.3720E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7655	68	37	1.1860E-06	2.3720E-06	2.3720E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	275	68	1	1.2170E-06	2.4341E-06	2.4341E+04
				0.0000E+00	-1.6515E-11	0.0000E+00
401	41					

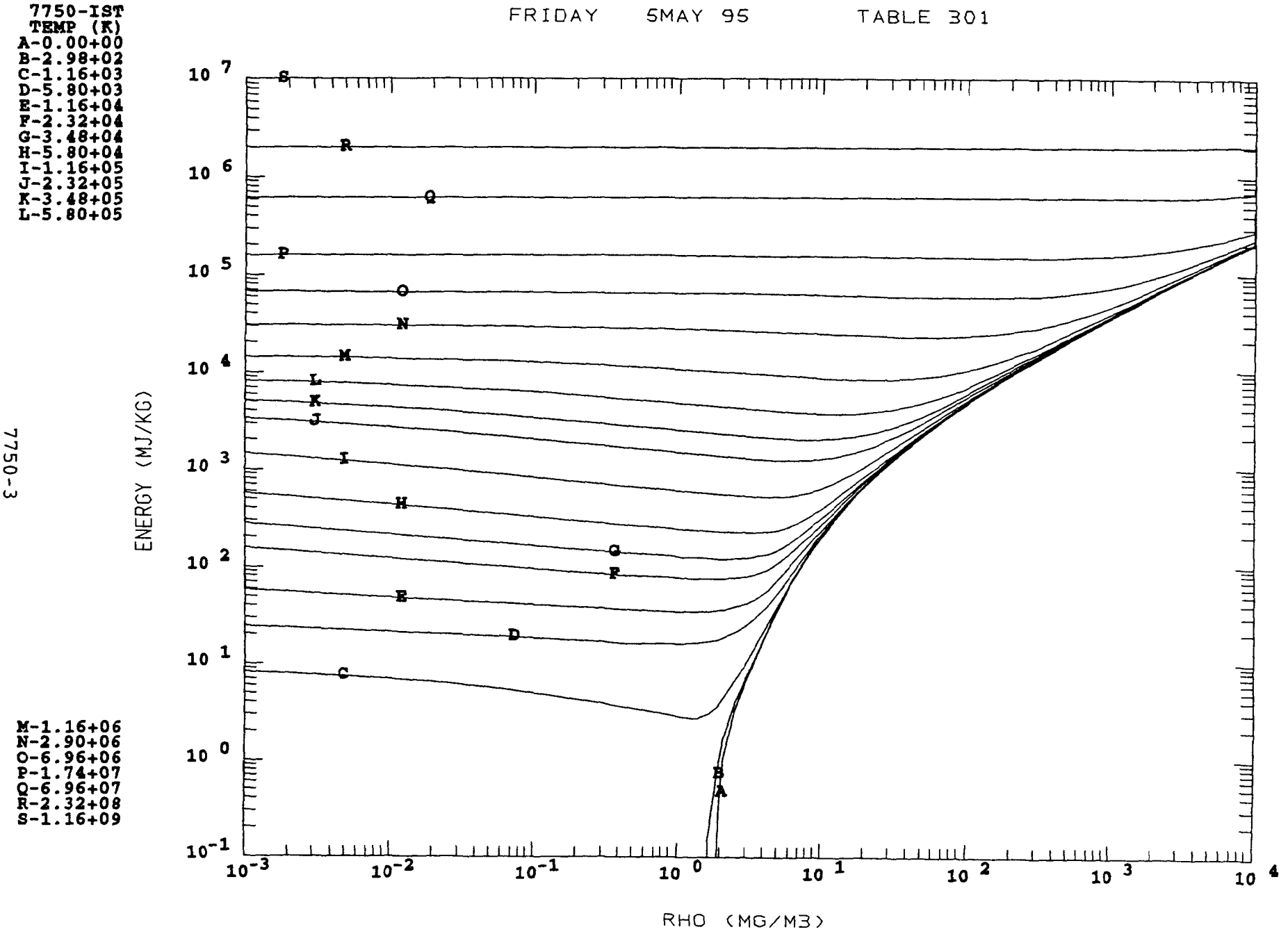
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. DEC 88
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 121988.
DATE OF LAST UPDATE. 122088.
SOURCE. J. BARNES, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH CHARTD GAMMA (IGRUN=1). GAMREF = 1.12, DEBKEL = 222, TMELT = 443. COLD CURVE FROM SHOCK DATA AND SOUND VELOCITY. (UP,US) DATA POINTS (0.0,2.223), (0.50,3.40), (2.90,7.09), (3.24,7.33), (5.25,9.80). INORDER TO MATCH CRITICAL POINT DATA, WE SET ECOHKC = 15 AND FACLJ = 0.17. INORDER TO GET A TOTAL PRESSURE OF 1 BAR AT ROOM TEMPERATURE AND NORMAL DENSITY, WE RESCALED THE COLD CURVE WITH RHOO = 1.21705. TFD MATCH COMPRESSION WAS 2.154. 301 TABLE HAS MAXWELL CONSTRUCTIONS.



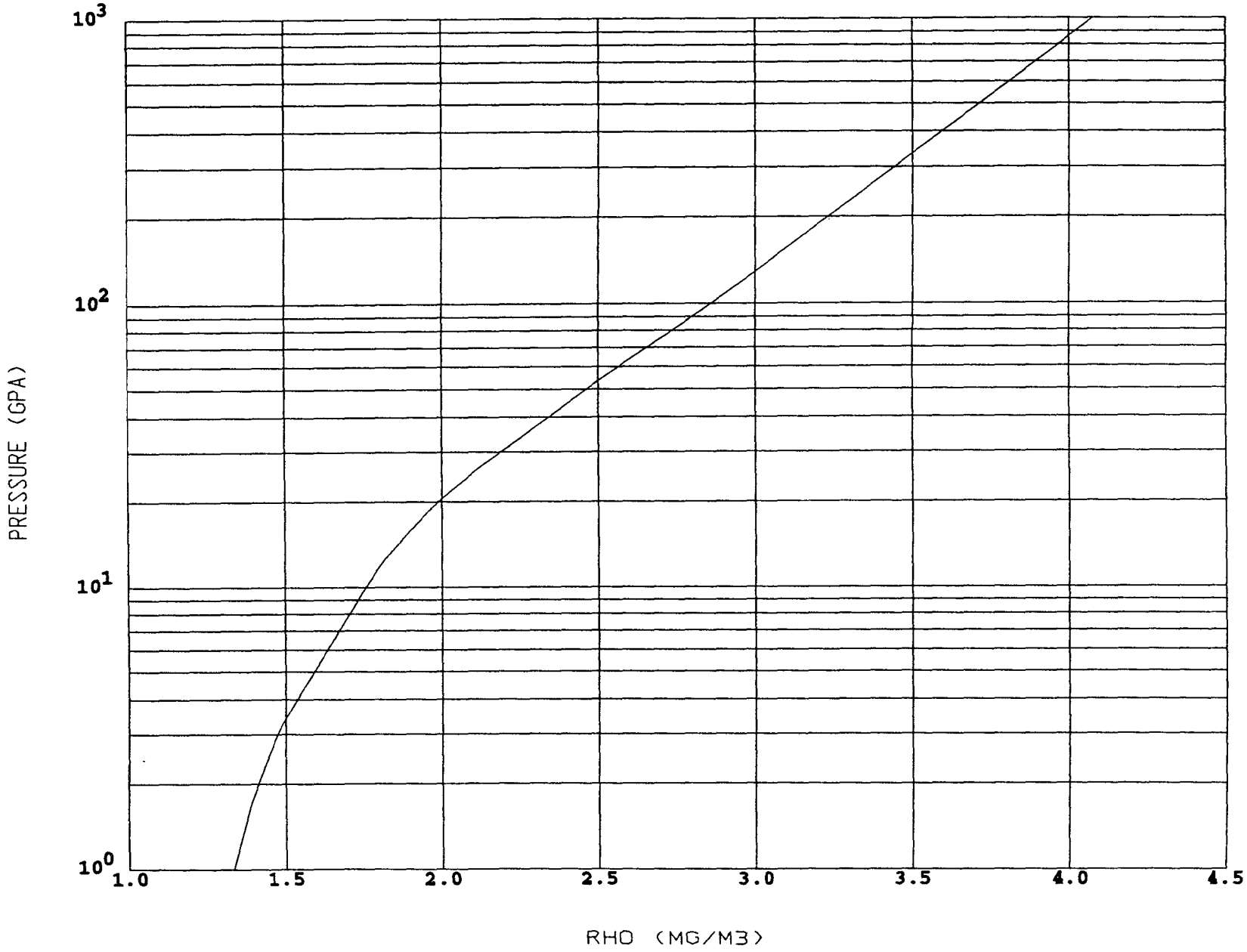
T1 SES2D CRAY



T1 SES2D CRAY 02

7750-HU1
E0 MJ/KG
0.00+00

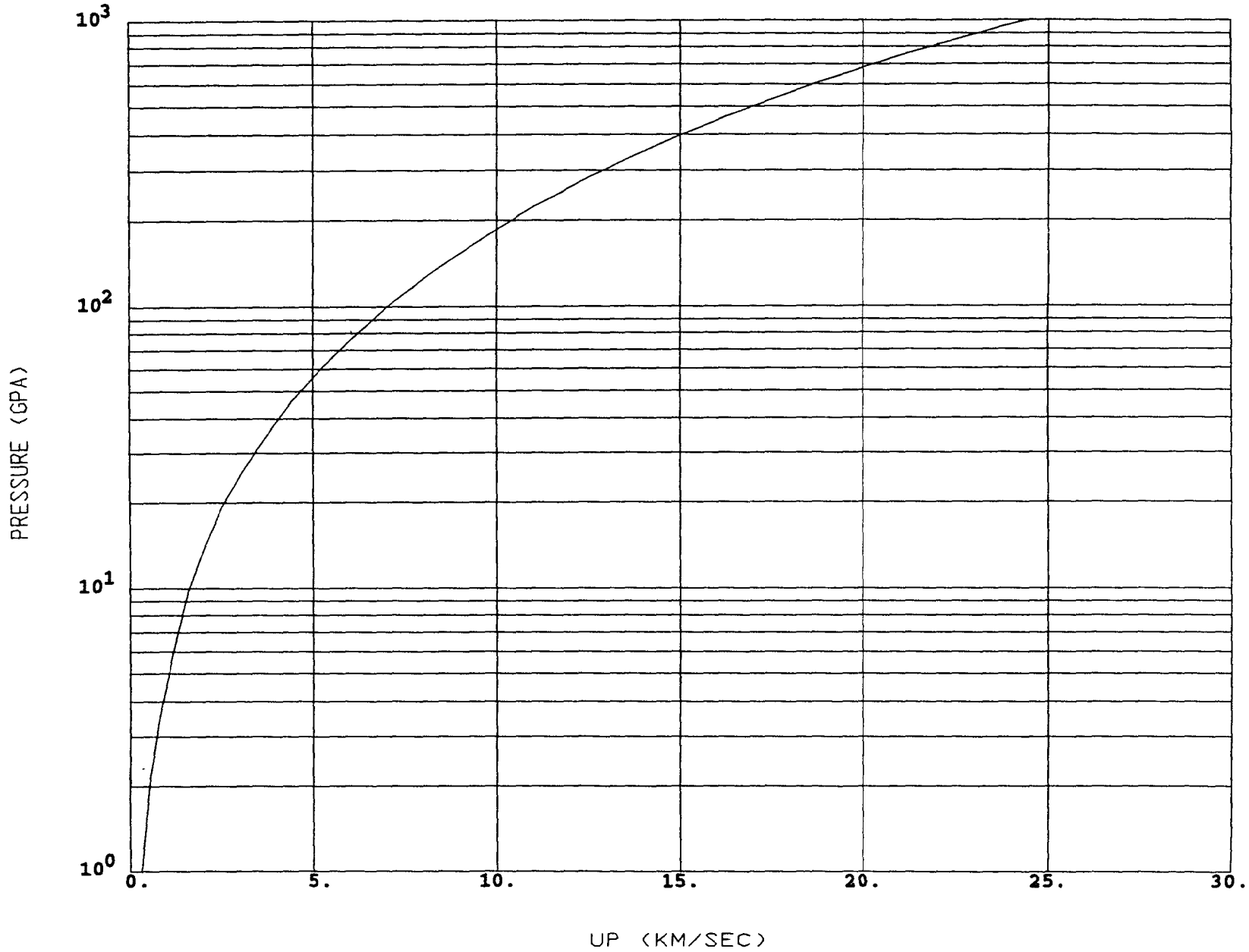
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7750-HU1
E0 MJ/KG
0.00+00

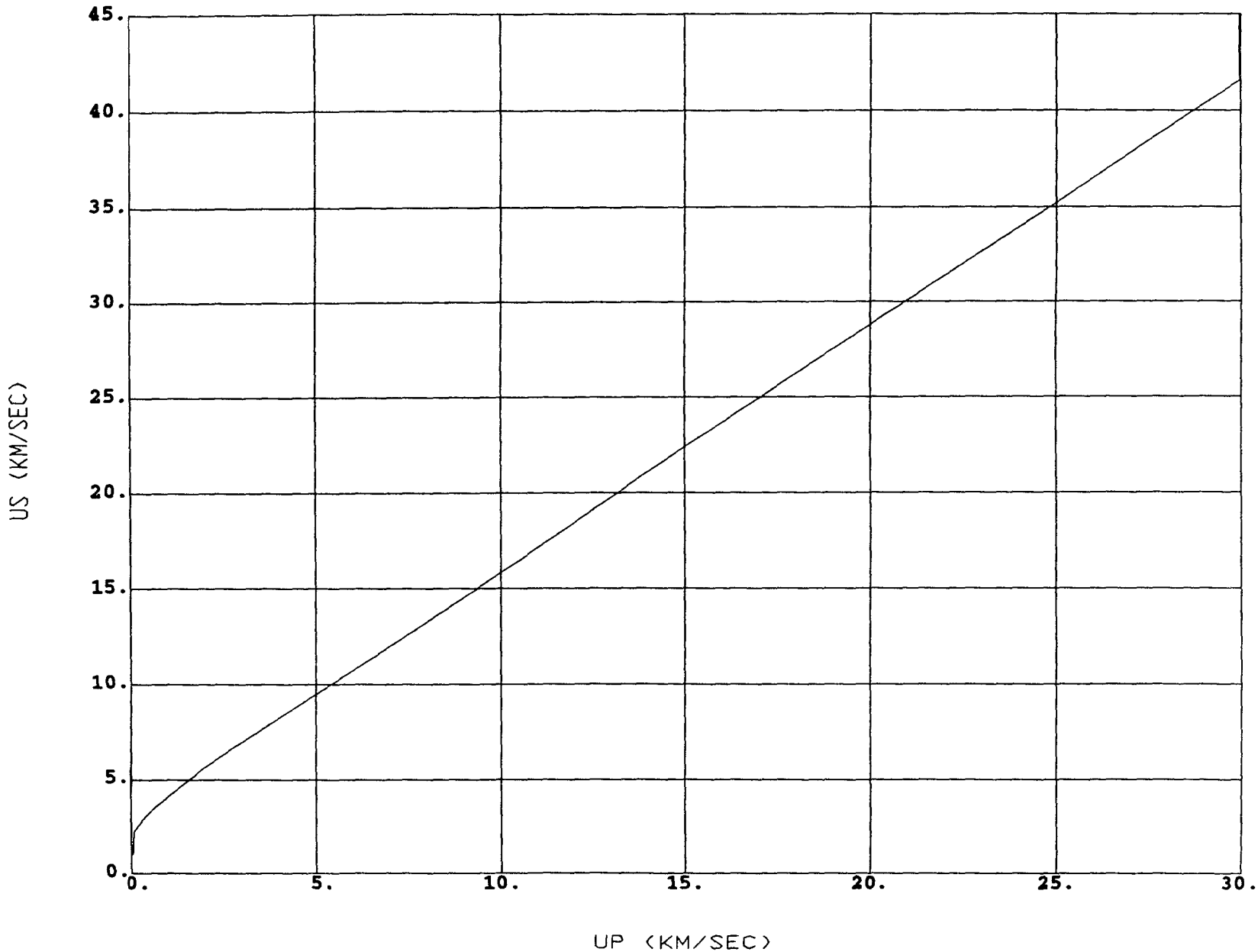
FRIDAY 5MAY 95 TABLE 301



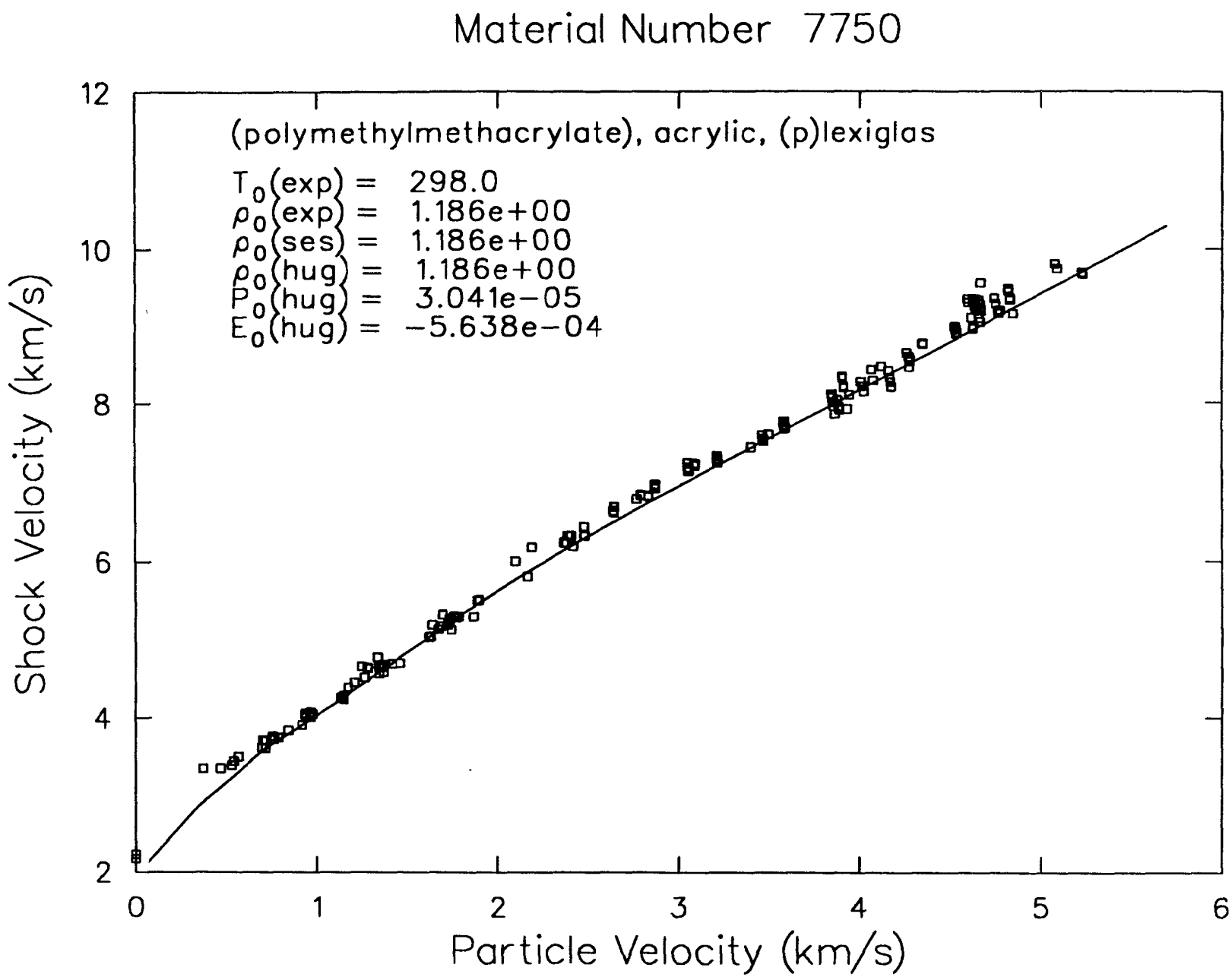
T1 SES2D CRAY 02

7750-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7750
(polymethylmethacrylate), acrylic, (p)lexiglas
T_0(exp) = 298.0
ρ_0(exp) = 1.186e+00
ρ_0(ses) = 1.186e+00
ρ_0(hug) = 1.186e+00
P_0(hug) = 3.041e−05
E_0(hug) = −5.638e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
12
10
8
6
4
2
0
1
2
3
4
5
6

MATERIAL NUMBER	SUMMARY
7760	MATERIAL. GARNET

COMP. 61.7477% O, 15.437% SI, 10.3279% FE, 10.0065% AL, 2.4809% CA BY NUMBER.
ATOMIC NUMBER. 1.1583E+01
ATOMIC MASS. 2.3677E+01
NORMAL DENSITY. 4.0500E+00

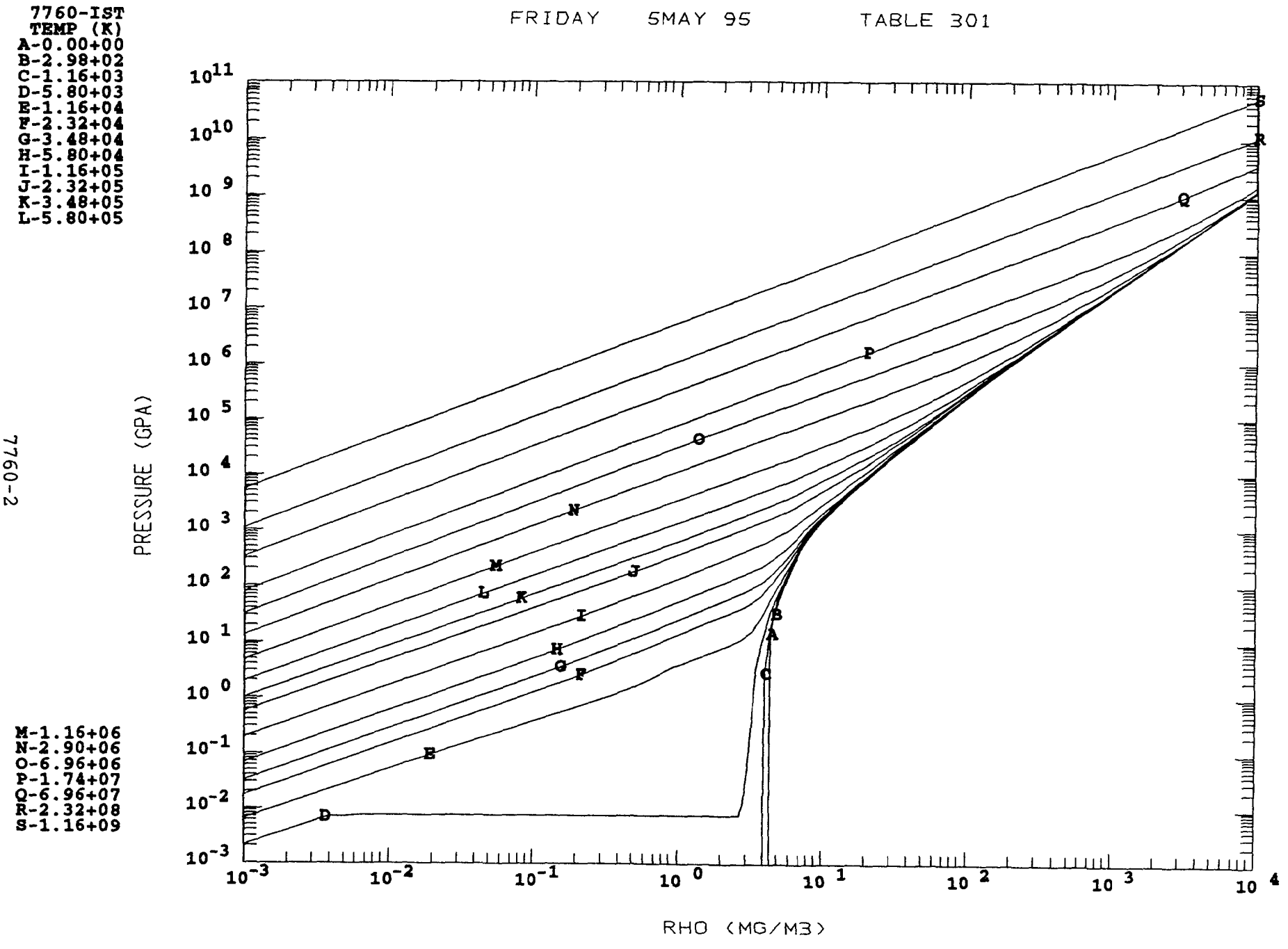
TABLE SUMMARY.

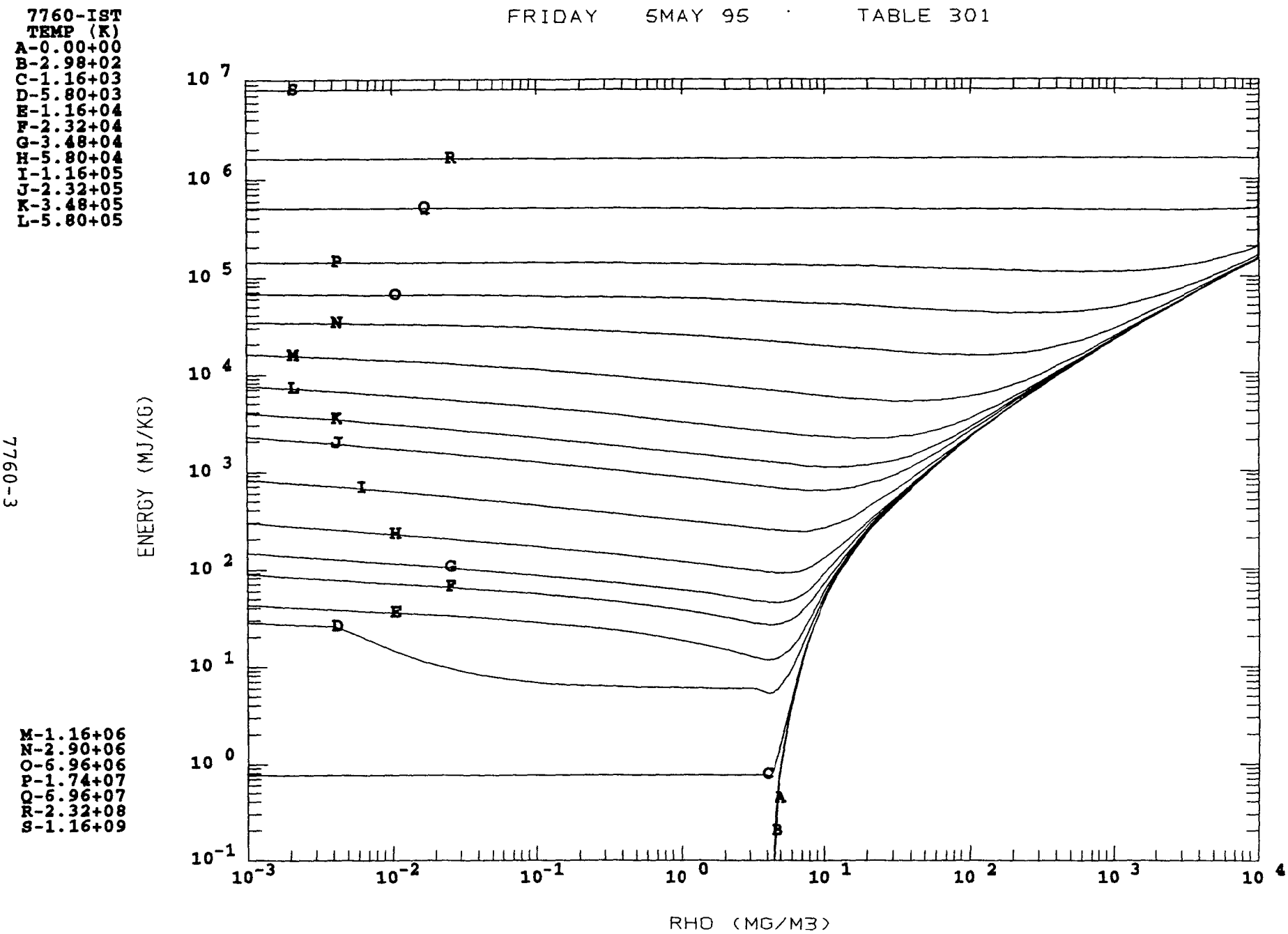
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	25					
102	72					
201	5					
301	8103	72	37	0.0000E+00	4.0500E-06	8.1000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7431	66	37	4.0500E-06	8.1000E-06	8.1000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	7879	70	37	4.0500E-06	8.1000E-06	8.1000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	283	70	1	4.0500E-06	8.1000E-06	8.1000E+04
				0.0000E+00	-8.2475E-11	0.0000E+00
401	65					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. MAR 89
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 63089.
DATE OF LAST UPDATE. 70589.
SOURCE. J.D. JOHNSON, S. LYON
REFS. LA-10391-MS
CODES. GRIZZLY

COMMENTS. AVERAGE ATOM MODELING USED THROUGHOUT EXCEPT FOR IDEAL GAS PORTION OF NUCLEAR MODEL WHERE IDEAL MIXING WAS USED. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. CHARTJD NUCLEAR MODEL WITH JD GAMMA (IGRUN=7). GAMREF = 1.00, DEBKEL = 1000.0, TMELT = 1800.0, GAMEPS = (0.66667,1.0), DGAMMA = (0.0,0.0). COLD CURVE FROM SHOCK DATA. US-UP COMPOSED OF THREE STRAIGHT LINES (UP,US) = (0.0,6.55), (0.57,7.37), (1.05,7.60), (5.00,14.10). CMAT = 1.55, ECOHKC = 140.0, FACLJ = 0.235. 301 TABLE HAS MAXWELL CONSTRUCTIONS. CRITICAL TEMPERATURE IS 7430 K.

