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RTR 014-7

SPT

SPACE SHUTTLE
MAIN ENGINE PLUME
RADIATION MODEL

Prepared by
John E. Reardon
Young C. Lee

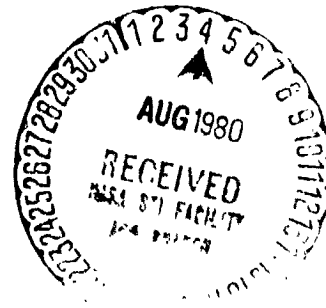


December 1978

Prepared Under Contract NAS8-29270

for

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
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FOREWORD

This report was prepared under Contract NAS8-29270 for the NASA Marshall Space Flight Center, and it represents a partial fulfillment of the requirements of that contract. The work was conducted under the technical cognizant of Dr. Terry Greenwood and Mr. David Seymour of NASA/MSFC and it was performed in cooperation with B. Audeh, R. E. Carter, and S. Smith of LMSC-HR&C.

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Section 1
INTRODUCTION

The base region of the Space Shuttle Orbiter receives significant thermal radiation from the plumes of the Space Shuttle Main Engines (SSME). This report describes the methods used in predicting this radiation and some of the results obtained for use as a portion of the 1978 thermal environment update. The complete base thermal radiation environment is presented in Refs. 1-4.

The procedure followed is similar to that described in Ref. 5 for the 1976 environment, but the plume property models have been improved. The method uses plume property data at four altitudes with the NASA/MSFC gaseous plume radiation program (GASRAD) to predict radiation to representative surface locations in the base region. These predictions are used to develop (1) a sea level plume radiation model using a number of geometric surfaces with specified emissive powers and (2) an altitude adjustment procedure to be used to adjust the sea level radiation predictions to the proper altitude value. The plume model is used with a radiation view factor (RAVFAC) program to predict sea level radiation at all the specified body points in the base region of the orbiter, external tank (ET), and solid rocket boosters (SRB). These RAVFAC results are reviewed for consistency in comparison with expected trends and available GASRAD results, and they are adjusted based on the comparative GASRAD values when it appears that the RAVFAC plume model has given erroneous results. The resulting corrected sea level predictions are then published along with altitude adjustment factors in the thermal radiation environment for the SSME plumes.

Radiation for the SRB plumes is predicted separately using RAVFAC models

at several altitudes developed in Ref. 6. No interaction between the SRB and SSME plumes is considered during development of the RAVFAC models, but opaque surfaces of the plume models do cause shading of other plumes in the RAVFAC predictions. An evaluation of the radiation potential of the SRB/SSME plume interaction region indicated it was not a significant radiation source. The evaluation and estimates of recirculating gas radiation are discussed along with the SSME plume predictions in Sections 2 and 3.

The procedure of using the RAVFAC program has been used primarily to reduce required computer time since it is much faster than the GASRAD program. Although a significant amount of time is required to prepare the RAVFAC plume model and provide GASRAD predictions to check and adjust the RAVFAC results, an overall time saving can be realized when computing radiation to the several hundred points required for the base region environment of the orbiter, ET, and SRB.

The plume predictions and some of the RAVFAC results presented here were not part of this work, but are taken from Refs. 1 thru 4 and 7 thru 9. The plume properties in the form used as input to the GASRAD program are presented in this report along with a brief review of the methods used for the plume predictions to provide sufficient data to substantiate the results. The report also contains a brief description of the GASRAD program used and the predictions obtained, the RAVFAC plume model development, and a discussion of the recommended method of computing the contribution of the SSME plumes to the Space Shuttle base thermal environment.

Section 2

SSME PLUME DESCRIPTION

Two methods were used for plume predictions. The low altitude predictions (0, 20, and 40 kft) considered the atmospheric mixing and resulting combustion with the fuel rich plumes, but each plume was treated as an individual axisymmetric plume with no interaction with the adjacent plumes. The high altitude prediction for vacuum conditions had no free stream effects considered, but did account for the interaction between adjacent engines with approximations for the complex shock structure. Complete listings of the plume properties used are in the Appendix.

2.1 LOW ALTITUDE PREDICTIONS

The low altitude plume property predictions were taken from Refs. 7-9. The viscous mixing analysis used a turbulent kinetic energy model, and the calculation was performed using the LAMP program (Ref. 10). Finite rate chemistry was used for the mixing analysis in all cases. The properties in the inviscid portions of the plume were predicted using a method-of-characteristics (MOC) program (Ref. 11). The mixing model was run starting with constant velocity and pressure for the engine flow, and a free-stream velocity of 250 ft/sec was used at all altitudes to represent the low velocity in the base region. The pressure and velocity of the plume for the mixing model were taken to be the exit wall boundary conditions predicted by the MOC program. The results of the mixing model and MOC engine plume were matched by hand. The Mach disk was located in the sea level plume based on photographs of test firings and in the 20 kft plume using the triple-point matching criteria.

The SSME engine arrangement shown in Fig. 2.1 shows the relatively tight spacing of the engines, particularly engines 2 and 3. This close spacing between the plumes will cause plume interference, but this was neglected in developing the low altitude plumes since there were no procedures to predict the interference and nonsymmetric mixing process. The interference between plumes is expected to impede the mixing process so that the assumption of no interference would be conservative for mixing effects, and over the altitude range considered, there should be no significant compression due to inviscid flow effects.

Isotherms for the plume predictions are illustrated in Figs. 2.2 and 2.3 and tabulated in the Appendix. The plumes are described as "revised" to distinguish them from the TKE plumes used in the 1976 prediction (Ref. 5). The sea level plume has a very high temperature region caused by a Mach disk at 52 inches. The predicted Mach disk at 20 kft occurs at 135 inches, but is too small for the maximum temperature to be shown in Fig. 2. At 40 kft, the Mach disk is absent, but the compression region on the center line has an initial peak at 160 inches.

The current low altitude SSME plumes have high temperature mixing regions which grow more slowly initially than those used in the previous environment (Ref.5), but the high temperature compression region following the Mach disk in the sea level plume persists farther downstream. The combined effect in the sea level plume produces radiation which is 1 to 20 percent lower than the previous plume model at representative base points shown in Table 2.1. At the two higher altitudes where the mixing layer is the predominate radiation source, the reductions for the new plume model are greater, ranging from 21 to 47 percent.

2.2 VACUUM PLUME

The vacuum plume was the same one used in Ref. 5 except that it was revised

100 inch diameter cylinders to illustrate relative plume positions

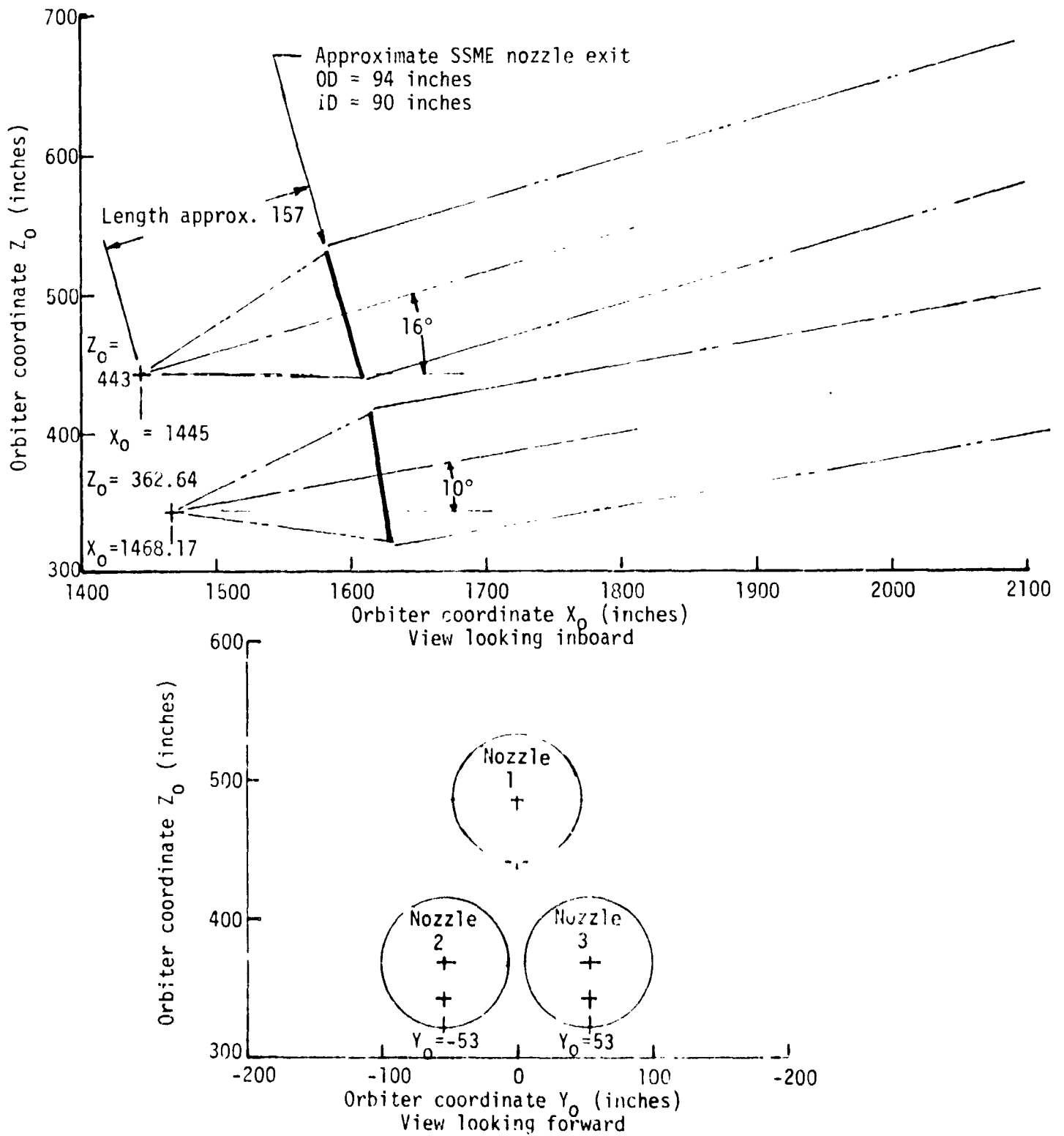


Fig. 2.1 SSME flight null engine arrangement

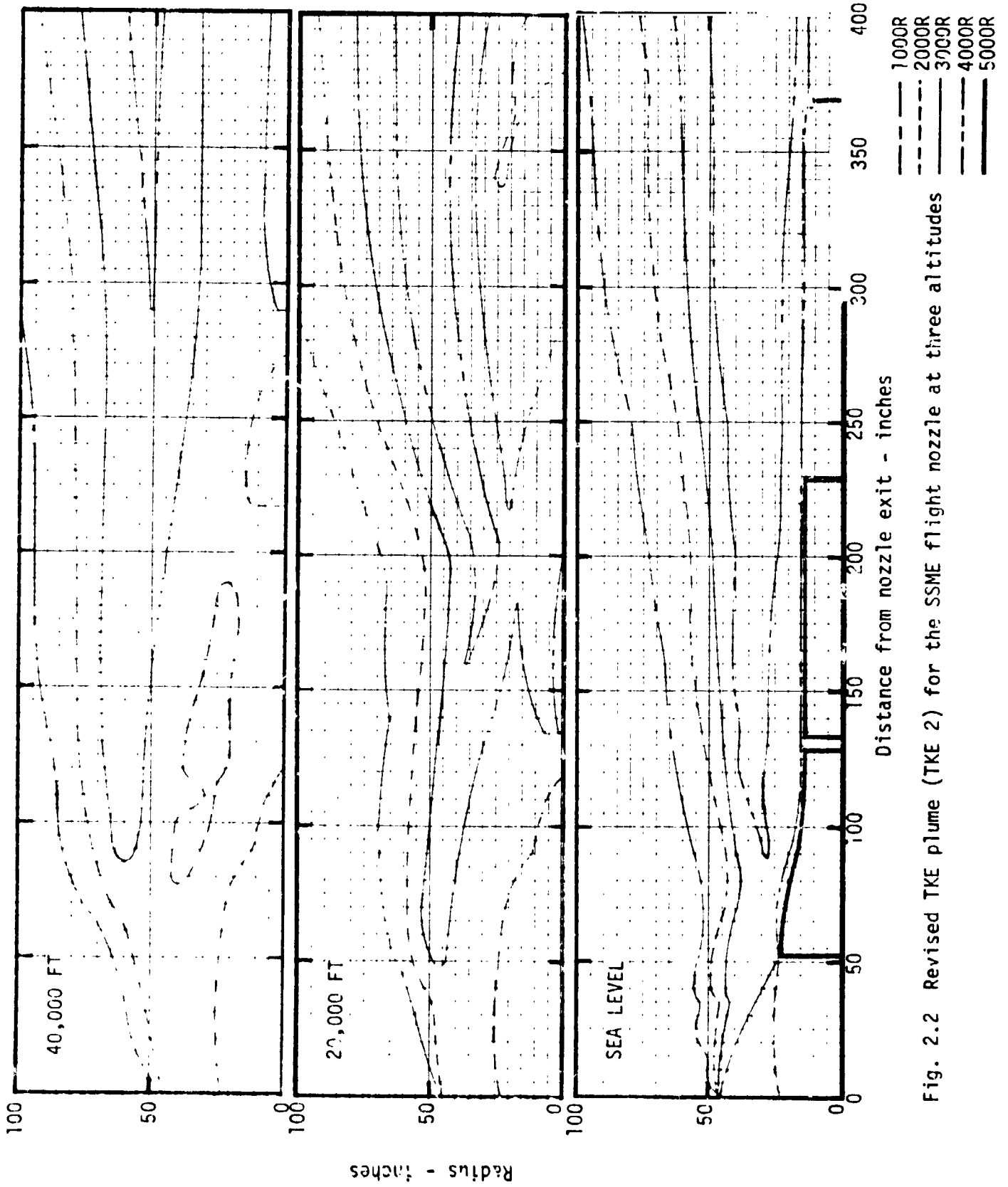


Fig. 2.2 Revised TKE plume (TKE 2) for the SSME flight nozzle at three altitudes

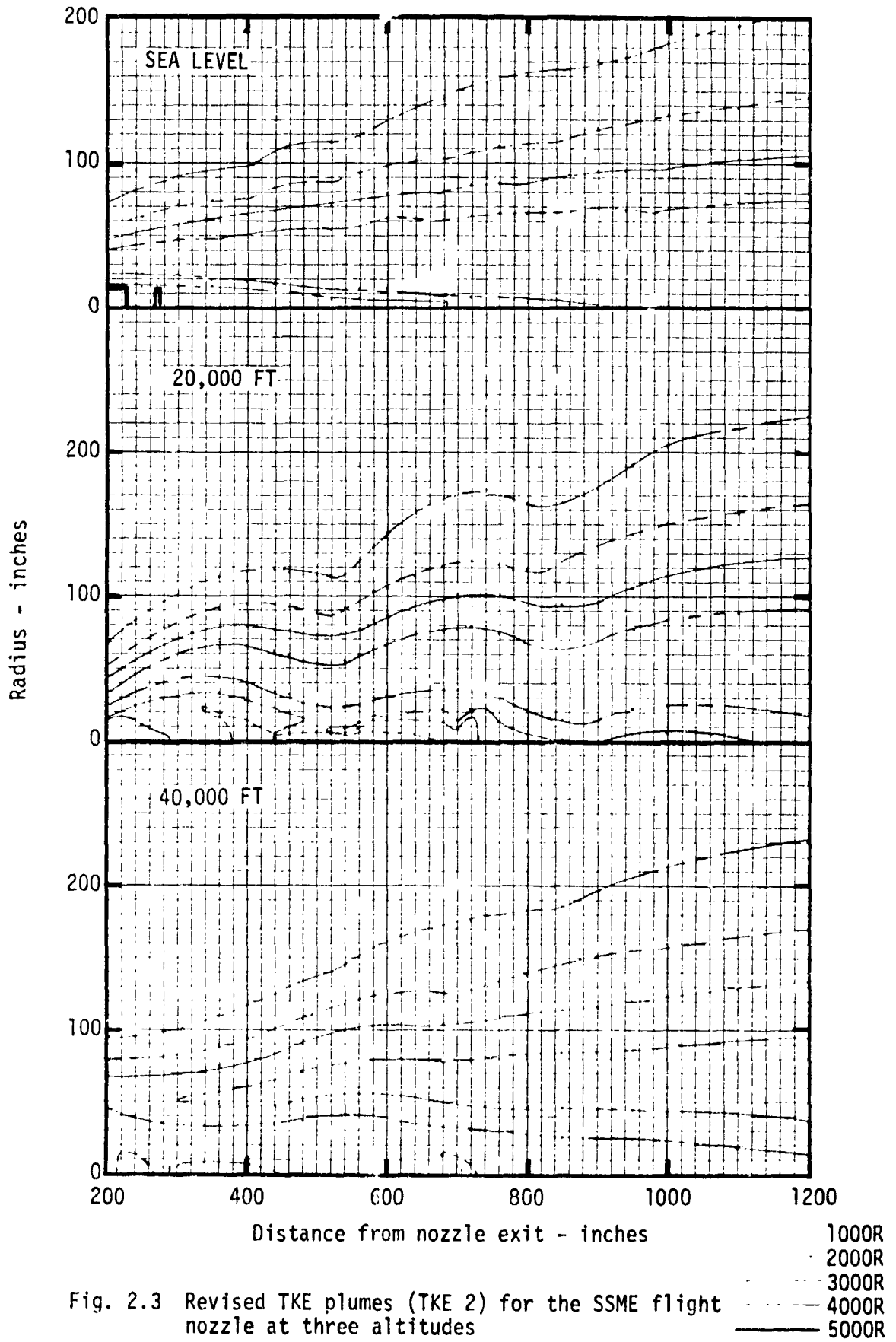


Fig. 2.3 Revised TKE plumes (TKE 2) for the SSME flight nozzle at three altitudes

TABLE 2.1

COMPARISON OF RADIATION PREDICTIONS FOR
THE 1976 (TKE1) AND 1978 (TKE2) PLUME MODELS

Location	RI Point No.	Incident radiation - Btu/ft ² -sec (ratio to TKE1)					
		Sea Level		20 kft		40 kft	
		TKE 1	TKE 2	TKE 1	TKE 2	TKE 1	TKE 2
Orbiter heat shield ctr	905	2.80	2.35 (0.84)	3.14	2.03 (0.65)	1.79	1.26 (0.70)
RCS Pod aft surface	837	13.1	12.1 (0.92)	8.60	5.87 (0.68)	4.15	3.05 (0.73)
Body Flap upr ctr TE	233	12.7	11.6 (0.91)	6.53	3.99 (0.61)	2.84	1.89 (0.67)
Fin TE 40° span	640	14.2	13.2 (0.93)	9.67	6.71 (0.69)	5.00	3.61 (0.72)
SSME 1 lip - aft	7580	29.8	25.7 (0.86)	15.7	9.61 (0.61)	6.76	5.03 (0.74)
- top	7480	11.2	10.7 (0.96)	6.20	3.26 (0.53)	2.36	1.45 (0.61)
ET base center	8000	2.88	2.84 (0.99)	2.52	1.88 (0.75)	1.35	1.06 (0.79)

- Notes: 1. Plume model TKE 1 was used for the 1976 thermal environment described in Ref. 5.
2. Plume model TKE 2 is the current model with isotherms shown in Figs. 2.2 and 2.3 and properties tabulated in the Appendix.

to provide property values at 5 inch radial intervals instead of 20 inch intervals. The portion of the plume aft of the exit plane is pieced together using four regions with three prediction techniques. The prediction techniques were tried for the Saturn S-II stage and checked against flight measurements to validate the prediction method.

Because of the geometry restrictions required to simplify the construction of the vacuum plume, it was necessary to use an equivalent symmetrical engine cluster in which all engines are canted an equal amount from a cluster centerline. The cluster centerline chosen is pitched up 12.024 degrees relative to the orbiter X_0 axis, and this centerline represents the Z axis of flow field coordinate system. Each engine is canted 4 degrees away from this centerline and equally spaced around the centerline. The resulting orbiter coordinates for the engine exits (using a 157 inch engine length) are compared to the actual locations below. Using a symmetrical cluster allows the plume to be described by the properties in one sector as shown in Fig. 2.4.

	Engine 1			Engines 2 or 3		
	X_0	Y_0	Z_0	X_0	Y_0	Z_0
Actual	1595.9	0	486.3	1622.8	±53	369.9
Equivalent Cluster	1597.2	0	485.5	1620.7	±64.9	375.5
Difference	+1.3	0	-0.8	-2.1	+11.9	+5.6

The procedure used in the present prediction was described in Ref. 14. The plume for the first 200 inches downstream of the nozzle exit plane is assembled as shown in Fig. 2.4 from an axisymmetric vacuum plume about an individual engine axis, a central core region resulting from the impingement of all three plumes at the center, and a diamond shape interaction region between adjacent plumes which intersects the central core on the inboard end and extends to an approximate plume boundary on the outboard end. The shocks

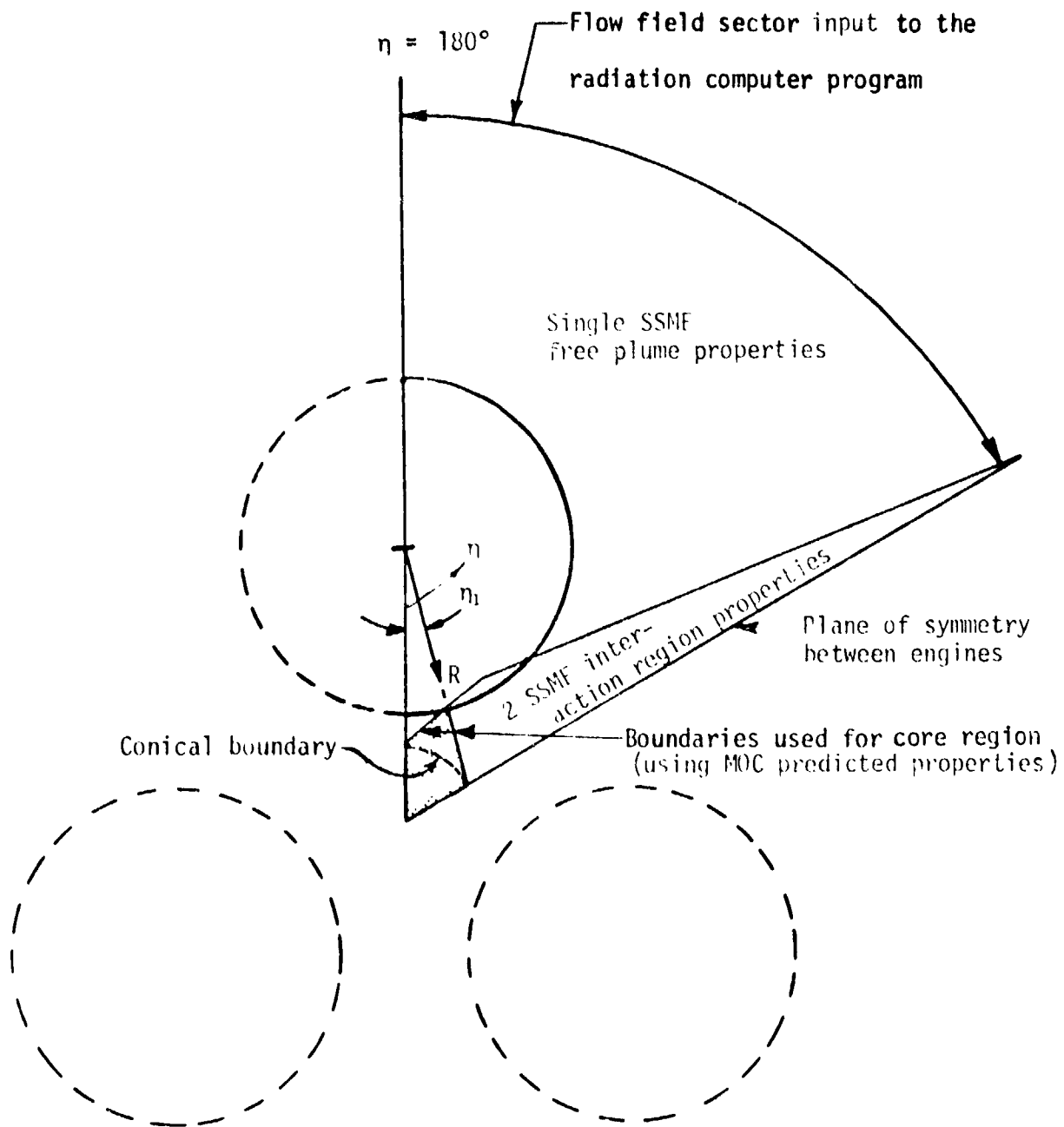


Fig. 2.4 Composite cross-section of the SSME flow field geometry for the vacuum plume

from the impingement regions cross the individual engine axes about 200 to 250 inches downstream of the exit. At this point, the approximation of the 3-D plume was abandoned and an axisymmetric prediction was used from 200 to 595 inches downstream of the nozzle exit.