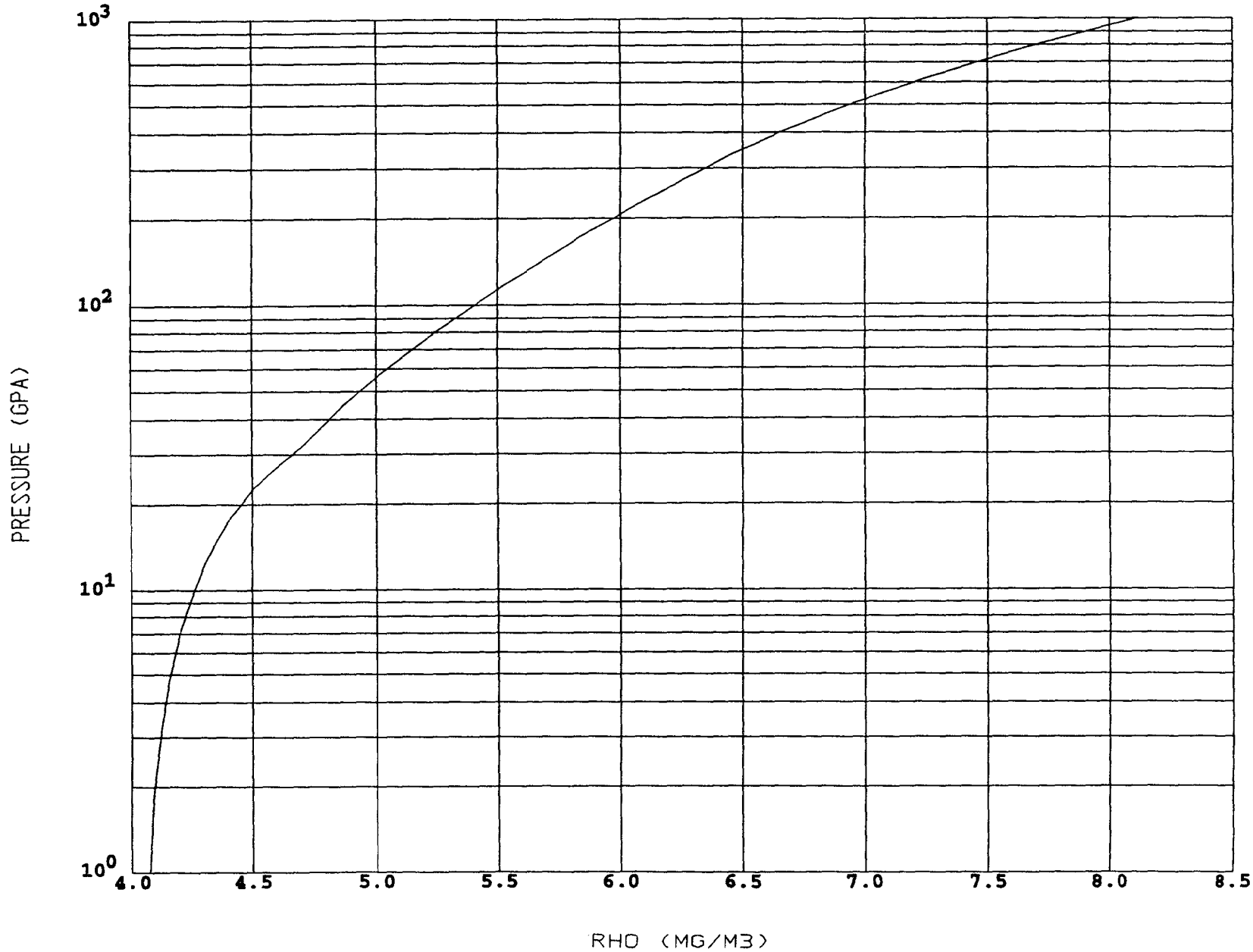

7760-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
FRIDAY 5MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY



T1 SES2D CRAY 02

7760-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301

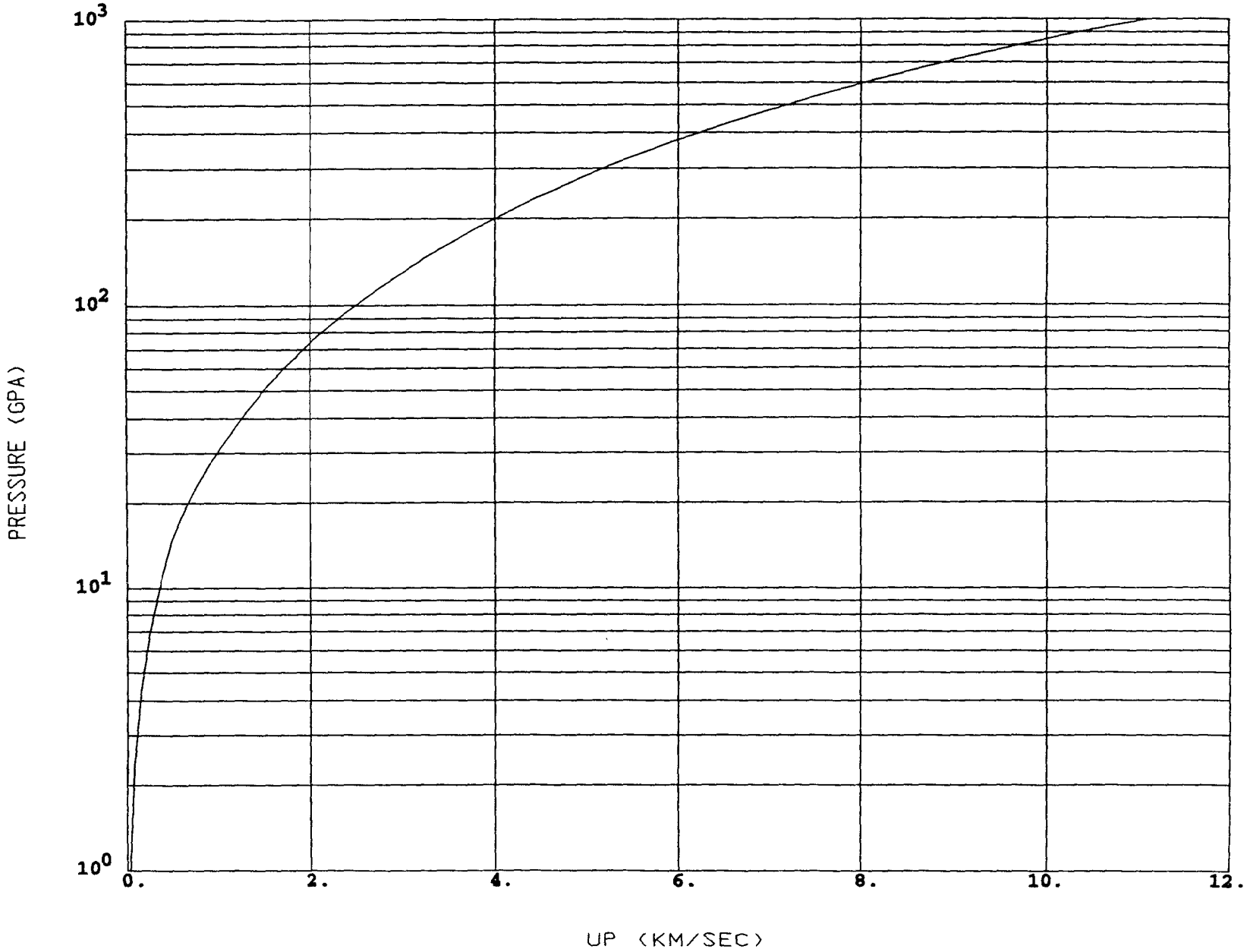


T1 SES2D CRAY

7760-4

7760-HU1
E0 MJ/KG
0.00+00

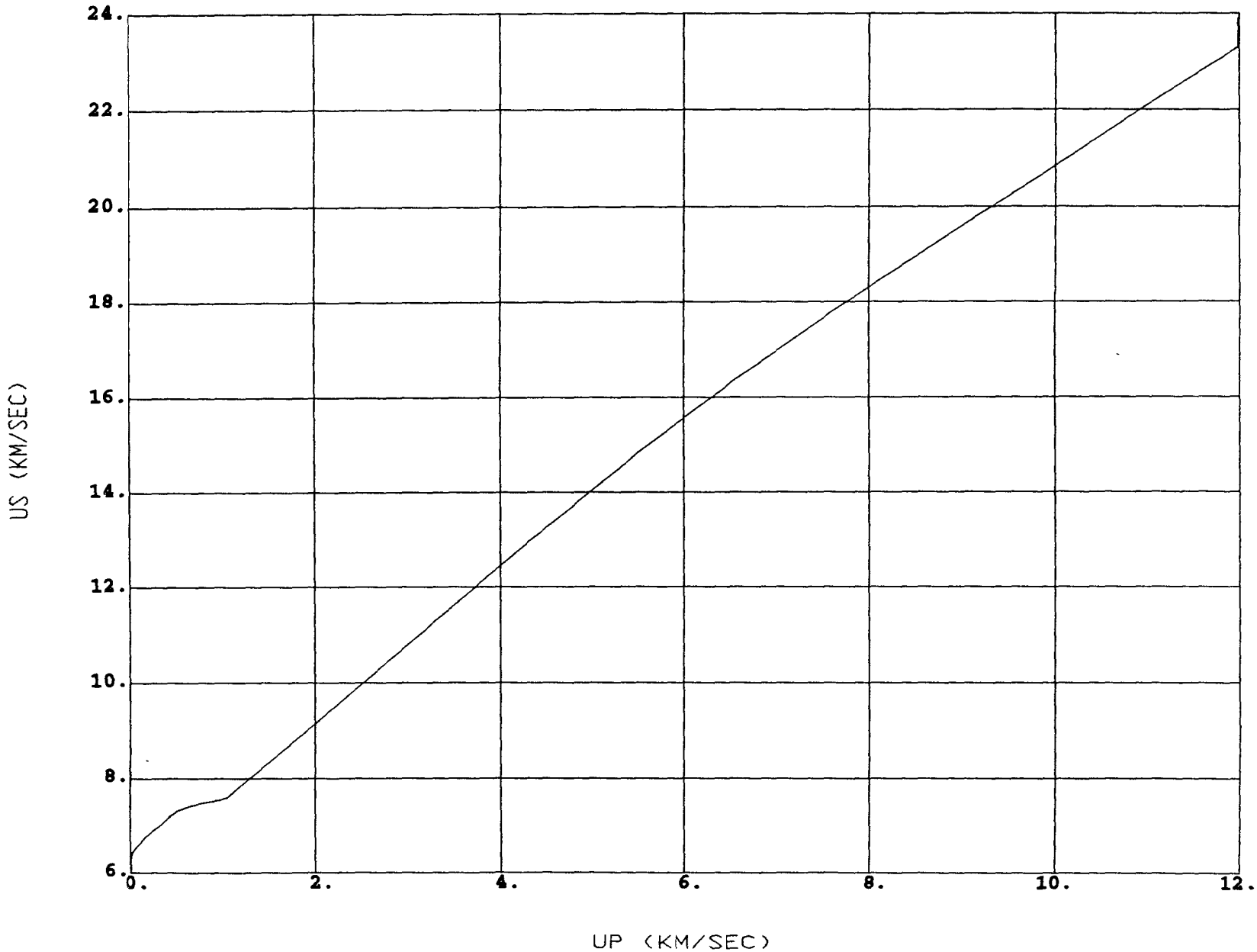
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY 02

7760-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7760-6

MATERIAL NUMBER | SUMMARY

7761 MATERIAL. GARNET SAND

COMP. 61.7477% O, 15.437% SI, 10.3279% FE, 10.0065% AL, 2.4809% CA BY NUMBER.
ATOMIC NUMBER. 1.1583E+01
ATOMIC MASS. 2.3677E+01
NORMAL DENSITY. 2.4000E+00

GAMMA(COMPUTED). 0.9340

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	26					
102	53					
201	5					
301	9442	74	42	4.0500E-06	8.1000E-06	8.1000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	8680	68	42	0.0000E+00	4.0500E-06	8.1000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	9442	74	42	4.0500E-06	8.1000E-06	8.1000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	299	74	1	4.0500E-06	8.1000E-06	8.1000E+04
				0.0000E+00	-9.3478E-11	0.0000E+00

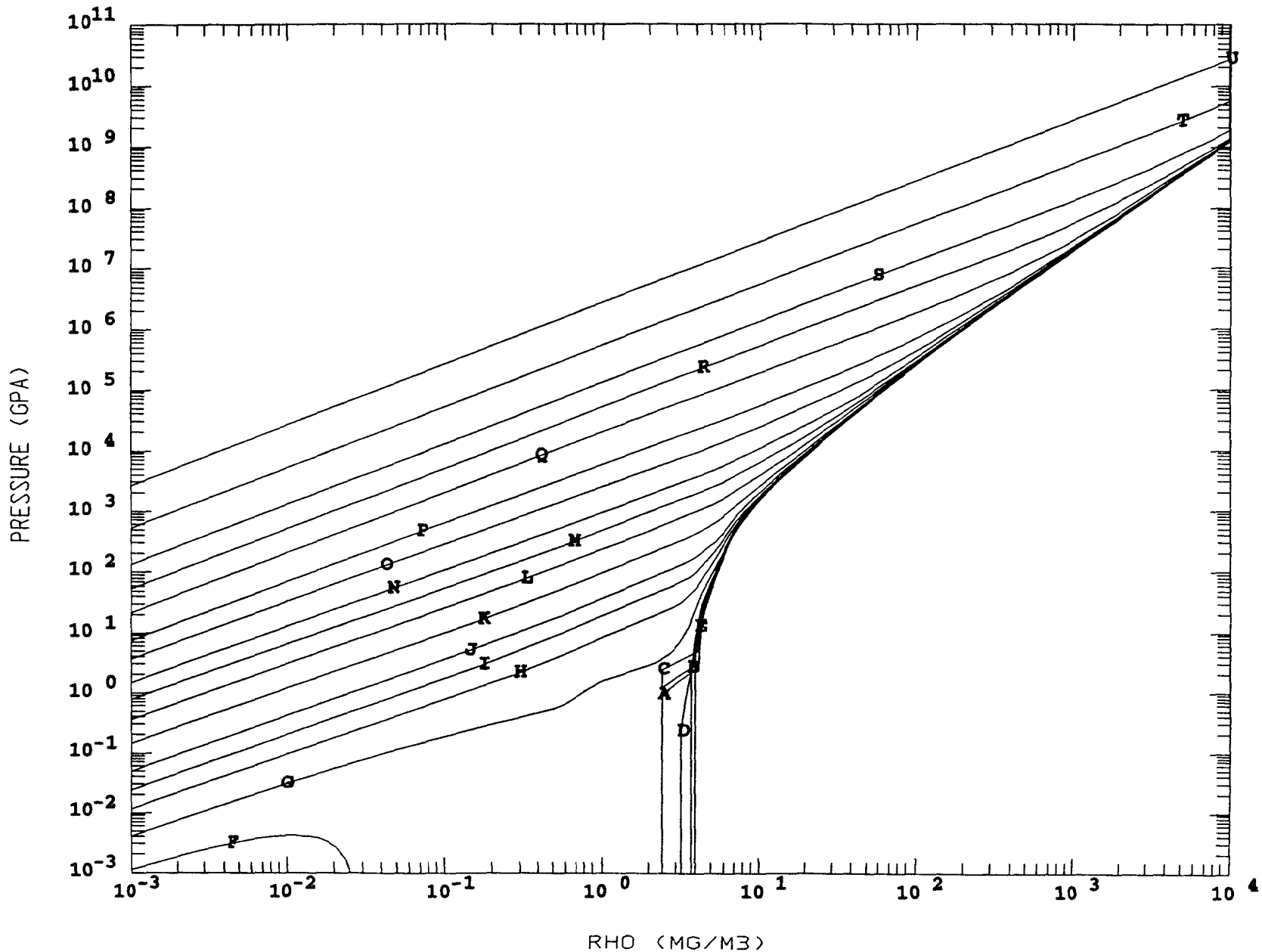
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. OCT 89
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 100289.
DATE OF LAST UPDATE. 112789.
SOURCE. J. BOETTGER, S. LYON
REFS. LA-117-26-MS
CODES. GRIZZLY

COMMENTS. THIS EOS IS BASED ON 7760 AND WAS GENERATED USING THE RAMP OPTION IN GRIZZLY. THE REFERENCE BULK MODULUS WAS 1.00 MBAR, THE CRUSH PRESSURE WAS 0.003 MBAR, AND THE BULK MODULUS IN THE CRUSH REGION WAS SET TO 0.010 MBAR. THE MELT TEMPERATURE USED WAS 1800K AND THE WIDTH OF THE MELT REGION WAS RAMPFF = 0.1. THE COHESIVE ENERGY IS 140 KCAL PER AVERAGE ATOM. SEE LA-117-26-MS FOR A DISCUSSION OF THE LIMITATIONS OF THIS EOS.

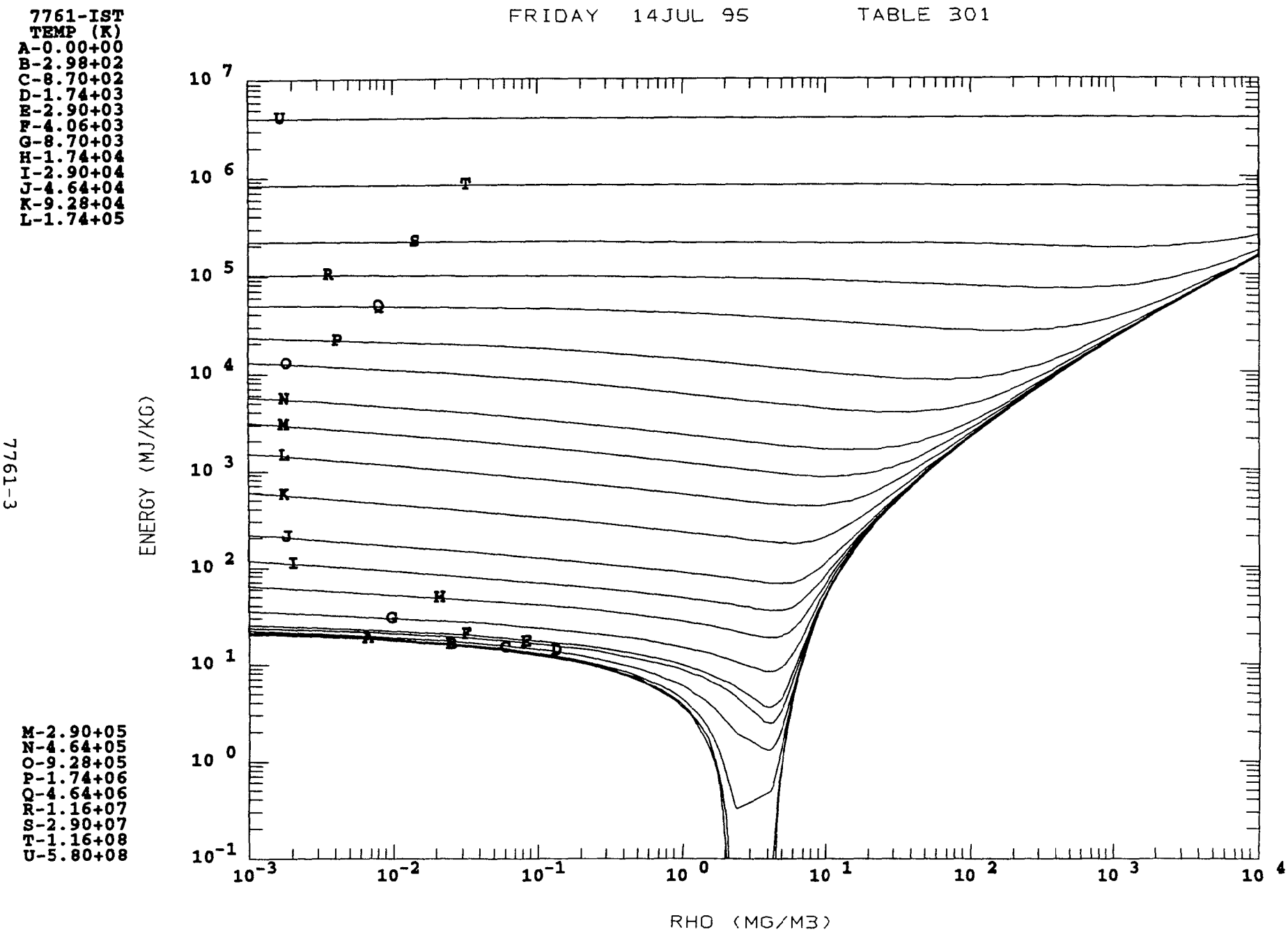
7761-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-8.70+02
D-1.74+03
E-2.90+03
F-4.06+03
G-8.70+03
H-1.74+04
I-2.90+04
J-4.64+04
K-9.28+04
L-1.74+05

FRIDAY 5MAY 95 TABLE 301



M-2.90+05
N-4.64+05
O-9.28+05
P-1.74+06
Q-4.64+06
R-1.16+07
S-2.90+07
T-1.16+08
U-5.80+08

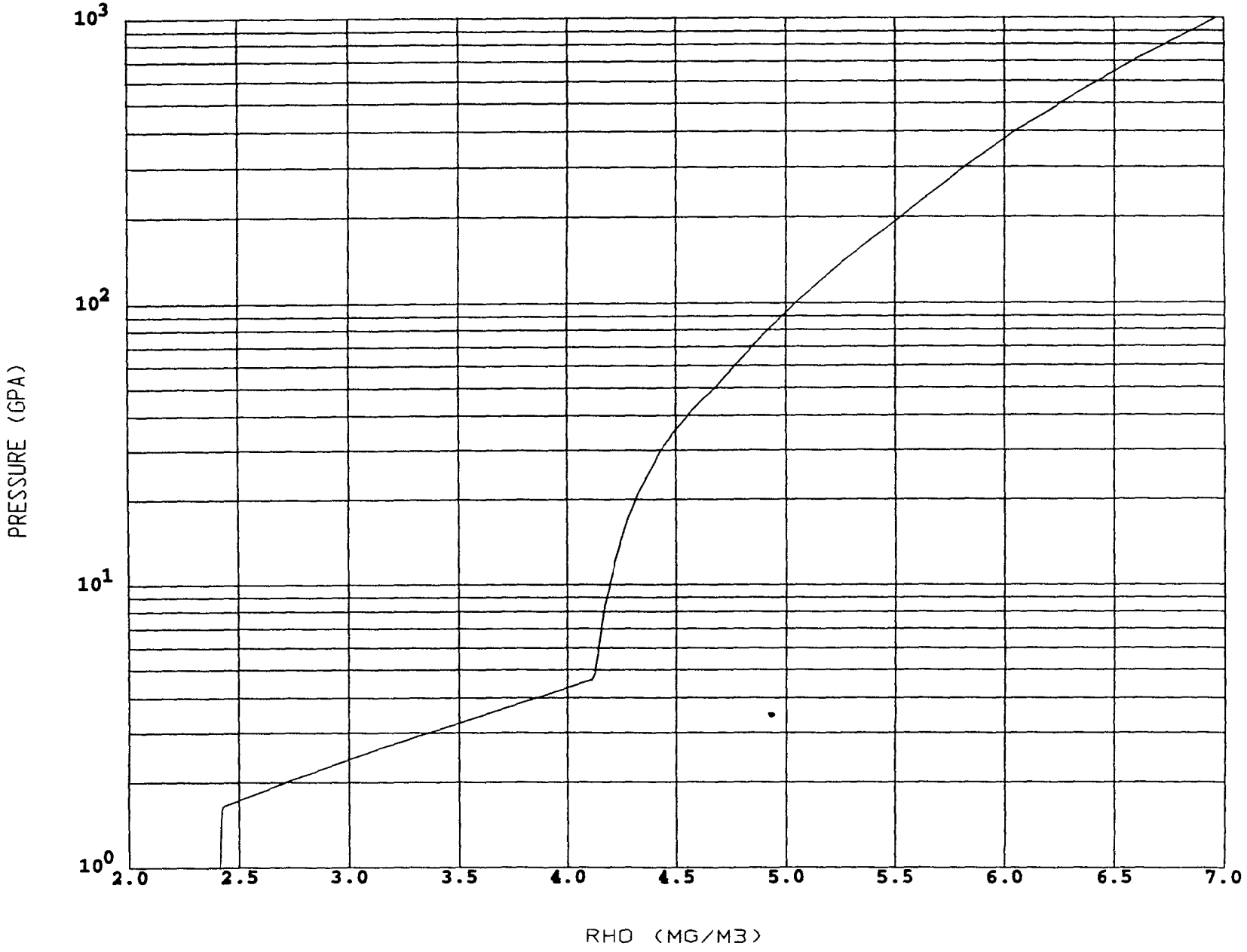
T1 SES2D CRAY



T1 SES2D CRAY 02

7761-HU1
E0 MJ/KG
0.00+00

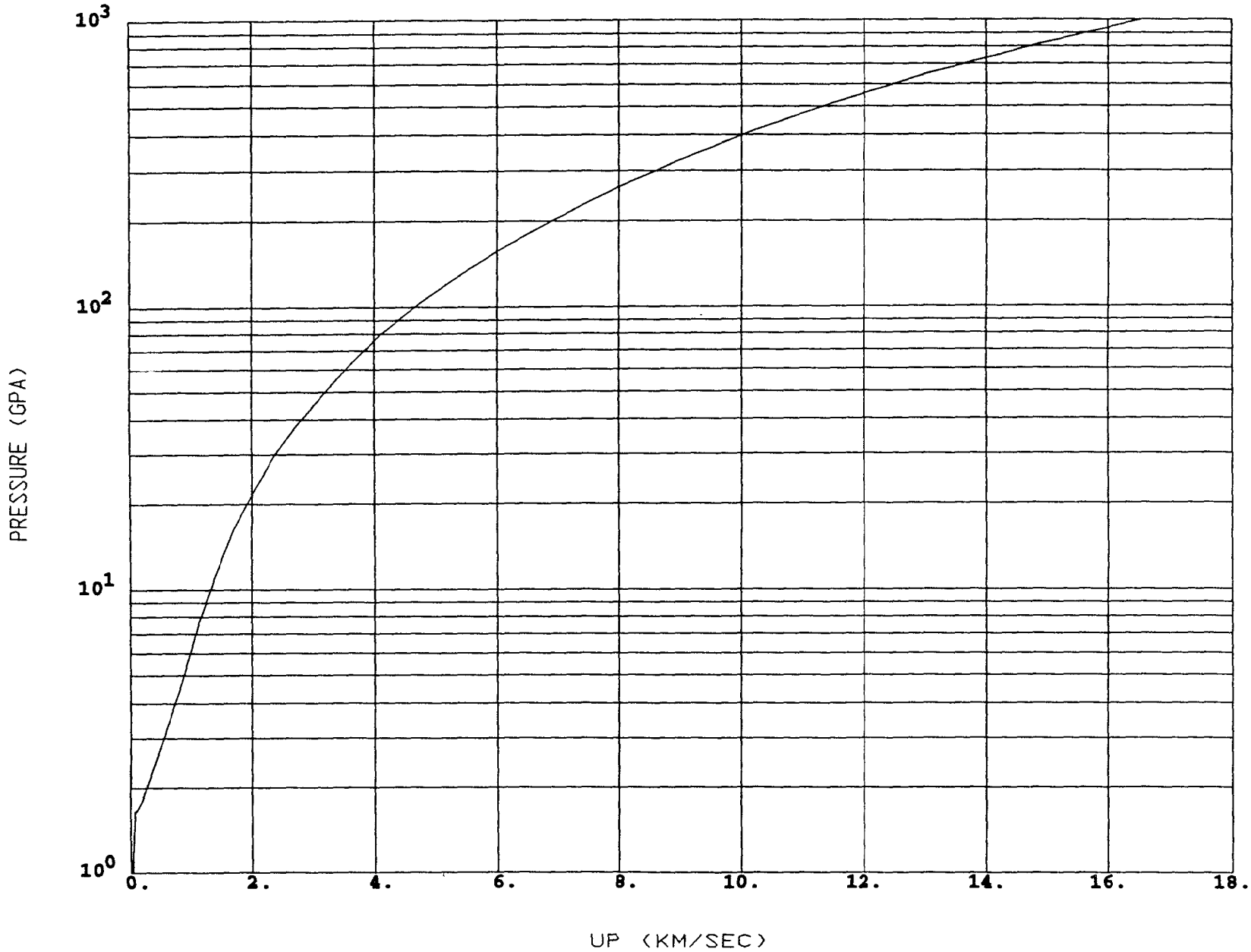
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7761-HU1
E0 MJ/KG
0.00+00

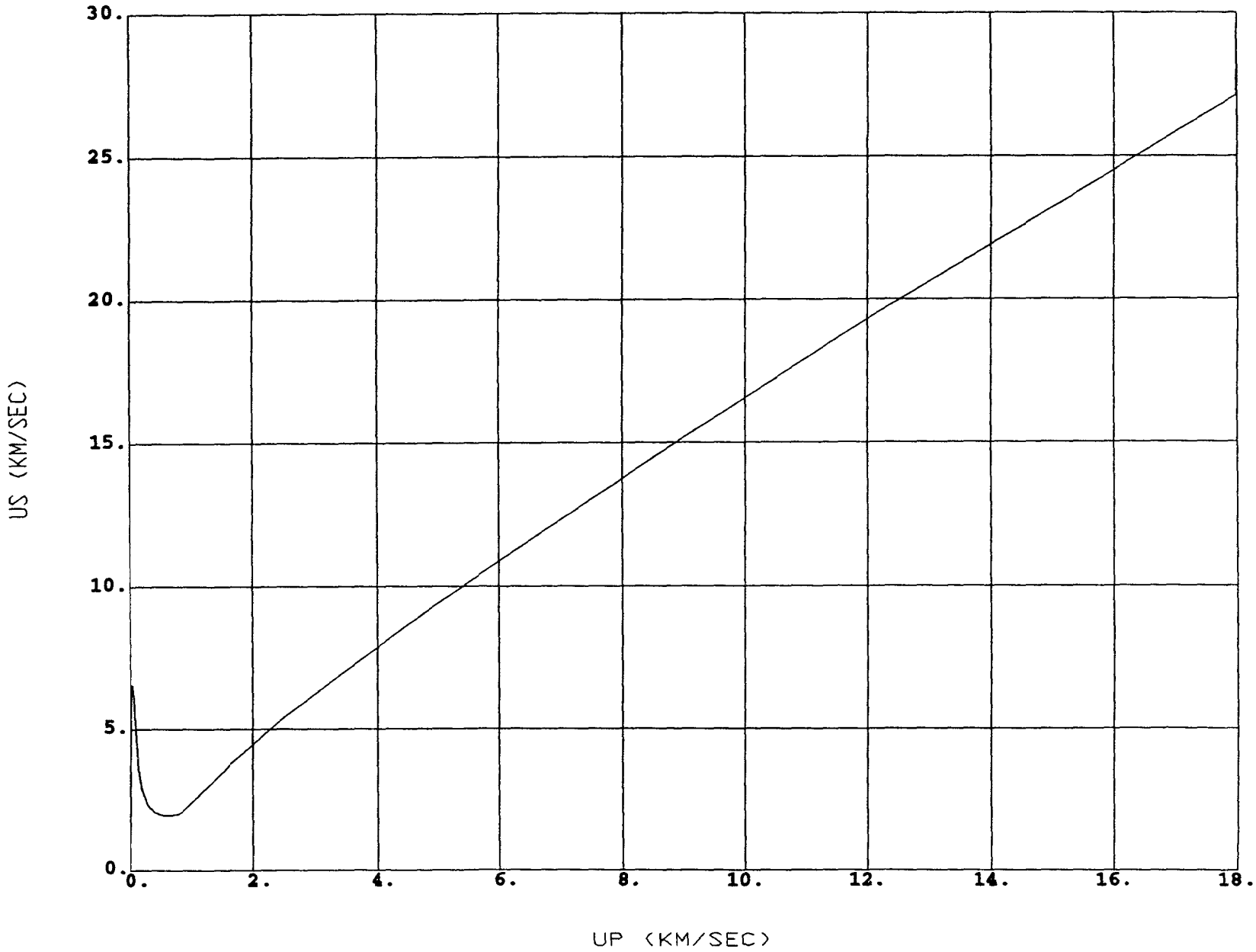
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY 02

7761-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY (

MATERIAL NUMBER SUMMARY

7770 MATERIAL. PARYLENE

COMP. C8H6CL2
ATOMIC NUMBER. 5.5000E+00
ATOMIC MASS. 1.0815E+01
NORMAL DENSITY. 1.4200E+00

GAMMA(COMPUTED). 0.4965

TABLE SUMMARY.

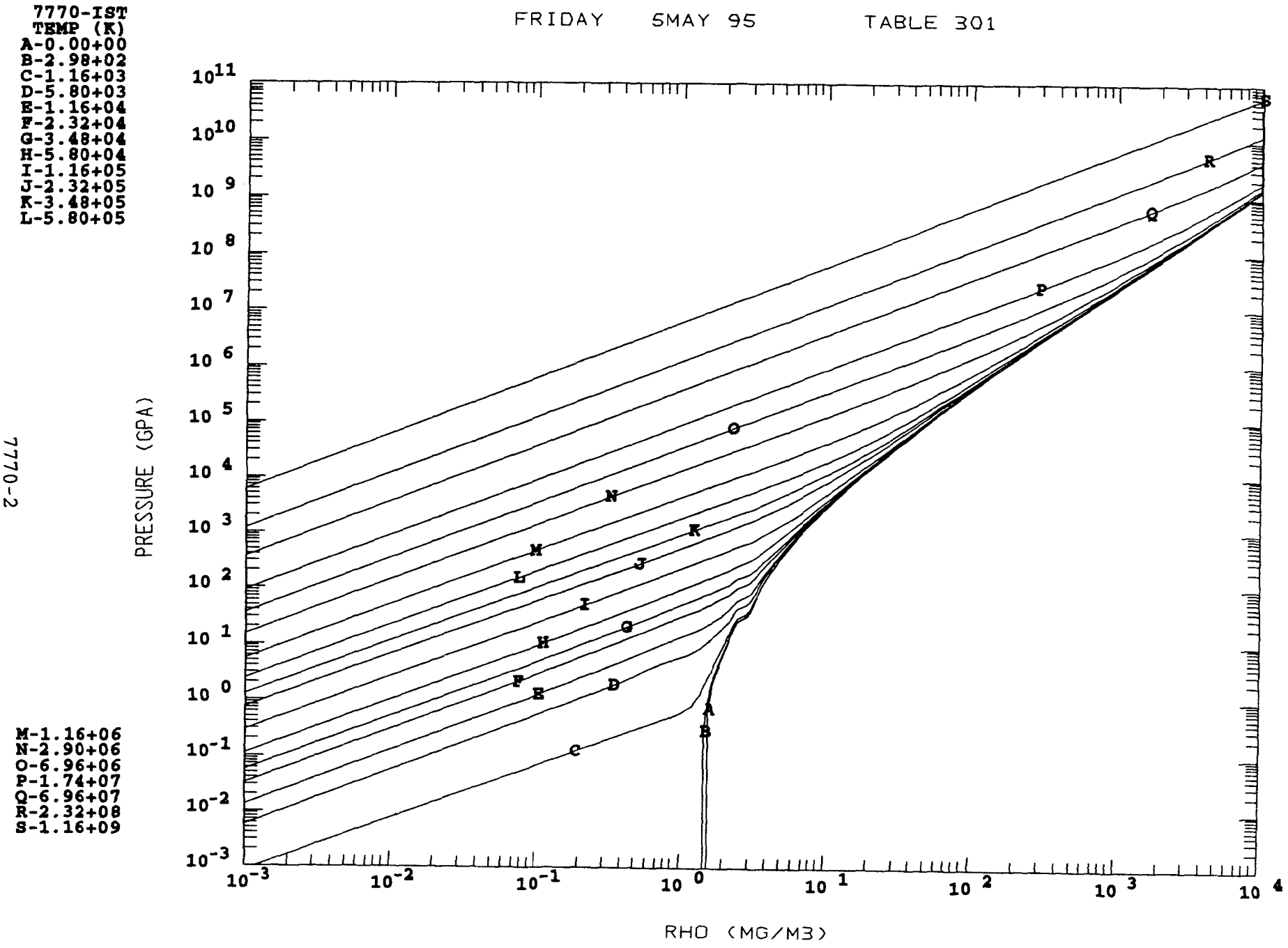
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	93					
201	5					
301	7991	71	37	0.0000E+00	1.4200E-06	2.8400E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7207	64	37	1.1732E-06	2.3463E-06	2.3463E+03
				0.0000E+00	1.2500E-02	9.9999E+04
305	7879	70	37	1.4200E-06	2.8400E-06	2.8400E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	283	70	1	1.4200E-06	2.8400E-06	2.8400E+04
				0.0000E+00	-1.4424E-11	0.0000E+00
401	41					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

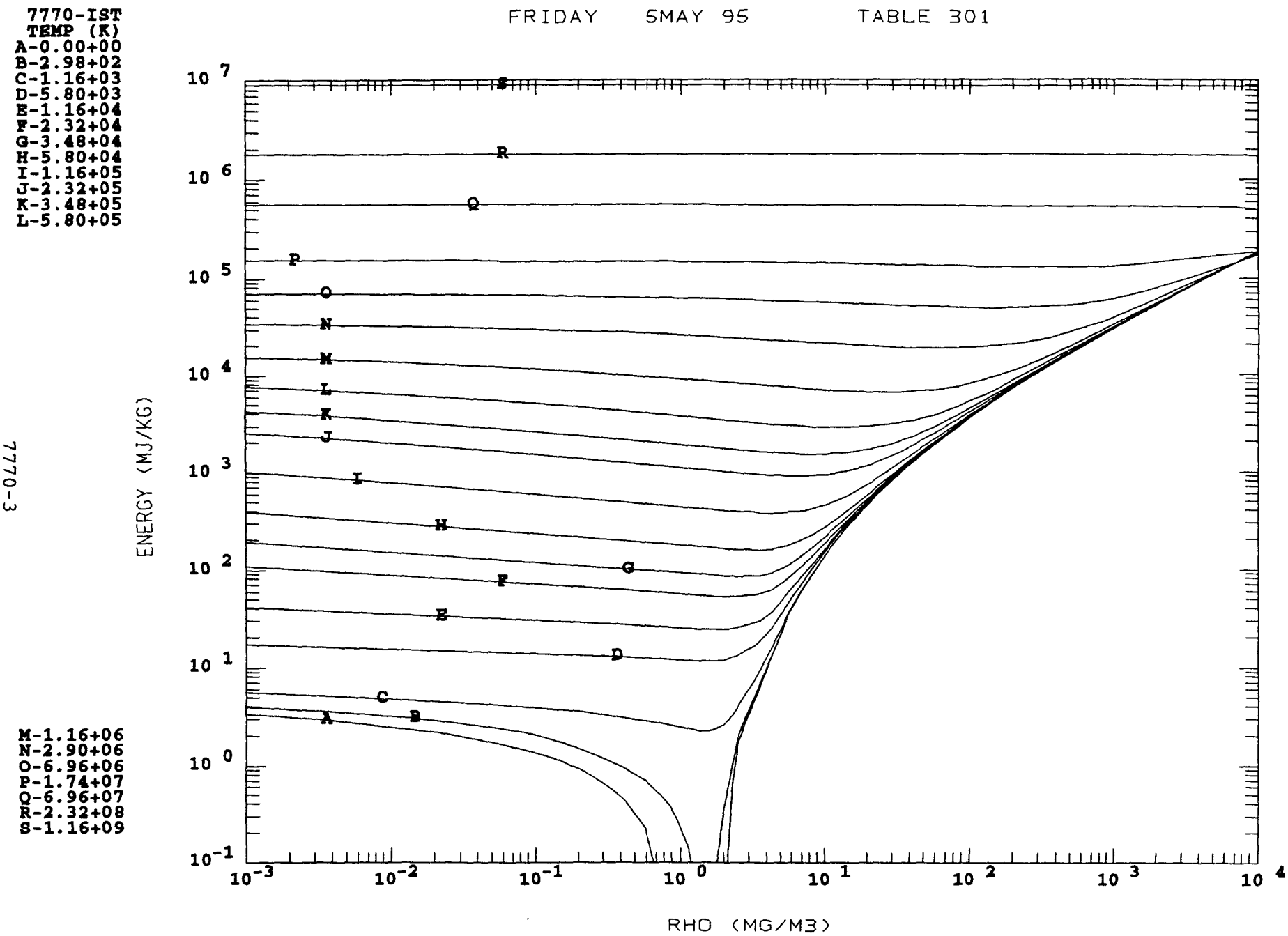
DATE. AUG 91
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 81591.
DATE OF LAST UPDATE. 30292.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. TO OBTAIN THE ELECTRONIC TABLE, THE ELECTRONIC TABLES FOR HYDROGEN, CARBON AND CHLORINE WERE FIRST CALCULATED USING TFD IN GRIZZLY. THESE TABLES WERE THEN MIXED USING ADDITIVE VOLUME MIXING. THE NUCLEAR AND COLD CURVE TABLES WERE THEN CALCULATED USING AVERAGE ATOM MODELING EXCEPT FOR THE IDEAL GAS PORTION OF THE NUCLEAR TABLE WHERE IDEAL MIXING WAS USED. JDJNUC NUCLEAR MODEL WITH IGRUN=7, DGAMMA=0.0, 0.0, GAMEPS= 0.66667, 0.5, GAMREF=0.5, TMELT=600 KELVIN. COLD CURVE FROM SHOCK DATA COMPOSED OF THREE STRAIGHT LINES WITH US-UP POINTS (0.0,2.3), (2.8,6.74), (3.75,7.2), (5.4,9.6). CMAT=2.29, ECOHKC=15.0, FACLJ=0.15. THE CRITICAL TEMPERATURE IS 812 KELVIN. 301 TABLE HAS VAN DER WAALS LOOPS. MATERIAL 37770 HAS MELT TABLES (411,412).

FRIDAY 5MAY 95 TABLE 301



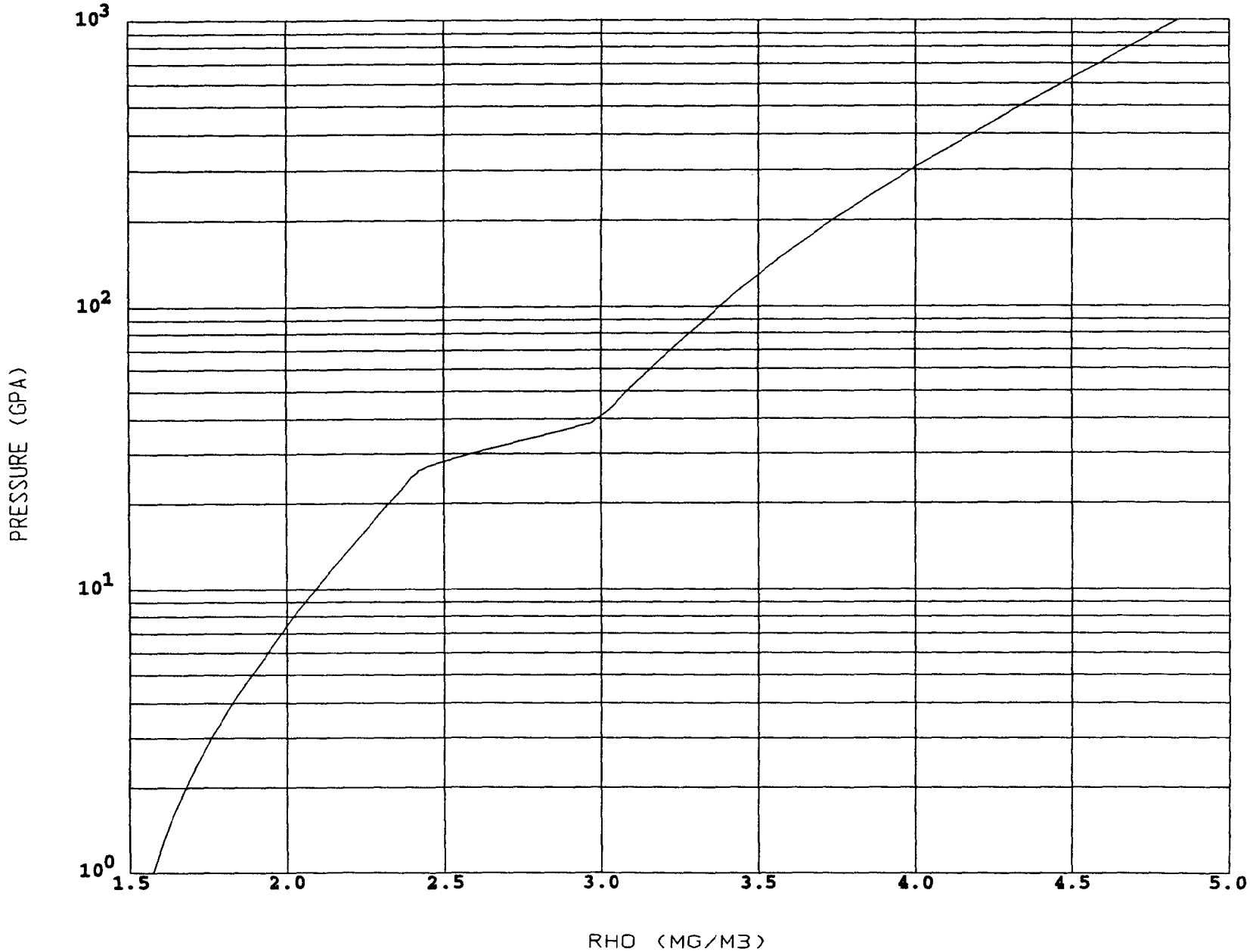
T1 SES2D CRAY



T1 SES2D CRAY 02

7770-HU1
E0 MJ/KG
0.00+00

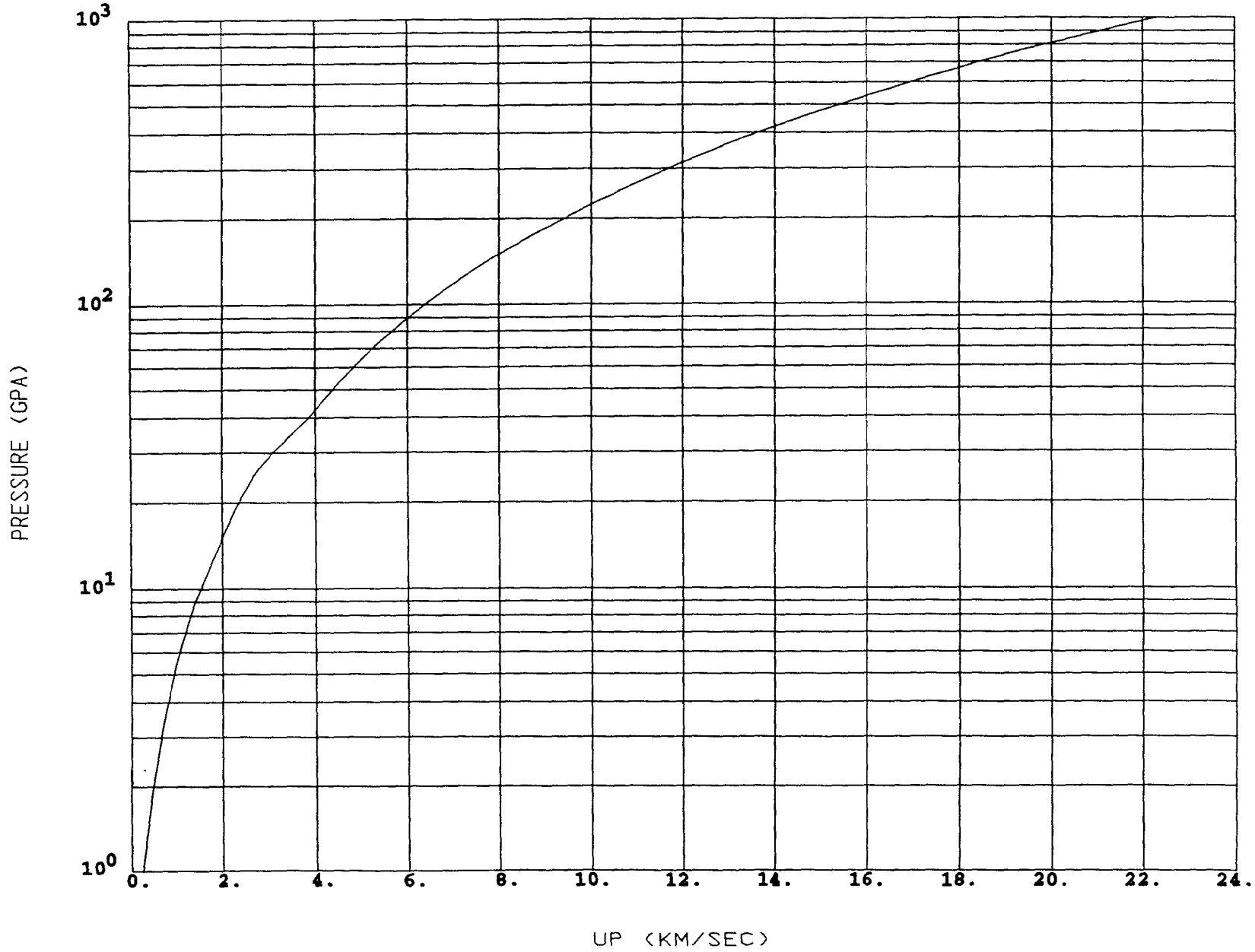
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7770-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301

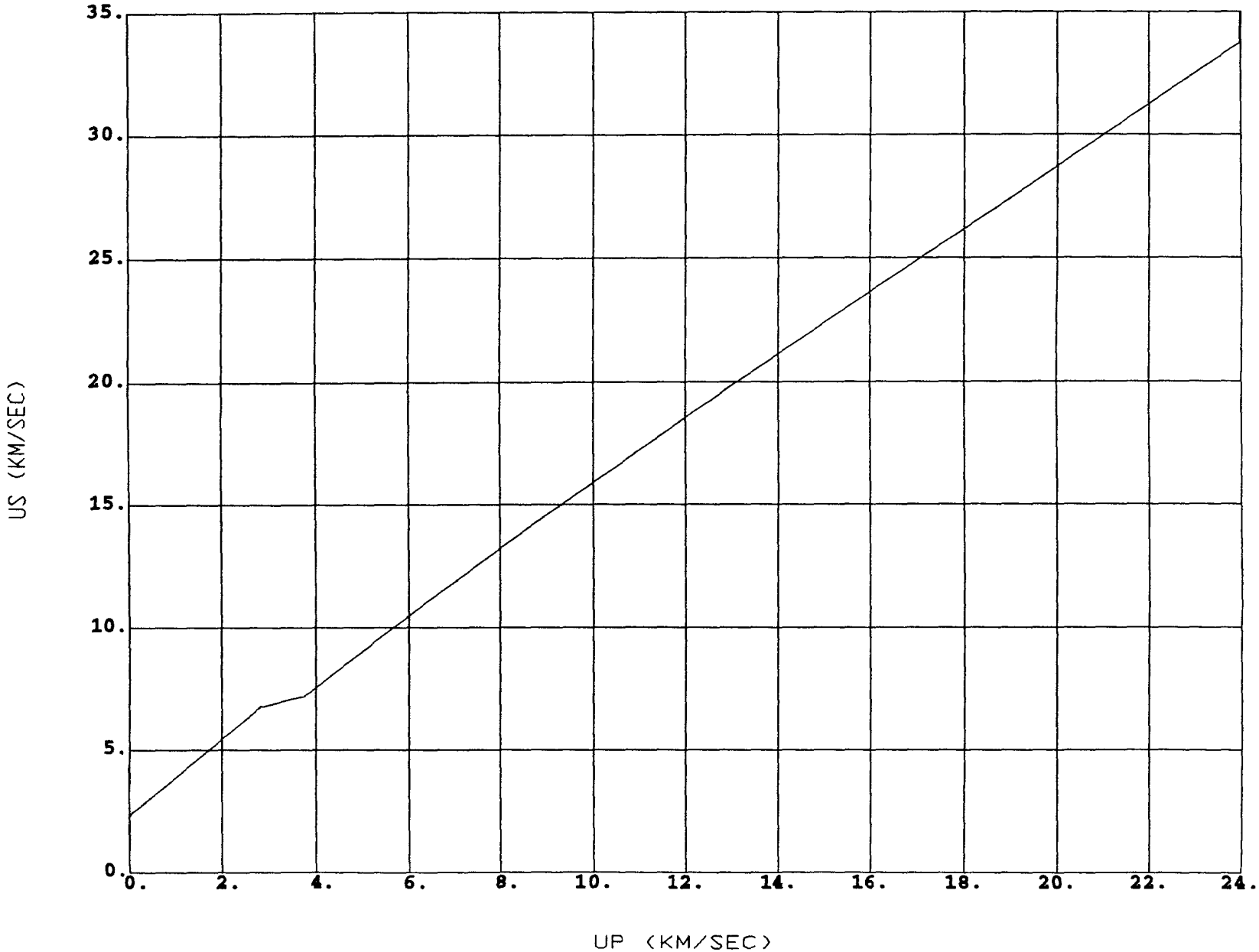


T1 SES2D CRAY 02

7770-5

7770-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

MATERIAL NUMBER SUMMARY

7771 MATERIAL. PARYLENE

COMP. C8H7CL
ATOMIC NUMBER. 4.5000E+00
ATOMIC MASS. 8.6624E+00
NORMAL DENSITY. 1.2900E+00

GAMMA(COMPUTED). 0.4968

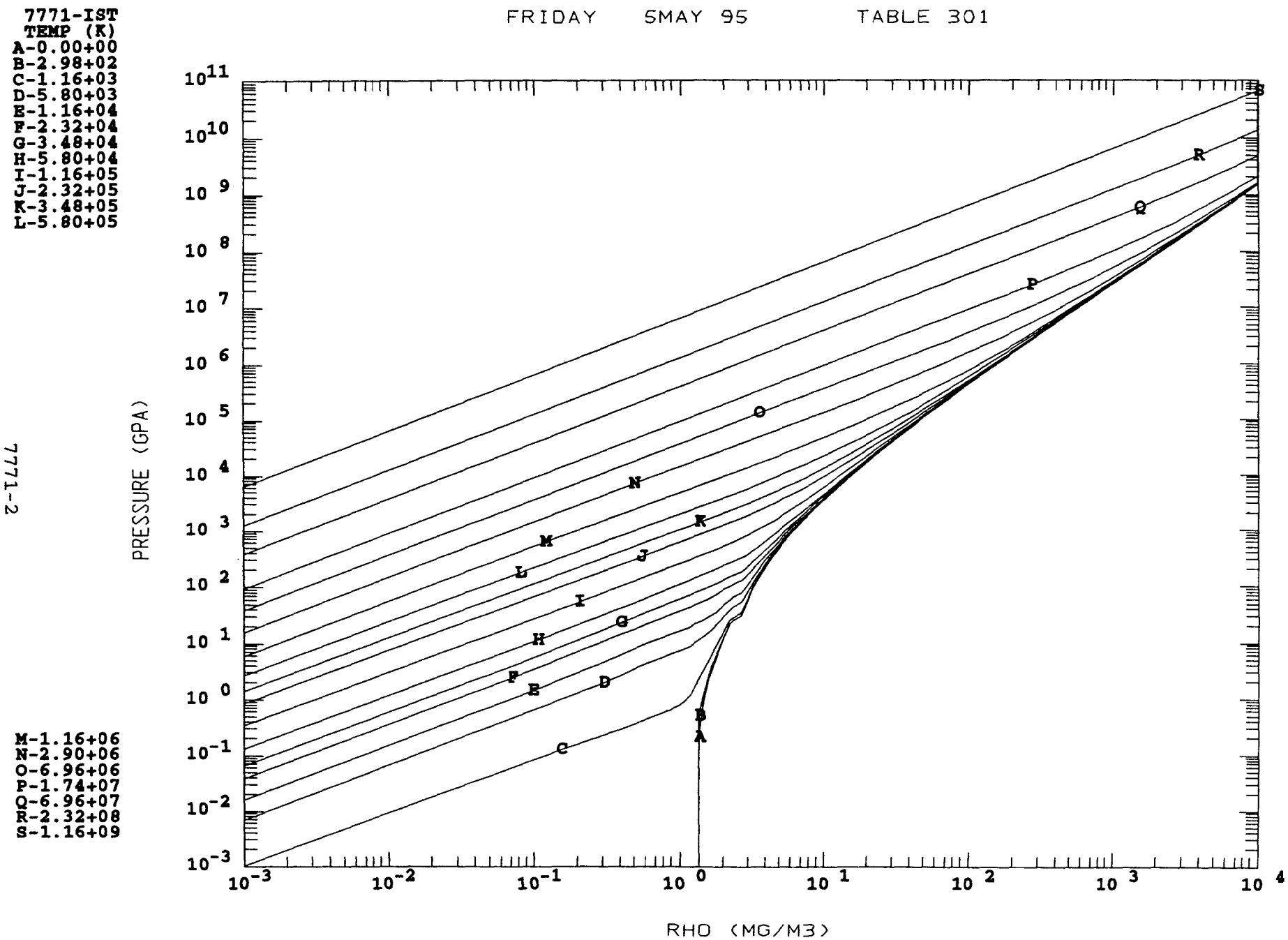
TABLE SUMMARY.

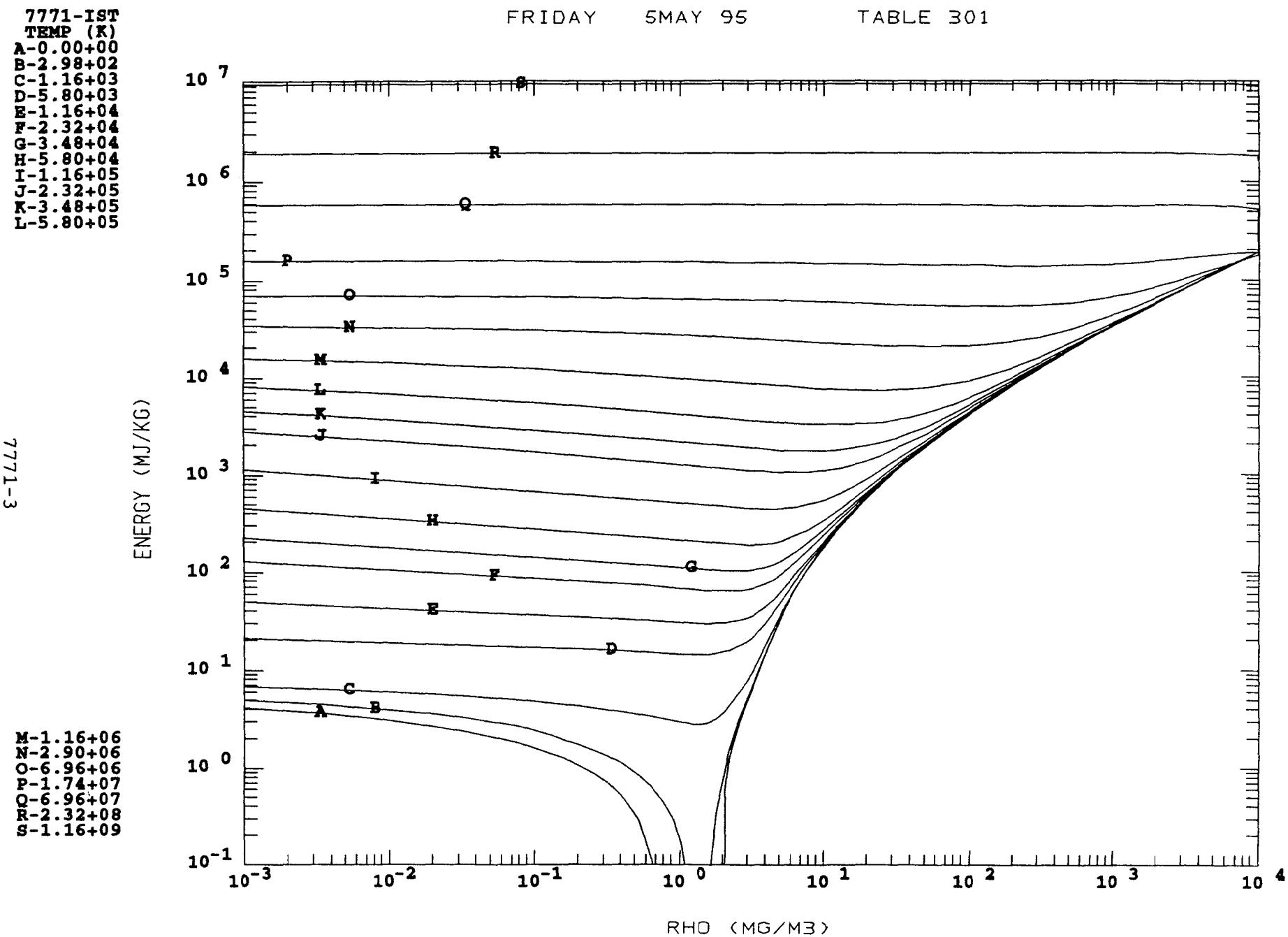
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	16					
102	14					
201	5					
301	7991	71	37	0.0000E+00	1.2900E-06	2.5800E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7207	64	37	1.0235E-06	2.0469E-06	2.0469E+03
				0.0000E+00	1.2500E-02	9.9999E+04
305	7879	70	37	1.2900E-06	2.5800E-06	2.5800E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	283	70	1	1.2900E-06	2.5800E-06	2.5800E+04
				0.0000E+00	-1.6557E-11	0.0000E+00
401	41					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. AUG 91
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 81591.
DATE OF LAST UPDATE. 30292.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. SAME AS 7770 EXCEPT FOR COMPOSITION. MATERIAL 7770 IS PARYLENE-D C8H6CL2. MATERIAL 7771 IS PARYLENE-C C8H7CL.