The free plume portion of the flow field was predicted using an MOC program (Ref. 11) run for near vacuum conditions. This plume was also used as input to the PLIMP program (Ref. 15) to predict pressures and temperatures on a surface representing the impingement plane between engines. The impingement pressures were predicted using a modified Newtonian procedure and a corresponding gas temperature was predicted as that downstream of an oblique shock which would give the predicted pressure. If an oblique shock solution was not possible, the shock angle was fixed at 90 degrees relative to the flow and the downstream entropy and predicted pressures were used to define the temperature.

The data (flow angle, Mach number, and entropy) predicted on the impingement plane were also used with a 2-D MOC solution to estimate the properties in the central core of the cluster caused by inward flow from the plumes and plume impingement regions. The location for the origin of the shock near the cluster centerline used in the MOC solution was estimated using a modified stand-off distance calculation. The shock shape developed by the MOC solution was estimated using a modified stand-off distance calculation. The shock shape developed by the MOC solution using the impingement plane flow as input is shown in Fig. 2.5. The curved shock was incompatible with the requirements of the DTRANS program (Ref. 16) used to assemble the flow field components, so a shock angle of 15.83 degrees was used as shown in Fig. 2.5.

The three flow field pieces (free plume, impingement region between adjacent engines, and central core region) were assembled by the DTRANS

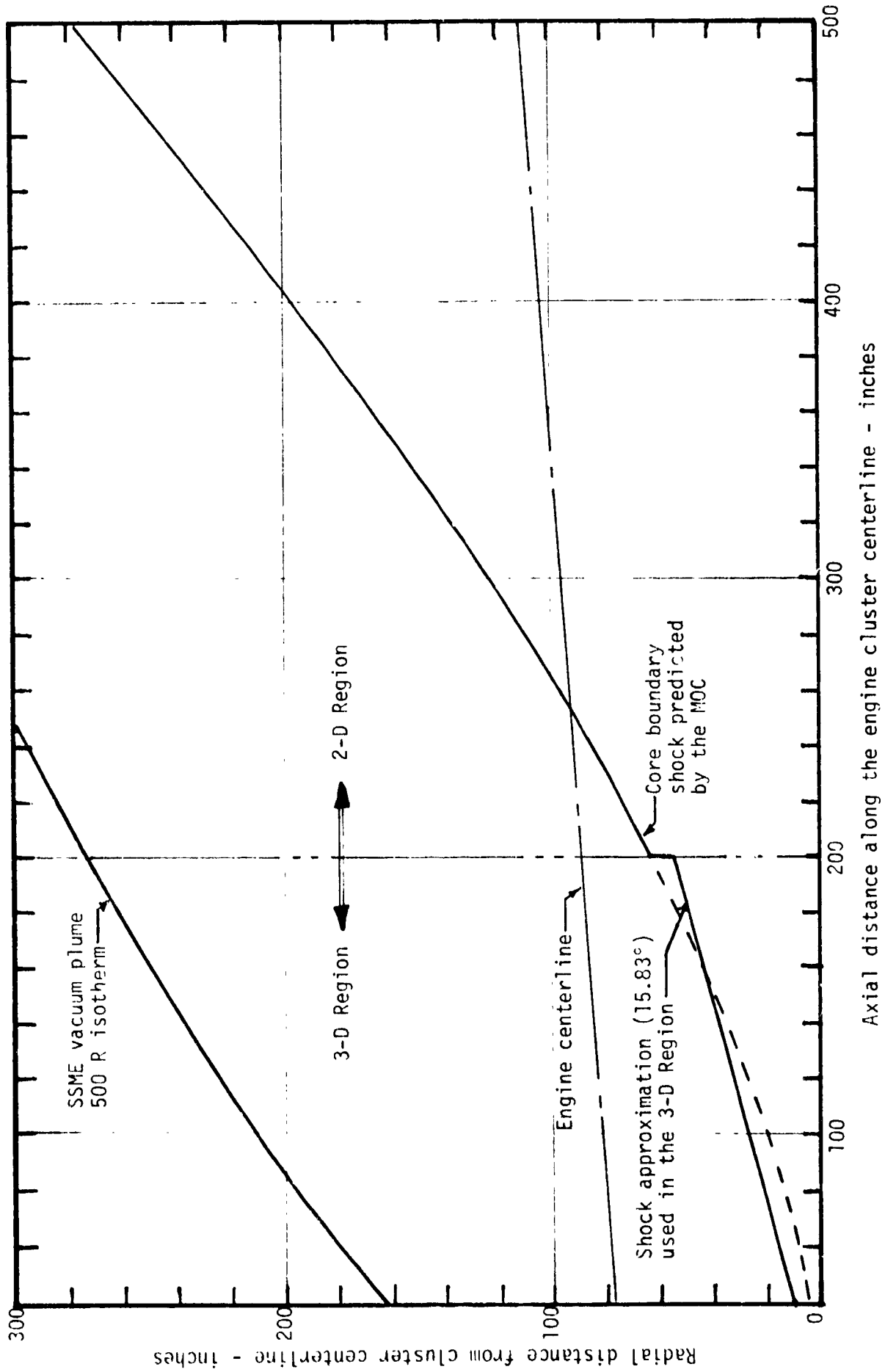


Fig. 2.5 SSME composite flow field central core shock position and 500 R boundary

program into a 3-D flow field for the sector shown in Fig. 2.4. The flow field in the sector consists of a three-dimensional array of data arranged in planes normal to the flow field Z axis (cluster centerline) with radial values at each Z-cut at particular values of η . The radial values are measured from an axis originating at the nozzle exit centerline, but parallel to the cluster centerline. The shock locations separating the regions are noted in the resultant flow field data. Since the DTRANS program uses a single shock angle to describe both the central core and impingement zone between engines, the 15.83 degree angle approximating the central core was used for both regions.

Due to the geometry of the 3-D flow field description it was difficult to describe the central core boundary as a cone as it had originally been visualized although the true physical shape is undefined. The two boundaries of the central core shown in Fig. 2.4 are a radial line and the impingement region boundary which both terminate at positions defined by the central core shock. The maximum depth of the impingement region on a line between the free plume axes is also determined by the 15.83 degree shock, but since this region starts nearer the engine exit than the central core, the distance to the shock is larger at a particular downstream location than the central core radius. The outer end of impingement zone between engines tapers to a point near the free plume boundary.

Properties at each axial position in the central core region are constant radially approximating the results of the MOC solution in the same area. Properties at the central plane of the impingement zone predicted by the PLIMP program were assumed constant normal to the impingement plane. As mentioned previously, the 3-D flow field terminates at Z=200 inches and the MOC prediction of the flow along the impingement plane and into the central core flow is used alone beyond this point.

Typical property variations for both the 3-D flow and the MOC prediction are shown in Figs. 2.6 and 2.7. The solid line indicates properties in a plane through an engine centerline. The constant property central core ends with the shock boundary and is followed by the free plume. In a plane between engines, the constant property central core is followed by the properties on the impingement plane between engines represented by the dashed line. The radial property variation corresponding to the MOC solution used downstream of $Z=200$ inches is represented by the broken line. It is interesting that the free plume has higher pressures at this point although the impingement regions have generally higher temperatures.

A representation of the base gas between the heat shield and engine exit plane was chosen to correspond approximately to current estimates of the recirculated flow properties on and above the heat shield. This representation was added to the 3-D plume flow field. The model is based on estimated pressures using isentropic flow with an isentropic exponent of 1.3, a stagnation temperature of 3400R, and a stagnation pressure of 0.033 psia. The model chosen was intended to be more representative of the region around the upper engine since the base flap causes some differences in the flow in the region between the lower engines. The base gas model described in the following table uses the geometry shown in Fig. 2.4 with η and R measured relative to the

BASE GAS MODEL

η deg.	Max. radius inches	Heatshield $Z = -123$		End RCS Pod $Z = -38$		Exit Plane $Z = -0.01$	
		p psia	T R	p psia	T R	p psia	T R
0	0-75.2	0.033	3400	0.021	3063	0.011	2639
50	0-69.3	0.033	3400	0.021	3063	0.011	2639
78	0-97.3	0.02	3029	0.01	2581	0	0
110	0-59.0	0.02	3029	0.01	2581	0	0

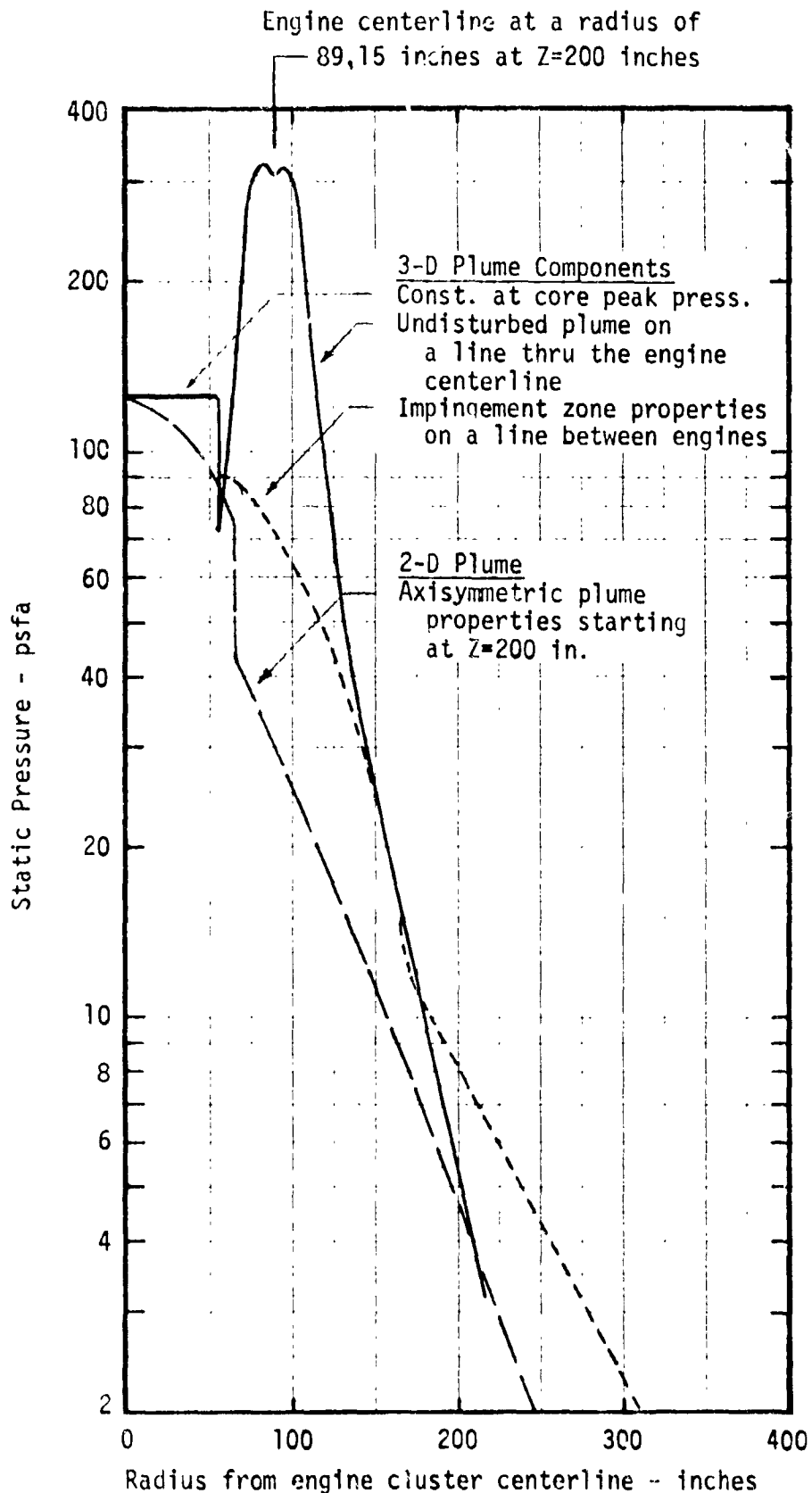


Fig. 2.6 Distribution of static pressure in the transition between 3-D and 2-D plume models at Z=200 inches.

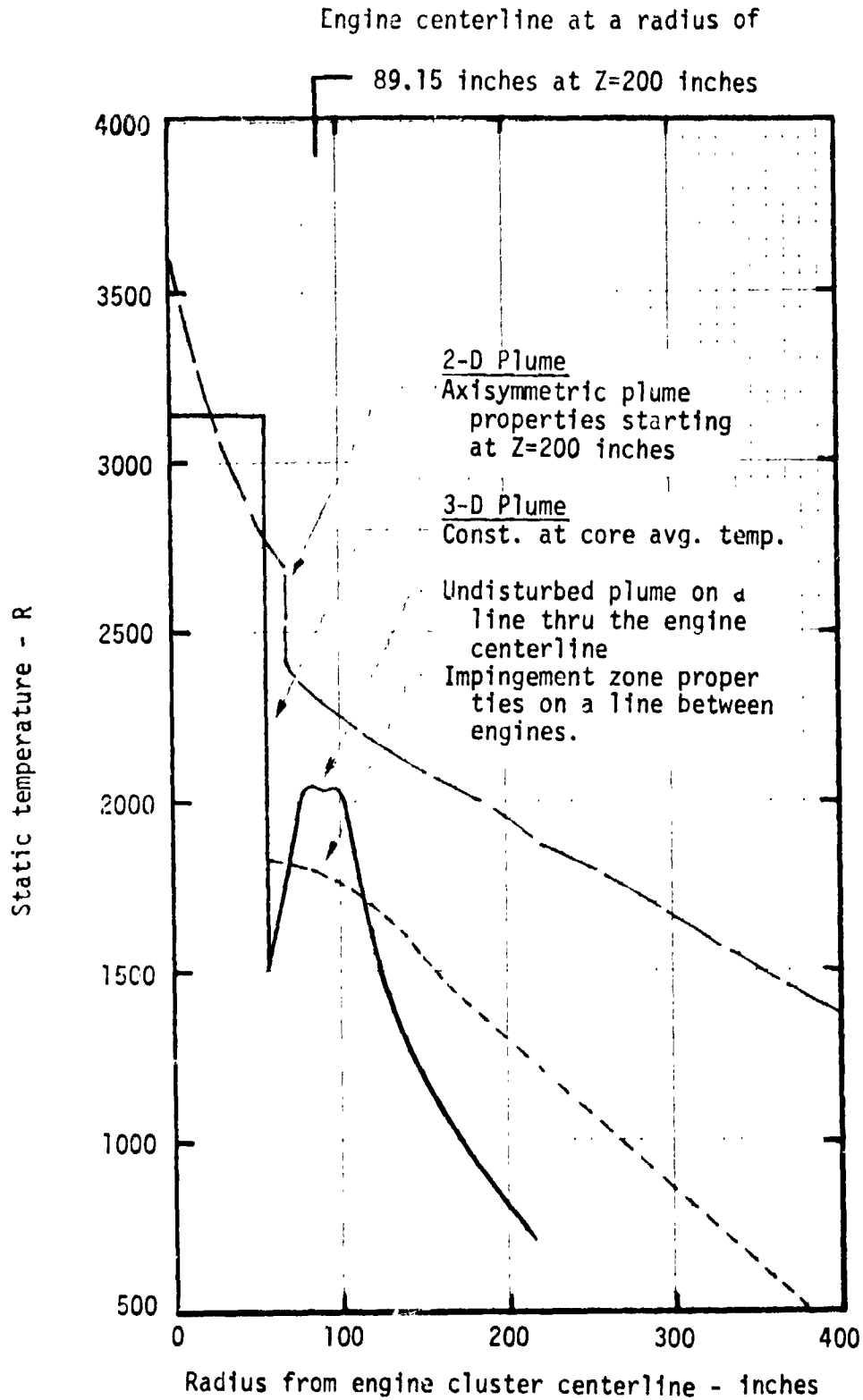


Fig. 2.7 Distribution of static temperature in the transition between 3-D and 2-D plume models at Z=200 inches.

upper nozzle exit centerline. The inner region represented by $\eta = 0$ to 50 degrees represents conditions within the cluster while the region represented by $\eta = 78$ to 110 degrees represents the outer base region. The radiation program will treat the zone between these regions as a transition zone with properties at any Z varying linearly with η .

A complete listing of the vacuum plume is in the appendix.

2.3 OTHER PLUME EFFECTS

In addition to the low altitude and vacuum plumes, consideration was given to the effects of radiation from the SSME/SRB plume interaction regions and the reversed gas from the SSME/SRB plume interactions. The radiation from these sources was not generally significant, but the effect of the reversed gas radiation was considered in assigning altitude correction factors for the SRB.

The SRB and SSME plumes intersect in the altitude range from 60 kft to 140 kft as shown by typical intersection curves in Fig. 2.8. The analysis of radiation from the intersection was performed at 100 kft. Although the surface of the intersection is not flat and has no symmetry, it was necessary to approximate it with a plane surface as shown in Fig. 2.9a. Properties on either side of the XZ plane were assumed to be symmetric about the X axis. The angular orientation of the plane was varied until the impingement pressures predicted on both sides of the plane were approximately equal. The ZMAX position indicated in Fig. 2.9b was used to approximate the indicated shock position relative to the plane, and the properties were assumed to be constant between the impingement plane and the upper bounding line between ZMAX and YMAX. The estimated gas properties are listed in the appendix.

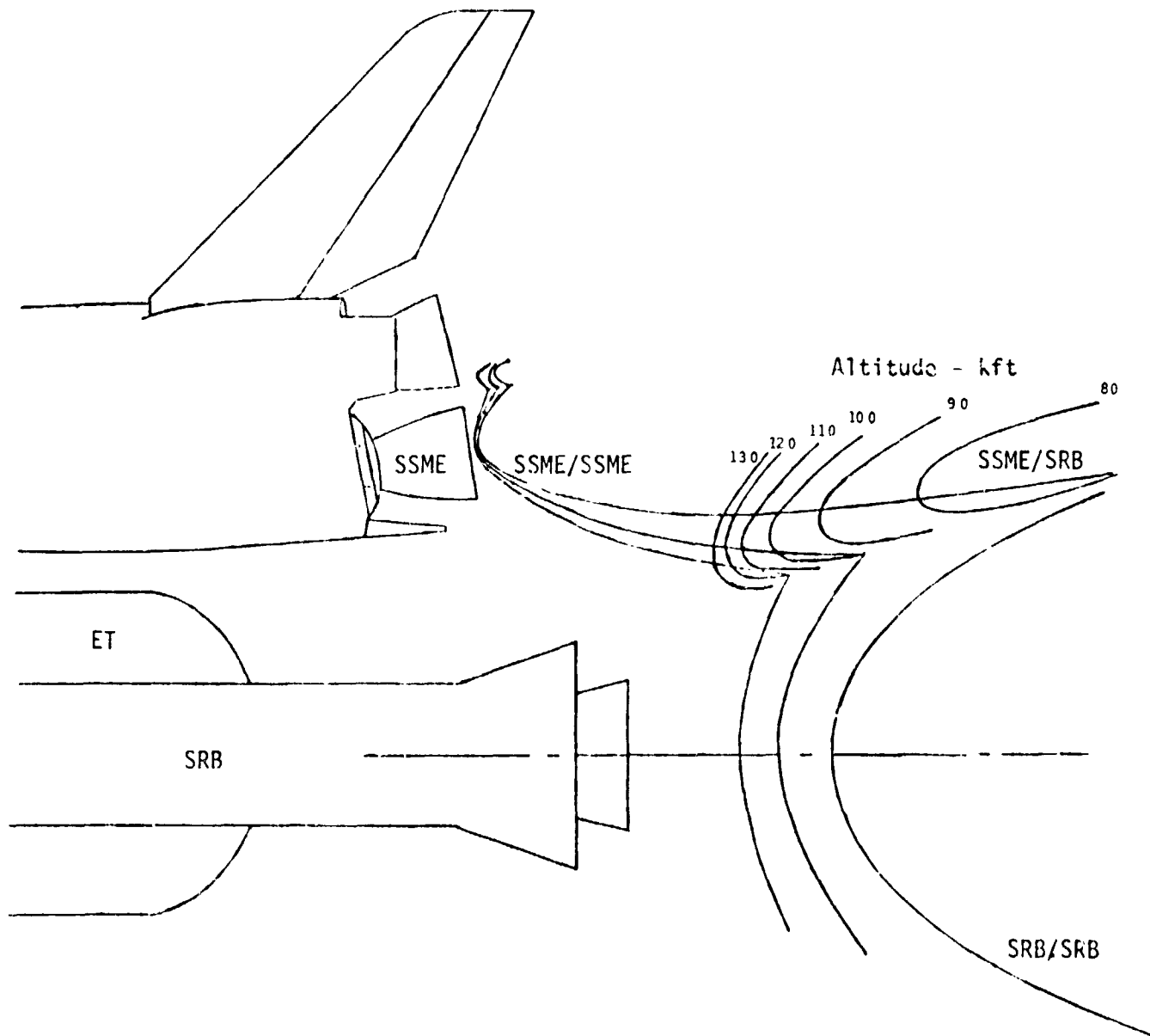
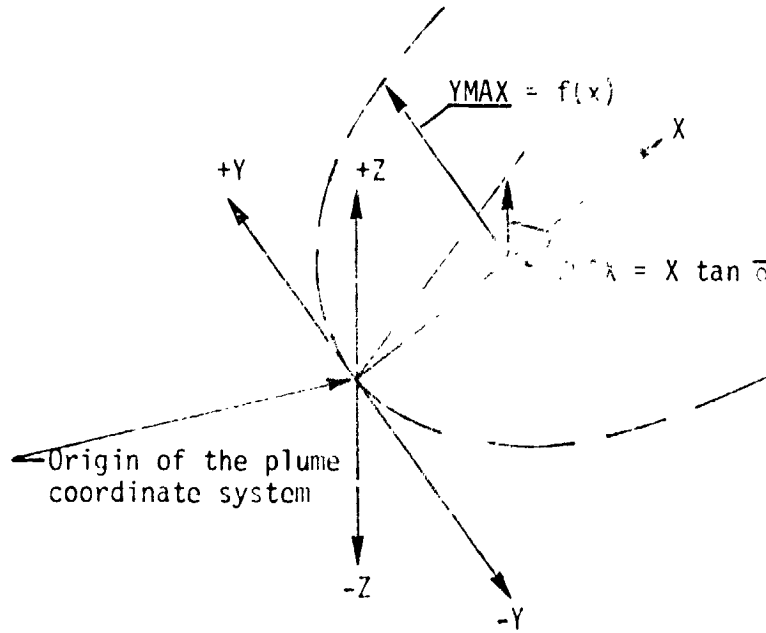
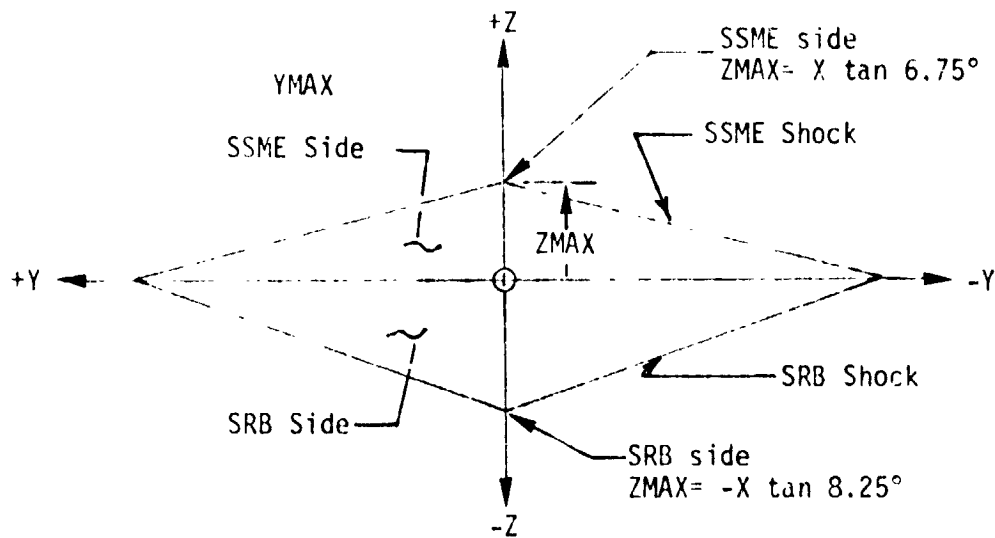


Fig. 2.8 Intersection boundaries for the SSME and SRB plumes (Ref. 23)

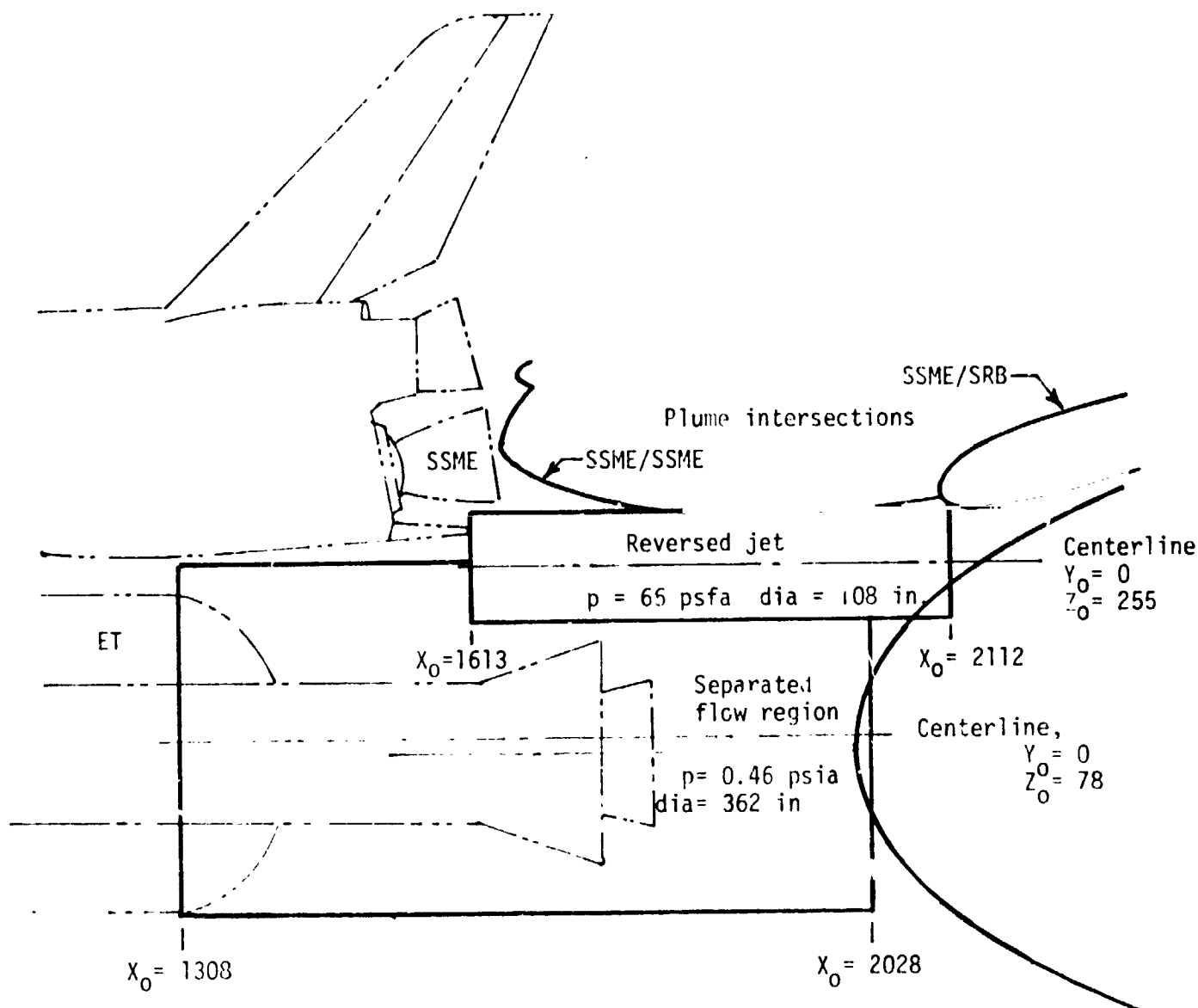


a) General Arrangement



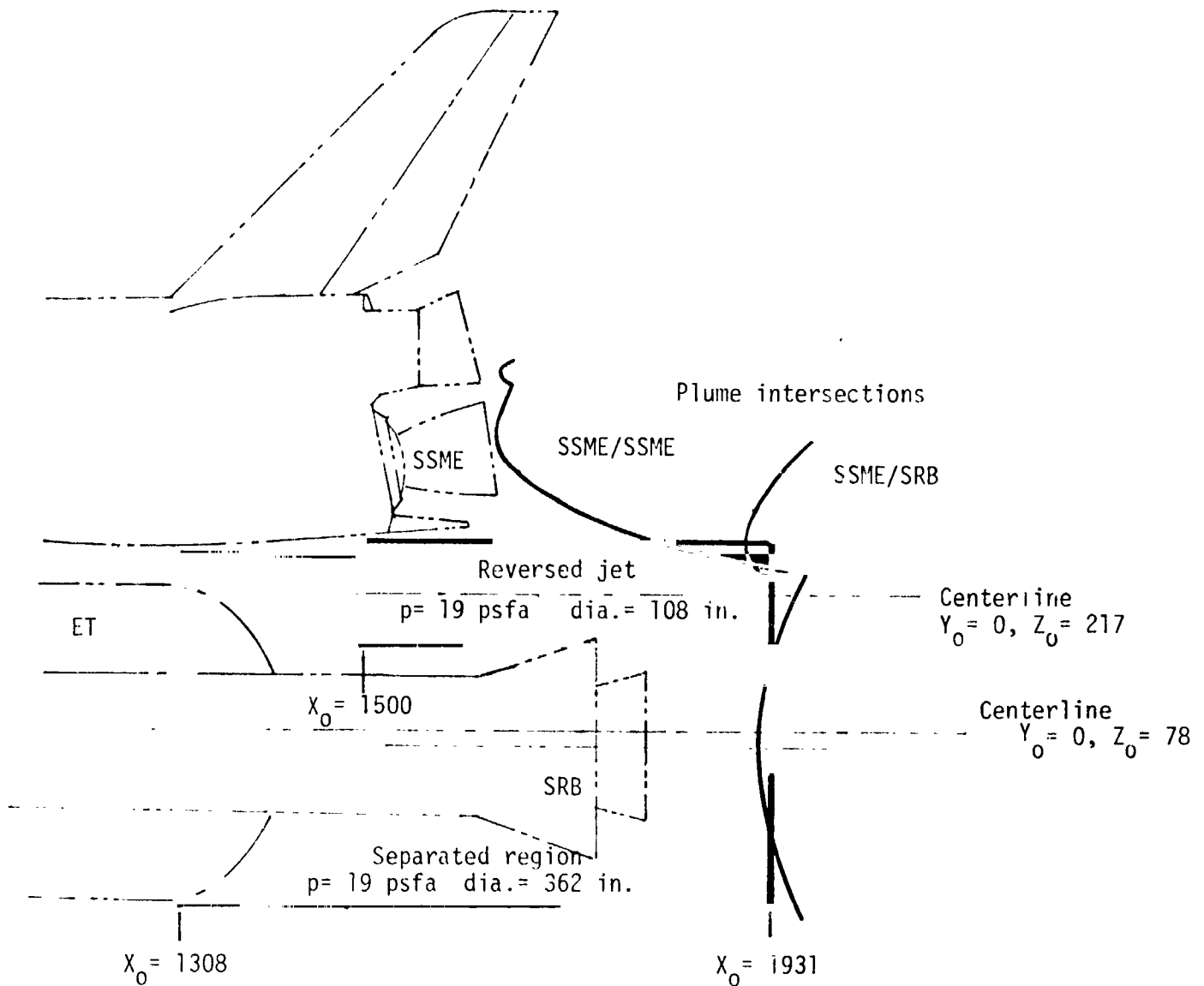
b) Specification of the Impingement Region Shape

Fig. 2.9 Arrangement for describing the SSME/SRB interaction region properties in the Gaseous Radiation Program.



Cylinder	Radius in.	X_0	T R	p psfa	Mole fractions				
					H ₂ O	CO ₂	CO	HCl	N ₂
Small (Reversed jet)	54	1613	1560	66	0.03	0.01	0.01	0.01	0.72
		2112	4100	66	0.33	0.06	0.13	0.09	0.06
Large (Separated flow)	181	1308	1560	66	0.03	0.01	0.01	0.01	0.72
		2028	1560	66	0.03	0.01	0.01	0.01	0.72

Fig. 2.10 Reversed gas model for 80 kft.



Cylinder	Radius in.	X_0	T R	p psfa	Mole fractions				
					H ₂ O	CO ₂	CO	HCl	N ₂
Small (Reversed jet)	54	1500	2800	19	0.13	0.02	0.05	0.04	0.50
		1931	4100	19	0.33	0.06	0.13	0.09	0.06
Large (Separated flow)	181	1308	2800	19	0.13	0.02	0.05	0.04	0.50
		1931	2800	19	0.13	0.02	0.05	0.04	0.50

Fig. 2.11 Reversed gas model for 120 kft.

Intersection of the SSME/SRB plumes also causes reversed flow in the lower base region. Properties and size of the reversed flow regions were conservatively estimated (Ref. 13) from analytical predictions and experimental results. The estimated gas volume and properties are illustrated in Figs. 2.10 and 2.11. Components of the gas property model were considered to be a small cylinder representing the reversed jet toward the base and a larger cylinder representing the separated region aft of the ET base. Temperature at the origin of the reversed jet (4100 R) is a prediction of the average stagnation temperature of the reversed portion of the SRB boundary layer. Temperature and pressure at the forward end is based on model measurements scaled to flight conditions. Gas at the origin of the reversed jet is estimated to be 66 percent SRM products and 34 percent SSME products. This gas is assumed to mix with sufficient air to lower the gas temperature to the value measured at the forward end. A linear variation of properties is assumed in the reversed jet and the properties in the separated region are taken to be equal to those at the forward end of the reversed jet.

Section 3

GASEOUS RADIATION PREDICTIONS

Predictions were made to many points in the base region using the gaseous radiation (GASRAD) program to serve as a basis for adjusting predictions made by the radiation view factor (RAVFAC) program and to provide data on the effects of altitude on plume radiation. The essential features of the program used and the results obtained are presented in this section.

3.1 PROGRAM DESCRIPTION

The program (Ref. 12) is similar to earlier radiation programs developed for NASA/MSFC, but it has been designed to handle specific requirements of the Space Shuttle Main Engine (SSME) plumes. The program has two sets of subroutines. The first set prepares property data along lines-of-sight through the plumes while the second set performs radiation calculations using a band model along the lines-of-sight and integrates the result. The first set of subroutines were changed to allow additional flow field input formats, reduce the number of radiating species considered, simplify input, and reduce run time. The second set of subroutines were modified to provide a separate subroutine for water vapor radiation with reduced output options and to provide for performing calculations with band model parameters averaged over large spectral intervals. Predictions of the SSME/SRB combined plume effects used the multiconstituent radiation prediction capability and special modifications of the flow field handling subroutines to handle the unusual data formats.

The calculation procedure and spectral averaging method used are described

in Ref. 12. The radiation equation for the incident radiant flux at a point which the program integrates is

$$\dot{q}/A = \sum_{\theta_i}^{\theta_f} \sum_{\phi_i}^{\phi_f} \sum_{\omega_i}^{\omega_f} \sum_0^L (\tau(S) - \tau(S + \Delta S)) \Delta N_{\omega}^{\circ} \cos \theta \sin \theta \Delta \phi \Delta \theta$$

where θ and ϕ are the hemispherical elevation and azimuth angles, ω is the wavenumber and L is radius of a hemisphere over the point (the upper limit of the distance S along the lines of sight). The transmissivity τ is determined using the statistical band model described in Ref. 17 as the single-line-group (SLG) model which uses the Curtis-Godson approximation to include the effects of inhomogeneous gases. The spectral integration is performed using integrated values of the Planck function ($\Delta N_{\omega}^{\circ}$) to eliminate errors due to representing it by a central value when large spectral intervals are used.

Tabulated values of absorption coefficient (k_{ω}) and line density ($1/d_{\omega}$) for water vapor used in the band model were obtained from two sources. Most of the data were obtained from Ref. 17, but in the 2500 to 4500 cm^{-1} spectral range, later data compiled by Dr. Stephen Young (Ref. 13) was used for SSME predictions. Dr. Young's data have improved representations of the absorption coefficient at low temperatures while using data of Ref. 17 at high temperatures. The data are available at 25 cm^{-1} intervals, but they were usually averaged over 400 cm^{-1} intervals from 1000 to 9800 cm^{-1} with

$$\bar{k} = \left(\sum_{\omega_1}^{\omega_2} \sqrt{k_{\omega}} N_{\omega}^{\circ} \Delta \omega / \sum_{\omega_1}^{\omega_2} N_{\omega}^{\circ} \Delta \omega \right)^2$$

$$1/\bar{d} = \left[\sum_{\omega_1}^{\omega_2} \sqrt{k_{\omega} (1/d_{\omega})} N_{\omega}^{\circ} \Delta \omega / \sum_{\omega_1}^{\omega_2} \sqrt{k_{\omega}} N_{\omega}^{\circ} \Delta \omega \right]^2$$

where N_{ω}° is the Planck function and Λ_{ω} is 25 cm^{-1} . The resulting values are given in Table 3.1 for the 1000 to 9800 cm^{-1} range used. Evaluation of the results obtained with this procedure is made in the next section.

The only radiating gas considered was water vapor and the only identified foreign gas was nitrogen. The broadening effect of all other gases was lumped together, so the collision line width (cm^{-1}) becomes

$$\gamma_C = p[(0.44(273/T)^{0.5} + 0.09) F_W + 0.09 F_N + 0.05(1 - F_W - F_N)](273/T)^{0.5}$$

where p is the pressure in atmospheres, T is the gas temperature in K, and F_W and F_N are the water vapor and nitrogen mole fractions.

During the spatial integration, the hemispherical elevation angle interval, $\Delta\theta$, is held constant while the azimuth interval, $\Delta\phi$, can be varied to maintain a constant value of the parameter $\Delta\theta\Delta\phi \sin\theta$. This allows the spacing between lines in the azimuth direction to be set equal to the spacing in the elevation direction (selection of the values used are discussed in Section 3.2).

The length of integration intervals along the line-of-sight (ΔS) is also varied by the program. Initially gas properties are interpolated at constant intervals (usually 3 to 6 inches) along each line-of-sight, but when the radiation computation is made, the available property values are averaged over larger intervals before a step in the radiation integration is made. This process is controlled by the input parameter TDIFF which is approximately equal to the change in temperature allowed between the first and final temperature values in an integration interval. The interval length with the averaged property values is used as a step with constant properties in the radiation integration.

TABLE 3,1
BAND MODEL PARAMETERS AVERAGED OVER
400 cm⁻¹ INTERVALS

H2O1(G) WAVE NO. (1/CM)	ABSORPTION COEFFICIENTS (atm ⁻¹ cm ⁻¹ at indicated temperature)						
	TEMPERATURES (DEG K)						
	300.	600.	1000.	1500.	2000.	2500.	3000.
1200.	1.476-03	2.232-02	4.463-02	5.495-02	5.304-02	4.934-02	4.699-02
1600.	5.463-01	2.367-01	1.252-01	6.934-02	4.406-02	3.244-02	2.458-02
2000.	2.935-02	3.065-02	2.529-02	2.036-02	1.698-02	1.417-02	1.237-02
2400.	1.250-04	1.591-04	4.013-04	7.840-04	1.774-03	2.486-03	2.522-03
2800.	1.143-04	2.160-04	4.792-04	1.331-03	2.647-03	4.025-03	4.154-03
3200.	3.510-03	4.797-03	1.126-02	1.695-02	2.122-02	2.084-02	1.727-02
3600.	1.241-01	1.357-01	1.023-01	5.646-02	3.386-02	2.366-02	1.821-02
4000.	1.867-01	6.958-02	3.931-02	2.310-02	1.574-02	1.229-02	1.090-02
4400.	2.144-05	5.886-05	2.331-04	4.487-04	8.348-04	1.315-03	1.498-03
4800.	5.262-05	1.644-04	6.071-04	1.777-03	3.137-03	3.862-03	3.458-03
5200.	1.437-02	1.377-02	1.244-02	8.892-03	6.527-03	5.187-03	3.930-03
5600.	2.127-02	8.697-03	6.071-03	4.477-03	3.679-03	3.311-03	2.831-03
6000.	1.495-05	2.230-05	6.891-05	1.731-04	4.158-04	8.396-04	9.445-04
6400.	4.118-05	1.462-04	3.187-04	6.157-04	1.246-03	1.858-03	1.674-03
6800.	1.308-03	1.965-03	3.261-03	3.333-03	3.169-03	3.108-03	2.018-03
7200.	1.724-02	1.812-02	1.095-02	4.956-03	3.264-03	2.595-03	2.192-03
7600.	3.293-03	5.191-04	8.334-04	7.129-04	6.241-04	5.565-04	6.153-04
8000.	3.340-06	6.010-06	2.121-05	7.211-05	1.910-04	2.497-04	3.377-04
8400.	1.925-05	3.107-05	9.499-05	2.174-04	3.799-04	3.896-04	4.434-04
8800.	1.484-05	1.396-05	6.584-05	1.982-04	3.498-04	3.179-04	3.054-04
9200.	2.558-06	2.271-06	5.721-06	2.660-05	8.846-05	1.006-04	1.473-04
9600.	0.000	0.000	0.000	0.000	1.076-04	1.152-04	1.196-04

H2O1(G) WAVE NO. (1/CM)	FINE STRUCTURE PARAMETERS (cm ⁻¹)						
	TEMPERATURES (DEG K)						
	300.	600.	1000.	1500.	2000.	2500.	3000.
1200.	2.739-01	4.151-01	1.026+00	3.058+00	1.065+01	3.499+01	1.265+02
1600.	1.461-01	3.855-01	7.975-01	1.947+00	4.701+00	1.115+01	2.463+01
2000.	1.161-01	2.992-01	6.704-01	1.861+00	4.803+00	1.383+01	4.015+01
2400.	3.061-01	6.083-01	1.521+00	4.123+00	9.153+00	4.058+01	1.939+02
2800.	1.832+00	2.379+00	3.166+00	4.636+00	1.049+01	3.850+01	1.084+02
3200.	8.936-01	1.823+00	2.263+00	2.689+00	5.221+00	1.352+01	2.558+01
3600.	1.009+00	1.420+00	1.861+00	2.650+00	3.865+00	7.887+00	1.369+01
4000.	7.882-01	1.170+00	1.512+00	2.241+00	5.325+00	1.151+01	1.949+01
4400.	9.408-01	1.103+00	1.756+00	4.892+00	2.852+01	7.504+01	1.700+02
4800.	2.771-01	1.051-01	3.131-01	1.230+00	5.808+00	2.222+01	8.313+01
5200.	1.163-01	8.919-02	2.616-01	1.132+00	4.662+00	1.978+01	1.082+02
5600.	1.288-01	2.239-01	3.879-01	1.557+00	8.065+00	3.636+01	2.794+02
6000.	3.897-01	1.239-01	8.185-01	5.961+00	7.212+01	2.787+02	1.396+03
6400.	3.930-01	8.677-02	5.201-01	3.382+00	4.519+01	1.704+02	9.368+02
6800.	1.529-01	5.907-02	3.075-01	1.917+00	1.517+01	6.210+01	2.731+02
7200.	1.257-01	3.229-02	1.952-01	1.465+00	7.937+00	3.556+01	1.300+02
7600.	2.339-01	1.997-01	1.082+00	6.028+00	2.892+01	1.230+02	4.115+02
8000.	4.942-01	1.065+00	2.760+00	7.988+00	1.878+01	3.704+01	6.068+01
8400.	2.292-01	4.850-01	1.274+00	3.510+00	8.296+00	1.643+01	2.727+01
8800.	1.161-01	2.585-01	6.794-01	1.031+00	4.577+00	9.026+00	1.483+01
9200.	1.803-01	4.208-01	1.034+00	3.102+00	8.686+00	1.765+01	2.913+01
9600.	0.000	0.000	0.000	0.000	1.945+01	3.826+01	6.273+01

The geometric methods used in locating the points in the plumes at which properties are desired on each line-of-sight are straight forward. Once the point in the plume is located, linear interpolation is performed parallel to the plume axis, and, in the three-dimensional plume, at constant n . Exceptions are made where a significant shock is present and can be located in the flow field. In these cases, the points used in the interpolation are forced to stay on the same side of the shock as the point being defined.