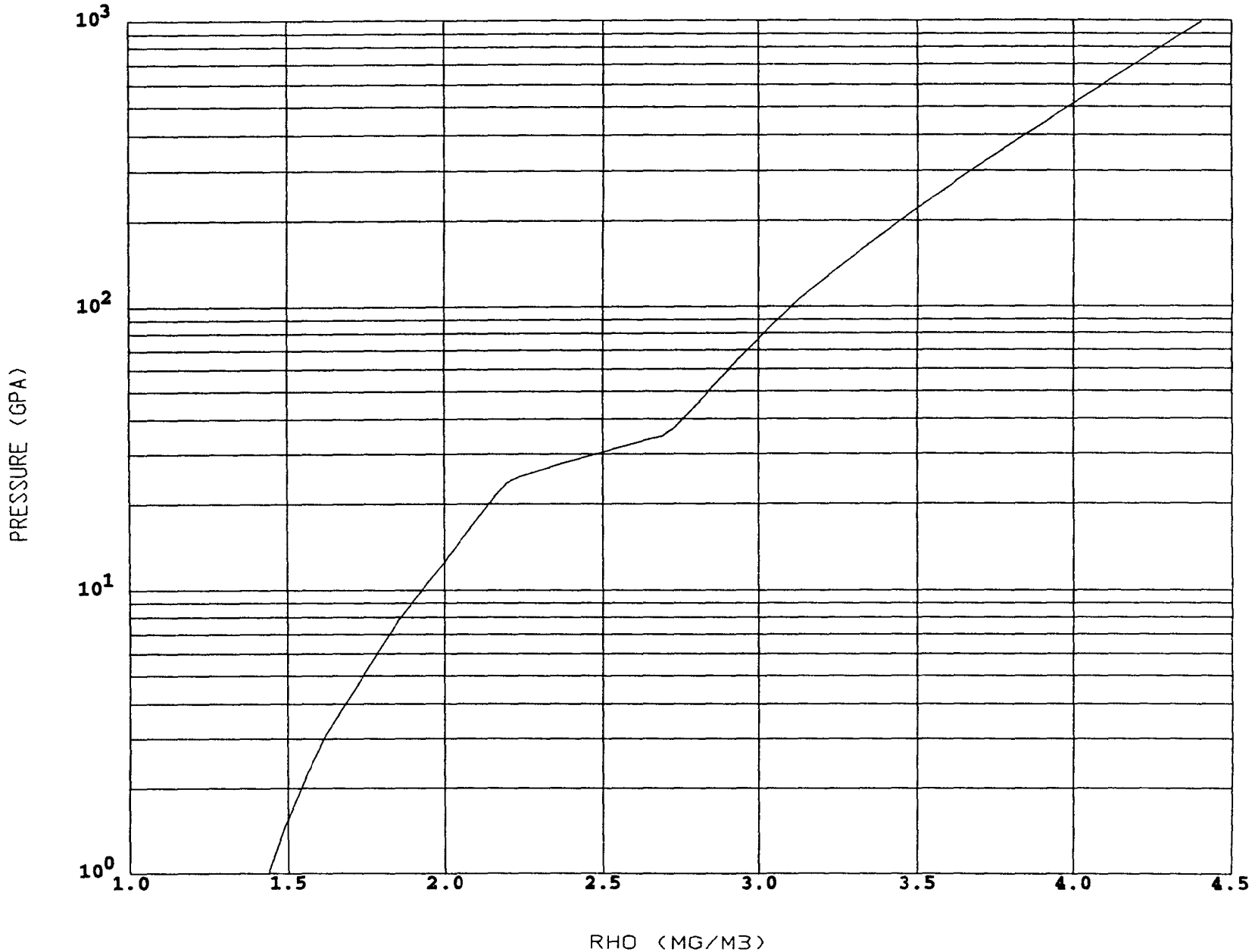

7771-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-5.80+03
E-1.16+04
F-2.32+04
G-3.48+04
H-5.80+04
I-1.16+05
J-2.32+05
K-3.48+05
L-5.80+05
M-1.16+06
N-2.90+06
O-6.96+06
P-1.74+07
Q-6.96+07
R-2.32+08
S-1.16+09
FRIDAY 5MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY



T1 SES2D CRAY 02

7771-HU1
E0 MJ/KG
0.00+00

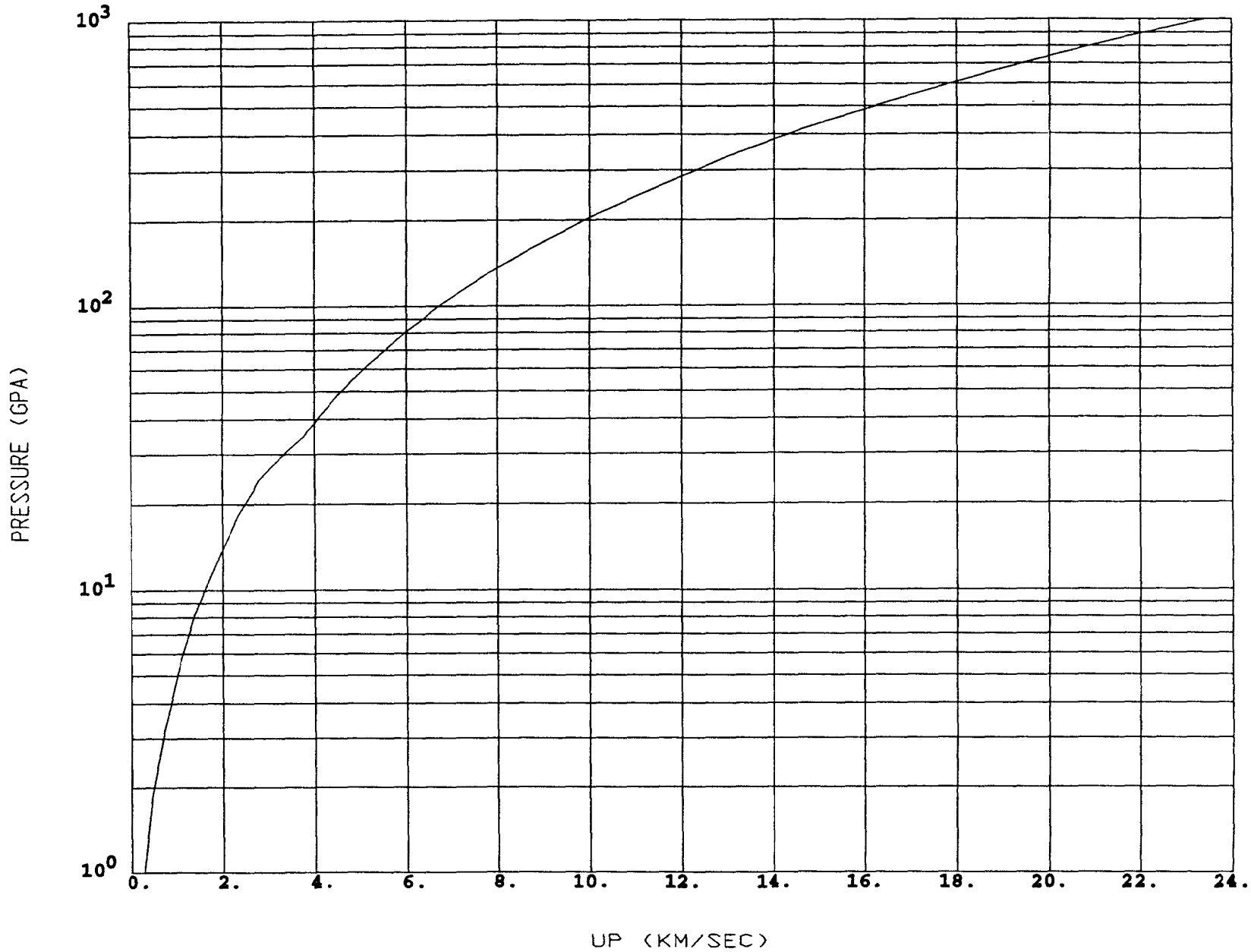
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7771-HU1
E0 MJ/KG
0.00+00

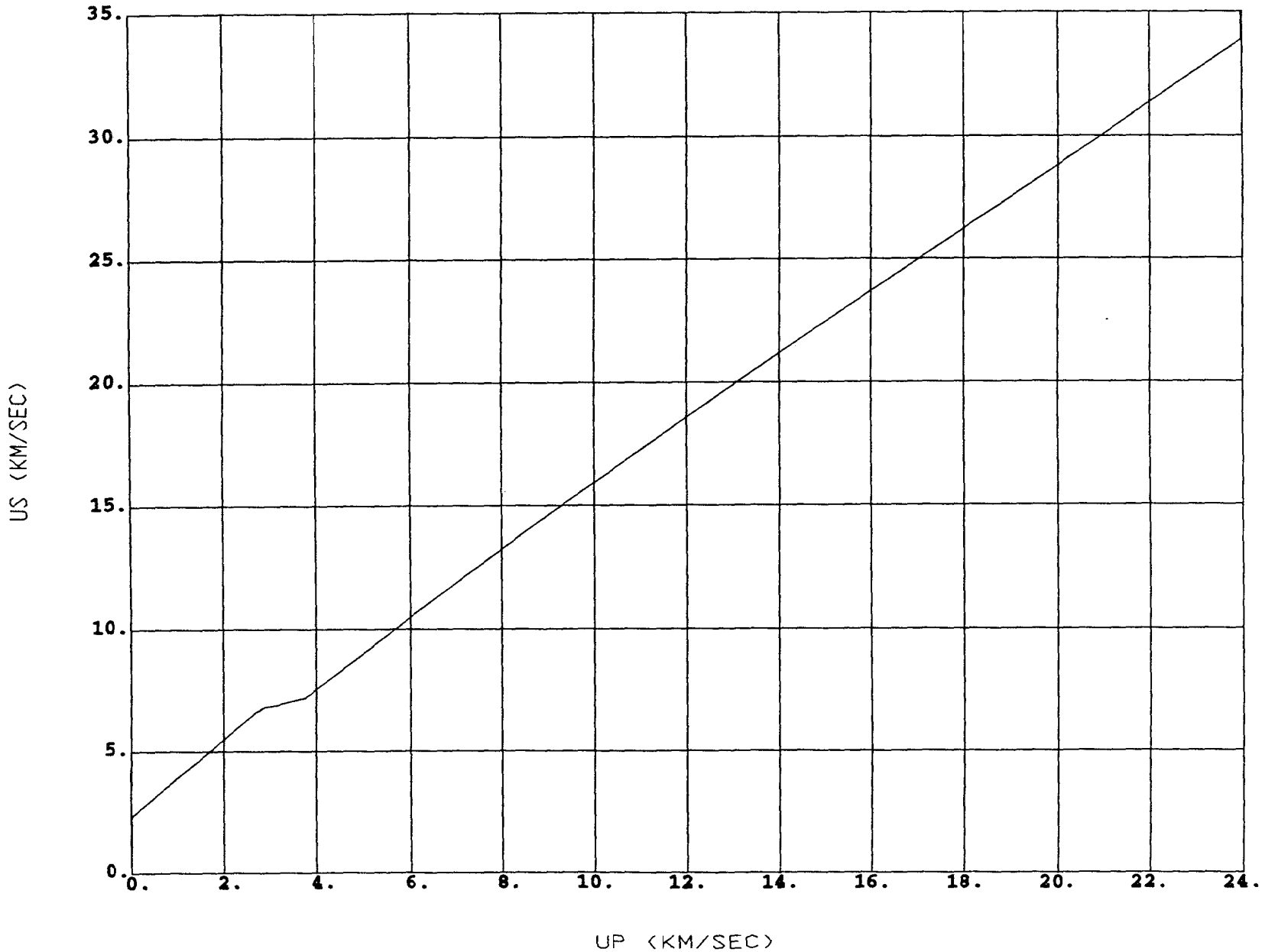
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY 02

7771-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

MATERIAL NUMBER SUMMARY

7830 MATERIAL. DIAMOND

COMP. C
ATOMIC NUMBER. 6.0000E+00
ATOMIC MASS. 1.2011E+01
NORMAL DENSITY. 3.5100E+00

GAMMA(COMPUTED). 0.5015

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	13					
102	65					
201	5					
301	4770	93	25	3.5238E-01	3.8050E-01	3.5238E+02
				0.0000E+00	2.5690E-02	3.2000E+04
303	4770	93	25	3.5238E-01	3.8050E-01	3.5238E+02
				0.0000E+00	2.5690E-02	3.2000E+04
304	4770	93	25	3.5238E-01	3.8050E-01	3.5238E+02
				0.0000E+00	2.5690E-02	3.2000E+04
305	4770	93	25	3.5238E-01	3.8050E-01	3.5238E+02
				0.0000E+00	2.5690E-02	3.2000E+04
306	282	93	1	3.5238E-01	3.8050E-01	3.5238E+02
				0.0000E+00	-2.6087E-04	0.0000E+00

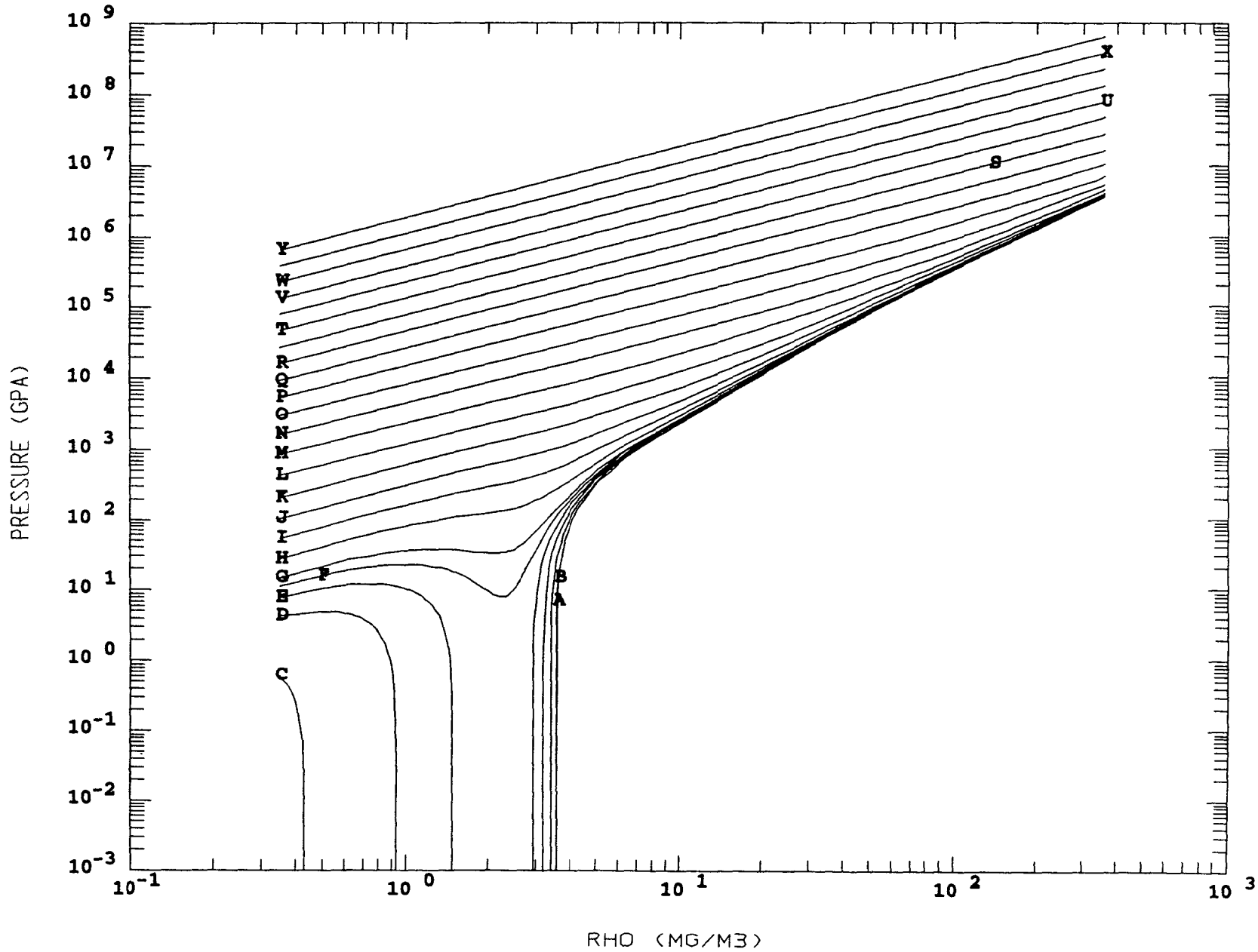
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE.
VERSION NUMBER. 5
DATE ADDED TO LIBRARY. 51479.
DATE OF LAST UPDATE. 101582.
SOURCE. B. BENNETT
REFS.
CODES. EOSLTS

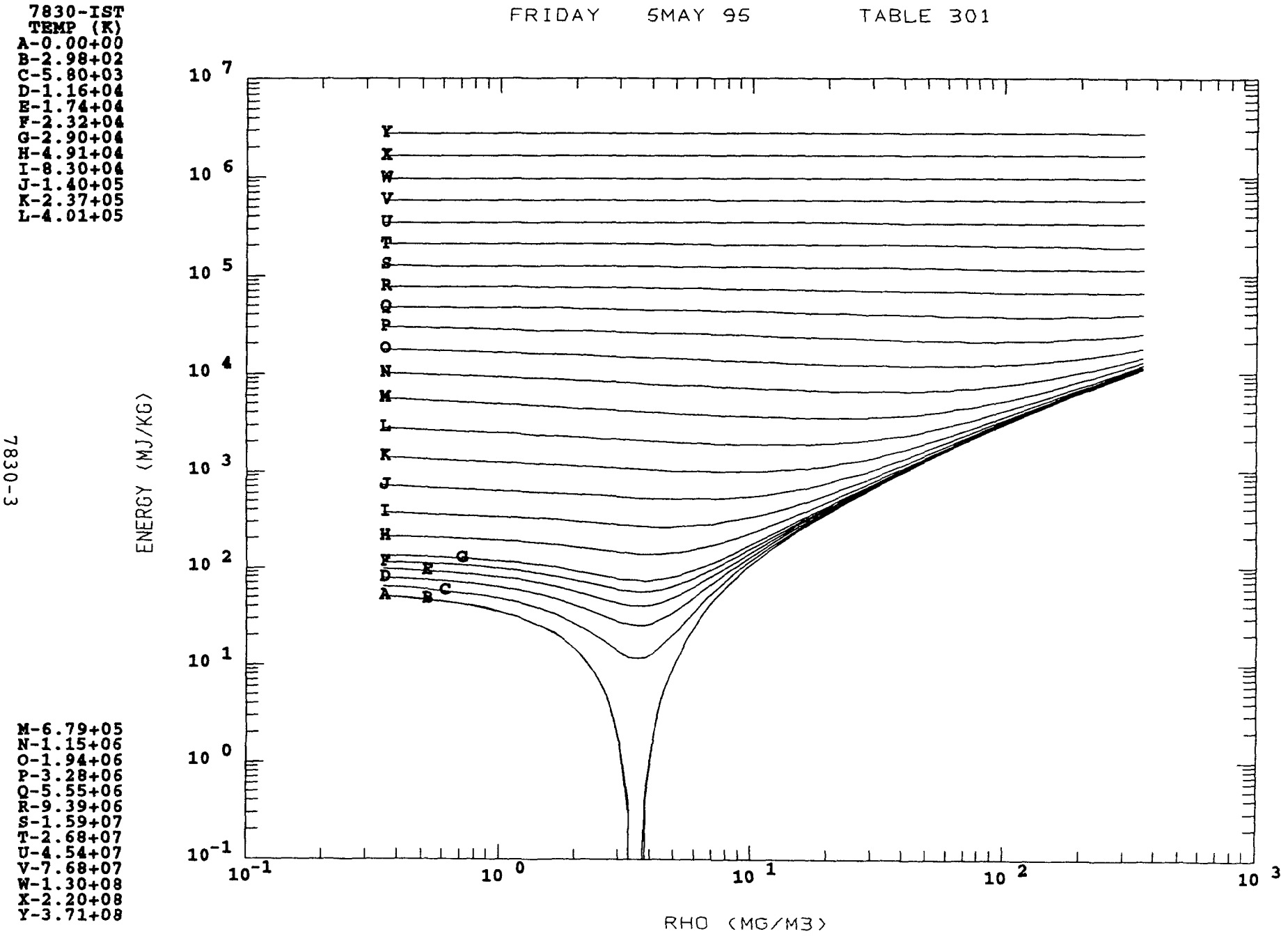
COMMENTS. THE TWO TEMPERATURE TABLES FOR THIS MATERIAL (TABLES 303-306) ARE A VERY ROUGH APPROXIMATION AND WERE DERIVED FROM THE CODE TWOTEMP (AND NOT FROM THE ORIGINAL EOS CALCULATIONS, WHICH IN MOST CASES ARE NO LONGER REPRODUCIBLE). THE TABLES ARE VERY NOISY DUE BOTH TO NOISE IN THE ORIGINAL DATA (WHICH SHOWS UP WHEN THE COLD CURVE IS SUBTRACTED TO GENERATE THE THERMAL CONTRIBUTION) AND TO THE CONSTRAINT THAT NO CROSSING ISOTHERMS ARE ALLOWED. IF YOU HAVE ANY PROBLEMS USING THESE TABLES, CONTACT BOB ALBERS (T-4).

7830-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-5.80+03
D-1.16+04
E-1.74+04
F-2.32+04
G-2.90+04
H-4.91+04
I-8.30+04
J-1.40+05
K-2.37+05
L-4.01+05
M-6.79+05
N-1.15+06
O-1.94+06
P-3.28+06
Q-5.55+06
R-9.39+06
S-1.59+07
T-2.68+07
U-4.54+07
V-7.68+07
W-1.30+08
X-2.20+08
Y-3.71+08

FRIDAY 5MAY 95 TABLE 301



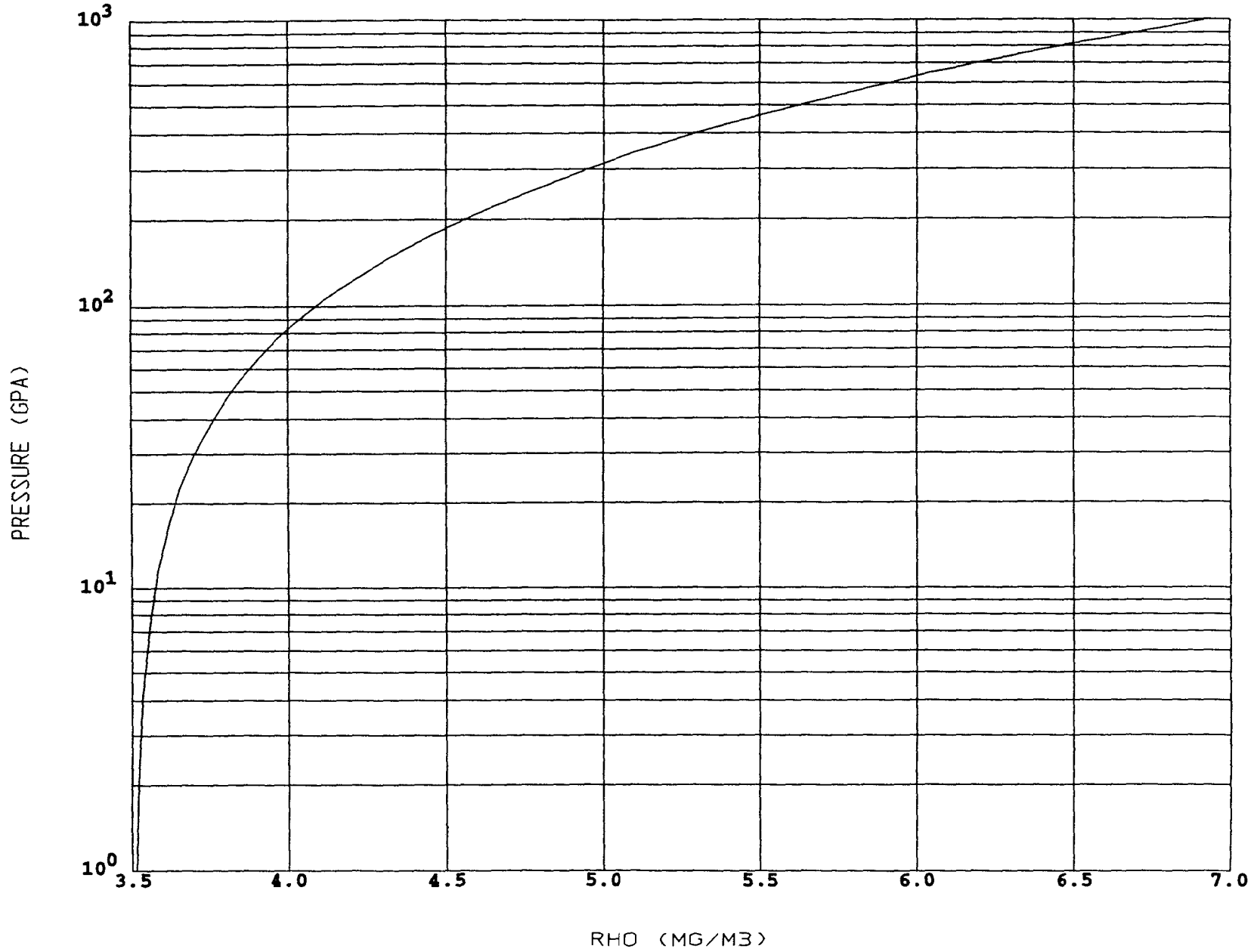
T1 SES2D CRAY



T1 SES2D CRAY 02

7830-HU1
E0 MJ/KG
0.00+00

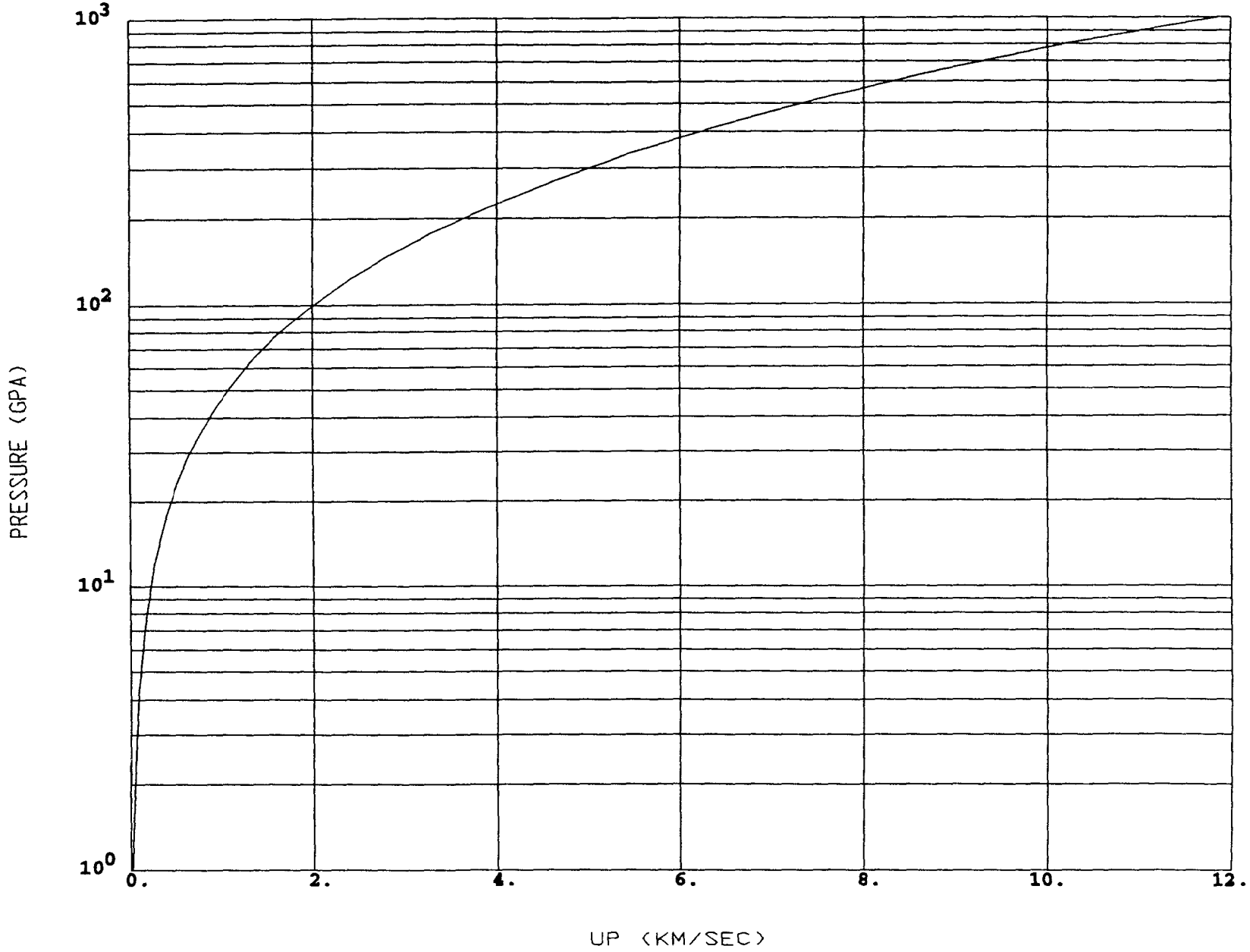
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7830-HU1
E0 MJ/KG
0.00+00

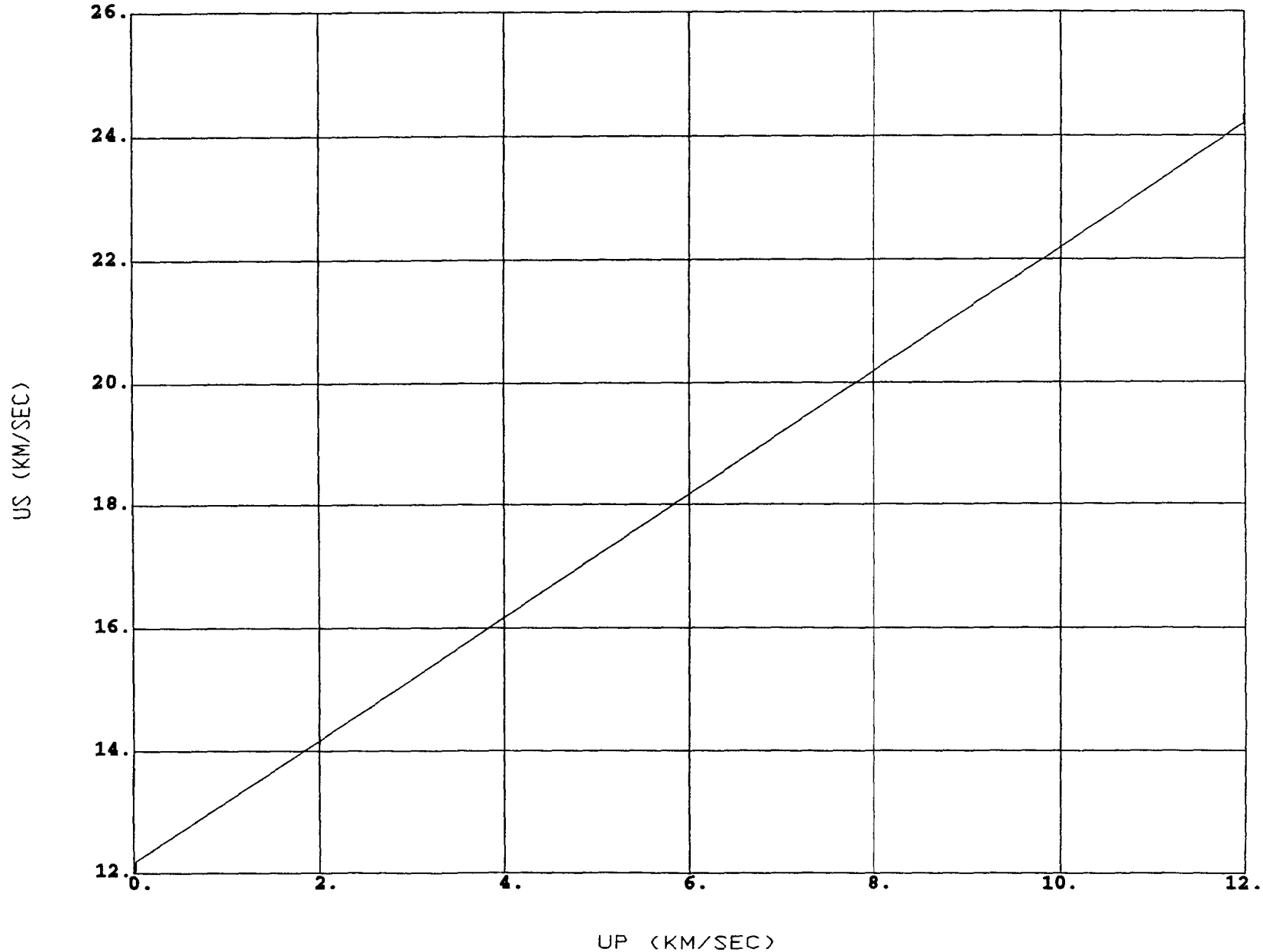
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY 02

7830-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

MATERIAL NUMBER SUMMARY

7831 MATERIAL. CARBON LIQUID

COMP. C
ATOMIC NUMBER. 6.0000E+00
ATOMIC MASS. 1.2011E+01
NORMAL DENSITY. 3.6878E+00

GAMMA(COMPUTED). 1.9537

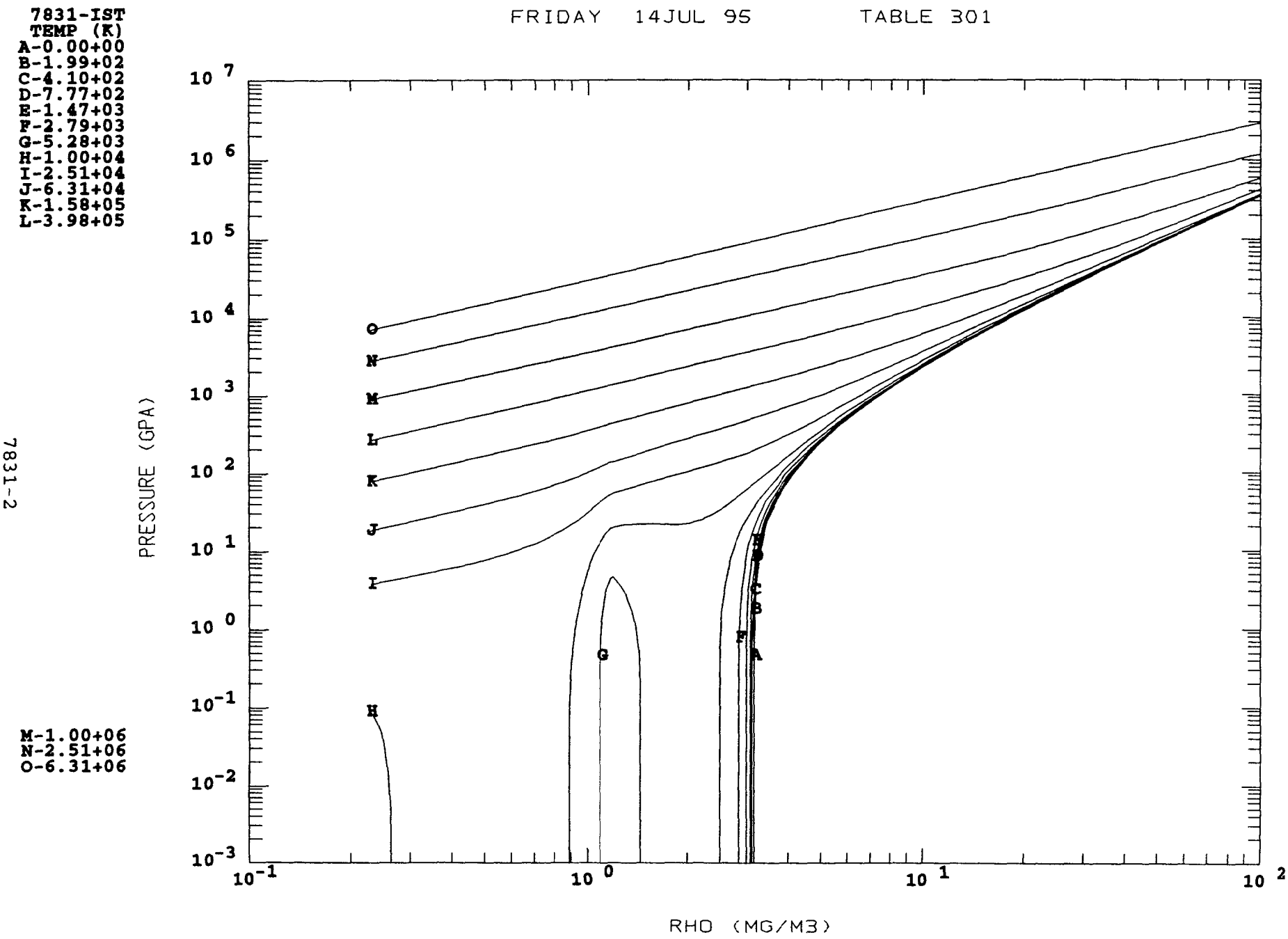
TABLE SUMMARY.

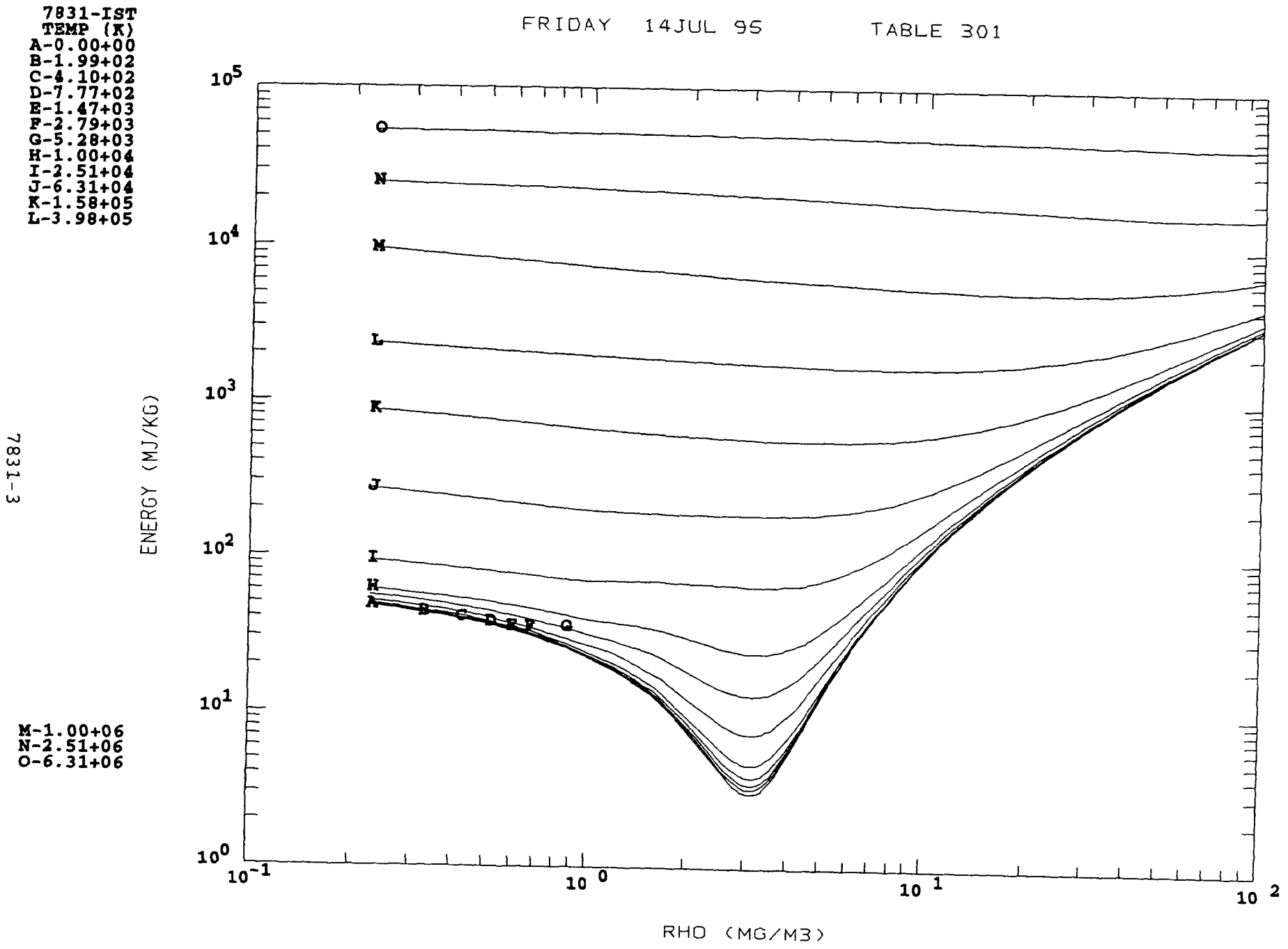
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	19					
102	34					
201	5					
301	4400	48	30	2.3000E-01	2.9082E-01	1.0000E+02
				0.0000E+00	8.5595E-03	8.6170E+02

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. OCT 81
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 10281.
DATE OF LAST UPDATE. 102281.
SOURCE. G. KERLEY
REFS. GIK NOTEBOOK NUMBER 15, PP 71-78
CODES. INFERNO, ERMA, PANDA

COMMENTS. AN EOS FOR THE METALLIC FLUID OF CARBON. ELECTRONIC EXCITATIONS COMPUTED FROM INFERNO, NUCLEAR CONTRIBUTIONS USING CRIS MODEL, COLD CURVE FROM MCMAHAN LMTO CALCULATIONS. REQUESTED BY RAGAN (P-3) FOR DESIGN AND INTERPRETATION OF HIGH PRESSURE SHOCK WAVE EXPERIMENT.


7831-IST
TEMP (K)
A-0.00+00
B-1.99+02
C-4.10+02
D-7.77+02
E-1.47+03
F-2.79+03
G-5.28+03
H-1.00+04
I-2.51+04
J-6.31+04
K-1.58+05
L-3.98+05
M-1.00+06
N-2.51+06
O-6.31+06
FRIDAY 14JUL 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY



7831-3

T1 SES2D CRAY 02

MATERIAL NUMBER | SUMMARY

7832 MATERIAL. CARBON (PRESSED POWDERED GRAPHITE)

COMP. C
ATOMIC NUMBER. 6.0000E+00
ATOMIC MASS. 1.2011E+01
NORMAL DENSITY. 2.2500E+00

GAMMA(COMPUTED). 0.2359

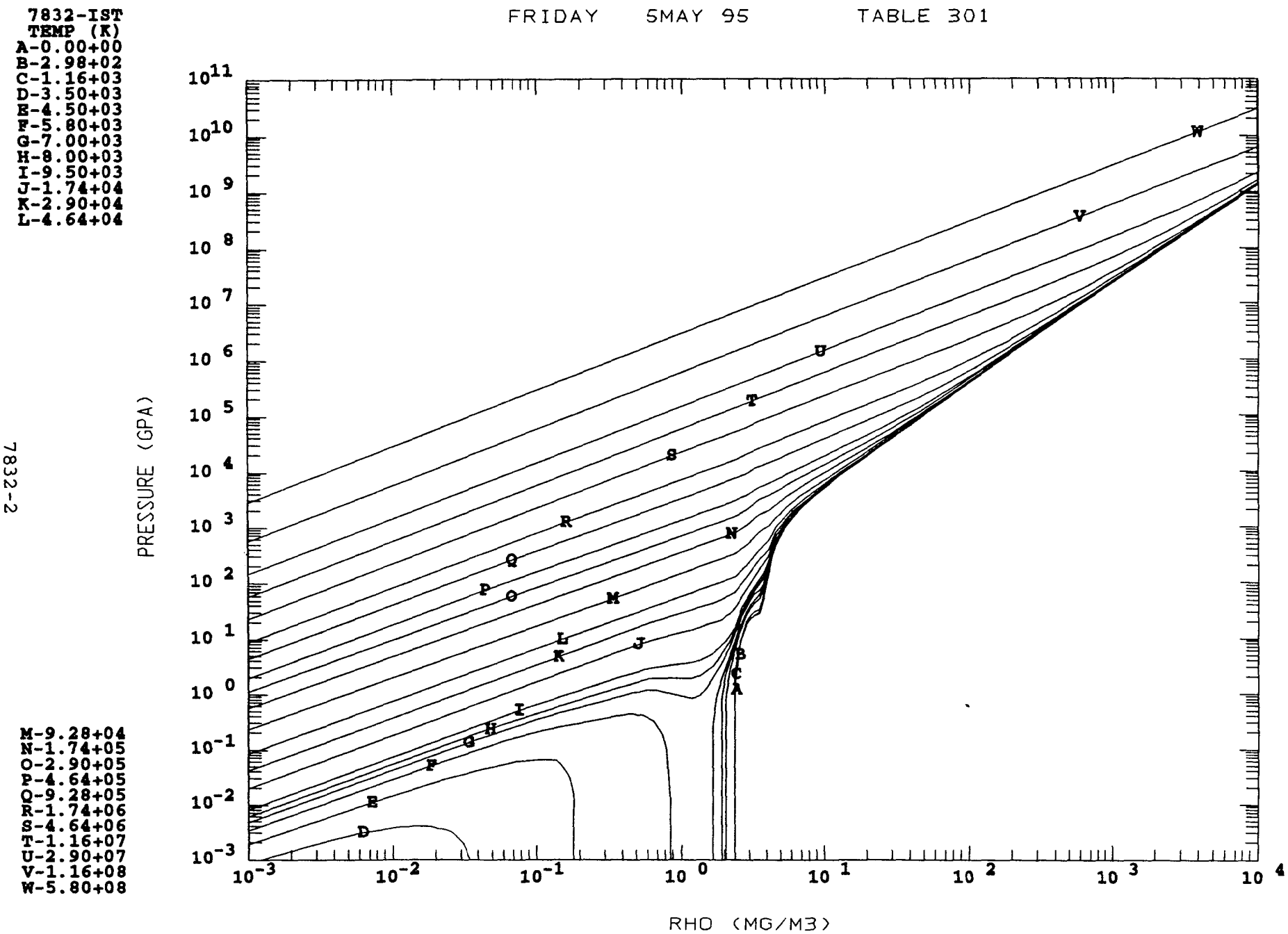
TABLE SUMMARY.

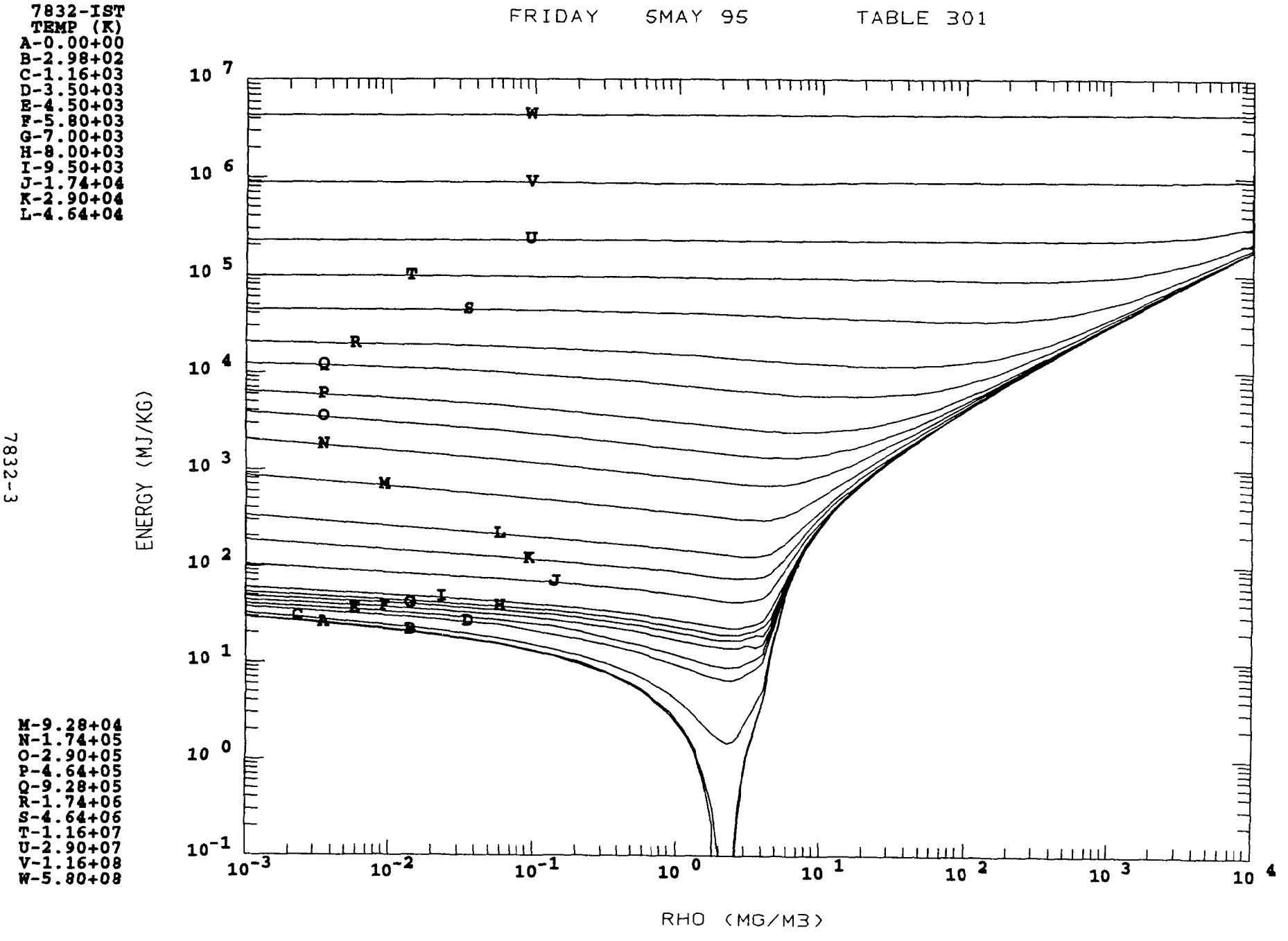
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	19					
102	125					
201	5					
301	10056	72	46	0.0000E+00	2.2500E-06	4.5000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7095	63	37	2.2500E-06	4.5000E-06	4.5000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	9917	71	46	2.2500E-06	4.5000E-06	4.5000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	287	71	1	2.2500E-06	4.5000E-06	4.5000E+04
				0.0000E+00	-3.1114E-10	0.0000E+00
401	129					

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JAN 93
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 10893.
DATE OF LAST UPDATE. 90893.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

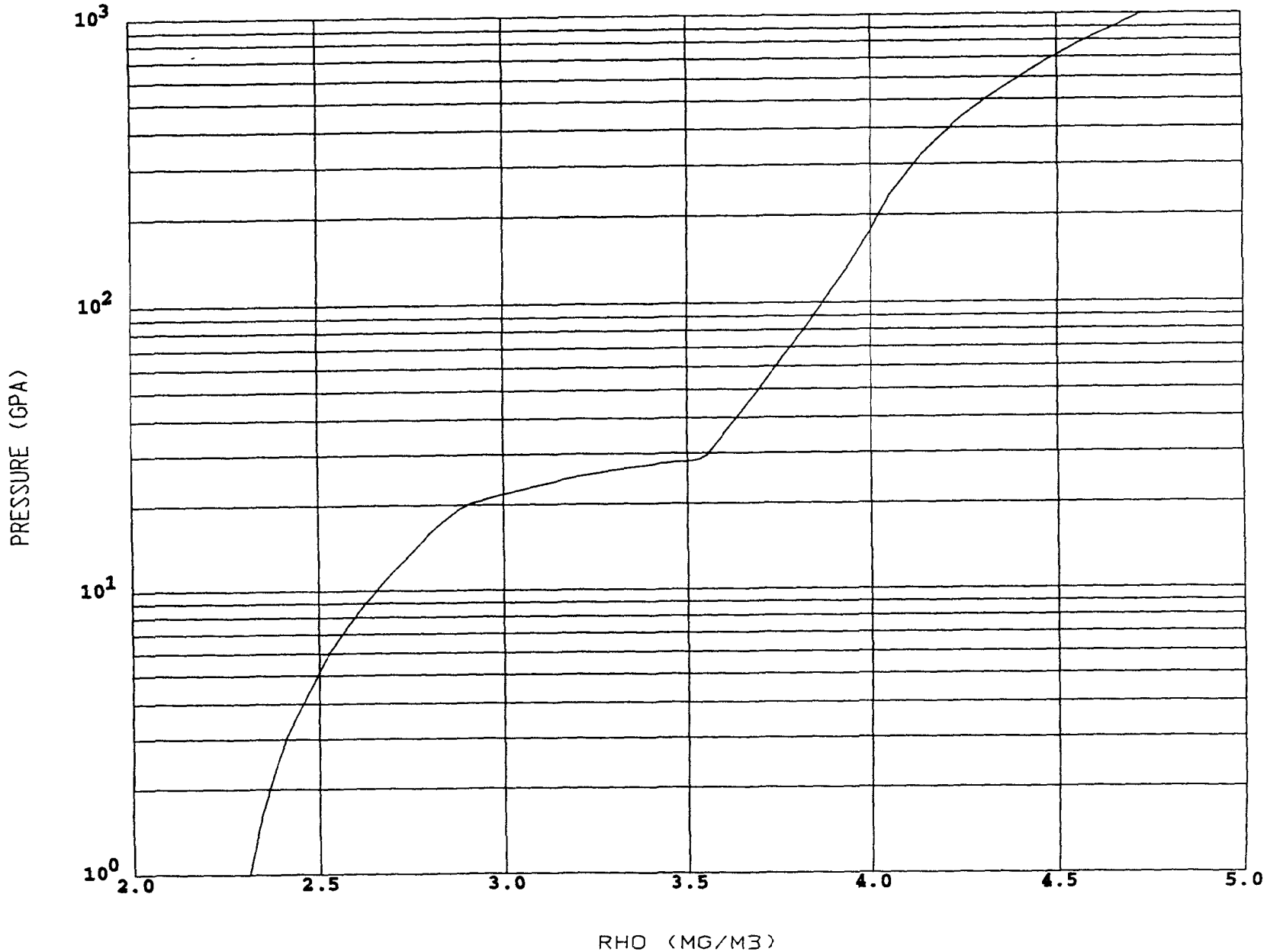
COMMENTS. TFD AS CALCULATED BY CANDIDE IN GRIZZLY WAS USED FOR THE ELECTRONIC CONTRIBUTION. JDJNUC NUCLEAR MODEL WITH PIECEWISE LINEAR GAMMA (IGRUN=8) MATCHED INTO THE EXPERIMENTAL VALUES FOR GRAPHITE AND DIAMOND. GAMRHO= (2.25,0.24),(2.89,0.5),(3.55,1.1), GAMEPS=(0.66667,0.5), TMELT=4530K. COLD CURVE FROM SHOCK DATA WITH RHO SHOCK OF 1.948 USED FOR DETAILED MATCH. REASONABLE AGREEMENT AT RHO SHOCK OF 2.134, 1.768, 1.011 AND 0.56. USUP= (0.0,3.9),(0.7,5.2),(1.4,6.3),(2.2,6.0),(6.0,13.7). FACLJ ADJUSTED TO GIVE VAPOR PRESSURE OF .01 GPA AT 4500K. RESULTING CRITICAL PARAMETERS ARE QUITE GOOD WHEN COMPARED TO OHSE AND TIPPELSKIRCH, HIGH TEMPERATURE-HIGH PRESSURE VOL.9, 367(1977) (TCRIT= 8204K, PCRIT=2.04 GPA, RHOCRIT=1.00 GM PER CC). ECOHKC=170, CMAT=1.78, DEBREF=0.11533. 301 TABLE HAS VAN DER WAAL LOOPS. THIS EOS IS FOR PRESSED POWDERED GRAPHITE. DUE TO NONEQUILIBRIUM EFFECTS IN THE GRAPHITE TO DIAMOND PHASE TRANSITION, CARE SHOULD BE EXERCISED IF EOS IS USED FOR CARBON PREPARED DIFFERENTLY.


7832-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-3.50+03
E-4.50+03
F-5.80+03
G-7.00+03
H-8.00+03
I-9.50+03
J-1.74+04
K-2.90+04
L-4.64+04
M-9.28+04
N-1.74+05
O-2.90+05
P-4.64+05
Q-9.28+05
R-1.74+06
S-4.64+06
T-1.16+07
U-2.90+07
V-1.16+08
W-5.80+08
FRIDAY 5MAY 95 TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY


7832-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-3.50+03
E-4.50+03
F-5.80+03
G-7.00+03
H-8.00+03
I-9.50+03
J-1.74+04
K-2.90+04
L-4.64+04
M-9.28+04
N-1.74+05
O-2.90+05
P-4.64+05
Q-9.28+05
R-1.74+06
S-4.64+06
T-1.16+07
U-2.90+07
V-1.16+08
W-5.80+08
FRIDAY 5MAY 95 TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7832-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301

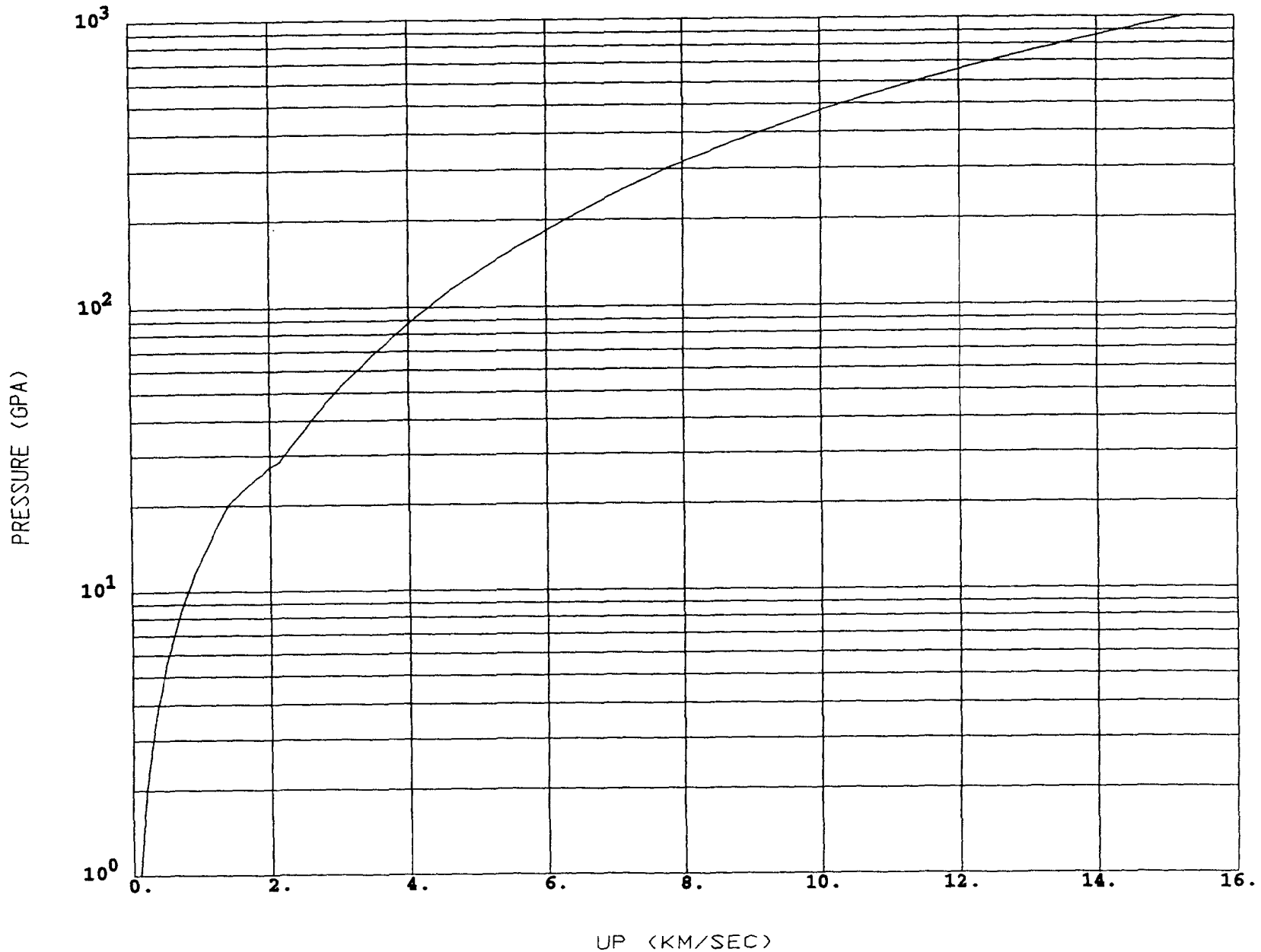


T1 SES2D CRAY

7832-4

7832-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301

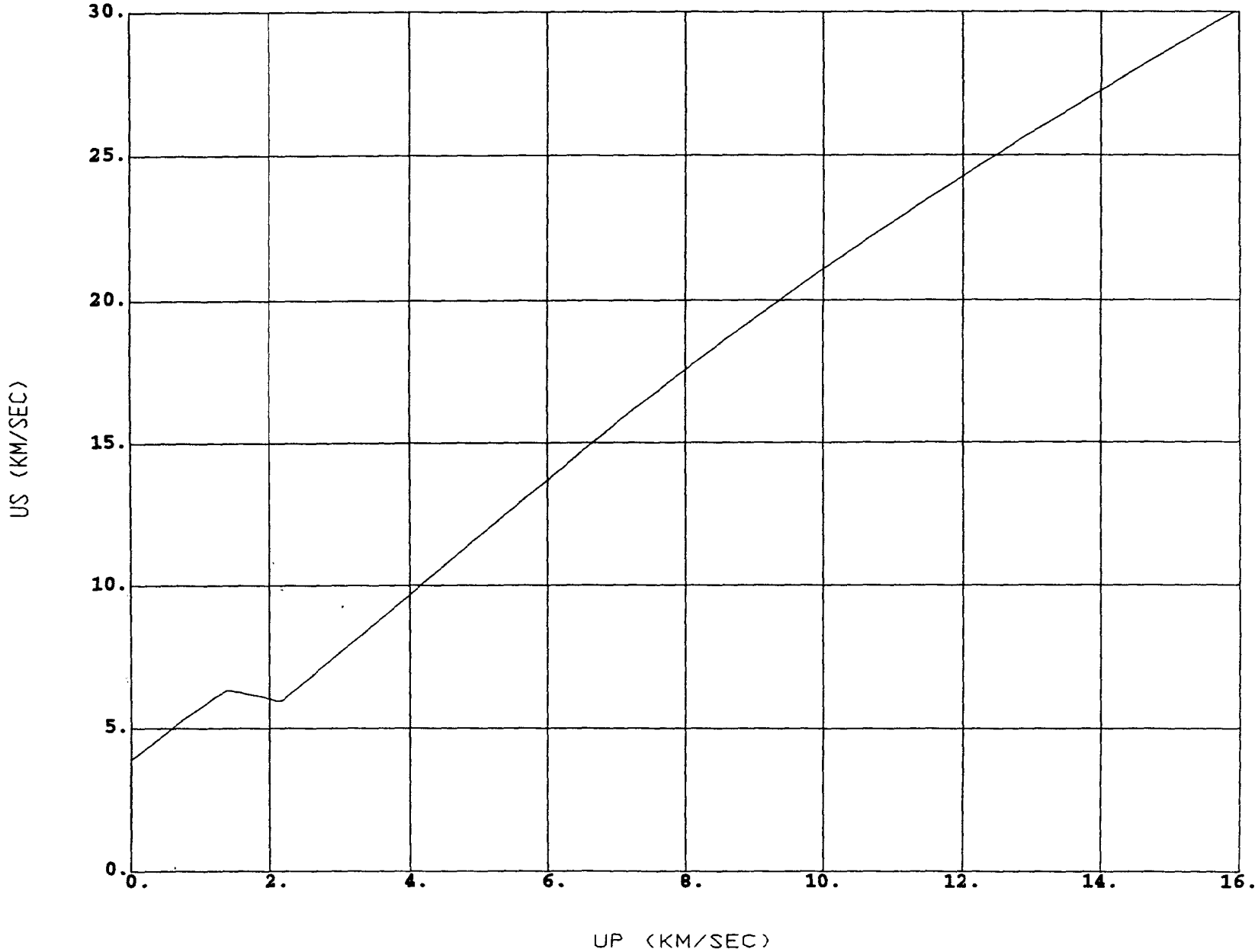


T1 SES2D CRAY 02

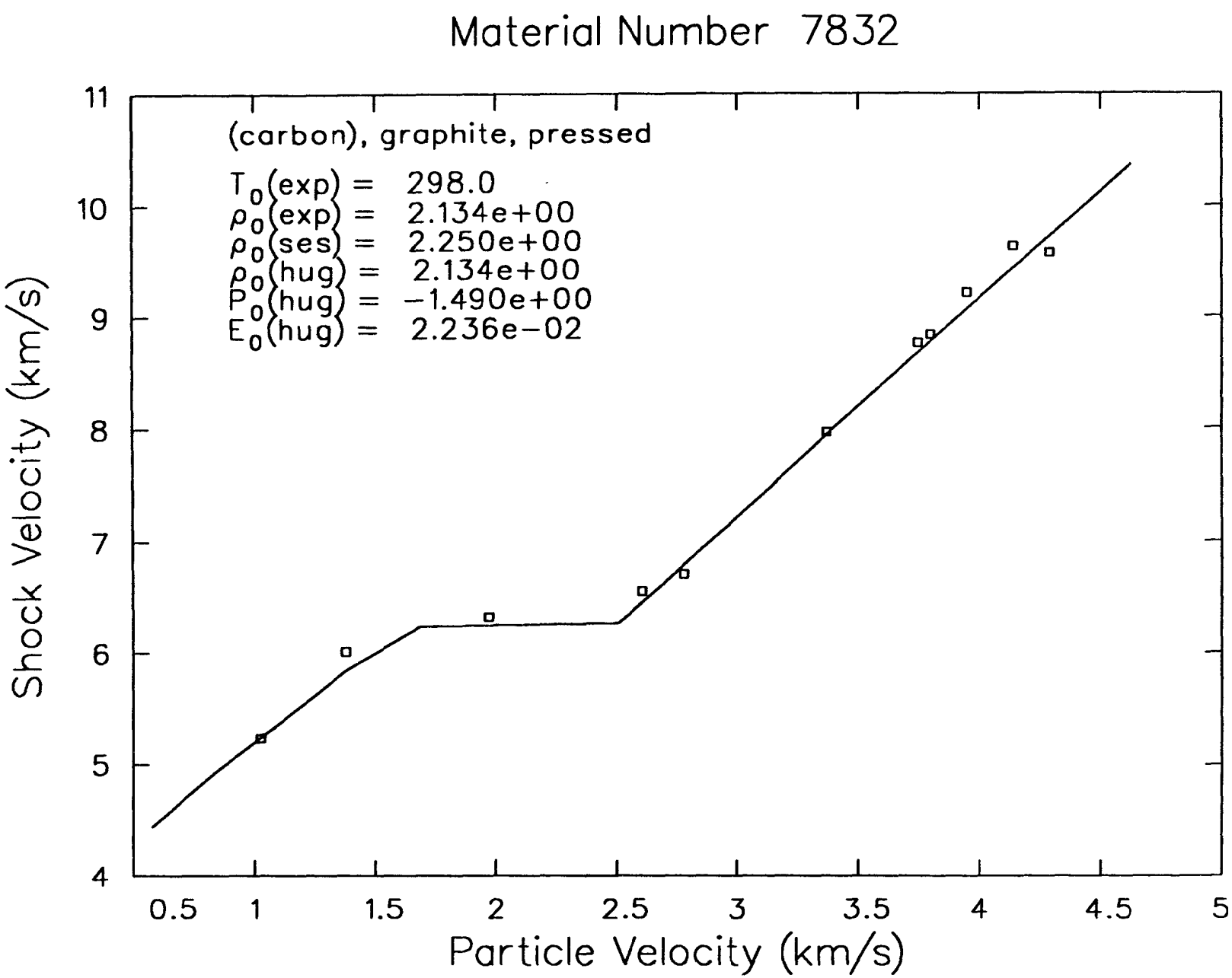
7832-5

7832-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7832
(carbon), graphite, pressed
T_0(exp) = 298.0
ρ_0(exp) = 2.134e+00
ρ_0(ses) = 2.250e+00
ρ_0(hug) = 2.134e+00
P_0(hug) = −1.490e+00
E_0(hug) = 2.236e−02
Shock Velocity (km/s)
Particle Velocity (km/s)
11
10
9
8
7
6
5
4
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