In generating properties in the low altitude plumes the distance from a point on a line-of-sight to the axis of each of the three plumes is determined and the property determination is made in the closest plume. In areas where the plumes overlap because of the close spacing, this method essentially discards the portion of each plume beyond a central surface between adjacent plumes.

3.2 PREDICTED RADIATION

Radiation predictions for the SSME plumes will be described first followed by predictions for the SSME/SRB impingement regions and the SSME/SRB reversed gas.

Predictions for the SSME plumes were made at representative points in the base region for the four altitude conditions considered. Predictions for the vacuum plume were not significantly different from the results of Ref. 5 which used a coarser mesh representation of the same basic flow field (20 inch instead of 5 inch radius increments as in the present vacuum flow field). Because of the slight change in results, the vacuum plume runs were only repeated for a few points. The current results for the SSME plume radiation at four altitudes are presented in Table 3.2 along with the vacuum plume results from Ref. 5. The maximum predicted radiation in the GASRAD

TABLE 3.2
RADIATION PREDICTIONS AT SELECTED LOCATIONS

Location	θ^1	Point No.	Incident radiation - Btu/ft ² -sec and (ratio to sea level)				
			Sea Level	20 Kft	40 Kft	Vacuum	Vacuum (Ref. 5)
Orbiter base heat shield							
Bottom center		900	3.53	2.25 (0.64)	1.23 (0.35)	0.47 (0.13)	0.48 (0.14)
Center		905	2.35	2.03 (0.86)	1.26 (0.54)	0.74 (0.31)	0.73 (0.31)
Bottom outboard		909	2.10	1.78 (0.85)	1.15 (0.55)	0.04 (0.02)	0.05 (0.02)
Bottom No. 1 bulge	270	941	2.47	1.83 (0.74)	1.01 (0.41)		
Top outboard		957	0.99	0.78 (0.79)	0.55 (0.56)		
Upper middle outboard		961	5.02	3.23 (0.64)	1.79 (0.36)	0.42 (0.08)	0.46 (0.09)
Bottom eng mtd hs 1	270	984	3.45	2.09 (0.61)	1.03 (0.30)	0.67 (0.19)	0.67 (0.19)
RCS Pod							
Lower surface		807	0.86	0.38 (0.44)	0.20 (0.23)		0.04 (0.05)
Aft surface		837	12.1	5.87 (0.48)	3.05 (0.25)	0.69 (0.06)	0.70 (0.06)
Outboard lower surface		851	0.45	0.17 (0.38)	0.10 (0.22)		0.003 (0.01)
Inboard surface		862	4.27	1.62 (0.38)	0.77 (0.18)	0.30 (0.07)	0.32 (0.07)
Top		874	0.030	0.038 (1.27)	0.034 (1.13)		
Top		877	0.105	0.110 (1.05)	0.081 (0.77)		0.003 (0.03)
OMS Pod							
Base		784	4.71	2.80 (0.59)	1.57 (0.33)		0.10 (0.02)
Nozzle shroud base		7780	7.41	3.51 (0.47)	1.69 (0.23)		0.52 (0.07)
Body flap trailing edge							
Upper center		233	11.6	3.99 (0.34)	1.89 (0.16)	0.93 (0.08)	0.96 (0.08)
Aft center		241	11.5	5.28 (0.46)	2.70 (0.23)		0.58 (0.05)
Fin trailing edge							
40° span aft		640	13.2	6.71 (0.51)	3.61 (0.27)	0.53 (0.04)	0.59 (0.04)
40° span side		6499	1.63	0.93 (0.57)	0.54 (0.37)		0.072 (0.04)

TABLE 3.2 (Continued)

RADIATION PREDICTIONS AT SELECTED LOCATIONS

Location	θ^1	Point No.	Incident radiation - Btu/ft ² -sec and (ratio to sea level)				
			Sea Level	20 Kft	40 Kft	Vacuum	Vacuum (Ref. C)
Wing trailing edge 60% span aft		360	3.51	2.35 (0.67)	1.34 (0.38)	0.063 (0.02)	0.093 (0.03)
60% span top		4699	2.17	1.29 (0.59)	0.70 (0.32)		0.075 (0.03)
OMS Nozzle Aft facing lip	180	7150	11.80	5.67 (0.48)	2.89 (0.24)	0.61 (0.05)	0.63 (0.05)
Inbd facing exterior surface	180	7152	5.93	1.96 (0.33)	0.91 (0.15)		0.42 (0.07)
Inbd facing inner lip	0	7201	10.6	4.42 (0.42)	2.13 (0.20)		0.63 (0.06)
Outbd facing inner lip	180	7251	0.005	0.007 (1.40)	0.010 (2.00)		0.007 (1.40)
RCS Aft Nozzles 8 and 9 Inbd facing inner lip	0	9502	8.90	3.57 (0.40)	1.72 (0.19)		0.59 (0.07)
Outbd facing inner lip	0	9652	0.10	0.11 (1.10)	0.08 (0.80)		0.008 (0.08)
Inbd facing outer lip	180	9651	4.92	1.48 (0.30)	0.64 (0.13)		0.41 (0.08)
SSME Nozzle 1 Hat-band 2 top - outbd	0	7402	0.33	0.14 (0.42)	0.08 (0.24)		0.05 (0.15)
Exit manifold top	270	7480	10.7	3.26 (0.30)	1.45 (0.14)		1.55 (0.14)
Hat-band 2 top - inbd	270	7482	6.62	2.00 (0.30)	0.88 (0.13)		0.74 (0.11)
Hat-band 4 top - inbd	270	7484	3.68	1.17 (0.32)	0.50 (0.14)		0.51 (0.14)
Hat-band 2 aft - outbd	0	7502	1.12	0.28 (0.25)	0.17 (0.15)	0.08 (0.07)	0.08 (0.07)
Exit manifold aft - outbd	90	7530	17.0	6.80 (0.40)	4.06 (0.24)		0.79 (0.05)
Exit manifold aft - inbd	270	7580	25.7	9.61 (0.37)	5.03 (0.20)	2.98 (0.12)	2.86 (0.11)
Hat-band 2 aft - inbd	270	7582	9.20	3.15 (0.34)	1.28 (0.14)	1.17 (0.13)	1.20 (0.13)
Hat-band 4 aft - inbd	270	7584	5.23	1.55 (0.30)	0.61 (0.12)	0.46 (0.09)	0.61 (0.12)
SSME Nozzle 2 Hat-band 1 top	135	7741	5.87	1.30 (0.31)	0.89 (0.15)	0.76 (0.13)	
Hat-band 2 top	135	7742	4.42	1.30 (0.29)	0.64 (0.14)		
Hat-band 2 top	180	7752	1.39	0.54 (0.39)	0.27 (0.19)		

TABLE 3.2 (Continued)
RADIATION PREDICTIONS AT SELECTED LOCATIONS

Location	Ø ¹	Point No.	Incident radiation - Btu/ft ² -sec and (ratio to sea level)				
			Sea Level	20 Kft	40 Kft	Vacuum	Vacuum (Ref. 5)
SSME Nozzle 2 (Cont.)							
Hat-band 2 top	225	7762	1.20	0.33 (0.28)	0.17 (0.14)		
Hat-band 1 aft	135	7841	10.3	3.54 (0.34)	1.74 (0.17)	1.68 (0.16)	
Hat-band 2 aft	135	7842	7.06	2.04 (0.29)	0.98 (0.14)		
Hat-band 2 aft	180	7852	3.76	1.12 (0.30)	0.54 (0.14)		
Hat-band 2 aft	225	7862	2.63	0.55 (0.21)	0.30 (0.11)		
ET Base							
Center		8000	2.84	1.88 (0.66)	1.06 (0.37)	0.047 (0.02)	
57.1 Inch radius - top	0	8330	2.77	1.98 (0.71)	1.12 (0.40)		
- bottom	180	8339	2.07	1.41 (0.68)	0.80 (0.39)		
103.4 inch radius - top	0	8670	1.65	1.31 (0.79)	0.79 (0.48)		
- bottom	180	8679	0.87	0.68 (0.77)	0.40 (0.51)		
154.2 inch radius - top	0	8950	0.21	0.22 (1.05)	0.16 (0.76)		
- bottom	180	8959	0.021	0.021 (1.00)	0.014 (0.67)		
ET/SRB Aft support							
Upper link - aft		775	1.50	1.19 (0.79)	0.72 (0.48)		
Lower link - aft		825	1.71	1.28 (0.75)	0.75 (0.44)		
SRB Aft support post							
Outer lip	30	671	8.98	4.84 (0.54)	2.49 (0.28)	0.33 (0.04)	0.36 (0.04)
SRB Skirt							
Outer lip - top	0	2109	4.78	2.41 (0.50)	1.21 (0.25)	0.19 (0.04)	0.21 (0.04)
- side	90	2139	1.59	0.59 (0.43)	0.33 (0.21)		0.08 (0.05)
Base web - top	0	2500	3.28	2.56 (0.78)	1.52 (0.46)		
SRB Curtain (contoured aft)							
↓ = 67.5' (measured out from SRB centerline)	45	2317	9.03		2.80 (0.31)		

TABLE 3.2 (Continued)
RADIATION PREDICTIONS AT SELECTED LOCATIONS

Location	θ^1	Point No.	Incident radiation - Btu/ft ² -sec and (ratio to sea level)				
			Sea Level	20 Kft	40 Kft	Vacuum	Vacuum (Ref. 5)
SRB Case/Skirt ring Aft facing web - top	0	6503	3.70	2.68 (0.72)	1.53 (0.41)		0.032 (0.01)
Inbd facing rim - side	90	6535	2.27	1.19 (0.52)	0.61 (0.27)		0.092 (0.04)
SRB stiffener at $X_B=1733.56$ Aft facing web - top	0	6303	2.86	2.12 (0.74)	1.23 (0.43)		0.024 (0.01)
- side	90	6333	3.11	2.18 (0.70)	1.24 (0.40)		
Outside rim - top	0	6305	3.33	1.78 (0.53)	0.95 (0.29)		0.10 (0.03)
- side	90	6335	1.49	0.80 (0.54)	0.41 (0.28)		

- NOTES: 1) θ is measured clockwise from the axis of the surface in the negative Y_0 direction for the Orbiter. For the SRB and ET it is measured from the top (positive Z_0).
- 2) Nozzle hat-bands numbered forward starting with the one next to the lip manifold.

results was at Point 7580 on the SSME engine exit lip at sea level (25.7 Btu/ft²-sec). Many other relatively unshaded aft facing surfaces near the SSME cluster have radiation rates in the range of 10 to 13 Btu/ft²-sec, but shading by the SSME nozzles limits the peak radiation for the base heat shield to 5 Btu/ft²-sec. Peak radiance for a single line-of-sight through the plumes reached 47.8 Btu/ft²-sec-sr for the aft facing nozzle lip on SSME nozzle 1 (Point 7530).

Although the effect of engine gimbaling was not covered as part of the thermal environment, sensitivity of the radiation rates to gimbaling was sampled by predictions of radiation to Point 7852 (the aft surface of hat band 2 on the inboard side of engine 2) with the lower engines gimballed 2, 4, and 6 degrees toward the left from flight null. The results indicate an increase in radiation of about 12 percent per degree of yaw gimbal, so any flight conditions which are expected to have a significant gimbal deflection for a long period of time should be evaluated to determine if the environment based on the flight null condition (shown in Fig. 2.1) is adequate.

An evaluation was made of the effect of several parameters on the predicted radiation. It included effects of the modified band model parameter data, the spectral integration interval, and the spatial integration interval along line-of-sight. The revised band model data in the 2500 to 4500 cm⁻¹ range gives slightly lower radiation predictions as indicated in Table 3.3, so when it is combined with the previously used data outside this spectral range the result is to reduce the predicted radiation for the typical SSME plume conditions considered. The 400 cm⁻¹ integration interval used for the prediction in Table 3.2 produces a slightly higher radiation than the 25 cm⁻¹ interval in all cases. This offsets the apparent reduction in predicted radiation when TDIFF* = 200 R is used. The TDIFF parameter extends

* See page 25 for description of TDIFF.

TABLE 3.3

RESULTS OF BAND MODEL PARAMETER
AND PATH LENGTH INTEGRATION INTERVAL VARIATIONS

Absorption Coefficient Date	TDIFF	Wave Number 1/cm			ET Base Center Point 8000			Nozzle Lip Normal to Eng Ctr1 Point 7480			Fin TE Side Point 6499		
		Init	Final	Δ	SL	20 kft	40 kft	SL	20 kft	40 kft	SL	20 kft	40 kft
NASA (Note 1)	200	1000	9800	400	2.91	1.93	1.09	11.0	3.28	1.43	1.67	0.95	0.55
		1000	9800	25	2.87	1.89	1.06						
		2500	4500	25	0.96	0.72	0.43						
Young (Note 2)		2500	4500	25	0.89	0.67	0.41						
Combined (Note 3)	0	1000	9800	400	2.84	1.88	1.06	10.7	3.26	1.45	1.63	0.93	0.54
		1000	9800	25	2.80	1.84	1.04	10.5	3.16	1.41	1.60	0.90	0.53
		1000	9800	400	2.87	1.91	1.09	10.8	3.39	1.54	1.65	0.95	0.56

- NOTES: 1) Data original provided by GD/C (Refs. 20-22) and included in NASA SP 3080 (Ref. 17)
- 2) Data from Dr. Young (Ref. 13) using half-widths from Ref. 17
- 3) Combination of Dr. Young's data (2500 - 4500 cm^{-1}) and NASA SP 3080 data (1000 - 2475 cm^{-1} and 4525 - 9800 cm^{-1})
- 4) All thermal environment predictions use the combined absorption coefficient data with TDIFF = 200, $\omega_i = 1000$, $\omega_f = 9800$, and $\Delta\omega = 400$

the integration interval by averaging the property data which are available at 6 inch intervals. When TDIFF = 0, the averaging procedure is not used, so a step in the radiation integration is performed at each 6 inch interval along a line-of-sight.

All of the errors apparent in this comparative evaluation are insignificant in comparison to other uncertainties in the prediction and use of the radiation environment, so the use of a 400 cm⁻¹ spectral interval and TDIRF = 20CR are considered satisfactory.

Angular intervals used in integrating over the spherical angles are more difficult to evaluate since errors incurred are likely to vary significantly with point location. Therefore, the intervals were chosen to be approximately equal to the 6 inch integration interval along the lines-of-sight at a distance of about 200 inches. The cord length represented by the azimuth angle increment ($\Delta\phi$) is a function of the elevation angle (θ) and increment ($\Delta\theta$). At a radius or line-of-sight length (S), the cord (C) is

$$C = S \Delta\phi \sin \theta$$

for small increments expressed in radians.

In making the SSME plume radiation prediction the procedure followed is to use a constant value of $\Delta\theta$ and vary $\Delta\phi$ with θ to keep C/S constant*. The values chosen were $\Delta\theta = 2^\circ$ and $C/S = \Delta\theta$, so when θ is 90°, $\Delta\phi = \Delta\theta$. The resulting cord length is

$$C = 0.035S,$$

so for $\Delta S = 6$ inches, C is equal to ΔS at $S = 171$ inches.

Radiation predictions for the SSME/SRB plume intersection region were made at only 4 points in the base region because the indicated heating rates were

* In the radiation program, C/S is controlled by the input parameter TANGLE.

so low. The results are shown in Table 3.4 in comparison with the current predicted rates due to the SSME and SRB plumes at the same altitude. The results for the intersection regions are conservative (high) estimates since they neglect absorption by the SSME and SRB plumes. In all cases, radiation from only one (the closest) intersection region was predicted. This was doubled to give the results for two intersection regions for the two points on the vertical plane of symmetry. For the two other points, it was estimated that the second intersection would increase the radiation by no more than 50 percent, so the single region prediction was increased by 50 percent for the comparison in Table 3.4.

The integration intervals used for the SSME/SRB plume intersection regions were the same as used on the SSME plumes with the exception that the increment along the line-of-sight was reduced from 6 inches to 3 inches because of the small thickness of the initial high temperature region in the intersection flow-field (described in Section 2.3).

Predictions were made at the ET base center and lower body flap trailing edge to evaluate the impact of radiation from the reversed gas from the SSME/SRB plume intersection. The results shown in Table 3.5 compared with the current environment indicate significant radiation could result from the reversed flow at 120 kft. Since the reversed flow radiation increases with altitude while most other radiation decreases with altitude, the altitude adjustment schemes* used do not furnish the necessary trends to define the effect.

The lower body flap surface receives no SSME plume radiation, so the SSME environment assigned is intended to recognize a small contribution of the reversed gas radiation. A full description of the radiation predicted would have required either artificially raising the low altitude heating rate (presently 0 up to 40 kft)

* Recommend altitude adjustment procedures described in Section 5.

TABLE 3.4
 COMPARISON OF RADIATION ESTIMATES FOR
 THE SSME/SRB PLUME INTERSECTION REGIONS
 WITH THE DESIGN ENVIRONMENT AT AN ALTITUDE OF 100,000 FEET

Location	Ø (Note 1)	Point No.	Predicted Radiation - Btu/ft ² -sec		
			Environment (Refs. 1-3)		SSME/SRB Intersection Estimate (Note 2)
			SRB	SSME	
Fin trailing edge	-	640	1.84	2.64	0.10
ET base center	-	8000	3.15	0.65	0.05
SRB skirt aft rim	0	2100	7.71	1.02	0.12
SRB skirt inbd rim	45	2119	0.85	0.85	0.02

- NOTES: 1) Ø defined in Table 3.2
 2) Predictions made for the closest intersection region were doubled for points on the vertical plane of symmetry (pts. 640 and 8000) and increased 50 percent for the other two points to give an estimate for both regions.

TABLE 3.5
 COMPARISON OF RADIATION ESTIMATES FOR THE REVERSED
 GAS WITH THE DESIGN ENVIRONMENT AT 80,000 AND 120,000 FEET

Location	Point No.	Alt kft	Predicted Radiation Btu/ft ² -sec		
			Environment (Refs. 1-3)		Reversed Gas Estimate
			SRB	SSME	
Body flap lower TE	213	80	2.24	0.04	0.11
		120	1.79	0.07	0.60
FT base center	8000	80	3.51	0.81	0.12
		120	2.89	0.45	0.53

or assigning special altitude adjustment factors for this surface. Neither approach was deemed justified since the thermal protection system intended for the body flap lower surface is likely to be designed by re-entry heating loads. A similar argument was made for the lower surface of the lower SSME nozzles where the thermal protection system is designed by high radiation and impingement heating at other locations on the interior of the engine cluster.

Radiation from the reversed gas to the IT base and the inner surface of the SRB were considered in assigning the SSME altitude adjustment factors and slight adjustments were made to the 160 kft heating rates in some cases to cover possible reversed gas radiation prior to the SRB separation. Surfaces other than those discussed here are not expected to receive significant radiation from the reversed gas.

Integration intervals used in the reversed gas prediction were the same as those for the SSME plumes except that the angular integration intervals were increased because of the relative uniformity of the gas and the close proximity of the gas to the prediction points.

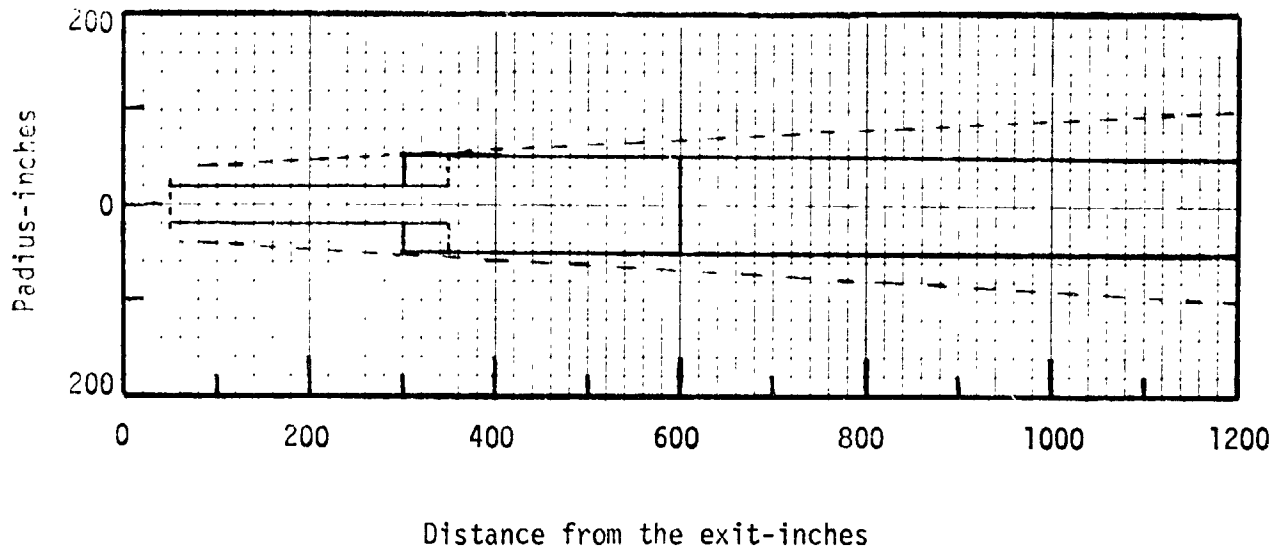
Section 4

VIEW FACTOR PLUME MODEL

In order to allow rapid prediction of radiation distributions, a model representing the sea level plume was developed for use with a modified version of the RAVFAC program (Ref. 19) which sums the products of computed view factors and emissive powers for plume components to arrive at predictions of incident radiation. This section will describe the development of the plume model and present a comparison of the RAVFAC and GASRAD predictions for surfaces in the Space Shuttle base region.

The modified RAVFAC program can handle either opaque or transparent shapes, so portions of the plume believed to have relatively high transmissivity can be modeled as transparent while those with low transmissivity can be specified as opaque. Because of the success achieved with the model of the previous plume predictions (Ref. 5), a similar model was chosen initially for development of the current plume model. However, it was difficult making the nozzle lip predictions high enough without forcing the upper body flap point too high. A new shape was tried with a disk inside a cylinder to shade it from view for directions approaching normal to the plume axis. The resulting model is described in Fig. 4.1. In general, the size of the shapes decreased while emissive powers increased in comparison with the model in Ref. 5. In the present model, the disks were made transparent to save shading calculation time since they would primarily shade the interior of the cylinders which do not radiate.

Ratios of RAVFAC to GASRAD predictions for the points used in developing the plume are shown in Table 4.1 for both the design plume and variations made



Shape	Emissive power Btu/ft ² -sec	Distance from exit inches	Radius inches	β -elements	γ -elements
Disk 1 - Transparent	150	50	25	2	8
2 - Transparent	120	350	20-50	3	8
Cylinder 1 - Opaque	60	50-350	20	6	16
2 - Opaque	60	300-600	50	6	16
3 - Opaque	40	600-1200	50	6	16
Cone - Transparent	12	120-1200	40-100	11	8

Fig. 4.1 RAVFAC model for the TKE 2 sea level plume

to test sensitivity to element size. The goal was to achieve ratios of 1.0 to 1.2 for the points used. The largest error (22.7%) was on the body flap upper trailing edge which seemed to be difficult to model. It was surmised that in the GASRAD prediction cooler portions of the lower plumes absorbed more of the high radiation levels from the upper plumes than could be duplicated within the RAVFAC model limitations.

In designing a RAVFAC model, an attempt is made to minimize the number of surface elements, so that more computer memory will be available for surfaces receiving radiation and computation time will be reduced. At the same time, the elements must be properly distributed to allow a reasonably accurate representation of shading effects. This also usually satisfies the requirement of having elements small enough for the necessary numerical computation requirements. The number of elements for the surfaces in the design plume were assigned considering these factors, then checked by varying the element size to determine the sensitivity and detect errors due to improper sizing. The results of varying element size presented in Table 4.1 indicate that increasing the size (reducing the number of elements) does not produce a significant deterioration in the plume model accuracy. However, no reductions in the number of elements were considered since the number of elements in the plume model were not considered excessive and there is always the possibility of larger errors at other locations. Increasing the number of elements did not result in any significant increases in the indicated RAVFAC plume error although the maximum error increased from 22.7 to 24.7 percent. The largest percentage change due to increasing the elements was at Point 8670 on the ET base where the RAVAC prediction decreased 5 percent when elements in the axial direction on the cylinders (β - elements) were doubled. This illustrates the relative sensitivity that heavily shaded

TABLE 4.1
RESULTS OF THE RAVFAC PLUME STUDY

Location	Point No.	Ratio of RAVFAC/GASRAD predictions				
		Design	β-elements Note 1		γ-elements Note 2	
			Double	Halve	Disks 16	Cyl's 8
Orbiter heat shield						
Bottom outboard	909	1.098	1.085	1.119	1.066	1.102
Upper middle outboard	961	1.095	1.055	1.128	1.096	1.115
RCS Pod						
Inboard facing surface	862	1.144	1.142	1.124	1.162	1.142
Body flap trailing edge						
Upper center	233	1.227	1.247	1.211	1.226	1.227
Fin trailing edge						
40° Span - aft	640	1.030	1.026	1.046	1.014	1.040
- side	6499	1.062	1.061	1.071	1.046	1.096
Wing trailing edge						
60° Span - aft	360	0.993	0.999	1.000	1.001	1.002
SSME 1						
Exit manifold - top	7480	1.054	1.069	1.000	1.055	1.058
- aft θ=90	7530	0.991	1.009	0.953	0.995	1.012
- aft θ=270	7580	1.061	1.070	1.032	1.059	1.072
ET Base						
Center	8600	1.053	1.054	1.070	1.058	1.068
108.4 inch radius - top	8670	1.165	1.100	1.139	1.153	1.159
ET/SRB Aft support						
Upper link facing aft	775	1.139	1.129	1.129	1.123	1.122
SRB Skirt						
Outer lip - top	2109	1.110	1.105	1.136	1.106	1.107
Base - top	2500	1.123	1.111	1.160	1.121	1.094
Mean		1.090	1.084	1.088	1.085	1.094

Notes: Changes described are variations to the "design" RAVFAC plume in Fig 4.1.

1) β-elements are the axial elements on cylinders and cones and the radial elements on disks. Since some surfaces have odd numbers of β-elements, the halving procedure followed was

$$(\beta\text{-elt})_{NEW} = ((\beta\text{-elt})_{OLD} + 1) / 2.$$

with the result truncated to an integer.

2) γ-elements are the circumferential elements. The γ-elements on the disks were increased to 16 to give 16 elements on all surfaces but the transparent cone. In reducing elements, the cylinders were reduced to 8 elements so all surfaces had 8 γ-elements.

points can have to the element distribution, but it was not considered sufficient cause to increase the elements in the plume model.

A comparison of the available RAVFAC and GASRAD predictions using the plume model are shown in Table 4.2. The indicated errors in the RAVFAC predictions are less than 20 percent for all significant heat rates with the exception of 9 points on the SSME nozzles.

Analysis of the errors indicated that too much emphasis had been placed on the disk located 50 inches from the nozzle exit which represents the beginning of the high temperature region caused by the plume Mach disk. This had been done to reduce the number of elements in the plume and the indicated error at the upper body flap point (Point 241). A better plume probably could have been achieved using two disks with lower emissive powers, but the errors caused by the use of one disk were not apparent in the sample problems used in developing the plume.

The possibility of increasing the number of elements on the first disk was investigated to determine if this would improve the agreement for the nozzle points. Increasing the elements from 16 (2 x 8) to 48 (3 x 16) caused significant changes in some of the predictions with poor agreement, but the trend was not always toward reducing the error.

On SSME nozzle 1 the agreement is good at the exit plane (Points 7XX0), but apparently too much radiation in the RAVFAC prediction comes from the near portion of plumes 2 and 3 while the mixing region of plume 1 contributes a negligible amount. Moving forward on the nozzle to hat band 2 (Points 7XX2) causes the GASRAD results to drop apparently due to shading of plume 1 by the nozzle exit manifold and aft most hat band, while the same location on the RAVFAC model does not have appreciable smaller view factors for the near plume of SSME

TABLE 4.2
RADIATION PREDICTION COMPARISONS AT SELECTED LOCATIONS

Location	θ^1	Point No.	Incident Radiation Btu/ft ² sec		Ratio RAVFAC/ GASRAD
			RAVFAC	GASRAD	
Orbiter base heat shield					
Bottom center		900	3.74	3.53	1.06
Center		905	2.63	2.35	1.12
Bottom outboard		909	2.31	2.10	1.10
Bottom No. 1 bulge	270	941	2.61	2.47	1.06
Top outboard		957	1.07	0.99	1.08
Upper middle outboard		961	5.50	5.02	1.10
Bottom eng mtd hs 1	270	984	3.18	3.45	0.92
RCS Pod					
Lower surface		807	0.77	0.86	0.90
Aft surface		837	13.4	12.1	1.11
Outboard lower surface		851	0.38	0.45	0.84
Inboard surface		862	4.88	4.27	1.14
Top		874	0.02	0.03	0.67
Top		877	0.07	0.105	0.67
OMS Pod					
Base		784	4.90	4.71	1.04
Nozzle shroud base		7780	7.08	7.41	0.96
Body flap trailing edge					
Upper center		233	14.2	11.6	1.23
Aft center		241	12.9	11.5	1.12
Fin trailing edge					
*40% span aft		640	13.6	13.2	1.03
*40% span side		6499	1.73	1.63	1.06
Wing trailing edge					
*60% span aft		360	3.49	3.51	0.99
60% span top		4699	1.79	2.17	0.82
OMS Nozzle					
Aft facing lip	180	7150	13.1	11.8	1.11

TABLE 4.2 (Continued)
 RADIATION PREDICTION COMPARISONS AT SELECTED LOCATIONS

Location	O ¹	Point No.	Incident Radiation Btu/ft ² sec		Ratio RAVFAC/ GASRAD
			RAVFAC	GASRAD	
Inbd facing exterior surface	180	7152	6.66	5.93	1.12
Inbd facing inner lip	0	7201	11.6	10.6	1.09
Outbd facing inner lip	180	7251	0	0.005	--
RCS Aft Nozzles 8 and 9					
Inbd facing inner lip	0	9502	9.75	8.90	1.10
Outbd facing inner lip	0	9652	0.01	0.10	0.10
Inbd facing outer lip	180	9651	5.82	4.92	1.18
SSME Nozzle 1					
Hat-band 2 top - outbd	0	7402	0.31	0.33	0.94
*Exit manifold top	270	7480	11.3	10.7	1.05
Hat-band 2 top - inbd	270	7482	9.14	6.62	1.38
Hat-band 4 top - inbd	270	7484	3.63	3.68	0.99
Hat-band 2 aft - outbd	0	7502	1.59	1.12	1.42
*Exit manifold aft - outbd	90	7530	16.8	17.0	0.99
*Exit manifold aft - inbd	270	7580	27.3	25.7	1.06
Hat-band 2 aft - inbd	270	7582	11.0	9.20	1.20
Hat-band 4 aft - inbd	270	7584	5.20	5.23	0.99
SSME Nozzle 2					
Hat-band 1 top	135	7741	7.56	5.87	1.29
Hat-band 2 top	135	7742	6.21	4.42	1.40
Hat-band 2 top	180	7752	1.02	1.39	0.73
Hat-band 2 top	225	7762	1.64	1.20	1.37
Hat-band 1 aft	135	7841	12.6	10.3	1.22
Hat-band 2 aft	135	7842	9.28	7.06	1.31
Hat-band 2 aft	180	7852	3.93	3.76	1.05
Hat-band 2 aft	225	7862	4.00	2.63	1.52
ET Base					
*Center		8000	2.96	2.84	1.04
57.1 inch radius - top	0	8330	2.81	2.77	1.01

TABLE 4.2 (Continued)

RADIATION PREDICTION COMPARISONS AT SELECTED LOCATIONS

Location	θ^1	Point No.	Incident Radiation Btu/ft ² sec		Ratio RAV/FAC/ GASRAD
			RAV/FAC	GASRAD	
57.1 inch radius - bottom	180	8339	2.20	2.07	1.06
*108.4 inch radius - top	0	8670	1.92	1.65	1.16
- bottom	180	8679	0.93	0.88	1.06
154.2 inch radius - top	0	8950	0.13	0.21	0.62
- bottom	180	8959	0.02	0.021	0.95
ET/SRB aft support					
*Upper link - aft		775	1.71	1.50	1.14
Lower link - aft		825	1.72	1.71	1.01
SRB aft support post					
Outer lip	30	671	9.23	8.98	1.03
SRB skirt					
*Outer lip - top	0	2109	5.31	4.78	1.11
- side	90	2139	1.40	1.59	0.88
*Base web - top	0	2500	3.68	3.28	1.12
SRB base curtain	45	2317	9.04	9.03	1.00
SRB case/skirt ring					
Aft facing web - top	0	6503	4.14	3.70	1.12
Inbd facing rim - side	90	6535	2.23	2.27	0.98
SRB stiffener at $X_B=1733.56$					
Aft facing web - top	0	6303	3.13	2.86	1.09
- side	90	6333	3.16	3.11	1.02
Outside rim - top	0	6305	3.54	3.33	1.06
- side	90	6335	1.53	1.49	1.03

* Points used in developing the RAVFAC plume model.

NOTES: 1) θ is measured clockwise from the axis of the surface in the negative Y_0 direction from the Orbiter. For the SRB and ET it is measured from the top (positive Z_0).

2) Nozzle hat-bands numbered forward starting with the one next to the lip manifold.

2 and 3. This results in an over-prediction by the RAVFAC model. The success of the RAVFAC model at the fourth hat-band (Points 7XX4) is fortuitous.

On SSME nozzle 2, the over-prediction at hat-band 2 (Points 7XX2) is similar to that of nozzle 1 except for the points at $\theta = 180^\circ$ (Points 7X5X). At this point, nozzle 3 is so close to nozzle 2 that the initial disk surface of plume 3 is shaded by nozzle 3. (Refer to Fig. 2.1 for engine position.)

Section 5
RECOMMENDED THERMAL ENVIRONMENT

The recommendations resulting from this study have been incorporated in the radiation environment presented in Refs. 1 thru 3 to provide a sea level prediction with multiplying factors to account for altitude variations.

The adjustments to the sea level predictions made using the RAVFAC program and plume model were generally minor except on the SSME nozzles as indicated by the comparison with GASRAD predictions in Table 4.2. The adjustments were judiciously applied using comparisons at known points as a guide to points with similar orientations or locations. Because of the poor agreement between the RAVFAC and GASRAD predictions on the SSME nozzles (Table 4.2) it was necessary to increase the number of GASRAD predictions in this region to assure the RAVFAC results could be properly adjusted. It is recommended that the RAVFAC plume model be revised before it is used for further radiation studies on the SSME nozzles.

Altitude adjustments were divided into three ranges: 0 to 40 kft., 40 to 160 kft., and over 160 kft. Double letter codes were provided for each point with the first letter designating a curve depicting the variation in adjustment factor from 0 to 40 kft and the second letter designating a heating rate of 160 kft and above. Between 40 and 160 kft a linear variation with altitude is assumed.

The altitude curves for 0 to 40 kft were determined by plotting the altitude to sea level radiation ratios for data in Table 3.2 which were $0.1 \text{ Btu/ft}^2\text{-sec}$ or greater at any altitude. The result is shown in Fig. 5.1 with the solid curve selected to represent the current data, while the dashed curve shows the 1976

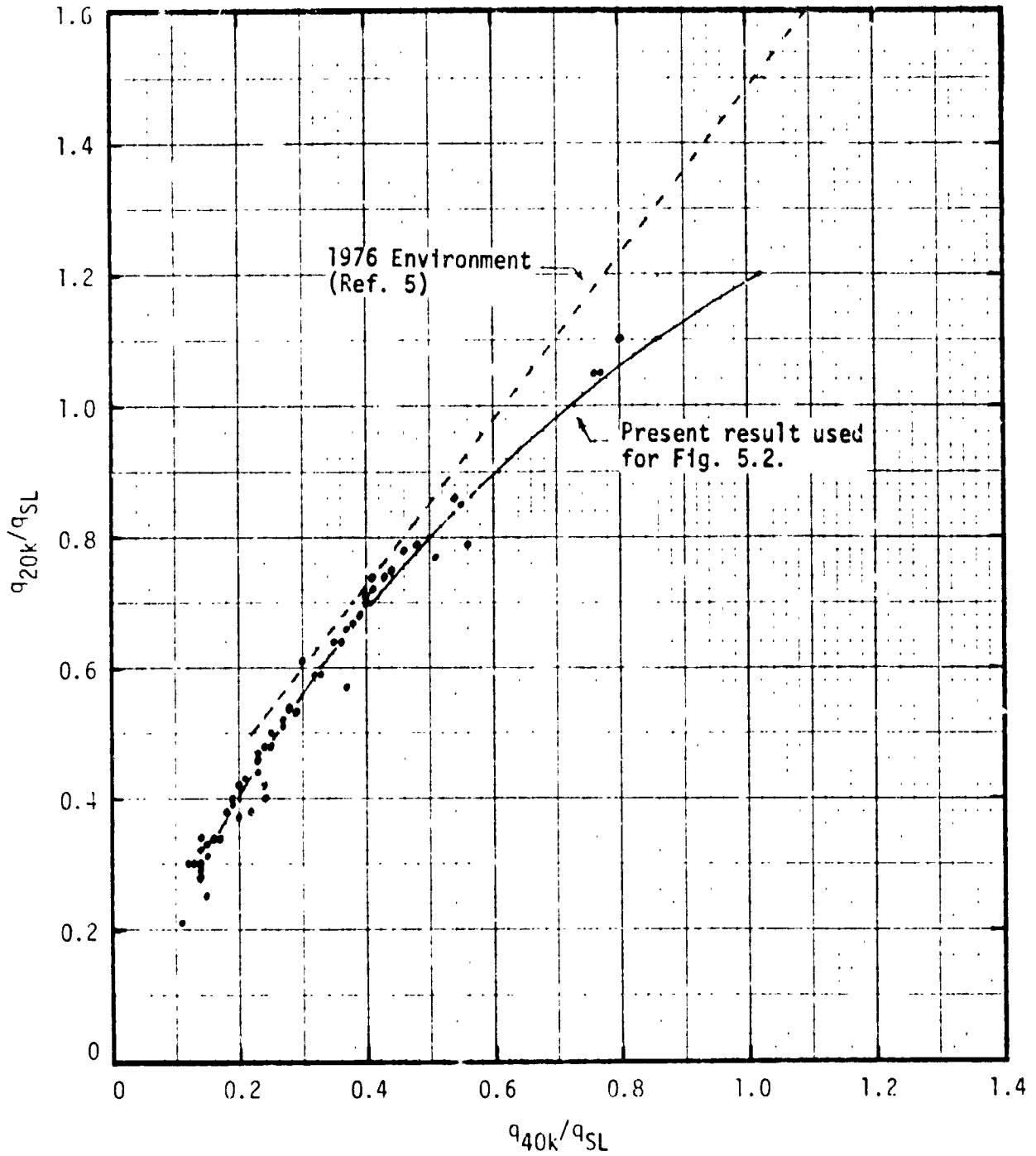


Fig. 5.1 Altitude radiation ratio relation used to define the 20kft and 40 kft points c^f the correction curves in Fig. 5.2.

trend (Ref. 5). The curve of altitude ratios was used to determine points for construction of the family of altitude curves illustrated in Fig. 5.2. The higher curves generally apply to points with low heating rates which are shaded at sea level and get a better view of the plume as it expands. Points which have a good view of the plume at sea level are characterized by the lower curves. The lower curves decrease relatively slowly at low altitude to represent the persistence of the large Mach disk and shock structure in the plume. One of these curves was assigned by the first altitude correction code letter to each point in the base region based upon (1) its view of the plume, and (2) the results reported for a similarly located point in Table 3.2.

The second letter in the double letter altitude code specifies the radiation at 160 kft. It represents either a fraction of sea level heating or a fixed rate as shown at the top of Fig. 5.2. These are the same altitude correction codes as used in 1976 for the environment at 160 kft, and are determined using the vacuum plume predictions in Table 3.2. For points receiving significant radiation from the vacuum plume model, one of the ratios was used, while for points with negligible radiation one of the fixed rates was used depending on the predicted heating or the uncertainty due to recirculating gas and other undefined plume features.

Although the SRBs are separated before 160 kft, an environment was specified at 160 kft to allow interpolation between 40 kft and 160 kft. In assigning the 160 kft correction factor for the SRB, the predicted heating of the inboard surfaces of the SRB by the reversed gases from the SSME/SRB plume impingement was considered, and in some cases, this condition determines the environment specified at 160 kft rather than the anticipated radiation from the vacuum plume. Radiation from the SSME/SRB plume intersection region was neglected.

Altitude Corrections for 160 kft							
Code Letter	<u>K</u>	<u>L</u>	<u>M</u>	<u>N</u>	<u>O</u>	<u>P</u>	<u>Q</u>
q_{160k}/q_{SL}	0.06	0.12	0.18	0.24	0.30	-	-
$q_{160k}(\text{Btu/ft}^2\text{-sec})$	-	-	-	-	-	0.1	0.2

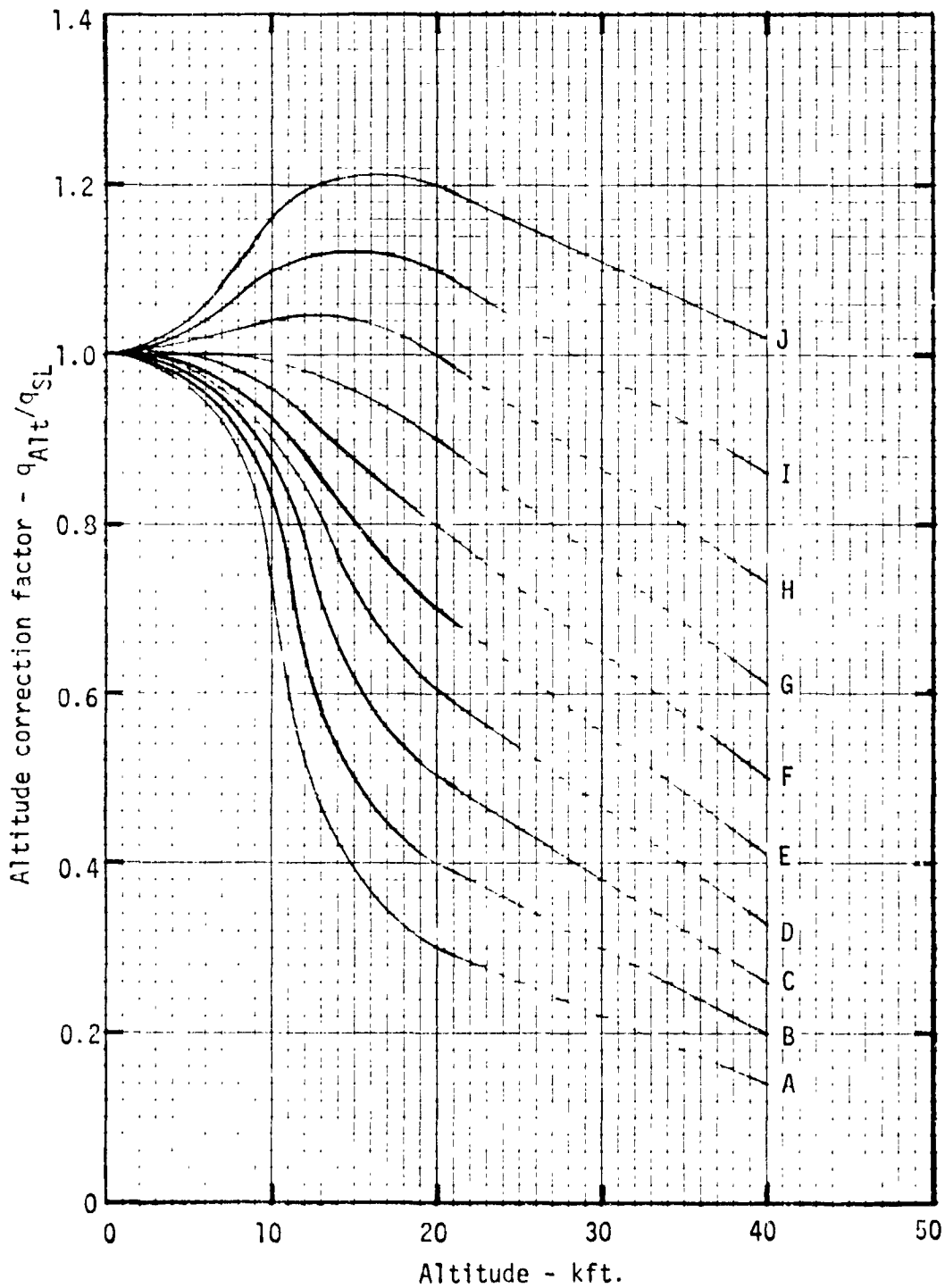


Fig. 5.2 Altitude correction factors for SSME plume radiation

Section 6

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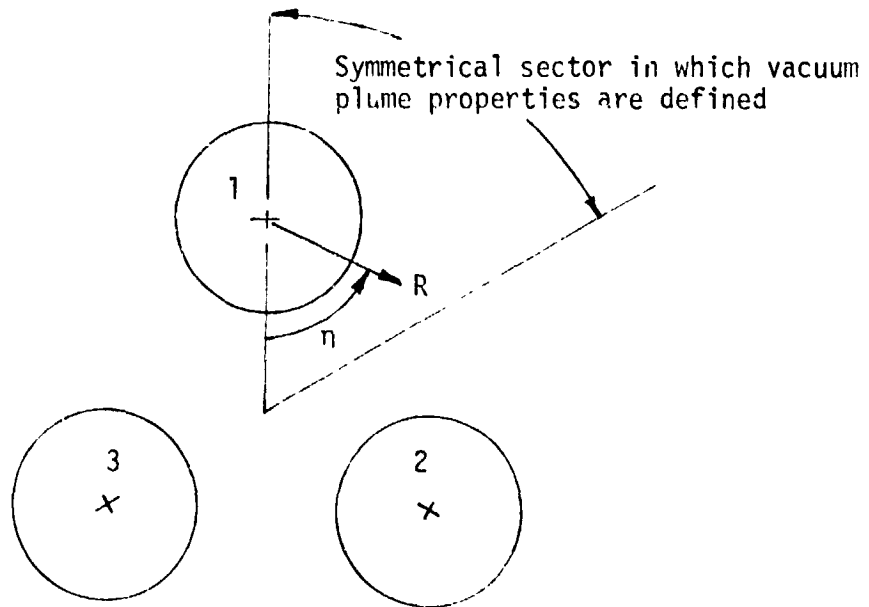
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APPENDIX

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NOMENCLATURE

<u>Symbol</u>		<u>Units</u>
F1	H ₂ O Mole Fraction	
F2	N ₂ Mole Fraction	
P	Pressure	psfa
R	Radius	inches
T	Temperature	R
Z	Axial distance from nozzle exit	inches
η	Angle used in vacuum plume definition	degrees



Three-dimensional geometry used for the vacuum plume

REMTECH INC.