MATERIAL NUMBER SUMMARY

7833 MATERIAL. CARBON (PRESSED POWDERED GRAPHITE)

COMP. C
ATOMIC NUMBER. 6.0000E+00
ATOMIC MASS. 1.2011E+01
NORMAL DENSITY. 2.2500E+00

TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	19					
102	11					
201	5					
301	10056	72	46	0.0000E+00	2.2500E-06	4.5000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	7095	63	37	2.2500E-06	4.5000E-06	4.5000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	9917	71	46	2.2500E-06	4.5000E-06	4.5000E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	287	71	1	2.2500E-06	4.5000E-06	4.5000E+04
				0.0000E+00	-3.1114E-10	0.0000E+00
401	129					

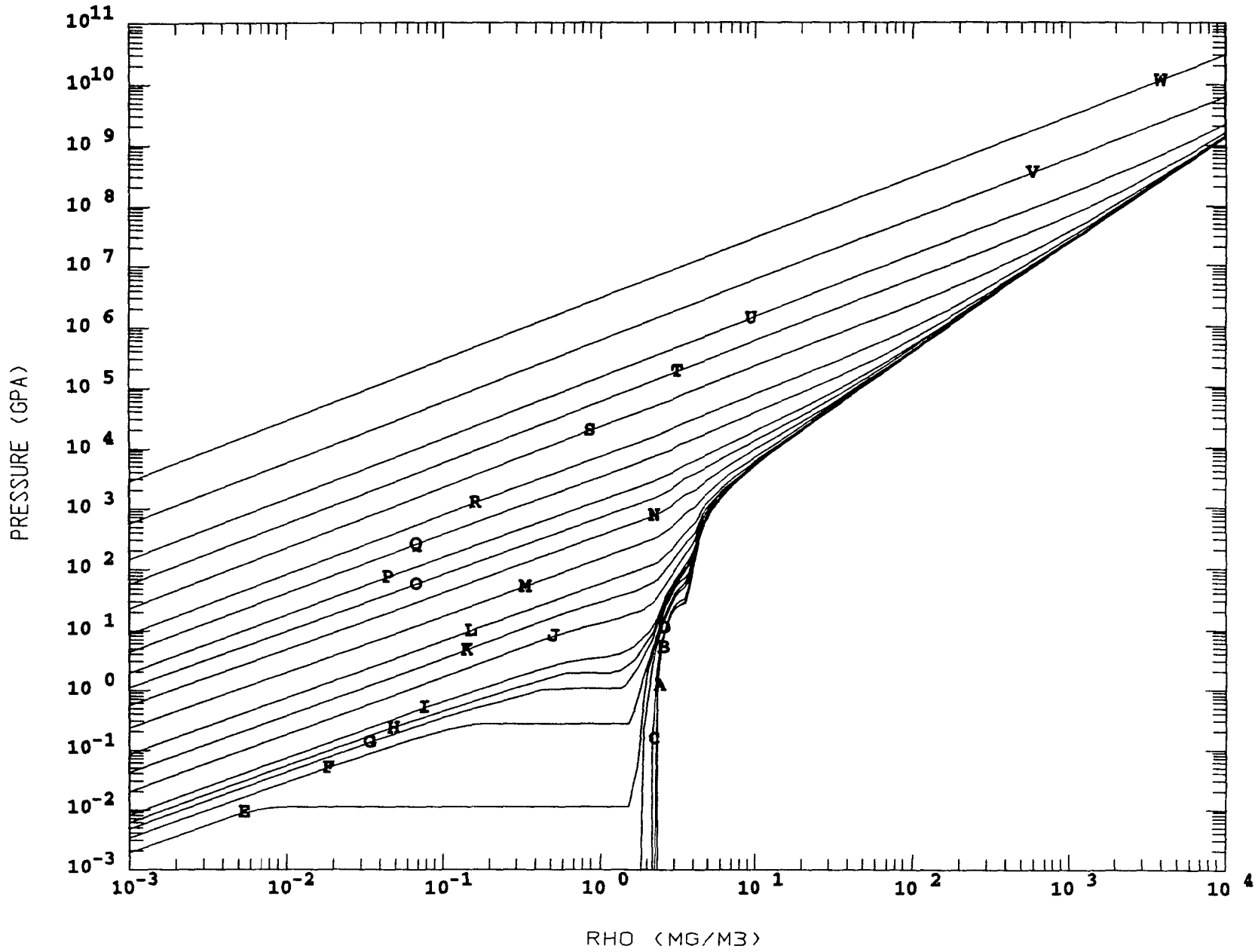
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. JAN 93
VERSION NUMBER. 2
DATE ADDED TO LIBRARY. 10893.
DATE OF LAST UPDATE. 90893.
SOURCE. J.D. JOHNSON, S. LYON
REFS. NONE
CODES. GRIZZLY

COMMENTS. THIS EOS IS THE SAME AS 7832 EXCEPT THAT THE 301 TABLE HAS MAXWELL CONSTRUCTIONS.

7833-IST
TEMP (K)
A-0.00+00
B-2.98+02
C-1.16+03
D-3.50+03
E-4.50+03
F-5.80+03
G-7.00+03
H-8.00+03
I-9.50+03
J-1.74+04
K-2.90+04
L-4.64+04

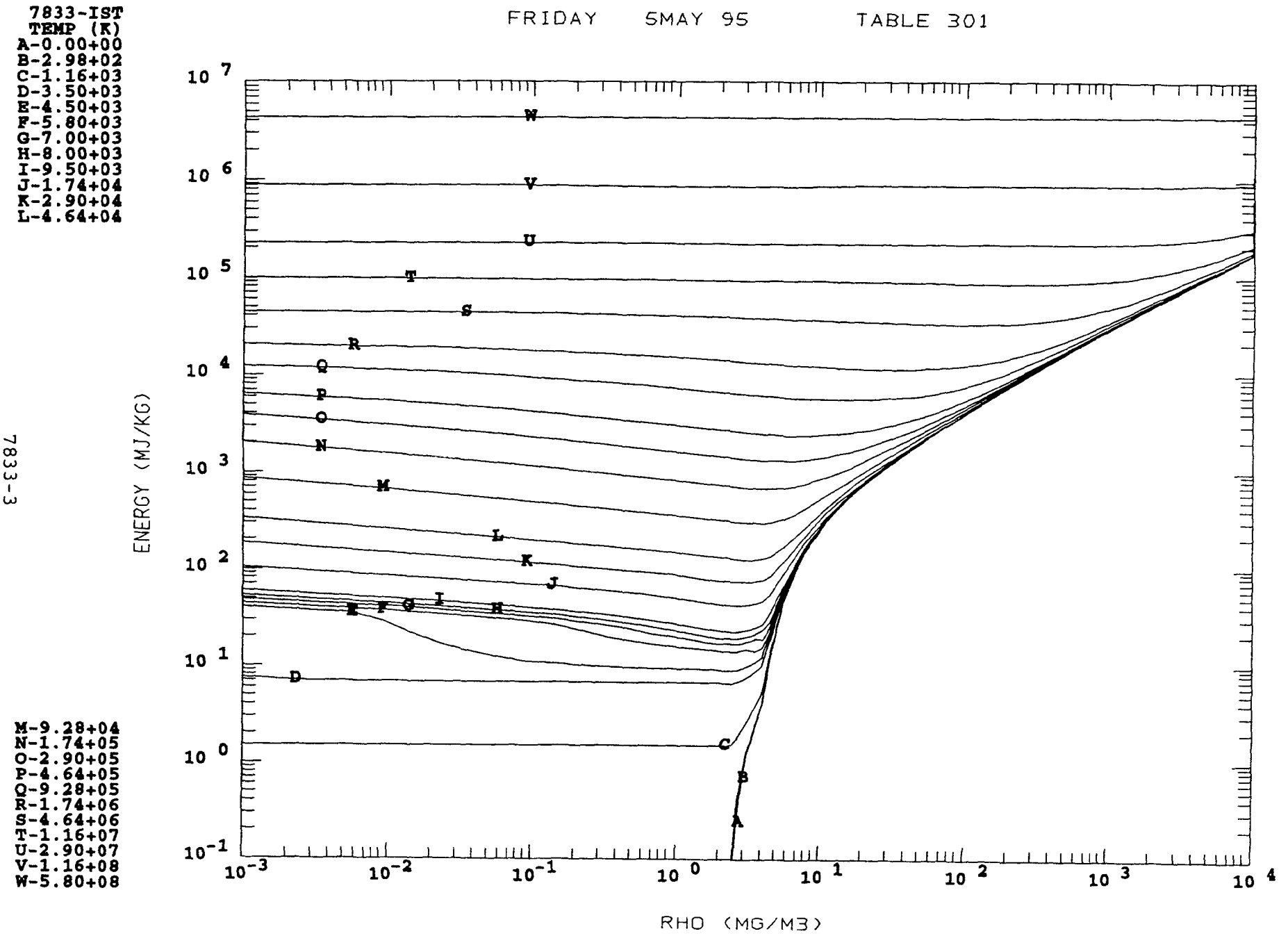
FRIDAY 5MAY 95 TABLE 301



M-9.28+04
N-1.74+05
O-2.90+05
P-4.64+05
Q-9.28+05
R-1.74+06
S-4.64+06
T-1.16+07
U-2.90+07
V-1.16+08
W-5.80+08

7833-2

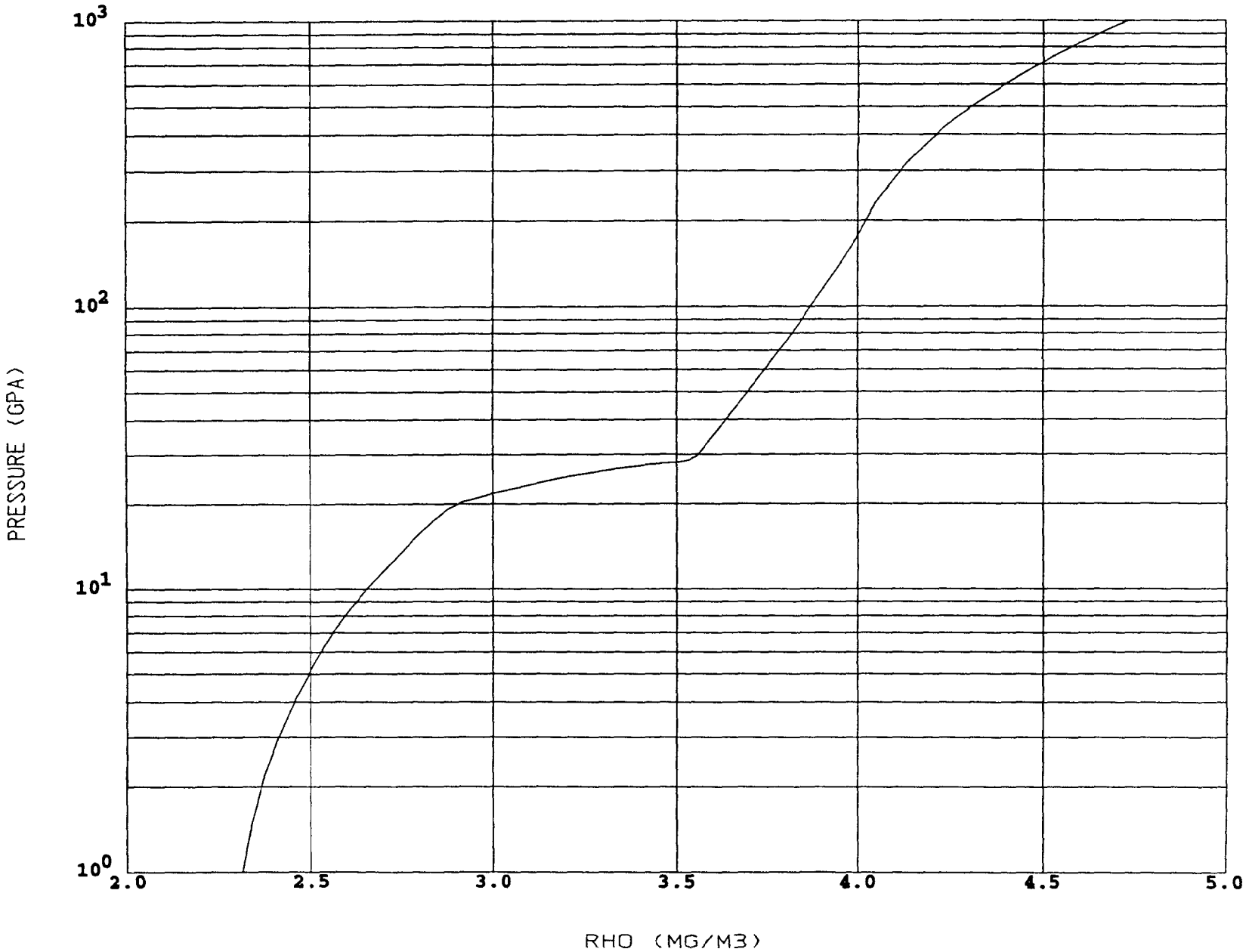
T1 SES2D CRAY



T1 SES2D CRAY 02

7833-HU1
E0 MJ/KG
0.00+00

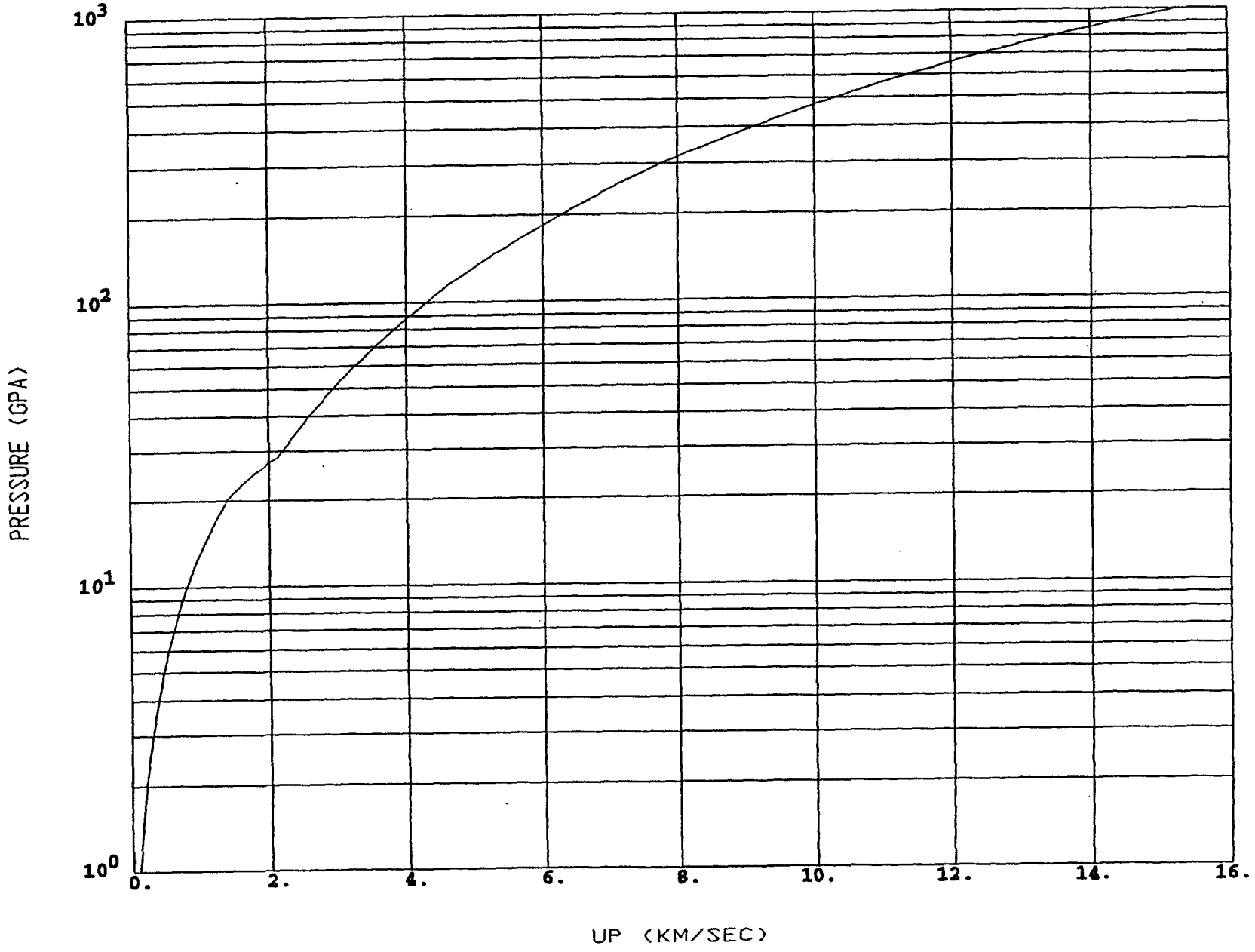
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7833-HU1
E0 MJ/KG
0.00+00

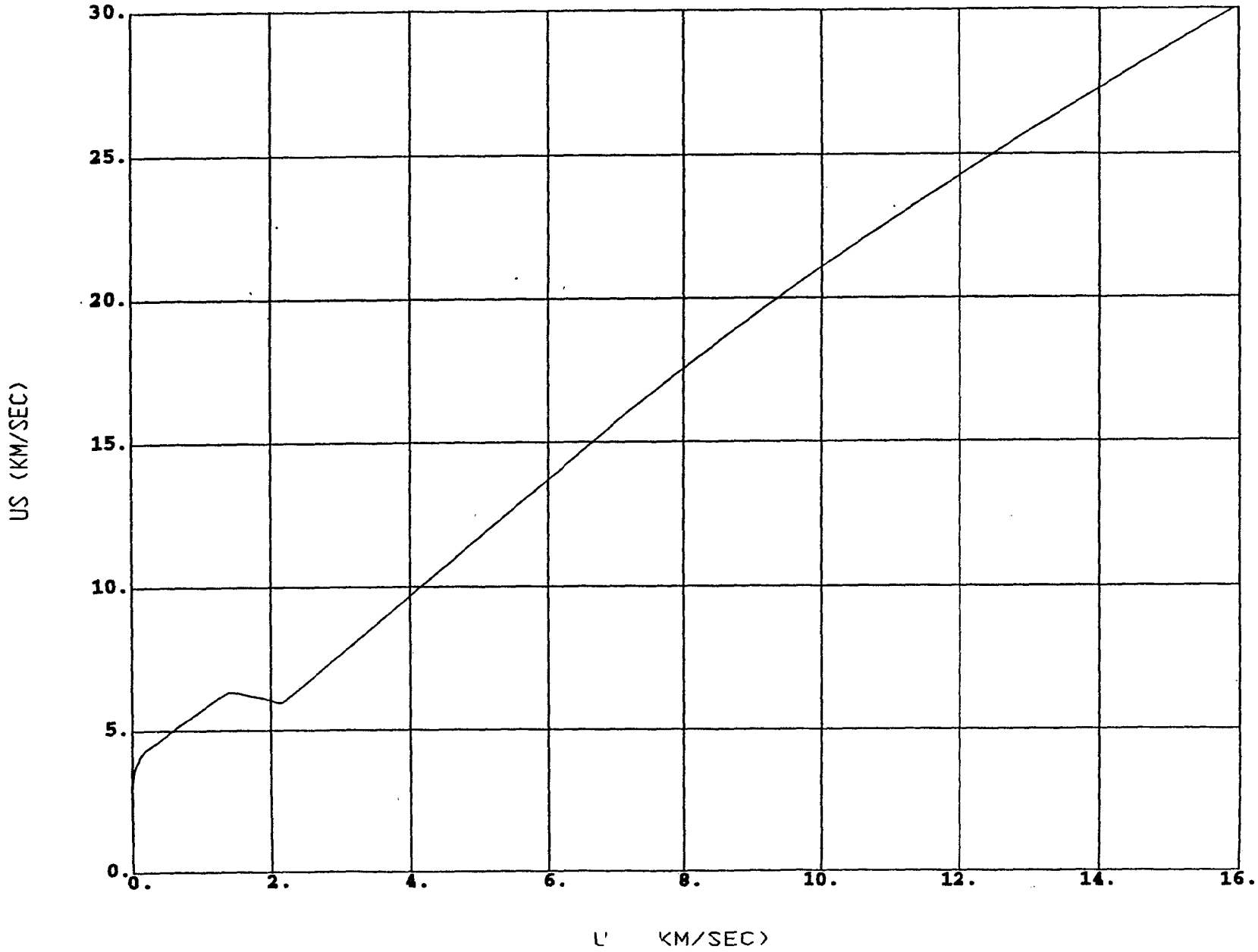
FRIDAY 5MAY 95 TABLE 301

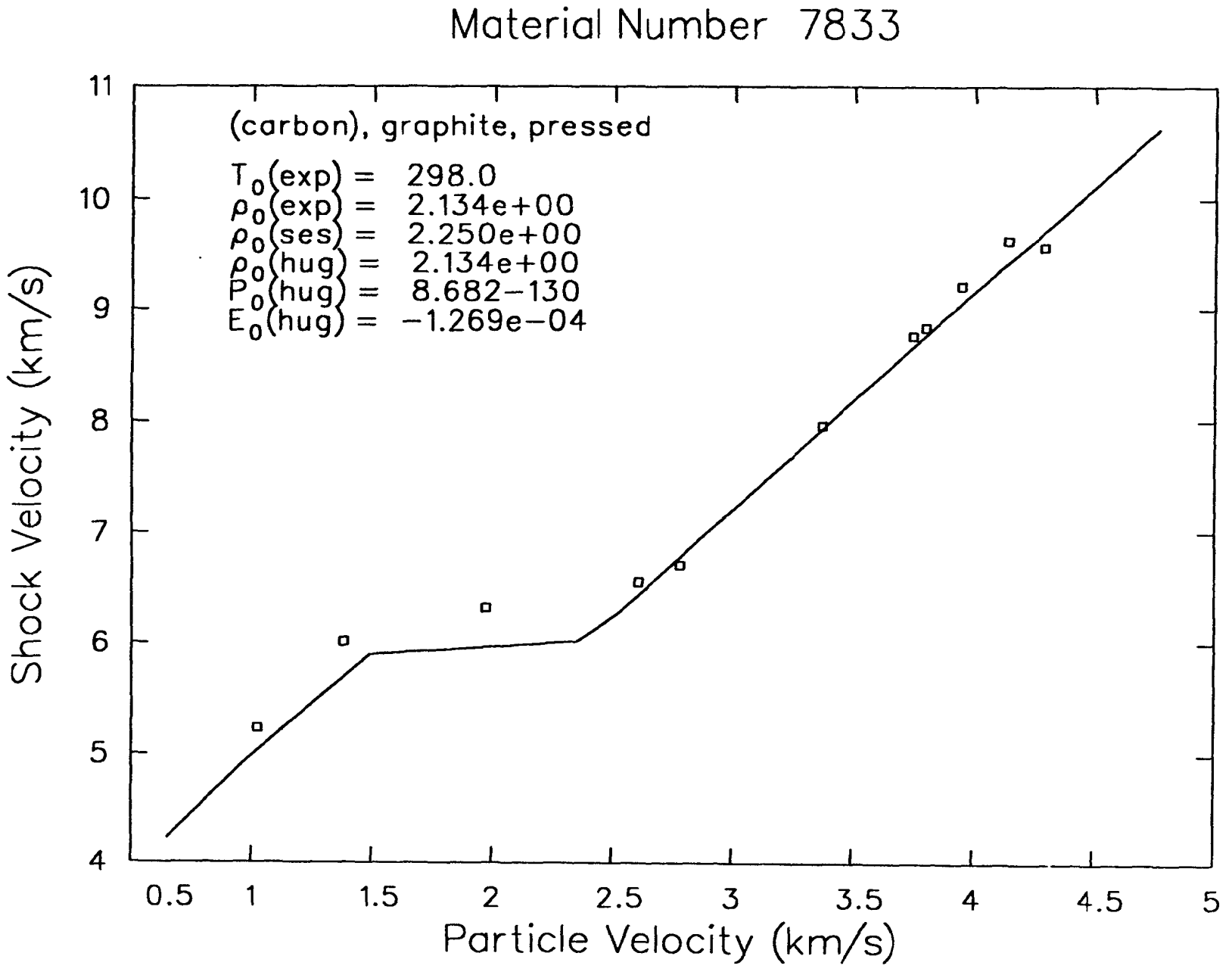


T1 SES2D CRAY 02

7833-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301




Material Number 7833
(carbon), graphite, pressed
T_0(exp) = 298.0
ρ_0(exp) = 2.134e+00
ρ_0(ses) = 2.250e+00
ρ_0(hug) = 2.134e+00
P_0(hug) = 8.682−130
E_0(hug) = −1.269e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
11
10
9
8
7
6
5
4
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

MATERIAL NUMBER	SUMMARY
7930	MATERIAL. SYLGARD (SILICONE RUBBER)

COMP. WT% - C(30.9), H(7.4), SI(37.8), O(23.9). APPROXIMATE FORM ULA - SI(CH3)2O.
ATOMIC NUMBER. 4.2000E+00
ATOMIC MASS. 7.8400E+00
NORMAL DENSITY. 1.0500E+00

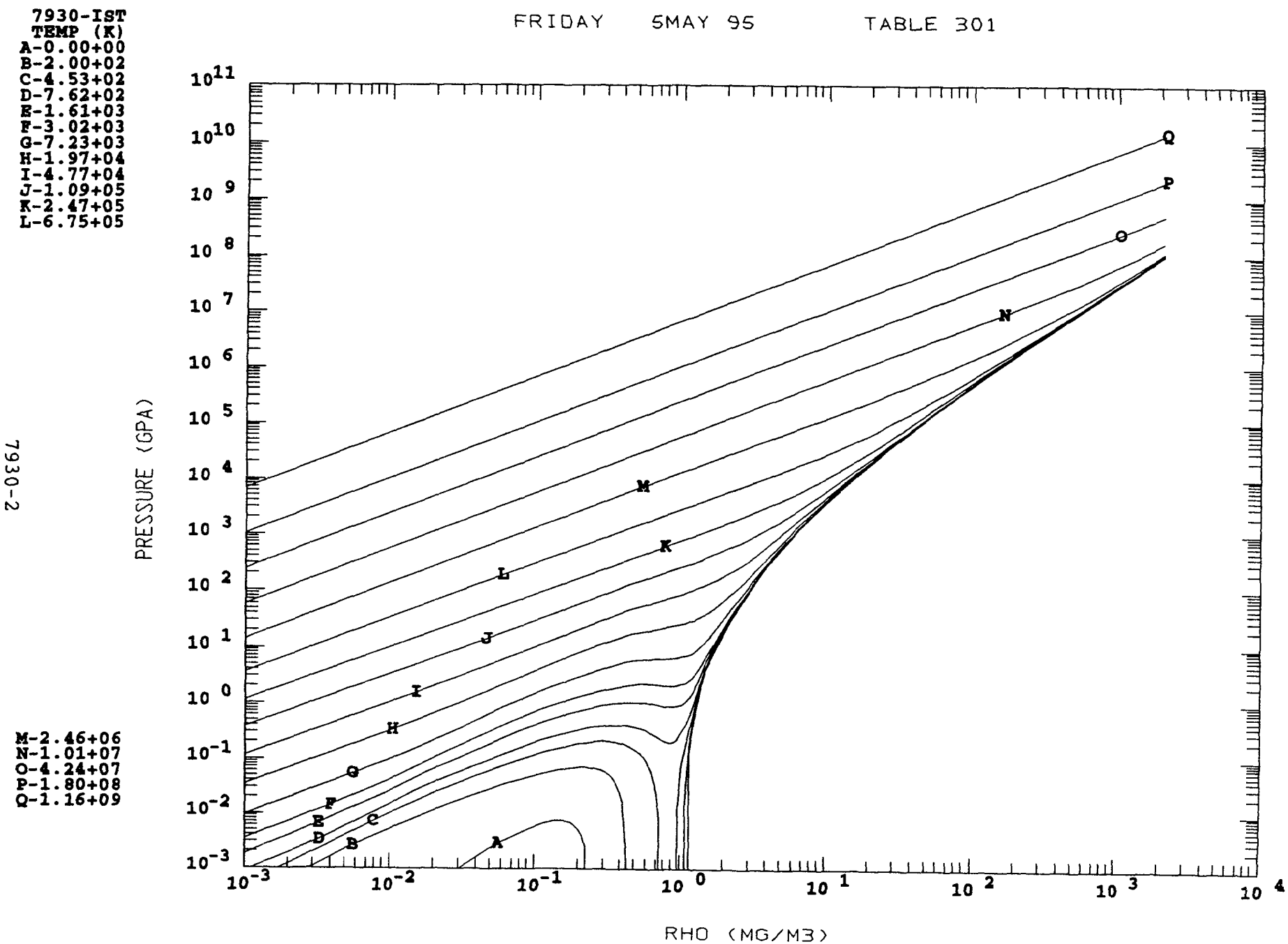
GAMMA(COMPUTED). 0.2068

TABLE SUMMARY.