SEA LEVEL PLUME PROPERTIES

A2

FLOW FIELD

Z	R	T	P	F1	F2
.000	.000	1406.4	39.6400	.7702	.0000
	2.000	1403.2	39.2400	.7702	.0000
	4.000	1650.7	76.4700	.7702	.0000
	6.000	1735.7	97.9400	.7702	.0000
	12.000	1807.3	122.6300	.7702	.0000
	16.000	1862.4	142.8400	.7702	.0000
	20.000	1925.8	168.4000	.7702	.0000
	24.000	2018	211.5500	.7702	.0000
	28.000	2135.9	277.3300	.7702	.0000
	30.000	2199.4	319.1400	.7702	.0000
	32.000	2263.6	366.3500	.7702	.0000
	34.000	2328.9	419.8300	.7702	.0000
	36.000	2388.6	477.1700	.7702	.0000
	38.000	2445.8	538.8900	.7702	.0000
	40.000	2504.0	608.0500	.7702	.0000
	42.000	2560.2	681.4100	.7702	.0000
	44.000	2619.4	766.1900	.7702	.0000
	45.370	2650.0	814.0000	.7700	.0000
45.380	3223.0	2116.0000	.7700	.0000	
45.390	558.0	2116.2200	.0010	.7900	
INNER SHOCK POINT IS NUMBER 18					
5.000	.000	1366.0	34.8700	.7702	.0000
	2.000	1415.4	40.0500	.7702	.0000
	4.000	1702.5	86.9100	.7702	.0000
	6.000	1752.7	102.3700	.7702	.0000
	10.000	1771.3	110.5600	.7702	.0000
	14.000	1813.7	125.2600	.7702	.0000
	18.000	1872.2	146.8200	.7702	.0000
	22.000	1950.0	178.9500	.7702	.0000
	26.000	2057.5	231.7500	.7702	.0000
	28.000	2110.0	265.1300	.7702	.0000
	30.000	2181.9	307.1800	.7702	.0000
	32.000	2244.8	352.0000	.7702	.0000
	34.000	2307.9	402.0600	.7702	.0000
	36.000	2366.1	456.5700	.7702	.0000
	38.000	2424.5	515.1800	.7702	.0000
	40.000	2479.9	578.5500	.7702	.0000
	42.000	2534.0	646.4100	.7702	.0000
	43.750	2578.0	706.0000	.7700	.0000
43.760	3191.0	1960.0000	.7700	.0000	
44.000	2838.2	1168.7300	.7702	.0000	
45.000	3286.0	2116.0000	.7700	.0000	
52.120	623.7	2116.2200	.0162	.7734	
INNER SHOCK POINT IS NUMBER 18					
10.000	.000	1326.9	30.6500	.7702	.0000
	2.000	1733.5	88.3600	.7702	.0000
	4.000	1751.4	99.1400	.7702	.0000
	6.000	1747.4	101.0500	.7702	.0000
	10.000	1759.6	107.1200	.7702	.0000
	14.000	1797.6	120.0600	.7702	.0000

ORIGINAL PAGE IS
OF POOR QUALITY

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
10.000	18.000	1854.5	140.2600	.7702	.0000
	22.000	1936.0	172.3400	.7702	.0000
	26.000	2043.6	224.3100	.7702	.0000
	29.000	2104.4	258.2500	.7702	.0000
	30.000	2205.6	323.4500	.7702	.0000
	32.000	2281.3	390.2600	.7702	.0000
	34.000	2340.9	430.2400	.7702	.0000
	36.000	2349.6	438.4800	.7702	.0000
	38.000	2459.5	554.5600	.7702	.0000
	40.000	2539.7	653.9100	.7702	.0000
	42.150	2514.0	670.0000	.7700	.0000
	42.160	3162.0	1833.0000	.7700	.0000
	44.500	3286.0	2116.0000	.7700	.0000
	50.970	740.1	2116.2200	.0439	.7450
	INNER SHOCK POINT IS NUMBER 17				
15.000	.000	1866.1	118.5000	.7702	.0000
	2.000	1866.1	118.5000	.7702	.0000
	4.000	1761.7	102.3900	.7702	.0000
	6.000	1745.9	100.7400	.7702	.0000
	10.000	1750.0	104.3700	.7702	.0000
	12.000	1763.3	108.9600	.7702	.0000
	16.000	1811.3	124.9100	.7702	.0000
	20.000	1879.4	149.7200	.7702	.0000
	24.000	1981.9	193.4900	.7702	.0000
	28.000	2095.6	253.1000	.7702	.0000
	32.000	2216.4	331.1500	.7702	.0000
	34.000	2276.7	3.7097	.7702	.0000
	36.000	2335.4	425.4800	.7702	.0000
	38.000	2391.1	479.8100	.7702	.0000
	40.230	2444.0	537.0000	.7700	.0000
40.240	3147.0	1709.0000	.7700	.0000	
43.800	3286.0	2116.0000	.7700	.0000	
50.350	96.7	2116.2200	.0933	.6952	
61.160	56.4	2116.2200	.0014	.7485	
INNER SHOCK POINT IS NUMBER 15					
20.000	.000	1866.2	129.0000	.7702	.0000
	2.000	1866.2	129.0000	.7702	.0000
	4.000	1769.9	105.3100	.7702	.0000
	6.000	1740.9	100.5800	.7702	.0000
	10.000	1754.4	106.3400	.7702	.0000
	16.000	1794.8	119.5700	.7702	.0000
	20.000	1868.5	145.6200	.7702	.0000
	24.000	1971.3	188.6400	.7702	.0000
	26.000	2028.0	216.2100	.7702	.0000
	28.000	2087.4	248.3900	.7702	.0000
	30.000	2148.7	285.3700	.7702	.0000
	32.000	2208.7	325.7200	.7702	.0000
	34.000	2265.5	367.8900	.7702	.0000
	36.000	2323.0	414.7700	.7702	.0000
	38.560	2389.0	476.0000	.7700	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
20.000	38.570	3135.0	1620.0000	.7700	.0000
	42.000	3149.8	2067.5000	.7701	.0000
	43.100	3374.6	2116.2200	.7509	.0415
	49.880	1243.2	2116.2200	.1510	.6383
	67.180	574.3	2116.2200	.0050	.7849
30.000	INNER SHOCK POINT IS NUMBER 15				
	.000	1810.9	118.0700	.7702	.0000
	4.000	1810.9	118.0700	.7702	.0000
	6.000	1751.0	102.5900	.7702	.0000
	9.000	1734.8	99.3500	.7702	.0000
	12.000	1743.3	103.1800	.7702	.0000
	14.000	1755.2	107.0800	.7702	.0000
	18.000	1814.9	126.4200	.7702	.0000
	22.000	1914.2	163.6800	.7702	.0000
	26.000	2028.2	216.3200	.7702	.0000
	30.000	2143.0	281.7800	.7702	.0000
	32.000	2221.0	334.4800	.7702	.0000
	34.080	2253.0	358.0000	.7700	.0000
	34.090	3130.0	1447.0000	.7700	.0000
	38.000	3066.9	1782.1100	.7701	.0000
	40.000	3155.6	2089.3700	.7701	.0000
	41.160	3486.8	2116.2200	.7438	.0622
	48.030	1586.4	2116.2200	.2133	.5805
	58.050	606.4	2116.2200	.0136	.7764
35.000	INNER SHOCK POINT IS NUMBER 12				
	.000	1843.9	128.8900	.7702	.0000
	4.000	1843.9	128.8900	.7702	.0000
	6.000	1757.9	104.6400	.7702	.0000
	10.000	1733.8	99.9300	.7702	.0000
	14.000	1751.5	106.0100	.7702	.0000
	16.000	1776.0	114.7900	.7702	.0000
	20.000	1864.4	144.0700	.7702	.0000
	22.000	1917.2	164.5000	.7702	.0000
	24.000	1974.6	190.1100	.7702	.0000
	26.000	2030.0	217.0000	.7702	.0000
	28.000	2089.1	249.3400	.7702	.0000
	30.000	2140.9	280.4800	.7702	.0000
	32.100	2190.0	316.0000	.7700	.0000
	32.110	3140.0	1390.0000	.7700	.0000
	36.000	3060.0	1760.0000	.7701	.0000
	38.000	3130.6	1998.6200	.7701	.0000
39.710	3545.4	2116.2200	.7404	.0723	
46.620	1754.3	2116.2200	.2412	.5558	
56.530	633.4	2116.2200	.0202	.7699	
40.000	INNER SHOCK POINT IS NUMBER 13				
	.000	1776.4	110.0700	.7702	.0000
	6.000	1776.4	110.0700	.7702	.0000
	10.000	1735.3	100.3400	.7702	.0000
	14.000	1753.7	106.6600	.7702	.0000
16.000	1779.2	114.6800	.7702	.0000	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
40.000	20.000	1869.7	146.0300	.7702	.0000	
	24.000	1979.2	190.2500	.7702	.0000	
	26.000	2034.9	219.7300	.7702	.0000	
	28.000	2092.3	251.1700	.7702	.0000	
	29.200	2125.0	275.0000	.7700	.0000	
	29.210	3165.0	1330.0000	.7700	.0000	
	34.000	3243.8	1708.3400	.7702	.0000	
	36.000	3111.1	1930.3200	.7701	.0000	
	38.270	3621.4	2116.2200	.7367	.0823	
	45.790	2674.5	2116.2200	.3395	.5498	
	57.310	590.1	2116.2200	.0300	.7617	
	INNER SHOCK POINT IS NUMBER 10					
	45.000	.000	1801.1	117.6400	.7702	.0000
6.000		1801.1	117.6400	.7702	.0000	
8.000		1747.4	102.9700	.7702	.0000	
10.000		1735.7	100.5100	.7702	.0000	
14.000		1757.4	107.7500	.7702	.0000	
16.000		1788.2	117.4900	.7702	.0000	
20.000		1877.7	149.0500	.7702	.0000	
24.000		1989.6	197.1400	.7702	.0000	
26.000		2291.8	388.2400	.7702	.0000	
27.000		2070.0	239.0000	.7700	.0000	
27.010		3200.0	1290.0000	.7700	.0000	
32.000		3034.7	1680.1900	.7702	.0000	
34.000		3096.6	1880.6400	.7701	.0000	
37.310	3690.9	2116.2200	.7365	.0895		
44.890	2820.5	2116.2200	.3615	.5343		
56.400	747.9	2116.2200	.0405	.7552		
INNER SHOCK POINT IS NUMBER 10						
50.000	.000	1767.5	108.7700	.7702	.0000	
	8.000	1767.5	108.7700	.7702	.0000	
	10.000	1740.6	101.8800	.7702	.0000	
	14.000	1765.4	110.1300	.7702	.0000	
	16.000	1801.6	121.7500	.7702	.0000	
	18.000	1842.3	135.8600	.7702	.0000	
	20.000	1893.6	155.2400	.7702	.0000	
	22.000	1983.3	193.9700	.7702	.0000	
	23.600	1993.0	200.0000	.7700	.0000	
	23.610	3273.0	1250.0000	.7700	.0000	
	30.000	3034.5	1679.2000	.7702	.0000	
	32.000	3091.0	1861.4200	.7701	.0000	
	34.000	3142.9	2042.6000	.7701	.0000	
35.600	3280.0	2116.0000	.7700	.0000		
35.660	3742.8	2116.2200	.7346	.0974		
47.500	2971.4	2116.2200	.3839	.5181		
54.990	822.4	2116.2200	.0527	.7470		
70.610	561.7	2116.2200	.0011	.7890		
INNER SHOCK POINT IS NUMBER 9						
52.000	.000	1765.7	108.5100	.7702	.0000	
	8.000	1765.7	108.5100	.7702	.0000	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
52.000	10.000	1740.8	101.9700	.7707	.0000	
	12.000	1746.2	104.6600	.7707	.0000	
	14.000	1772.1	112.1700	.7707	.0000	
	16.000	1806.6	123.3000	.7707	.0000	
	18.000	1847.8	137.8200	.7707	.0000	
	20.000	1901.2	158.2500	.7707	.0000	
	22.000	1952.6	180.0300	.7707	.0000	
	23.010	1978.0	192.0000	.7700	.0000	
	23.020	3289.0	1244.0000	.7707	.0000	
	28.000	3001.7	1580.3100	.7707	.0000	
	30.000	3056.6	1748.9000	.7701	.0000	
	32.000	3110.5	1927.9000	.7701	.0000	
	34.000	3220.4	2090.7400	.7700	.0000	
	35.000	3286.0	2116.0000	.7700	.0000	
	35.860	3742.8	2116.2200	.7346	.0974	
	43.500	2971.4	2116.2200	.3839	.5181	
	54.990	822.4	2116.2200	.0527	.7470	
70.610	561.7	2116.2200	.0011	.7890		
INNER SHOCK POINT IS NUMBER 10						
52.100	.000	5600.0	4354.0000	.7707	.0000	
	23.000	5600.0	4354.0000	.7707	.0000	
	23.010	4236.0	4354.0000	.7707	.0000	
	23.020	3288.0	1244.0000	.7700	.0000	
	24.000	3346.0	1563.0400	.7707	.0000	
	26.000	3200.9	1501.6500	.7701	.0000	
	28.000	3191.5	1657.4500	.7701	.0000	
	30.000	3196.1	1809.5400	.7701	.0000	
	32.000	3207.8	1957.4200	.7701	.0000	
	35.000	3286.0	2116.0000	.7700	.0000	
	35.860	3742.8	2116.2200	.7346	.0974	
	43.500	2971.4	2116.2200	.3839	.5181	
	54.990	822.4	2116.2200	.0527	.7470	
	70.610	561.7	2116.2200	.0011	.7890	
	60.000	.000	5700.0	5400.0000	.7700	.0000
		22.250	5700.0	5400.0000	.7707	.0000
		22.260	4378.0	5400.0000	.7700	.0000
23.920		4063.0	5222.0000	.7707	.0000	
23.930		3227.0	1650.0000	.7700	.0000	
26.000		3217.7	1772.5700	.7707	.0000	
28.000		3215.8	1900.4900	.7700	.0000	
30.000		3219.8	2017.6700	.7707	.0000	
32.930		3327.8	2116.2200	.7315	.1086	
47.660		3175.2	2116.2200	.4131	.4967	
52.080		949.4	2116.2200	.0730	.7334	
67.920		566.1	2116.2200	.0023	.7880	
70.000		.000	5600.0	4712.0000	.7700	.0000
		21.000	5600.0	4712.0000	.7707	.0000
		21.010	4285.0	4712.0000	.7700	.0000
		22.000	4203.1	5077.6500	.7673	.0000
		24.000	4033.6	5570.9600	.7681	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
75.000	25.000	3985.0	5835.0000	.7700	.0000	
	25.010	3244.0	2037.0000	.7700	.0000	
	26.000	3237.3	2051.6400	.7700	.0000	
	28.000	3226.6	2113.8400	.7700	.0000	
	29.510	3910.4	2116.2200	.7283	.1197	
	37.320	3363.7	2116.2200	.4390	.4773	
	48.650	1103.1	2116.2200	.0965	.7176	
	64.680	574.2	2116.2200	.0043	.7865	
	80.000	.000	5600.0	4602.0000	.7700	.0000
		19.170	5600.0	4602.0000	.7700	.0000
19.180		4271.0	4602.0000	.7700	.0000	
22.610		3946.7	4765.4300	.7685	.0000	
24.610		3850.3	4905.5300	.7688	.0000	
26.400		3286.0	2116.0000	.7700	.0000	
27.100		3984.7	2116.2200	.7252	.1297	
34.970		3524.5	2116.2200	.4601	.4610	
46.170		1268.4	2116.2200	.1207	.7013	
62.360		587.1	2116.2200	.0072	.7844	
90.000	.000	5600.0	4686.0000	.7700	.0000	
	17.100	5600.0	4686.0000	.7700	.0000	
	17.110	4293.0	4686.0000	.7700	.0000	
	19.610	4139.9	4667.1100	.7677	.0000	
	20.610	3644.4	3846.9200	.7689	.0000	
	22.610	3439.0	2308.1300	.7699	.0000	
	24.610	3224.0	1743.4100	.7700	.0000	
	25.610	3273.4	2036.2100	.7700	.0000	
	27.680	4051.6	2116.2200	.7223	.1388	
	35.620	3663.6	2116.2200	.4775	.4473	
100.000	46.670	1440.8	2116.2200	.1450	.6850	
	63.030	606.1	2116.2200	.0112	.7814	
	.000	5550.0	4033.0000	.7700	.0000	
	15.400	5550.0	4033.0000	.7700	.0000	
	15.410	4186.0	4033.0000	.7700	.0000	
	16.610	3594.9	3478.9100	.7683	.0000	
	18.610	3708.9	2703.3700	.7694	.0000	
	20.610	3433.9	2071.0100	.7699	.0000	
	22.610	3291.3	1749.0500	.7700	.0000	
	24.610	3260.2	1813.3700	.7700	.0000	
105.000	26.610	3276.9	2020.0000	.7700	.0000	
	27.500	3286.0	2116.0000	.7700	.0000	
	29.770	4111.8	2116.2200	.7195	.1471	
	36.770	3783.4	2116.2200	.4917	.4355	
	47.650	1617.3	2116.2200	.1688	.6691	
	64.170	632.2	2116.2200	.0165	.7776	
	.000	5530.0	3513.0000	.7700	.0000	
	14.850	5530.0	3513.0000	.7700	.0000	
	14.860	4093.0	3513.0000	.7700	.0000	
	14.610	3635.3	2790.7700	.7689	.0000	
18.610	3576.8	2161.0000	.7698	.0000		
20.610	3335.4	1659.2000	.7700	.0000		

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
105.000	22.610	7323.6	1816.2700	.7700	.0000	
	24.610	3312.9	1961.0900	.7700	.0000	
	26.610	3316.2	2142.8300	.7700	.0000	
	27.900	3286.0	2116.0000	.7700	.0000	
	28.850	4165.8	2116.2200	.7169	.1547	
	36.900	3887.6	2116.2200	.5035	.4253	
	47.640	1797.3	2116.2200	.1920	.6539	
	64.300	666.5	2116.2200	.0230	.7730	
	115.000	.000	5300.0	2386.0000	.7700	.0000
		14.600	5300.0	2386.0000	.7700	.0000
14.610		3240.4	2386.0000	.7680	.0000	
16.610		3695.4	2176.3300	.7694	.0000	
18.610		3501.9	1820.2300	.7699	.0000	
20.610		3399.4	1763.7700	.7699	.0000	
22.610		3390.8	1995.5000	.7699	.0000	
24.610		3372.3	2133.9200	.7699	.0000	
26.610		3310.1	2122.5200	.7700	.0000	
28.200		3226.0	2116.0000	.7700	.0000	
120.000	29.200	4214.1	2116.2200	.7141	.1616	
	37.290	3478.5	2116.2200	.5133	.4166	
	47.860	1978.3	2116.2200	.2143	.6394	
	64.690	709.7	2116.2200	.0300	.7675	
	81.540	561.1	2116.2200	.0010	.7893	
	.000	5170.0	1779.0000	.7700	.0000	
	14.600	5170.0	1779.0000	.7700	.0000	
	14.610	3658.5	1779.0000	.596	.0000	
	16.610	3584.4	1769.4900	.7699	.0000	
	18.610	3553.6	1907.4300	.7699	.0000	
130.000	20.610	3474.8	1949.7900	.7699	.0000	
	22.610	3439.8	2116.3900	.7699	.0000	
	24.610	3365.1	2095.6700	.7700	.0000	
	26.610	3314.7	2106.6700	.7700	.0000	
	28.300	3280.0	2116.0000	.7700	.0000	
	29.540	4257.3	2116.2200	.7114	.1681	
	37.670	4050.6	2116.2200	.5215	.4090	
	48.070	2147.0	2116.2200	.2347	.6255	
	65.000	761.9	2116.2200	.0390	.7613	
	82.060	563.0	2116.2200	.0016	.7888	
140.000	.000	4970.0	1099.0000	.7700	.0000	
	14.600	4970.0	1099.0000	.7700	.0000	
	14.610	3301.1	1099.0500	.7700	.0000	
	16.610	3404.4	1282.4600	.7699	.0000	
	18.610	3530.7	1767.0000	.7699	.0000	
	20.610	3554.6	2134.1000	.7699	.0000	
	22.610	3503.2	2295.6700	.7699	.0000	
	24.140	3574.1	2116.2200	.7522	.0626	
	29.630	4295.9	2116.2200	.7367	.1741	
	37.910	4120.2	2116.2200	.5281	.4025	
150.000	48.020	2300.5	2116.2200	.2537	.6122	
	65.010	822.5	2116.2200	.0497	.7545	

ORIGINAL PAGE IS
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FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
130.000	82.300	567.3	2116.2200	.0026	.7881
140.000	.000	5070.0	1402.0000	.7700	.0000
	14.600	5070.0	1402.0000	.7700	.0000
	14.610	3511.8	1402.6400	.7699	.0000
	16.610	3489.4	1502.1600	.7699	.0000
	18.610	3452.0	1588.5600	.7699	.0000
	20.610	3434.1	1755.1100	.7699	.0000
	22.610	3421.9	1961.7200	.7699	.0000
	24.170	3615.8	2116.2200	.7505	.0686
	20.740	4330.4	2116.2200	.7060	.1798
	37.940	4188.0	2116.2200	.5333	.3969
	47.980	2465.5	2116.2200	.2717	.5995
	65.000	891.1	2116.2200	.0604	.7470
	82.510	572.7	2116.2200	.0039	.7871
150.000	.000	5210.0	1958.0000	.7700	.0000
	14.600	5210.0	1958.0000	.7700	.0000
	14.610	3717.7	1958.1700	.7693	.0000
	16.610	3613.0	1877.6100	.7697	.0000
	18.610	3405.5	1523.5800	.7699	.0000
	20.610	3352.6	1565.0700	.7700	.0000
	22.610	3344.8	1734.7100	.7700	.0000
	24.200	3657.6	2116.2200	.7487	.0746
	20.830	4361.1	2116.2200	.7031	.1851
	39.060	4239.0	2116.2200	.5375	.3921
	47.930	2617.6	2116.2200	.2868	.5874
	64.950	966.7	2116.2200	.0717	.7392
	82.680	580.3	2116.2200	.0057	.7859
160.000	.000	5210.0	1918.0000	.7700	.0000
	14.600	5210.0	1918.0000	.7700	.0000
	14.610	3705.3	1918.9800	.7694	.0000
	16.610	3629.9	1932.5200	.7697	.0000
	18.610	3558.5	1974.2800	.7698	.0000
	20.610	3324.9	1542.7000	.7700	.0000
	22.610	3271.3	1563.3600	.7700	.0000
	24.730	3699.5	2116.2200	.7470	.0804
	30.430	4386.7	2116.2200	.7003	.1901
	38.680	4282.6	2116.2200	.5407	.3880
	48.400	2764.1	2116.2200	.3050	.5759
	65.360	1046.6	2116.2200	.0834	.7311
	83.350	590.4	2116.2200	.0080	.7843
180.000	.000	5210.0	2035.0000	.7700	.0000
	14.600	5210.0	2035.0000	.7700	.0000
	14.610	3741.7	2035.8900	.7692	.0000
	16.610	3634.3	1955.8700	.7696	.0000
	18.610	3504.7	1811.1800	.7699	.0000
	20.610	3449.7	1881.7100	.7699	.0000
	22.610	3443.6	2113.1500	.7699	.0000
	23.800	3782.4	2116.2200	.7436	.0916
	29.640	4435.8	2116.2200	.6944	.1996
	37.930	4352.0	2116.2200	.5457	.3814

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
180.000	47.340	3037.6	2116.2200	.3347	.5545	
	64.110	1227.6	2116.2200	.1074	.7145	
190.000	82.560	620.1	2116.2200	.0143	.7799	
	.000	5190.0	1798.0000	.7700	.0000	
	14.600	5190.0	1798.0000	.7700	.0000	
	14.610	3665.9	1798.9700	.7695	.0000	
	16.610	3598.0	1821.7800	.7698	.0000	
	18.610	3598.8	2085.8800	.7698	.0000	
	20.610	3565.8	2287.5800	.7698	.0000	
	22.350	3823.2	2116.2200	.7418	.0971	
	28.240	4456.0	2116.2200	.6914	.2040	
	36.550	4379.5	2116.2200	.5468	.3787	
	45.830	3165.4	2116.2200	.3482	.5446	
	62.440	1323.1	2116.2200	.1194	.7061	
	81.130	640.6	2116.2200	.0183	.7770	
	200.000	.000	5210.0	1932.0000	.7700	.0000
14.600		5210.0	1932.0000	.7700	.0000	
14.610		3709.5	1932.2700	.7694	.0000	
16.610		3679.5	2108.5200	.7695	.0000	
18.610		3674.3	2427.0400	.7695	.0000	
20.610		3635.0	2648.2400	.7696	.0000	
22.390		3863.3	2116.2200	.7401	.1023	
28.350		4474.5	2116.2200	.6884	.2082	
36.670		4403.3	2116.2200	.5480	.3764	
45.810		3281.1	2116.2200	.3607	.5354	
62.270		1421.7	2116.2200	.1315	.6978	
81.190		665.2	2116.2200	.0220	.7738	
210.000		.000	5480.0	3123.0000	.7700	.0000
		14.600	5480.0	3123.0000	.7700	.0000
	14.610	4016.2	3123.9100	.7682	.0000	
	16.610	3854.3	2930.3000	.7689	.0000	
	18.610	3655.4	2489.3200	.7694	.0000	
	20.610	3470.6	2099.3700	.7699	.0000	
	22.930	3902.6	2116.2200	.7383	.1075	
	28.950	4491.2	2116.2200	.6854	.2123	
	37.290	4424.0	2116.2200	.5490	.3744	
	46.300	3390.5	2116.2200	.3723	.5267	
	62.560	1522.6	2116.2200	.1434	.6895	
	81.720	694.2	2116.2200	.0281	.7702	
	98.470	562.2	2116.2200	.0013	.7891	
	220.000	.000	5550.0	3760.0000	.7700	.0000
14.600		5550.0	3760.0000	.7700	.0000	
14.610		4141.2	3760.5700	.7677	.0000	
16.610		3862.0	2971.1800	.7688	.0000	
18.610		3677.5	2599.4800	.7695	.0000	
20.610		3439.8	2025.2400	.7699	.0000	
22.610		3385.3	2061.5300	.7699	.0000	
28.040		3978.5	2116.2200	.7347	.1174	
20.190		4520.4	2116.2200	.6794	.2200	
37.540		4457.9	2116.2200	.5504	.3711	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
220.000	46.300	3583.7	2116.2200	.3927	.5111	
	62.140	1724.6	2116.2200	.1669	.6731	
	81.710	765.5	2116.2200	.0399	.7620	
	98.860	567.5	2116.2200	.0027	.7881	
230.000	.000	4920.0	2182.0000	.7700	.0000	
	14.600	4920.0	2182.0000	.7700	.0000	
	14.610	3785.0	2182.5000	.7691	.0000	
	16.610	3773.3	2480.8000	.7691	.0000	
	18.610	3760.4	2852.8900	.7692	.0000	
	20.610	3640.0	2744.3900	.7696	.0000	
	22.610	3453.1	2319.0700	.7699	.0000	
	23.100	4015.0	2116.2200	.7329	.1221	
	29.290	4533.1	2116.2200	.6765	.2236	
	37.660	4471.8	2116.2200	.5508	.3698	
	46.310	3667.4	2116.2200	.4015	.5042	
	61.920	1834.7	2116.2200	.1784	.6651	
	81.660	807.6	2116.2200	.0464	.7574	
	99.040	571.7	2116.2200	.0038	.7873	
250.000	.000	4915.0	2184.0000	.7700	.0000	
	14.600	4915.0	2184.0000	.7700	.0000	
	14.610	3785.6	2184.5000	.7691	.0000	
	16.610	3693.7	2169.7100	.7694	.0000	
	17.800	3533.2	2116.2200	.7548	.0562	
	22.970	4084.8	2116.2200	.7293	.1313	
	29.280	4555.4	2116.2200	.6708	.2304	
	37.660	4494.6	2116.2200	.5514	.3677	
	46.090	3809.5	2116.2200	.4166	.4918	
	61.250	2045.9	2116.2200	.2010	.6493	
	81.230	903.4	2116.2200	.0603	.7477	
	99.060	594.0	2116.2200	.0067	.7853	
	280.000	.000	4920.0	2286.0000	.7700	.0000
		14.600	4920.0	2286.0000	.7700	.0000
14.610		3809.2	2268.4000	.7690	.0000	
16.610		3635.4	1947.7000	.7696	.0000	
18.610		3461.2	1667.8300	.7699	.0000	
19.140		2661.8	2116.2200	.7497	.0739	
24.500		4209.9	2116.2200	.7217	.1486	
31.010		4590.2	2116.2200	.6599	.2427	
39.410		4526.5	2116.2200	.5512	.3654	
47.480		4012.5	2116.2200	.4385	.4726	
61.710		2458.8	2116.2200	.2436	.6194	
81.780		1133.4	2116.2200	.0899	.7271	
100.600		631.3	2116.2200	.0165	.7784	
290.000		.000	4650.0	1332.0000	.7700	.0000
	14.600	4650.0	1332.0000	.7700	.0000	
	14.610	3479.8	1332.8400	.7699	.0000	
	16.610	3471.2	1446.8500	.7699	.0000	
	18.610	3451.2	1563.9900	.7699	.0000	
	19.420	3695.0	2116.2200	.7484	.0783	
	24.830	4238.0	2116.2200	.7198	.1526	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
290.000	31.380	4597.2	2116.2200	.6573	.2456
	39.770	4532.5	2116.2200	.5510	.3652
	47.770	4051.2	2116.2200	.4429	.4688
	61.800	2557.0	2116.2200	.2535	.6123
	81.790	1196.9	2116.2200	.0973	.7219
	100.880	649.2	2116.2200	.0198	.7761
300.000	.000	4550.0	1104.0000	.7700	.0000
	14.600	4550.0	1104.0000	.7700	.0000
	14.610	3364.6	1104.5600	.7700	.0000
	16.610	3359.8	1192.3000	.7700	.0000
	18.610	3498.5	1668.2200	.7699	.0000
	19.450	3728.4	2116.2200	.7471	.0825
	24.900	4264.8	2116.2200	.7178	.1566
	31.500	4603.5	2116.2200	.6548	.2483
	39.890	4537.6	2116.2200	.5507	.3650
	47.820	4085.8	2116.2200	.4466	.4652
	61.630	2652.1	2116.2200	.2631	.6055
	81.540	1262.3	2116.2200	.1048	.7166
100.880	669.7	2116.2200	.0235	.7735	
310.000	.000	4808.0	1802.0000	.7700	.0000
	14.600	4808.0	1802.0000	.7700	.0000
	14.610	3667.2	1802.7300	.7695	.0000
	16.610	3505.2	1550.8400	.7699	.0000
	18.610	3457.3	1612.5900	.7699	.0000
	19.350	3761.7	2116.2200	.7457	.0868
	24.840	4290.3	2116.2200	.7158	.1605
	31.480	4609.5	2116.2200	.6523	.2510
	39.900	4542.4	2116.2200	.5503	.3649
	47.740	4116.8	2116.2200	.4501	.4620
	61.350	2743.9	2116.2200	.2727	.5990
	81.140	1329.3	2116.2200	.1123	.7114
	100.750	693.0	2116.2200	.0275	.7707
	320.000	.000	4901.0	2159.0000	.7700
14.600		4901.0	2159.0000	.7700	.0000
14.610		3778.4	2159.5	.7691	.0000
16.610		3687.9	2148.4	.7695	.0000
18.610		3423.0	1584.1000	.7699	.0000
19.380		3794.8	2116.2200	.7444	.0909
24.930		4314.6	2116.2200	.7137	.1643
31.600		4615.0	2116.2200	.6499	.2536
40.020		4546.5	2116.2200	.5500	.3648
47.790		4144.5	2116.2200	.4532	.4590
61.220		2832.0	2116.2200	.2811	.5927
80.860		1397.6	2116.2200	.1198	.7062
100.720		719.1	2116.2200	.0318	.7677
124.130		561.6	2116.2200	.0011	.7892
350.000	.000	4929.0	2218.0000	.7700	.0000
	14.600	4929.0	2218.0000	.7700	.0000
	14.610	3795.1	2218.1500	.7690	.0000
	16.610	3693.2	2169.4300	.7694	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
350.000	18.130	3892.2	2116.2200	.7403	.1031	
	23.820	4379.5	2116.2200	.7074	.1752	
	30.610	4628.9	2116.2200	.6428	.2611	
	39.000	4556.8	2116.2200	.5486	.3651	
	46.610	4212.5	2116.2200	.4609	.4515	
	59.510	3072.2	2116.2200	.3050	.5755	
	78.630	1609.0	2116.2200	.1422	.6905	
	99.150	813.7	2116.2200	.0461	.7577	
	123.280	566.8	2116.2200	.0024	.7883	
	360.000	.000	4860.0	1911.0000	.7700	.0000
		12.700	4860.0	1911.0000	.7700	.0000
		12.710	3471.9	2116.2200	.7575	.0472
		17.670	3923.7	2116.2200	.7389	.1070
23.410		4398.7	2116.2200	.7052	.1787	
30.230		4632.8	2116.2200	.6406	.2634	
38.620		4559.5	2116.2200	.5481	.3652	
46.170		4231.1	2116.2200	.4630	.4493	
58.920		3144.0	2116.2200	.3121	.5703	
77.840		1680.9	2116.2200	.1496	.6853	
98.530		850.3	2116.2200	.0513	.7541	
122.920		569.5	2116.2200	.0030	.7879	
370.000		.000	5049.0	2798.0000	.7700	.0000
	12.400	5049.0	2798.0000	.7700	.0000	
	12.480	3498.3	2116.2200	.7565	.0511	
	17.480	3954.6	2116.2200	.7374	.1109	
	27.250	4416.8	2116.2200	.7030	.1821	
	30.090	4636.5	2116.2200	.6384	.2657	
	38.490	4562.1	2116.2200	.5476	.3655	
	46.000	4248.0	2116.2200	.4649	.4474	
	58.580	3211.7	2116.2200	.3188	.5654	
	77.310	1753.2	2116.2200	.1570	.6802	
	98.140	889.2	2116.2200	.0565	.7504	
	122.780	572.7	2116.2200	.0038	.7873	
	380.000	.000	4755.0	3438.0000	.7700	.0000
12.400		4755.0	3438.0000	.7700	.0000	
12.490		3525.5	2116.2200	.7554	.0550	
17.530		3985.0	2116.2200	.7360	.1147	
23.330		4433.9	2116.2200	.7008	.1855	
30.230		4639.8	2116.2200	.6367	.2680	
38.610		4564.4	2116.2200	.5470	.3657	
46.070		4263.5	2116.2200	.4666	.4456	
58.500		3275.3	2116.2200	.3251	.5607	
77.030		1825.6	2116.2200	.1644	.6750	
97.980		930.3	2116.2200	.0619	.7467	
122.870		576.7	2116.2200	.0047	.7867	
390.000		.000	4755.0	3483.0000	.7700	.0000
	12.400	4755.0	3483.0000	.7700	.0000	
	12.510	3553.6	2116.2200	.7543	.0589	
	17.590	4014.7	2116.2200	.7346	.1185	
	27.440	4449.9	2116.2200	.6986	.1888	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
390.000	30.350	4642.9	2116.2200	.6347	.2702
	38.730	4566.6	2116.2200	.5465	.3660
	46.150	4277.7	2116.2200	.4681	.4439
	54.430	3335.1	2116.2200	.3311	.5563
	76.740	1898.1	2116.2200	.1716	.6699
	97.800	973.3	2116.2200	.0673	.7429
	122.950	581.3	2116.2200	.0057	.7860
400.000	.000	4532.0	2063.0000	.7700	.0000
	12.400	4532.0	2063.0000	.7700	.0000
	12.770	3582.2	2116.2200	.7532	.0627
	17.880	4043.8	2116.2200	.7331	.1223
	23.780	4465.0	2116.2200	.6964	.1920
	30.720	4645.7	2116.2200	.6319	.2724
	39.100	4568.4	2116.2200	.5459	.3663
	46.470	4290.7	2116.2200	.4695	.4424
	58.620	3391.1	2116.2200	.3367	.5521
	76.730	1970.2	2116.2200	.1789	.6649
	97.860	1018.0	2116.2200	.0728	.7390
420.000	123.260	586.9	2116.2200	.0068	.7852
	.000	4463.0	1807.0000	.7700	.0000
	12.400	4463.0	1807.0000	.7700	.0000
	14.050	3611.3	2116.2200	.7521	.0666
	19.190	4072.2	2116.2200	.7316	.1260
	25.130	4479.2	2116.2200	.6942	.1952
	32.090	4646.3	2116.2200	.6299	.2745
	40.470	4570.2	2116.2200	.5452	.3667
	47.790	4302.8	2116.2200	.4708	.4410
	59.830	3443.5	2116.2200	.3420	.5481
	77.720	2041.8	2116.2200	.1860	.6599
	98.880	1064.3	2116.2200	.0783	.7352
	124.540	593.4	2116.2200	.0081	.7843
440.000	.000	4540.0	2119.0000	.7700	.0000
	12.400	4540.0	2119.0000	.7700	.0000
	14.640	3729.5	2116.2200	.7476	.0816
	19.940	4178.2	2116.2200	.7255	.1403
	26.020	4528.1	2116.2200	.6852	.2073
	33.060	4656.7	2116.2200	.6217	.2826
	41.450	4575.9	2116.2200	.5426	.3684
	48.610	4342.3	2116.2200	.4747	.4365
	60.180	3621.3	2116.2200	.3601	.5343
	77.270	2318.6	2116.2200	.2131	.6408
	98.360	1260.8	2116.2200	.1001	.7200
	125.010	630.5	2116.2200	.0150	.7795
	460.000	.000	4282.0	1210.0000	.7700
12.400		4282.0	1210.0000	.7700	.0000
14.470		3788.4	2116.2200	.7452	.0889
19.830		4226.4	2116.2200	.7223	.1472
25.980		4548.5	2116.2200	.6807	.2130
33.080		4660.0	2116.2200	.6181	.2864
41.430		4578.1	2116.2200	.5412	.3693

FLOW FIELD (CONTINUED)

Z	R	T	F	F1	F2
460.000	48.540	4357.9	2116.2200	.4761	.4348
	59.900	3693.0	2116.2200	.3675	.5284
	76.600	2448.6	2116.2200	.2256	.6320
	97.510	1363.5	2116.2200	.1106	.7126
	124.670	656.9	2116.2200	.0194	.7764
480.000	.000	4540.0	2026.0000	.7700	.0000
	9.400	4540.0	2026.0000	.7700	.0000
	9.410	3457.0	2116.2200	.7582	.0451
	14.290	3846.4	2116.2200	.7429	.0961
	19.730	4271.2	2116.2200	.7189	.1539
	25.940	4566.5	2116.2200	.6763	.2186
	33.070	4662.7	2116.2200	.6144	.2902
	41.410	4579.8	2116.2200	.5398	.3704
	48.450	4371.5	2116.2200	.4772	.4333
	59.630	3755.4	2116.2200	.3741	.5231
	75.970	2571.4	2116.2200	.2373	.6237
	96.650	1467.5	2116.2200	.1209	.7054
	124.300	689.1	2116.2200	.0245	.7729
	500.000	.000	4644.0	2637.0000	.7700
9.180		4644.0	2637.0000	.7700	.0000
9.200		3532.7	2116.2200	.7552	.0559
13.160		3931.0	2116.2200	.7392	.1067
19.720		4332.4	2116.2200	.7137	.1636
25.010		4589.7	2116.2200	.6696	.2266
32.180		4666.0	2116.2200	.6090	.2956
40.500		4581.7	2116.2200	.5375	.3720
47.470		4388.5	2116.2200	.4784	.4316
58.380		3834.8	2116.2200	.3825	.5161
74.230		2740.9	2116.2200	.2532	.6124
94.480		1624.4	2116.2200	.1358	.6950
122.780		748.7	2116.2200	.0333	.7667
520.000		.000	4532.0	2142.0000	.7700
	7.450	4532.0	2142.0000	.7700	.0000
	7.460	3586.0	2116.2200	.7532	.0631
	12.520	3985.4	2116.2200	.7366	.1136
	18.130	4369.0	2116.2200	.7101	.1699
	24.470	4603.2	2116.2200	.6652	.2318
	31.680	4667.8	2116.2200	.6055	.2990
	39.990	4582.6	2116.2200	.5359	.3732
	46.900	4398.1	2116.2200	.4780	.4308
	57.660	3879.7	2116.2200	.3872	.5121
	73.190	2643.9	2116.2200	.2627	.6056
	93.130	1728.4	2116.2200	.1455	.6882
	121.810	795.8	2116.2200	.0398	.7621
	170.380	563.0	2116.2200	.0013	.7891
540.000	.000	4400.0	3276.0000	.7700	.0000
	8.000	4400.0	3276.0000	.7700	.0000
	8.030	3640.4	2116.2200	.7512	.0701
	13.120	4038.1	2116.2200	.7340	.1204
	18.790	4402.5	2116.2200	.7063	.1761

ORIGINAL PAGE IS
OF POOR QUALITY

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
540.000	25.200	4614.9	2116.2200	.6609	.2368
	32.420	4669.0	2116.2200	.6020	.3025
	40.710	4583.4	2116.2200	.5344	.3745
	47.580	4406.6	2116.2200	.4792	.4301
	58.210	3919.3	2116.2200	.3913	.5086
	73.420	2938.8	2116.2200	.2715	.5994
	93.030	1831.3	2116.2200	.1549	.6816
	122.040	848.3	2116.2200	.0468	.7573
	171.310	565.3	2116.2200	.0018	.7887
	560.000	.000	4152.0	1835.0000	.7700
8.000		4152.0	1835.0000	.7700	.0000
9.070		3695.3	2116.2200	.7491	.0771
14.220		4088.8	2116.2200	.7314	.1271
19.970		4433.2	2116.2200	.7024	.1821
26.420		4625.3	2116.2200	.6566	.2417
33.660		4670.1	2116.2200	.5987	.3058
41.930		4583.8	2116.2200	.5327	.3758
48.750		4413.9	2116.2200	.4793	.4296
59.250		3954.4	2116.2200	.3948	.5054
74.200		3026.2	2116.2200	.2794	.5936
93.480		1932.7	2116.2200	.1641	.6752
122.730		905.9	2116.2200	.0547	.7522
172.700		568.5	2116.2200	.0025	.7883
580.000	.000	4056.0	1563.0000	.7700	.0000
	8.000	4056.0	1563.0000	.7700	.0000
	10.130	3750.1	2116.2200	.7470	.0840
	15.340	4137.3	2116.2200	.7286	.1337
	21.150	4461.2	2116.2200	.6985	.1880
	27.630	4634.6	2116.2200	.6523	.2464
	34.890	4670.8	2116.2200	.5953	.3091
	43.160	4584.1	2116.2200	.5311	.3771
	49.930	4420.5	2116.2200	.4793	.4293
	60.310	3980.0	2116.2200	.3980	.5026
	75.020	3106.6	2116.2200	.2867	.5883
	93.960	2032.1	2116.2200	.1731	.6689
	123.390	967.8	2116.2200	.0615	.7470
	174.030	572.7	2116.2200	.0033	.7877
600.000	.000	4168.0	1932.0000	.7700	.0000
	6.100	4168.0	1932.0000	.7700	.0000
	6.130	3482.4	2116.2200	.7572	.0491
	10.970	3831.6	2116.2200	.7437	.0942
	16.290	4205.8	2116.2200	.7242	.1434
	22.170	4498.5	2116.2200	.6924	.1966
	28.720	4646.6	2116.2200	.6460	.2534
	36.000	4671.4	2116.2200	.5904	.3139
	44.250	4584.1	2116.2200	.5285	.3793
	50.970	4428.8	2116.2200	.4789	.4292
	61.180	4028.0	2116.2200	.4020	.4990
	75.530	3214.8	2116.2200	.2966	.5811
	94.000	2170.2	2116.2200	.1962	.6597