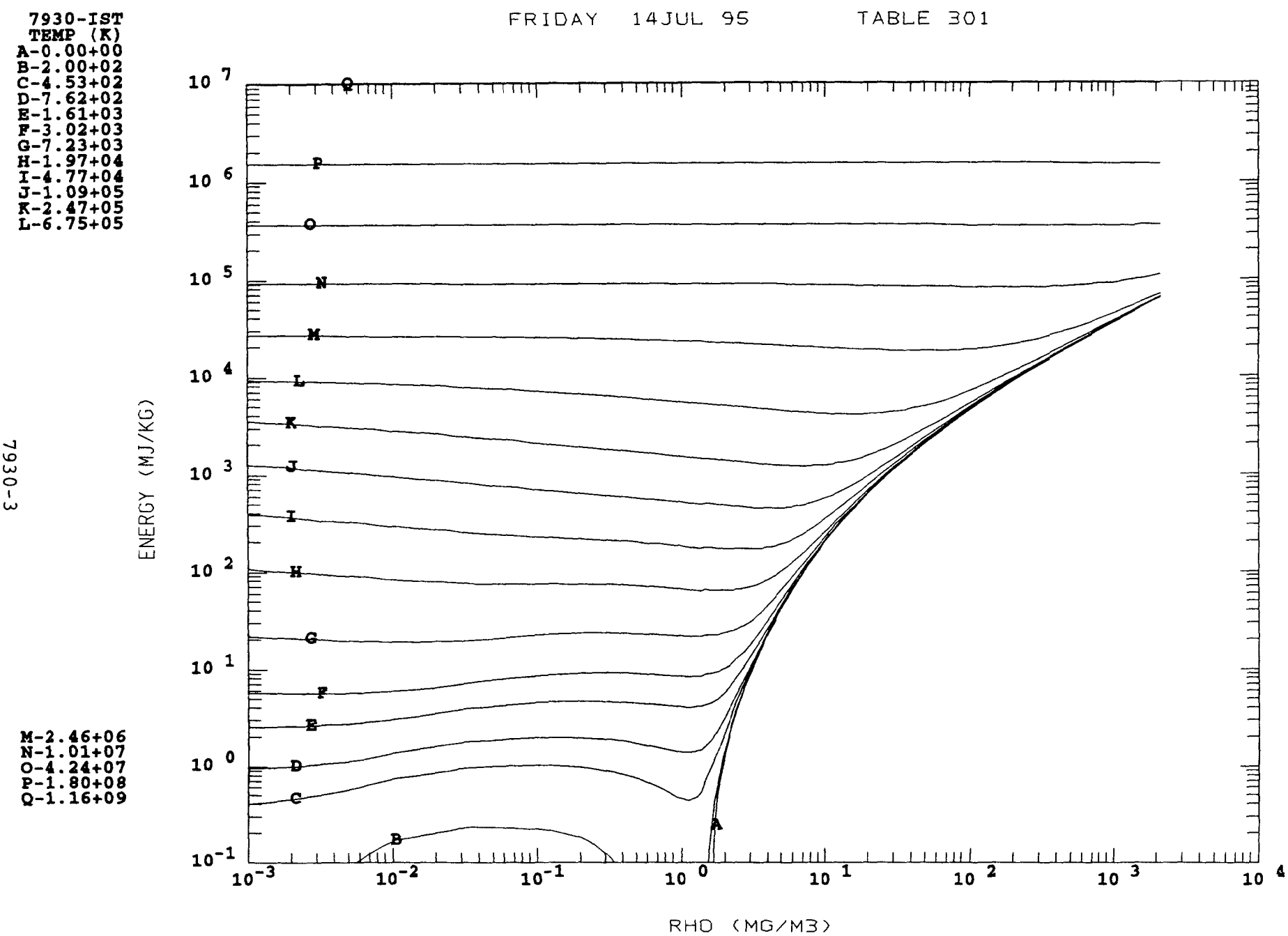
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	27					
201	5					
301	6935	69	33	0.0000E+00	1.0500E-06	2.1000E+03
				0.0000E+00	8.6170E-03	9.9996E+04
304	4990	68	24	1.0500E-06	1.0500E-05	2.1000E+03
				0.0000E+00	2.6000E-01	9.9996E+04
305	6835	68	33	1.0500E-06	1.0500E-05	2.1000E+03
				0.0000E+00	8.6170E-03	9.9996E+04
306	275	68	1	1.0500E-06	1.0500E-05	2.1000E+03
				0.0000E+00	-1.1924E-20	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. MAY 84
VERSION NUMBER. 3
DATE ADDED TO LIBRARY. 43084.
DATE OF LAST UPDATE. 60485.
SOURCE. F. DOWELL
REFS. LA-10164-MS
CODES. GRIZZLY, FIXTB32



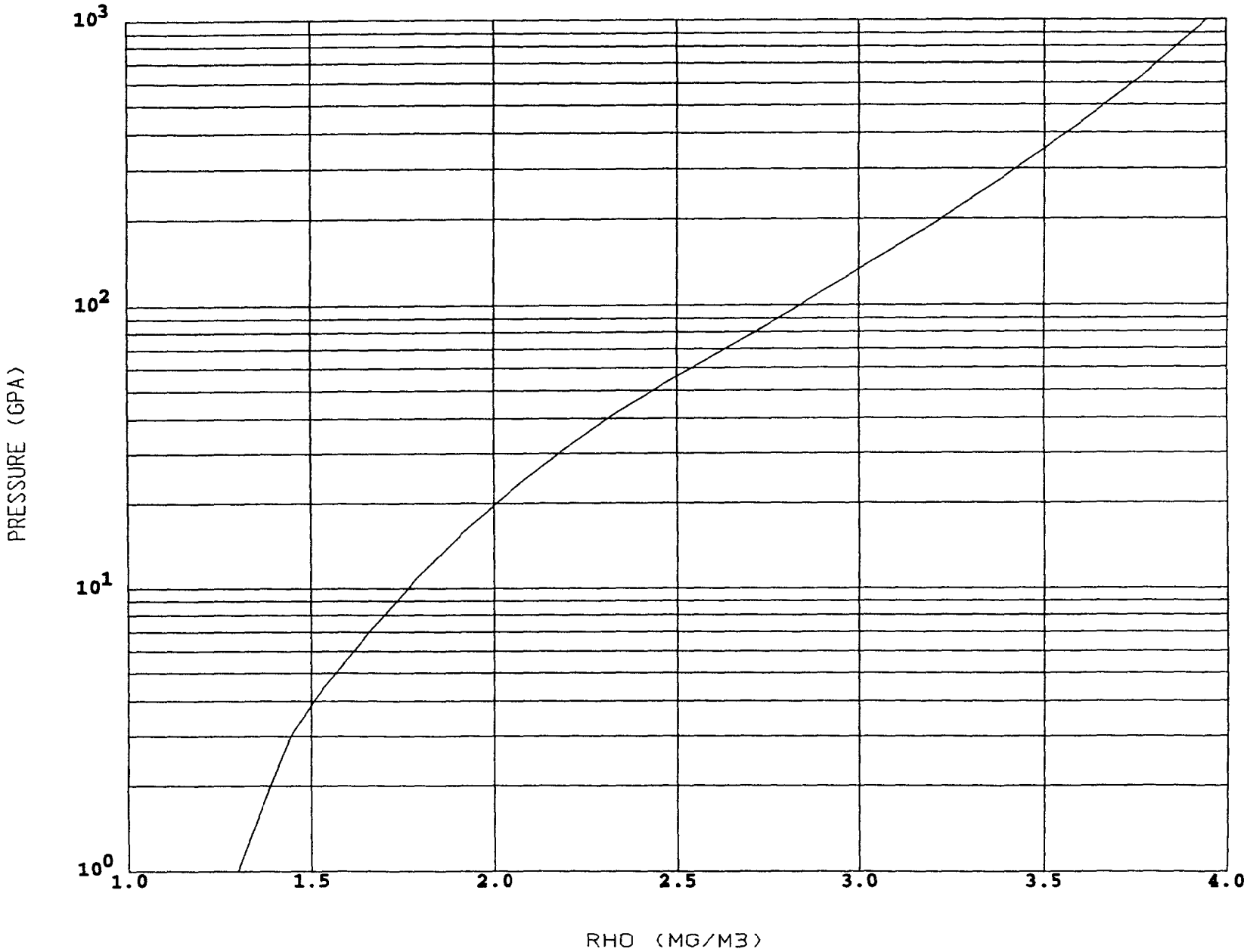
T1 SES2D CRAY



T1 SES2D CRAY 02

7930-HU1
E0 MJ/KG
0.00+00

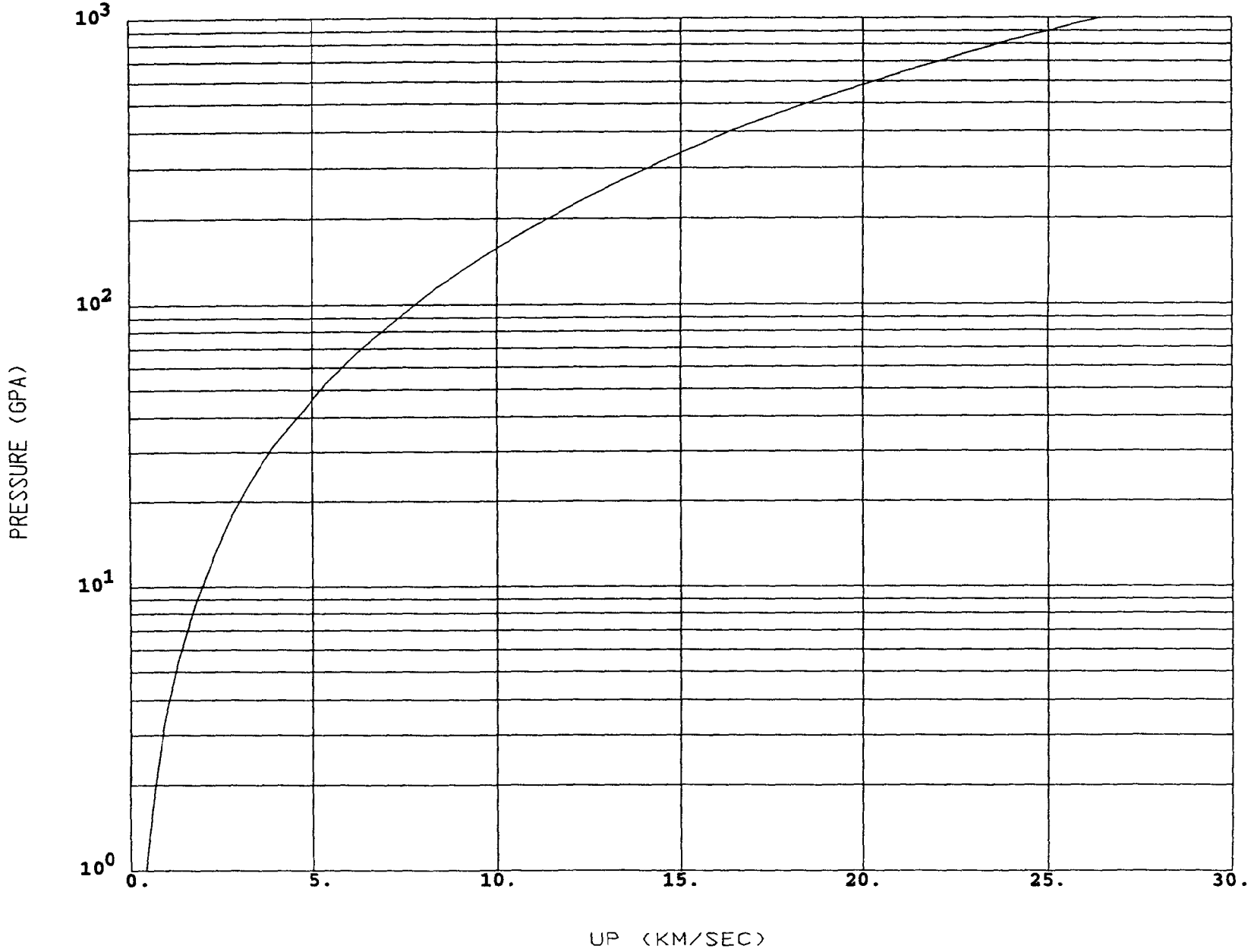
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY

7930-HU1
E0 MJ/KG
0.00+00

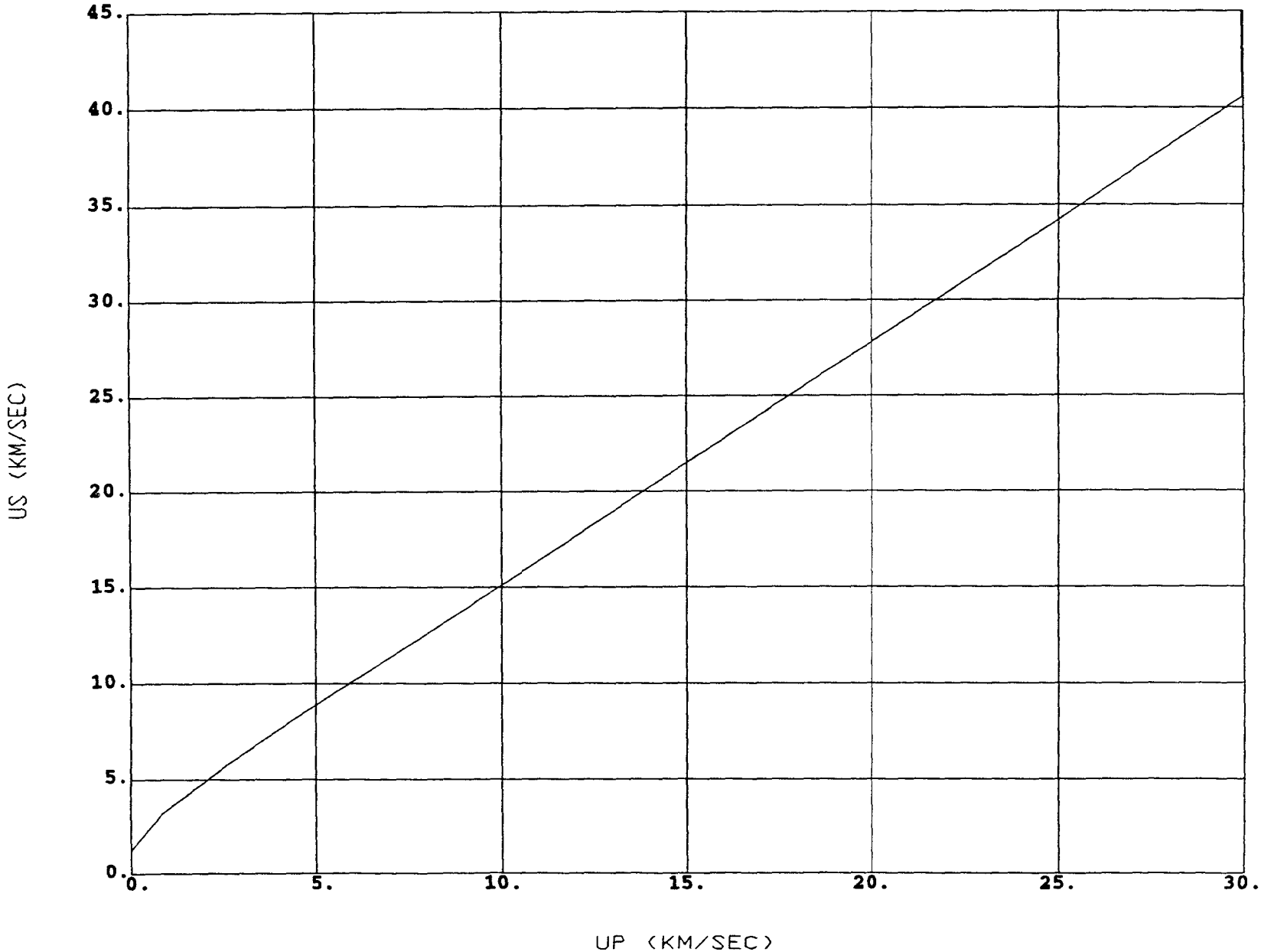
FRIDAY 5MAY 95 TABLE 301



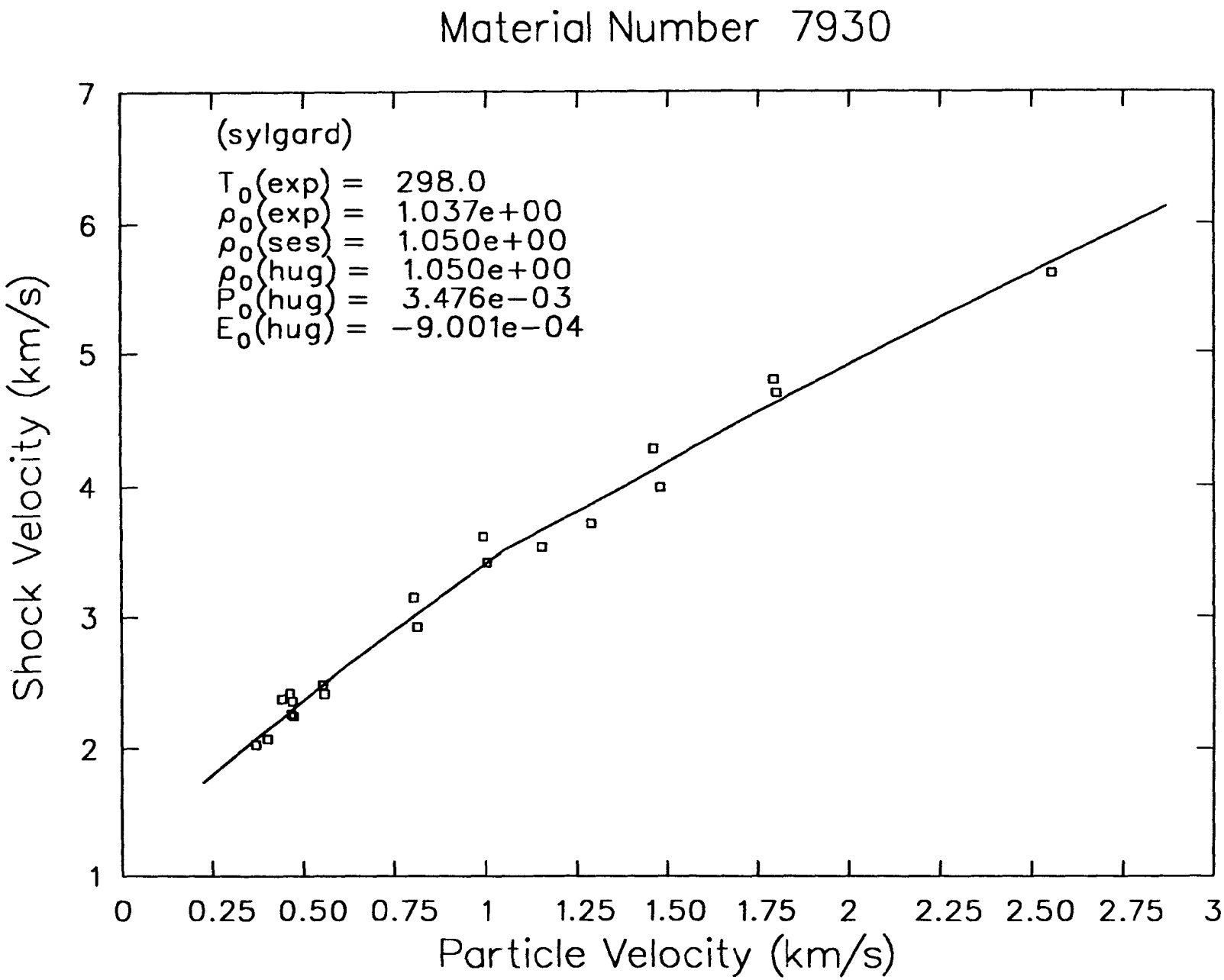
T1 SES2D CRAY 02

7930-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7930
(sylgard)
T_0(exp) = 298.0
ρ_0(exp) = 1.037e+00
ρ_0(ses) = 1.050e+00
ρ_0(hug) = 1.050e+00
P_0(hug) = 3.476e−03
E_0(hug) = −9.001e−04
Shock Velocity (km/s)
Particle Velocity (km/s)
1
2
3
4
5
6
7
0
0.25
0.50
0.75
1
1.25
1.50
1.75
2
2.25
2.50
2.75
3

MATERIAL NUMBER | SUMMARY

7931 MATERIAL. SYLGARD 184 (SILICONE RUBBER)

COMP. WT% - C(30.9), H(7.4), SI(37.8), O(23.9). APPROXIMATE FORM ULA - SI(CH3)2O.
ATOMIC NUMBER. 4.2000E+00
ATOMIC MASS. 7.8400E+00
NORMAL DENSITY. 1.0380E+00

GAMMA(COMPUTED). 1.1386

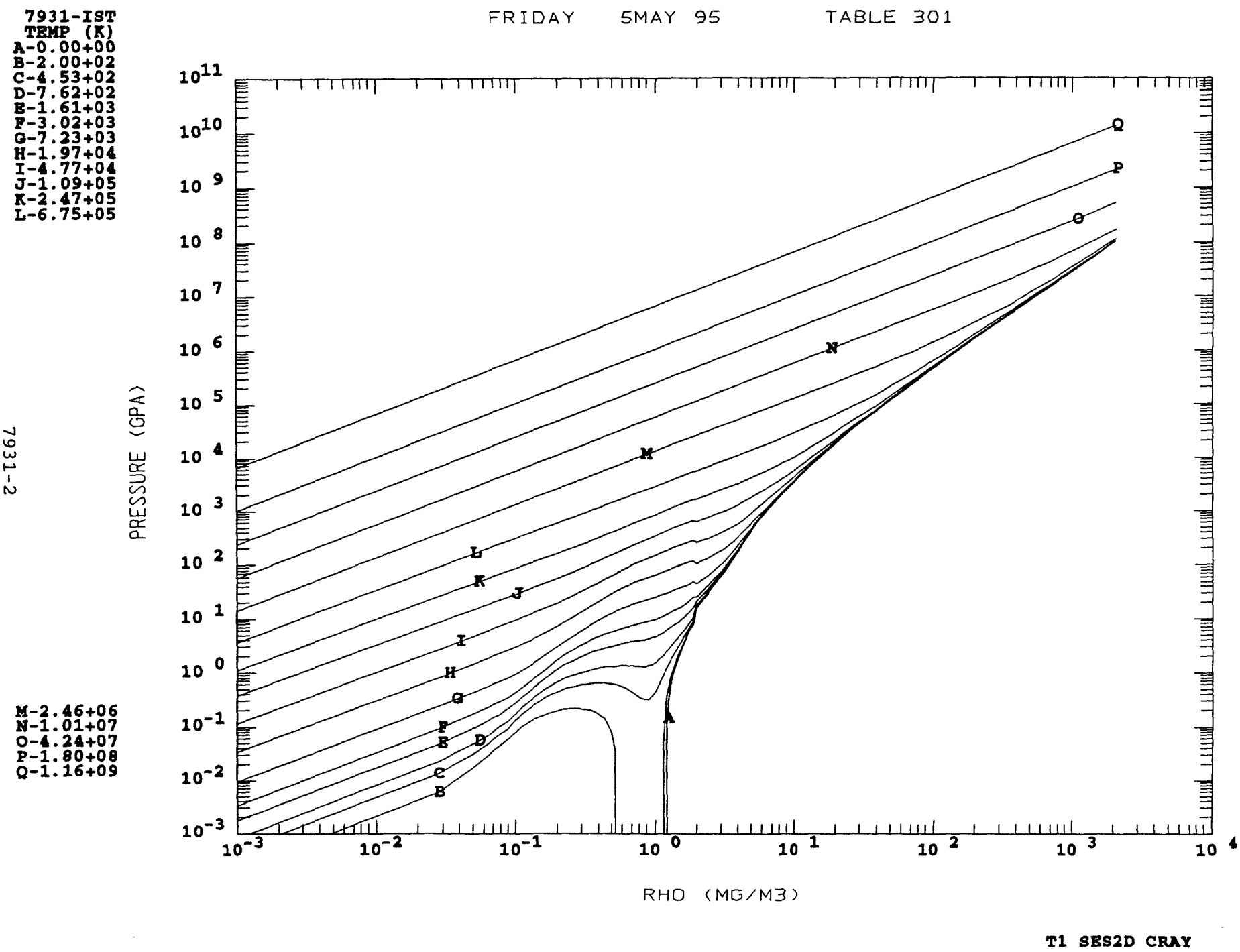
TABLE SUMMARY.

TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	28					
102	10					
201	5					
301	6835	68	33	0.0000E+00	1.0380E-06	2.0760E+03
				0.0000E+00	8.6170E-03	9.9996E+04
304	4990	68	24	1.0500E-06	1.0500E-05	2.1000E+03
				0.0000E+00	2.6000E-01	9.9996E+04
305	6735	67	33	1.0380E-06	1.0380E-05	2.0760E+03
				0.0000E+00	8.6170E-03	9.9996E+04
306	271	67	1	1.0380E-06	1.0380E-05	2.0760E+03
				0.0000E+00	-4.7901E-22	0.0000E+00

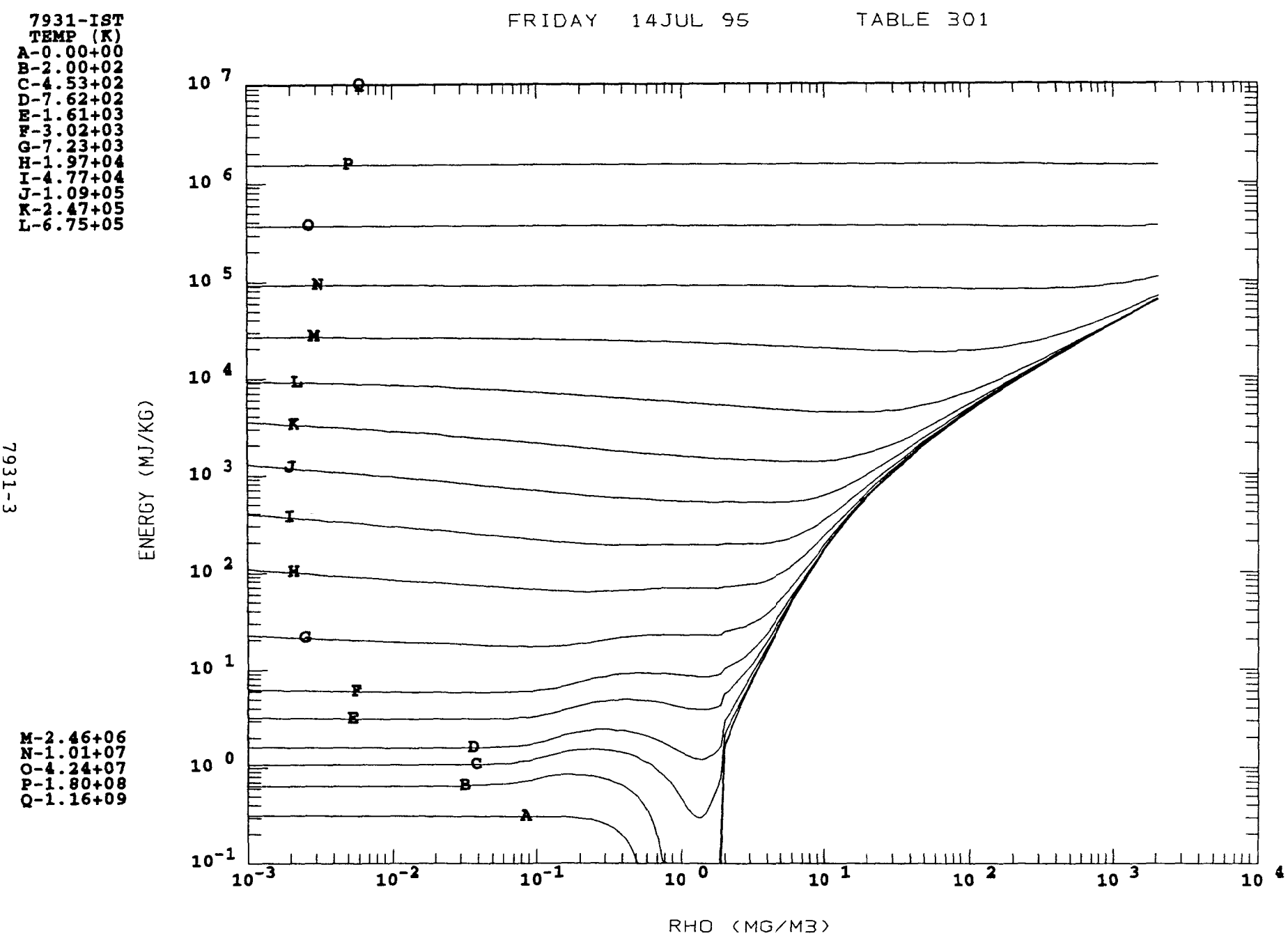
DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

DATE. MAY 85
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 31285.
DATE OF LAST UPDATE. 60485.
SOURCE. F. DOWELL
REFS. LAMS TO BE PUBLISHED
CODES. GRIZZLY, FIXTB32

COMMENTS. SEE LAMS. STRONGLY RECOMMEND USING 7931 FOR SYLGARD 184 RATHER THAN 7930.

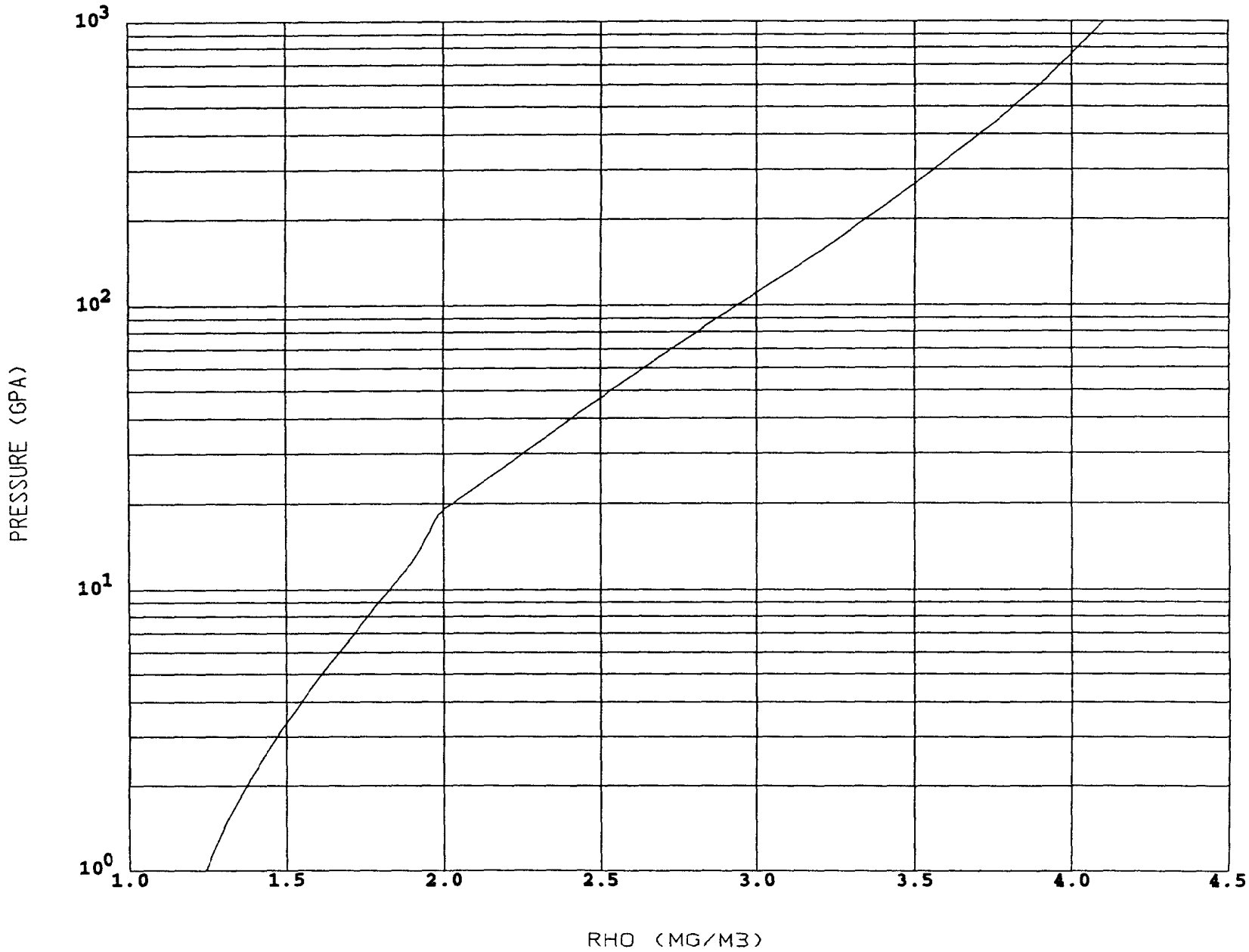

7931-IST
TEMP (K)
A-0.00+00
B-2.00+02
C-4.53+02
D-7.62+02
E-1.61+03
F-3.02+03
G-7.23+03
H-1.97+04
I-4.77+04
J-1.09+05
K-2.47+05
L-6.75+05
M-2.46+06
N-1.01+07
O-4.24+07
P-1.80+08
Q-1.16+09
FRIDAY 5MAY 95
TABLE 301
PRESSURE (GPA)
RHO (MG/M3)
T1 SES2D CRAY

7931-2


7931-IST
TEMP (K)
A-0.00+00
B-2.00+02
C-4.53+02
D-7.62+02
E-1.61+03
F-3.02+03
G-7.23+03
H-1.97+04
I-4.77+04
J-1.09+05
K-2.47+05
L-6.75+05
M-2.46+06
N-1.01+07
O-4.24+07
P-1.80+08
Q-1.16+09
FRIDAY 14JUL 95
TABLE 301
ENERGY (MJ/KG)
RHO (MG/M3)
T1 SES2D CRAY 02

7931-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301

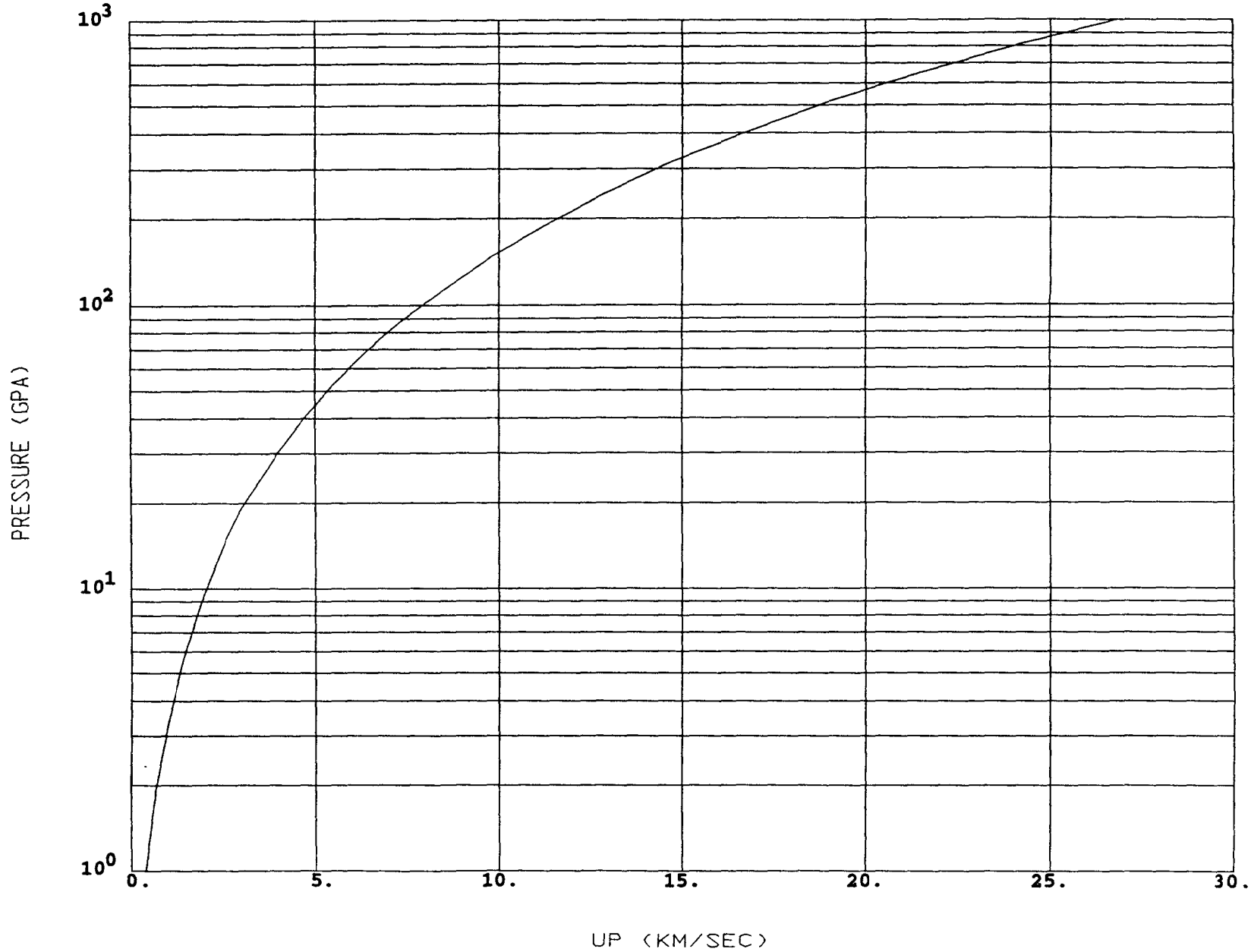


T1 SES2D CRA:

7931-4

7931-HU1
E0 MJ/KG
0.00+00

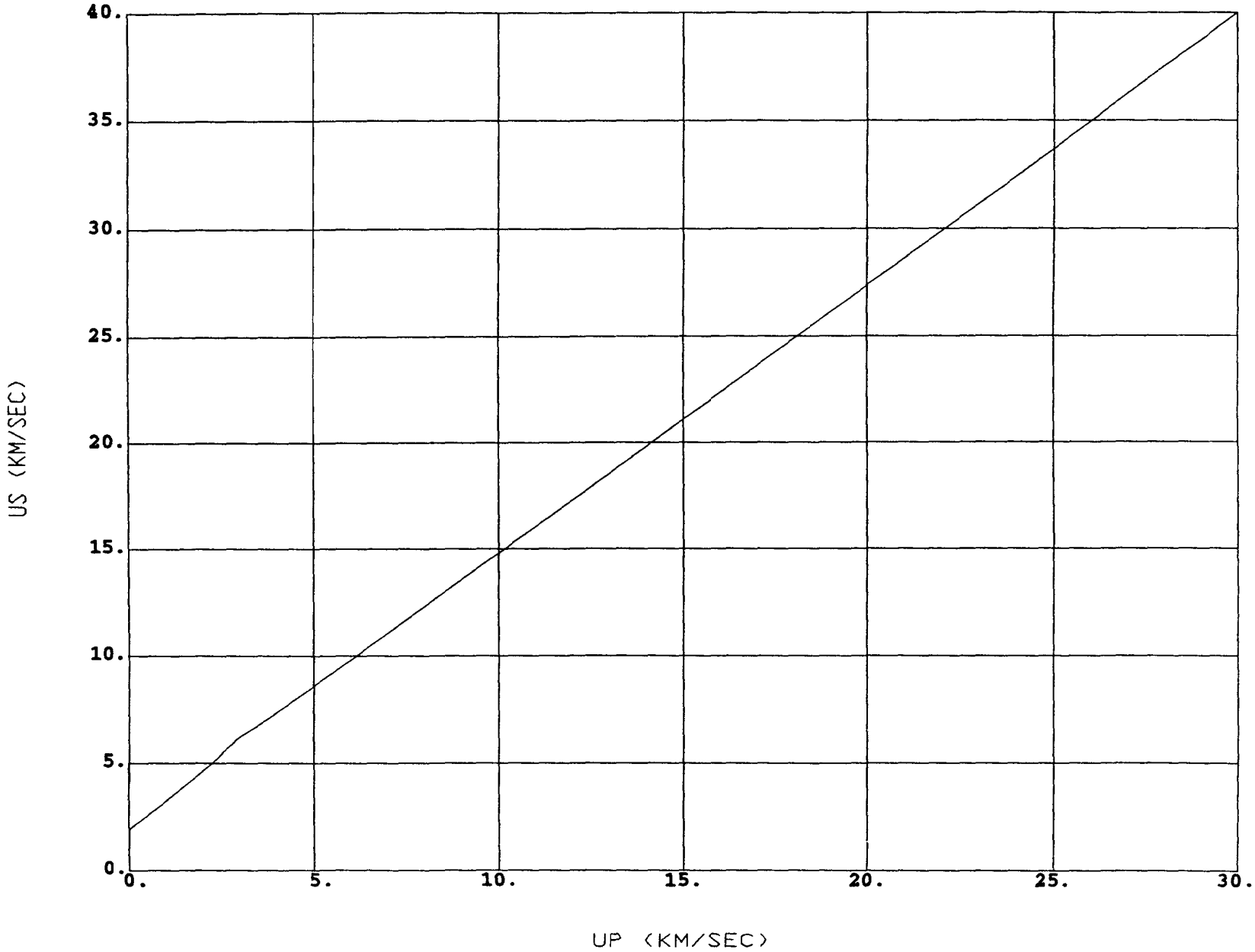
FRIDAY 5MAY 95 TABLE 301



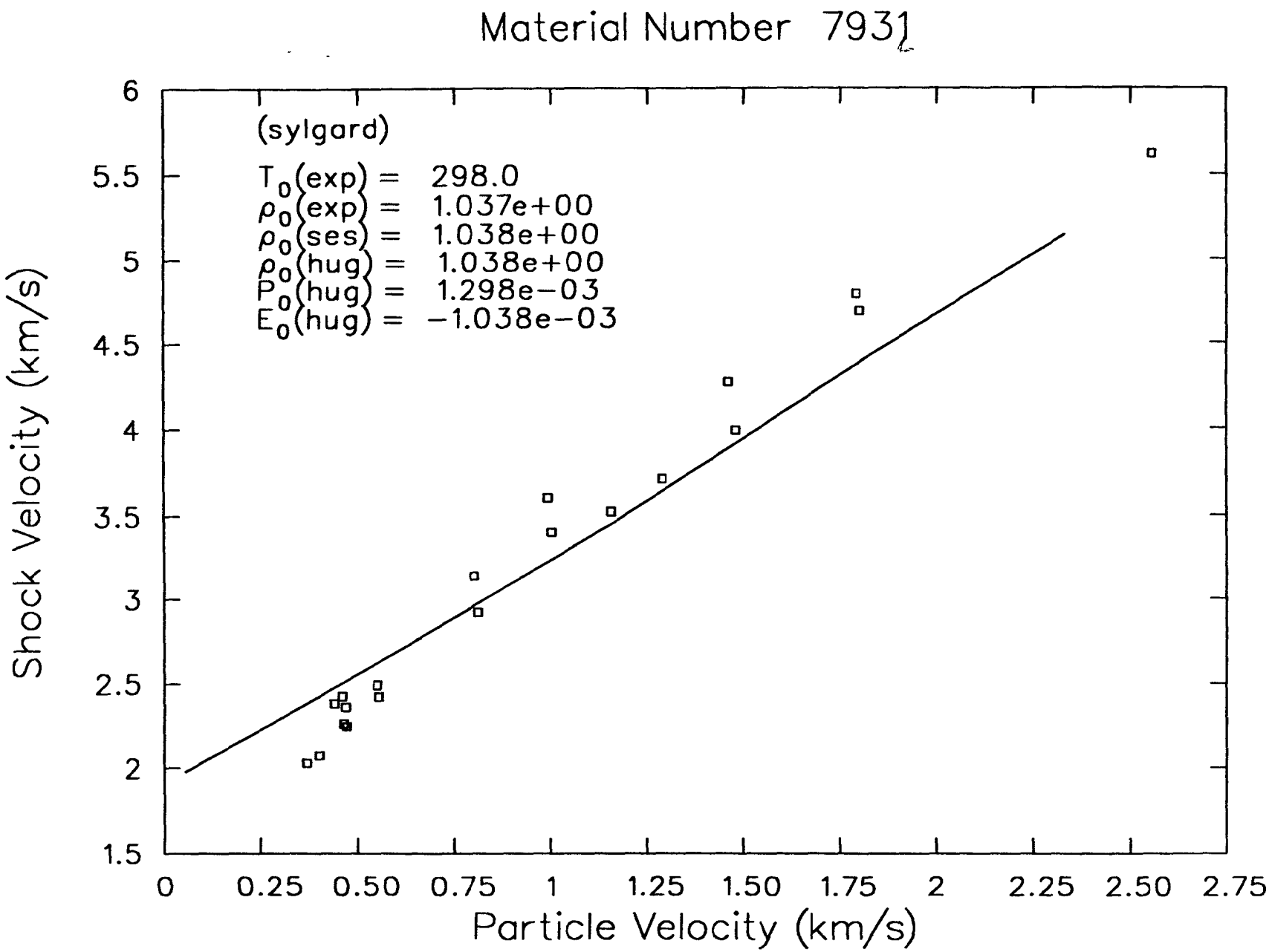
T1 SES2D CRAY 02

7931-HU1
E0 MJ/KG
0.00+00

FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY


Material Number 7931
(sylgard)
T_0(exp) = 298.0
ρ_0(exp) = 1.037e+00
ρ_0(ses) = 1.038e+00
ρ_0(hug) = 1.038e+00
P_0(hug) = 1.298e−03
E_0(hug) = −1.038e−03
Shock Velocity (km/s)
Particle Velocity (km/s)
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
0
0.25
0.50
0.75
1
1.25
1.50
1.75
2
2.25
2.50
2.75

7931-7

MATERIAL NUMBER | SUMMARY

8020 MATERIAL. POLYETHERETHERKETONE (PEEK)

COMP. C19H12O3
ATOMIC NUMBER. 4.4121E+00
ATOMIC MASS. 8.4796E+00
NORMAL DENSITY. 1.3130E+00

GAMMA(COMPUTED). 0.3275

TABLE SUMMARY.

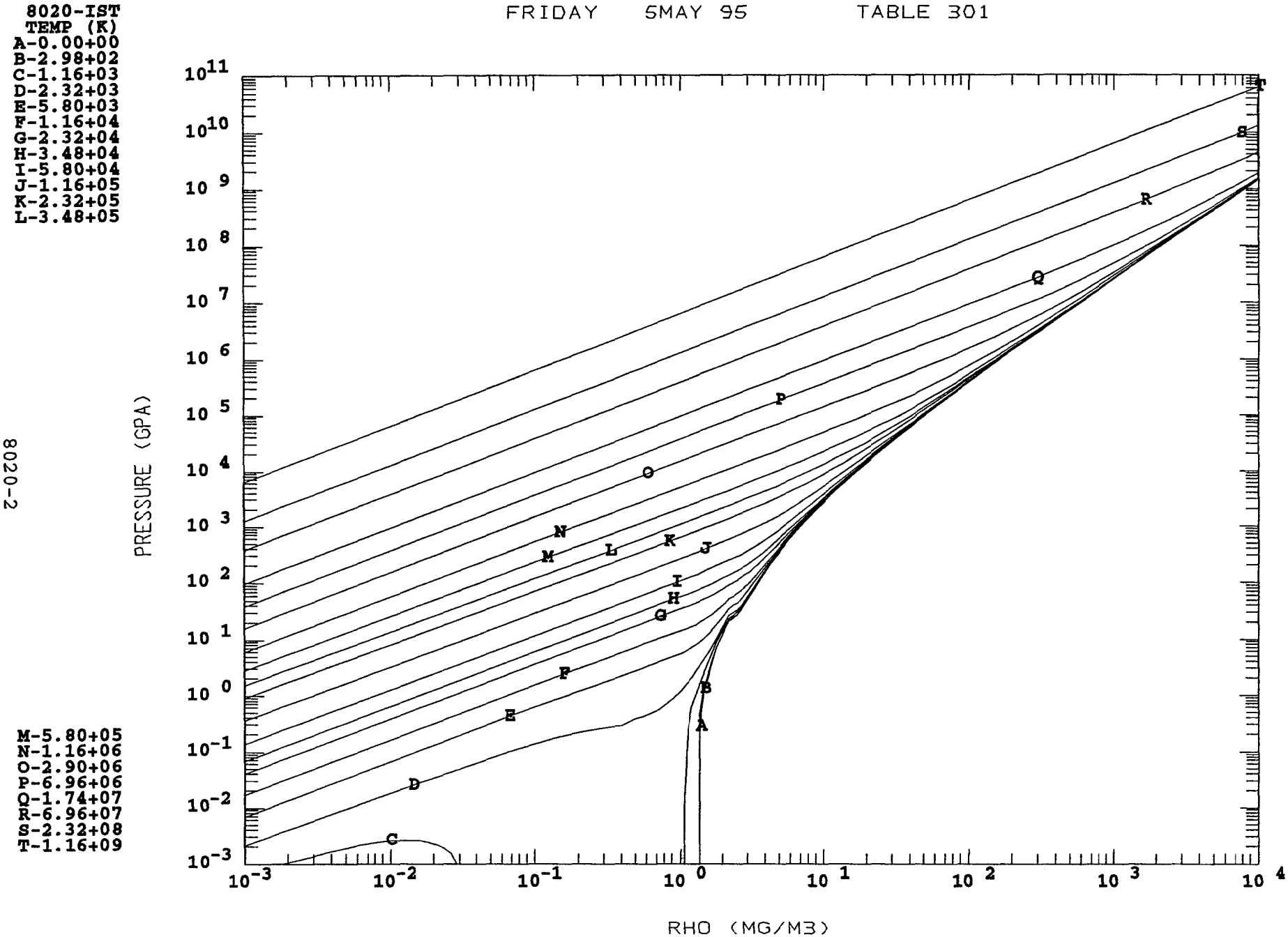
TID	NW	NR	NT	R1/T1	R2/T2	RN/TN
101	20					
102	55					
201	5					
301	8891	75	39	0.0000E+00	1.3130E-06	2.6260E+04
				0.0000E+00	1.2500E-02	9.9999E+04
303	8891	75	39	0.0000E+00	1.3130E-06	2.6260E+04
				0.0000E+00	1.2500E-02	9.9999E+04
304	8773	74	39	0.0000E+00	1.3130E-06	1.3130E+04
				0.0000E+00	1.2500E-02	9.9999E+04
305	8655	73	39	1.3130E-06	2.6260E-06	1.3130E+04
				0.0000E+00	1.2500E-02	9.9999E+04
306	295	73	1	1.3130E-06	2.6260E-06	1.3130E+04
				0.0000E+00	-2.8735E-11	0.0000E+00

DENSITY IN GM/CC
TEMPERATURE IN ELECTRON VOLTS

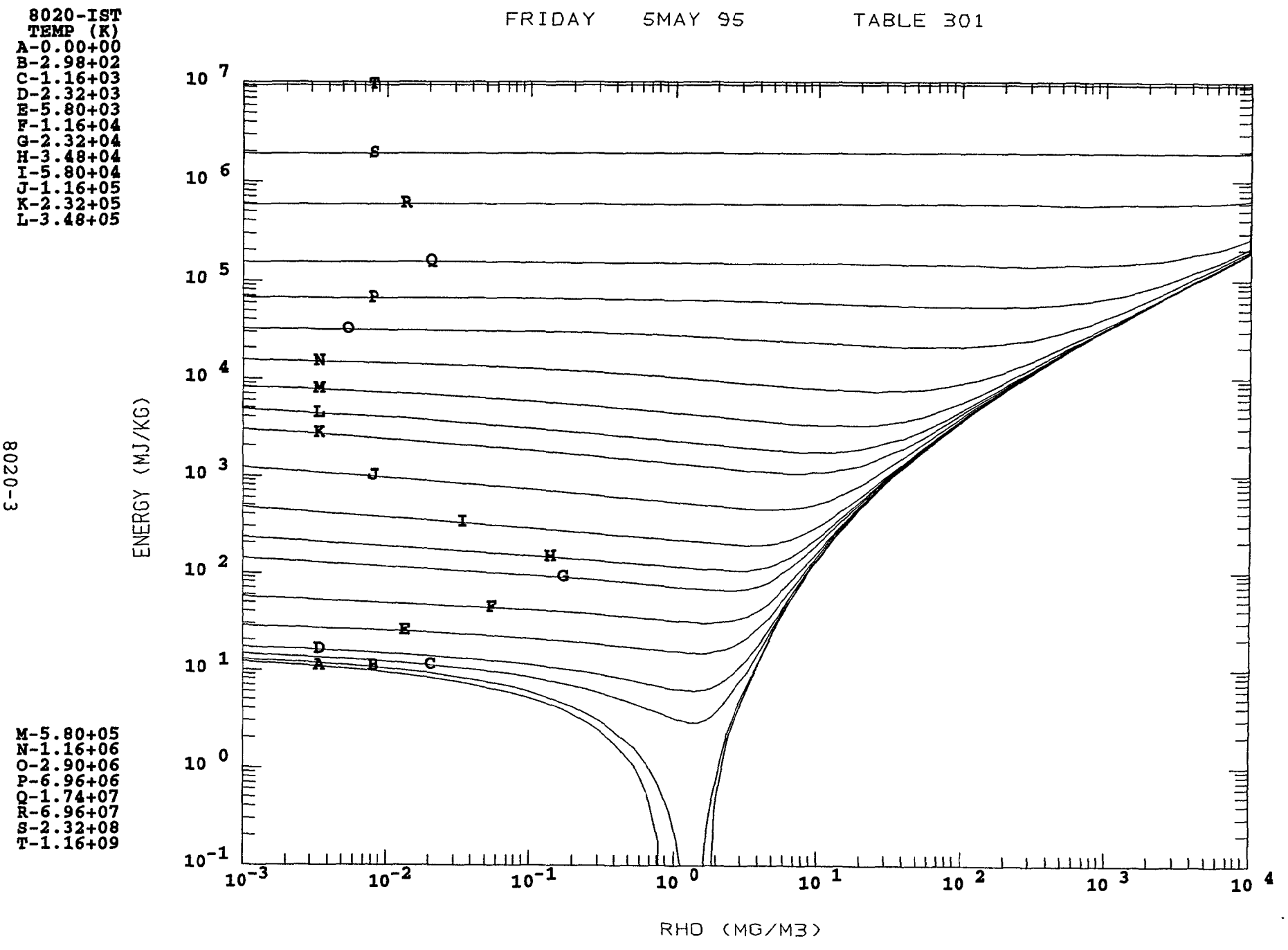
DATE. SEPT 93
VERSION NUMBER. 1
DATE ADDED TO LIBRARY. 51493.
DATE OF LAST UPDATE. 91093.
SOURCE. J. BOETTGER
REFS. LAMS IN PREPARATION
CODES. GRIZZLY

COMMENTS. MIXED TDF WAS USED FOR THE ELECTRONIC TABLE AND THE LARGE COMPRESSION COLD CURVE. THE NUCLEAR MODEL WAS JDJNUC WITH IGRUN = 7, GAMREF = 0.33, GAMINF = 0.66667, GAMZERO = 0.66667, DGAMMA = -0.05, AND TMELT = 630 KELVIN. THE COLD CURVE WAS OBTAINED WITH THE CHUG MODEL USING CMAT = 2.0, ECOH = 35 KCAL PER MOLE AND FACLJ = 0.2. THE HUGONIOT WAS SPECIFIED BY 5 (US,UP) PAIRS; (0.0,2.3), (1.21,4.447), (2.69,6.517), (3.35,6.758), (5.00,9.018).

FRIDAY 5MAY 95 TABLE 301



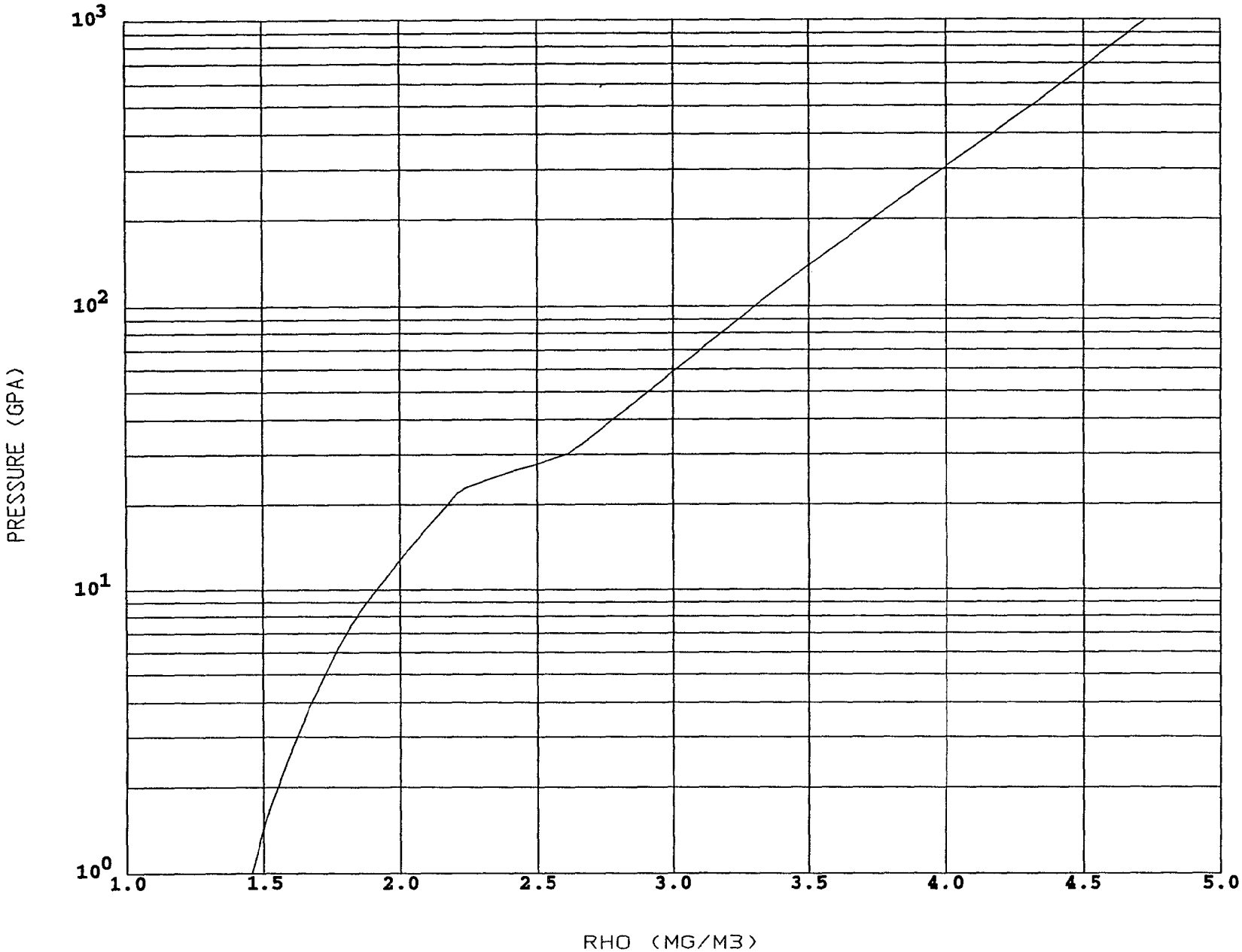
T1 SES2D CRAY 02



T1 SES2D CRAY 02

8020-HU1
E0 MJ/KG
0.00+00

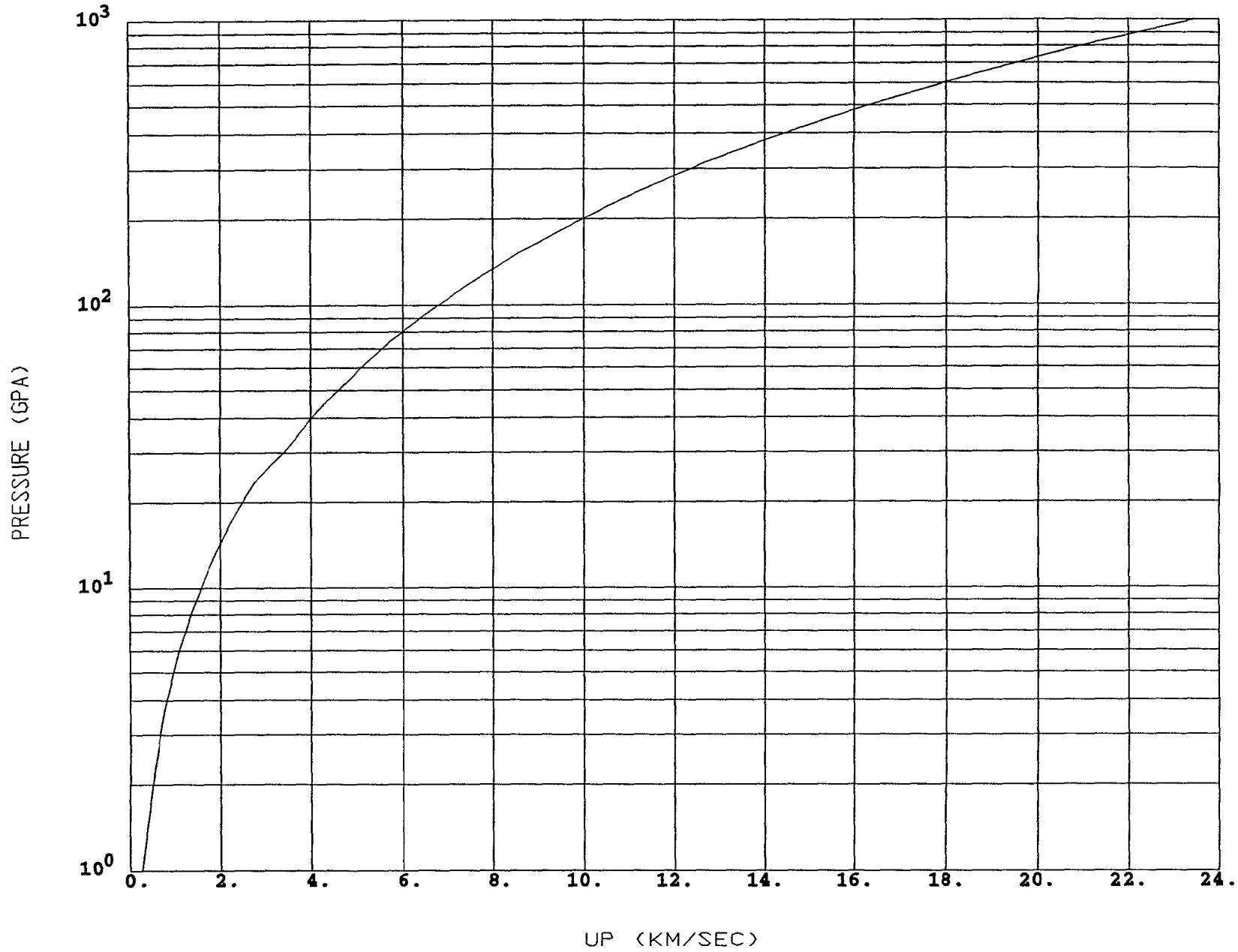
FRIDAY 5MAY 95 TABLE 301



T1 SES2D CRAY 02

8020-HU1
E0 MJ/KG
0.00+00

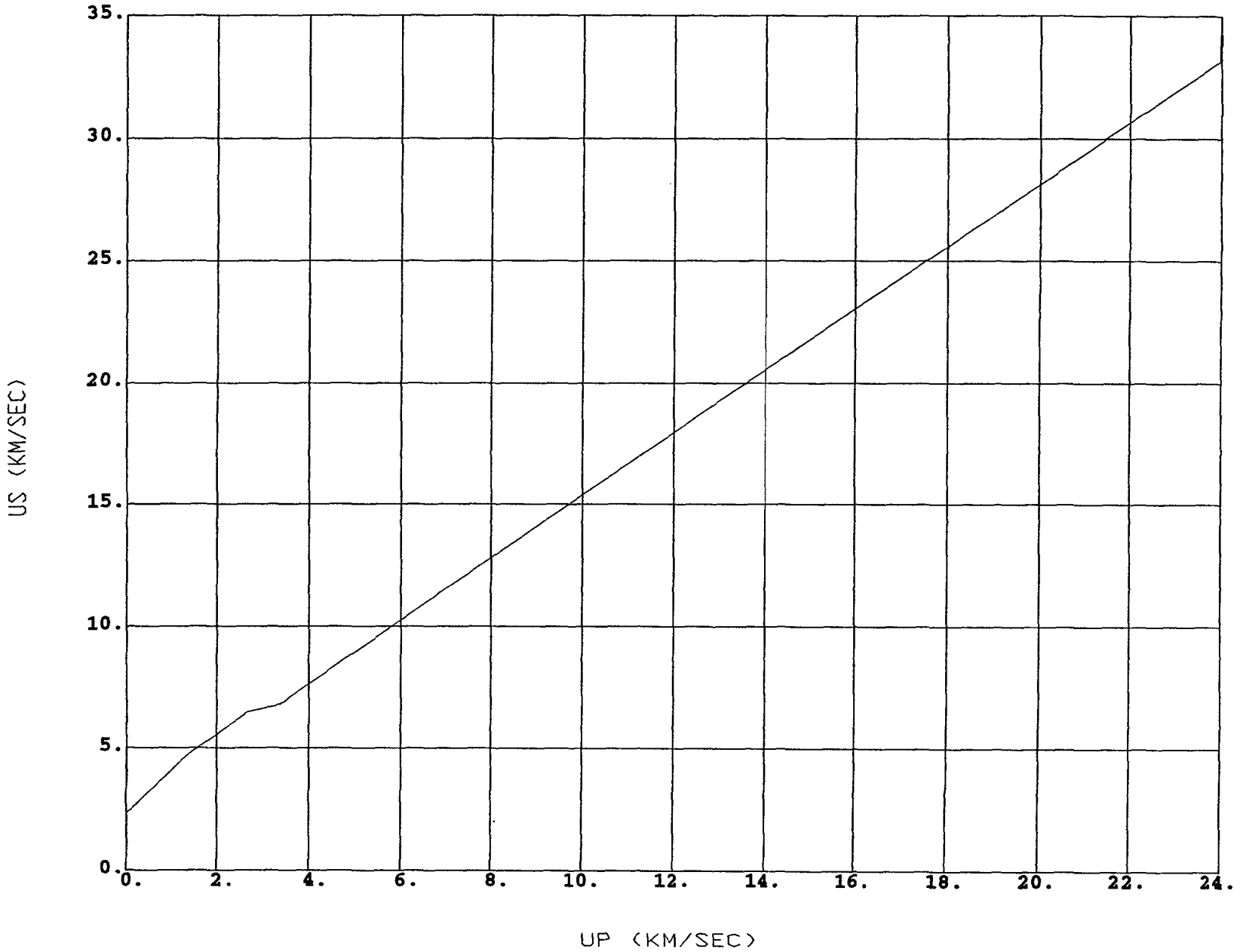
FRIDAY 14JUL 95 TABLE 301



T1 SES2D CRAY 02

8020-HU1
E0 MJ/KG
0.00+00

FRIDAY 14JUL 95 TABLE 301



T1 SES2D CRAY 02