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
600.000	123.510	1067.6	2116.2200	.0730	.7390	
	175.150	581.2	2116.2200	.0050	.7865	
620.000	.000	4024.0	1335.0000	.7700	.0000	
	5.100	4024.0	1335.0000	.7700	.0000	
	5.150	3531.8	2116.2200	.7553	.0561	
	10.060	3885.0	2116.2200	.7414	.1010	
	15.420	4248.5	2116.2200	.7212	.1497	
	21.360	4520.6	2116.2200	.6883	.2022	
	27.940	4653.4	2116.2200	.6418	.2579	
	35.240	4671.4	2116.2200	.5872	.3171	
	43.470	4583.8	2116.2200	.5267	.3807	
	50.140	4433.6	2116.2200	.4786	.4292	
	60.270	4052.4	2116.2200	.4042	.4970	
	74.400	3279.6	2116.2200	.3026	.5767	
	92.550	2268.4	2116.2200	.1946	.6538	
		122.060	1137.6	2116.2200	.0807	.7336
		174.310	588.6	2116.2200	.0063	.7856
640.000	.000	4120.0	2355.0000	.7700	.0000	
	4.150	4120.0	2355.0000	.7700	.0000	
	4.180	3582.9	2116.2200	.7534	.0630	
	9.130	3937.4	2116.2200	.7391	.1076	
	14.570	4286.7	2116.2200	.7180	.1559	
	20.560	4540.6	2116.2200	.6842	.2076	
	27.170	4659.4	2116.2200	.6377	.2623	
	34.460	4671.2	2116.2200	.5840	.3202	
	42.700	4583.3	2116.2200	.5240	.3823	
	49.340	4437.7	2116.2200	.4781	.4294	
	59.360	4074.4	2116.2200	.4062	.4951	
	73.300	3339.4	2116.2200	.3081	.5726	
	91.150	2357.1	2116.2200	.2027	.6481	
	120.570	1209.7	2116.2200	.0864	.7282	
	173.430	597.6	2116.2200	.0079	.7845	
680.000	.000	4020.0	2401.0000	.7700	.0000	
	3.000	4020.0	2401.0000	.7700	.0000	
	7.020	3687.6	2116.2200	.7494	.0766	
	8.080	4038.6	2116.2200	.7342	.1208	
	13.630	4361.5	2116.2200	.7112	.1682	
	19.690	4575.1	2116.2200	.6757	.2183	
	26.360	4669.5	2116.2200	.6296	.2709	
	33.690	4670.7	2116.2200	.5777	.3263	
	41.880	4582.0	2116.2200	.5212	.3854	
	49.460	4444.3	2116.2200	.4769	.4300	
	58.300	4112.2	2116.2200	.4094	.4920	
	71.860	3445.1	2116.2200	.3180	.5653	
	89.170	2523.1	2116.2200	.2170	.6374	
	118.290	1357.8	2116.2200	.1034	.7177	
	172.320	621.2	2116.2200	.0119	.7817	
700.000	.000	3454.0	2116.2200	.7582	.0456	
	4.340	3766.9	2116.2200	.7463	.0867	
	9.490	4110.7	2116.2200	.7302	.1305	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
700.000	15.120	4409.6	2116.2200	.7058	.1771	
	21.240	4596.9	2116.2200	.6693	.2261	
	27.940	4675.3	2116.2200	.6236	.2772	
	35.280	4669.6	2116.2200	.5730	.3308	
	43.460	4520.7	2116.2200	.5184	.3878	
	49.990	4448.1	2116.2200	.4756	.4307	
	59.720	4135.9	2116.2200	.4114	.4901	
	73.040	3514.0	2116.2200	.3245	.5603	
	89.960	2637.4	2116.2200	.2284	.6300	
	118.740	1470.1	2116.2200	.1143	.7101	
	173.580	644.2	2116.2200	.0155	.7792	
	720.000	.000	3284.9	2116.2200	.7660	.0161
		.840	3501.4	2116.2200	.7564	.0525
		5.660	3819.6	2116.2200	.7441	.0935
10.860		4156.6	2116.2200	.7275	.1369	
16.530		4438.7	2116.2200	.7020	.1830	
22.700		4609.6	2116.2200	.6640	.2312	
29.410		4676.5	2116.2200	.6196	.2813	
36.770		4668.7	2116.2200	.5690	.3338	
44.930		4579.5	2116.2200	.5165	.3894	
51.420		4450.2	2116.2200	.4748	.4312	
61.090		4150.0	2116.2200	.4125	.4890	
74.260		3555.6	2116.2200	.3284	.5573	
90.920		2708.6	2116.2200	.2347	.6254	
119.450		1544.8	2116.2200	.1213	.7052	
174.800	662.3	2116.2200	.0182	.7773		
760.000	.000	3343.2	2116.2200	.7629	.0279	
	.900	3601.9	2116.2200	.7525	.0663	
	5.810	3923.8	2116.2200	.7396	.1069	
	11.130	4242.8	2116.2200	.7216	.1496	
	16.880	4490.3	2116.2200	.6941	.1945	
	23.100	4631.5	2116.2200	.6563	.2411	
	29.860	4683.8	2116.2200	.6118	.2893	
	37.220	4666.4	2116.2200	.5639	.3396	
	45.360	4576.9	2116.2200	.5127	.3927	
	51.790	4453.3	2116.2200	.4730	.4324	
	61.320	4174.4	2116.2200	.4142	.4871	
	74.230	3629.6	2116.2200	.3355	.5519	
	90.450	2839.6	2116.2200	.2469	.6169	
	118.410	1692.0	2116.2200	.1347	.6958	
174.680	705.1	2116.2200	.0243	.7730		
221.210	563.6	2116.2200	.0014	.7890		
800.000	.000	3733.1	2116.2200	.7474	.0837	
	7.800	4049.5	2116.2200	.7334	.1235	
	9.220	4338.9	2116.2200	.7134	.1652	
	15.070	4543.6	2116.2200	.6837	.2085	
	21.370	4652.8	2116.2200	.6454	.2531	
	29.160	4687.8	2116.2200	.6022	.2990	
	35.530	4662.8	2116.2200	.5565	.3468	
	43.630	4573.1	2116.2200	.5079	.3969	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
800.000	50.020	4455.6	2116.2200	.4705	.4342	
	59.390	4199.2	2116.2200	.4157	.4854	
	72.000	3706.7	2116.2200	.3427	.5461	
	87.717	2983.3	2116.2200	.2599	.6076	
	114.930	1869.9	2116.2200	.1503	.6849	
	172.130	770.3	2116.2200	.0330	.7669	
	219.770	569.5	2116.2200	.0027	.7881	
	840.000	.000	3839.8	2116.2200	.7430	.0976
		3.760	4144.9	2116.2200	.7280	.1367
		9.280	4405.5	2116.2200	.7061	.1774
15.200		4578.3	2116.2200	.6747	.2194	
21.540		4665.9	2116.2200	.6367	.2624	
28.360		4689.6	2116.2200	.5948	.3066	
35.730		4659.3	2116.2200	.5506	.3524	
43.810		4569.5	2116.2200	.5047	.4003	
50.140		4456.4	2116.2200	.4684	.4358	
59.400		4215.3	2116.2200	.4163	.4845	
860.000	71.790	3756.6	2116.2200	.3475	.5422	
	87.160	3084.1	2116.2200	.2680	.6011	
	117.770	2005.9	2116.2200	.1619	.6767	
	171.480	830.4	2116.2200	.0404	.7617	
	220.080	577.0	2116.2200	.0042	.7871	
	880.000	.000	3893.2	2116.2200	.7406	.1046
		5.130	4190.3	2116.2200	.7251	.1433
		10.660	4435.5	2116.2200	.7022	.1835
		16.640	4593.4	2116.2200	.6705	.2248
		23.000	4671.5	2116.2200	.6324	.2669
29.830		4690.0	2116.2200	.5917	.3103	
37.200		4657.4	2116.2200	.5477	.3551	
45.270		4567.7	2116.2200	.5021	.4020	
51.570		4456.5	2116.2200	.4677	.4367	
60.790		4222.3	2116.2200	.4165	.4842	
900.000	73.070	3781.7	2116.2200	.3495	.5405	
	88.280	3130.3	2116.2200	.2729	.5982	
	114.590	2071.4	2116.2200	.1675	.6729	
	172.460	862.7	2116.2200	.0443	.7590	
	221.570	581.8	2116.2200	.0051	.7864	
	920.000	.000	3733.3	2116.2200	.7469	.0857
		1.660	4024.7	2116.2200	.7343	.1222
		6.960	4296.0	2116.2200	.7170	.1598
		12.600	4501.2	2116.2200	.6919	.1985
		18.620	4625.1	2116.2200	.6591	.2380
25.020		4682.5	2116.2200	.6217	.2781	
31.870		4690.0	2116.2200	.5819	.3194	
39.250		4652.1	2116.2200	.5405	.3620	
47.280		4562.4	2116.2200	.4971	.4063	
57.550		4456.0	2116.2200	.4647	.4390	
940.000	62.650	4237.2	2116.2200	.4165	.4838	
	74.690	3832.7	2116.2200	.3537	.5369	
	89.510	3234.5	2116.2200	.2820	.5915	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
900.000	115.100	2227.7	2116.2200	.1805	.6637
	173.160	948.5	2116.2200	.0540	.7523
	223.520	597.8	2116.2200	.0080	.7844
920.000	.000	3789.8	2116.2200	.7446	.0934
	1.510	4076.1	2116.2200	.7315	.1293
	6.840	4334.8	2116.2200	.7134	.1664
	12.510	4524.0	2116.2200	.6874	.2044
	18.560	4635.6	2116.2200	.6545	.2431
	24.980	4685.9	2116.2200	.6174	.2825
	31.830	4685.5	2116.2200	.5783	.3229
	39.210	4549.8	2116.2200	.5377	.3647
	47.240	4560.3	2116.2200	.4952	.4080
	53.480	4455.3	2116.2200	.4629	.4400
	62.530	4242.2	2116.2200	.4163	.4838
	74.500	3850.7	2116.2200	.3553	.5356
	89.170	3272.2	2116.2200	.2853	.5891
	114.480	2287.0	2116.2200	.1855	.6602
	172.540	984.3	2116.2200	.0578	.7496
223.400	605.8	2116.2200	.0094	.7834	
940.000	.000	4126.5	2116.2200	.7286	.1365
	5.490	4371.2	2116.2200	.7096	.1730
	11.190	4544.9	2116.2200	.6829	.2103
	17.250	4645.2	2116.2200	.6498	.2483
	23.670	4686.9	2116.2200	.6131	.2869
	30.550	4688.7	2116.2200	.5746	.3265
	37.920	4647.5	2116.2200	.5348	.3674
	45.930	4556.0	2116.2200	.4931	.4098
	52.160	4454.6	2116.2200	.4616	.4411
	61.160	4246.7	2116.2200	.4161	.4838
	73.060	3867.4	2116.2200	.3566	.5344
	87.590	3307.9	2116.2200	.2883	.5869
	112.640	2344.5	2116.2200	.1903	.6569
	170.620	1020.8	2116.2200	.0617	.7469
	222.010	614.8	2116.2200	.0109	.7824
1000.000	.000	4291.5	2116.2200	.7167	.1620
	5.010	4481.2	2116.2200	.6946	.1960
	10.800	4604.4	2116.2200	.6661	.2307
	16.920	4671.3	2116.2200	.6333	.2660
	23.390	4695.6	2116.2200	.5983	.3019
	30.280	4684.7	2116.2200	.5621	.3387
	37.660	4636.2	2116.2200	.5248	.3767
	45.630	4549.2	2116.2200	.4860	.4161
	51.800	4450.9	2116.2200	.4567	.4450
	60.670	4254.3	2116.2200	.4147	.4845
	72.300	3917.5	2116.2200	.3602	.5312
	86.410	3417.9	2116.2200	.2974	.5800
	110.570	2530.4	2116.2200	.2057	.6460
	168.000	1151.8	2116.2200	.0749	.7376
	221.120	654.5	2116.2200	.0171	.7781
1100.000	.000	4496.7	2116.2200	.6904	.2044

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
1100.000	5.890	4601.6	2116.2200	.6656	.2329
	11.770	4664.2	2116.2200	.6371	.2626
	17.950	4694.4	2116.2200	.6065	.2933
	24.470	4697.1	2116.2200	.5749	.3250
	31.400	4673.6	2116.2200	.5424	.3577
	38.770	4621.3	2116.2200	.5090	.3915
	46.670	4533.3	2116.2200	.4743	.4264
	52.760	4441.6	2116.2200	.4481	.4520
	61.460	4270.5	2116.2200	.4110	.4869
	72.730	3975.3	2116.2200	.3631	.5282
	86.300	3552.1	2116.2200	.3083	.5719
	109.200	2775.4	2116.2200	.2258	.6318
	165.110	1360.6	2116.2200	.0944	.7240
	220.680	740.7	2116.2200	.0268	.7699
	267.790	568.5	2116.2200	.0025	.7883
1200.000	.000	4619.2	2116.2200	.6568	.2446
	6.630	4665.7	2116.2200	.6335	.2675
	12.580	4692.9	2116.2200	.6079	.2923
	18.810	4701.2	2116.2200	.5800	.3186
	25.370	4690.5	2116.2200	.5528	.3463
	32.300	4659.0	2116.2200	.5239	.3752
	39.680	4602.8	2116.2200	.4941	.4052
	47.550	4516.0	2116.2200	.4628	.4364
	53.570	4429.3	2116.2200	.4394	.4593
	62.130	4272.6	2116.2200	.4061	.4904
	73.160	4010.8	2116.2200	.3634	.5275
	86.300	3640.3	2116.2200	.3145	.5669
	109.240	2951.3	2116.2200	.2407	.6217
	162.440	1547.0	2116.2200	.1109	.7125
	210.550	837.9	2116.2200	.0402	.7619
	268.390	583.4	2116.2200	.0054	.7862

REMTECH INC.

20,000 FOOT PLUME PROPERTIES

A23

FLOW FIELD

Z	R	T	P	F1	F2
.000	.000	1404.5	39.4000	.7702	.0000
	2.000	1400.8	38.9500	.7702	.0000
	4.000	1651.9	81.3500	.7702	.0000
	6.000	1741.4	104.3200	.7702	.0000
	8.000	1758.1	109.1900	.7702	.0000
	10.000	1779.0	115.5500	.7702	.0000
	12.000	1803.3	123.3100	.7702	.0000
	14.000	1826.8	131.8900	.7702	.0000
	16.000	1857.1	141.9700	.7702	.0000
	18.000	1889.4	154.2100	.7702	.0000
	20.000	1924.2	168.2700	.7702	.0000
	22.000	1966.8	186.8900	.7702	.0000
	24.000	2017.4	211.0900	.7702	.0000
	26.000	2073.7	240.8000	.7702	.0000
	28.000	2133.5	275.9300	.7702	.0000
	30.000	2197.8	316.1100	.7702	.0000
	34.000	2324.5	416.1400	.7702	.0000
	36.000	2385.6	474.1700	.7702	.0000
	38.000	2444.2	537.0500	.7702	.0000
	40.000	2501.4	604.7300	.7702	.0000
	42.000	2558.2	678.6300	.7702	.0000
	45.380	2613.8	757.8800	.7702	.0000
20.000	.000	2280.8	379.9100	.7702	.0000
	2.000	1836.4	134.5600	.7702	.0000
	4.000	1754.5	106.1400	.7702	.0000
	6.000	1735.2	102.5400	.7702	.0000
	8.000	1732.9	101.8900	.7702	.0000
	10.000	1735.6	102.6700	.7702	.0000
	12.000	1746.5	105.8000	.7702	.0000
	14.000	1766.0	111.5600	.7702	.0000
	16.000	1792.0	119.6600	.7702	.0000
	18.000	1825.8	130.8600	.7702	.0000
	20.000	1866.0	145.2600	.7702	.0000
	22.000	1915.3	164.5700	.7702	.0000
	24.000	1968.8	187.7900	.7702	.0000
	26.000	2025.3	215.0700	.7702	.0000
	28.000	2086.1	247.7900	.7702	.0000
	30.000	2144.4	282.7500	.7702	.0000
	32.000	2204.6	322.8600	.7702	.0000
	34.000	2263.0	365.9200	.7702	.0000
	36.000	2320.2	412.4400	.7702	.0000
	38.000	2373.5	462.2000	.7702	.0000
	40.000	2425.3	516.0500	.7702	.0000
	42.000	2594.6	726.7400	.7702	.0000
	44.000	2670.6	845.5800	.7702	.0000
	52.430	1065.1	967.6100	.1571	.6258
30.000	.000	1968.5	187.5700	.7702	.0000
	2.000	1976.8	191.5000	.7702	.0000
	4.000	1822.7	129.8000	.7702	.0000
	6.000	1740.7	104.1200	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	I	P	F1	F2
30.000	8.000	1727.6	100.4300	.7702	.0000
	10.000	1727.8	100.4700	.7702	.0000
	12.000	1734.4	102.3400	.7702	.0000
	14.000	1750.6	107.0400	.7702	.0000
	16.000	1777.5	115.1000	.7702	.0000
	18.000	1812.0	126.2100	.7702	.0000
	20.000	1859.0	142.6600	.7702	.0000
	22.000	1910.4	162.5700	.7702	.0000
	24.000	1965.2	186.1600	.7702	.0000
	26.000	2025.1	214.9600	.7702	.0000
	28.000	2080.6	244.6600	.7702	.0000
	30.000	2138.8	279.2500	.7702	.0000
	32.000	2195.1	316.2500	.7702	.0000
	34.000	2249.9	355.9500	.7702	.0000
	36.000	2303.4	398.3300	.7702	.0000
	38.000	2372.2	460.5200	.7702	.0000
	40.000	2539.1	651.8500	.7702	.0000
	42.000	2615.7	759.7700	.7702	.0000
	44.000	2686.4	871.9300	.7702	.0000
	52.250	1309.9	967.6100	.2162	.5641
	60.620	615.6	967.6100	.0223	.7667
40.000	.000	1876.4	149.1500	.7702	.0000
	2.000	1891.1	154.8400	.7702	.0000
	4.000	1867.0	145.6300	.7702	.0000
	6.000	1771.3	113.1800	.7702	.0000
	8.000	1732.4	101.7600	.7702	.0000
	10.000	1726.5	100.0600	.7702	.0000
	12.000	1732.6	101.8300	.7702	.0000
	14.000	1748.7	106.4300	.7702	.0000
	16.000	1774.5	114.1800	.7702	.0000
	18.000	1817.7	128.1100	.7702	.0000
	20.000	1867.3	145.7500	.7702	.0000
	22.000	1919.9	166.4700	.7702	.0000
	24.000	1977.7	191.9200	.7702	.0000
	26.000	2032.5	218.7500	.7702	.0000
	28.000	2088.7	249.2600	.7702	.0000
	30.000	2142.2	281.3700	.7702	.0000
	32.000	2194.0	315.5100	.7702	.0000
	34.000	2245.6	352.6900	.7702	.0000
	36.000	2328.5	419.3200	.7702	.0000
	38.000	2504.2	606.9000	.7702	.0000
	40.000	2577.9	704.8200	.7702	.0000
	42.000	2645.4	805.1500	.7702	.0000
	44.000	2707.4	908.7800	.7702	.0000
	45.340	2902.2	967.6100	.7167	.0804
	52.370	1800.5	967.6100	.2890	.5148
	60.870	703.4	967.6100	.0486	.7399
50.000	.000	1840.6	136.0400	.7702	.0000
	2.000	1838.4	135.2400	.7702	.0000
	4.000	1848.1	136.7000	.7702	.0000

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OF POOR QUALITY

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
50.000	6.000	1841.9	136.4900	.7702	.0000
	8.000	1755.4	108.3900	.7702	.0000
	10.000	1734.6	102.3700	.7702	.0000
	12.000	1740.9	104.1600	.7702	.0000
	14.000	1758.5	109.3100	.7702	.0000
	16.000	1794.1	120.3200	.7702	.0000
	18.000	1838.6	135.3200	.7702	.0000
	20.000	1890.5	154.5300	.7702	.0000
	22.000	1944.5	176.9400	.7702	.0000
	24.000	1998.0	201.5300	.7702	.0000
	26.000	2051.5	228.7100	.7702	.0000
	28.000	2103.6	257.9300	.7702	.0000
	30.000	2153.2	288.3800	.7702	.0000
	32.000	2204.2	322.6100	.7702	.0000
	34.000	2319.9	411.5100	.7702	.0000
	36.000	2485.5	583.4900	.7702	.0000
	38.000	2553.0	670.1700	.7702	.0000
	40.000	2616.9	761.3000	.7702	.0000
	42.000	2678.5	858.4500	.7702	.0000
	44.000	2732.2	953.9700	.7702	.0000
45.000	3081.7	967.6100	.7172	.0961	
60.000	52.830	2844.9	967.6100	.4088	.4974
	62.820	891.6	967.6100	.0821	.7167
	.000	1795.1	120.6700	.7702	.0000
	2.000	1800.2	122.3100	.7702	.0000
	4.000	1812.0	126.2000	.7702	.0000
	6.000	1827.5	131.4500	.7702	.0000
	8.000	1822.0	129.5600	.7702	.0000
	10.000	1759.6	109.6500	.7702	.0000
	12.000	1762.3	110.4500	.7702	.0000
	14.000	1791.7	119.5600	.7702	.0000
	16.000	1830.1	132.3400	.7702	.0000
	18.000	1878.7	150.0500	.7702	.0000
	20.000	1926.2	169.1000	.7702	.0000
	22.000	1978.4	192.2200	.7702	.0000
	24.000	2029.0	216.9400	.7702	.0000
	26.000	2077.3	242.8200	.7702	.0000
	28.000	2124.2	270.2400	.7702	.0000
	30.000	2170.2	299.4600	.7702	.0000
	32.000	2417.6	505.1000	.7702	.0000
	34.000	2487.2	585.3000	.7702	.0000
36.000	2550.1	666.1400	.7702	.0000	
38.000	2608.2	748.3000	.7702	.0000	
40.000	2661.5	830.6100	.7702	.0000	
42.000	2710.9	914.9400	.7702	.0000	
44.150	3220.9	967.6100	.7150	.1088	
52.180	3081.6	967.6100	.4427	.4721	
62.150	1110.5	967.6100	.1167	.6952	
77.310	577.2	967.6100	.0066	.7840	
70.000	.000	1765.4	111.3700	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
70.000	2.000	1777.9	115.2300	.7702	.0000	
	4.000	1767.3	118.1600	.7702	.0000	
	6.000	1804.9	123.8300	.7702	.0000	
	8.000	1833.2	133.4200	.7702	.0000	
	10.000	1864.7	144.7700	.7702	.0000	
	12.000	1812.4	126.3200	.7702	.0000	
	14.000	1841.1	136.2000	.7702	.0000	
	16.000	1886.3	153.7500	.7702	.0000	
	18.000	1927.7	169.7600	.7702	.0000	
	20.000	1973.7	190.0300	.7702	.0000	
	22.000	2019.4	212.0700	.7702	.0000	
	24.000	2063.9	235.3900	.7702	.0000	
	26.000	2107.1	259.9600	.7702	.0000	
	28.000	2369.5	453.8700	.7702	.0000	
	30.000	2439.3	528.4500	.7702	.0000	
	32.000	2500.9	601.7600	.7702	.0000	
	34.000	2556.9	674.9600	.7702	.0000	
	36.000	2607.7	747.3400	.7702	.0000	
	38.000	2655.6	821.4100	.7702	.0000	
	40.000	2699.7	894.9000	.7702	.0000	
	43.260	3311.2	967.6100	.7131	.1177	
	51.420	3230.9	967.6100	.4634	.4556	
	61.320	1292.2	967.6100	.1439	.6782	
	76.670	593.5	967.6100	.0109	.7806	
	80.000	.000	1772.8	113.6400	.7702	.0000
		2.000	1768.1	112.2100	.7702	.0000
		4.000	1776.9	114.9200	.7702	.0000
		6.000	1799.9	122.2000	.7702	.0000
		8.000	1835.7	134.3100	.7702	.0000
		10.000	1897.1	157.2200	.7702	.0000
		12.000	1947.7	178.3400	.7702	.0000
		14.000	1916.8	165.1800	.7702	.0000
16.000		1951.2	174.8900	.7702	.0000	
18.000		1989.2	197.3200	.7702	.0000	
20.000		2025.9	215.3600	.7702	.0000	
22.000		2063.5	235.2100	.7702	.0000	
24.000		2345.4	428.4800	.7702	.0000	
26.000		2413.6	498.7200	.7702	.0000	
28.000		2472.2	565.8800	.7702	.0000	
30.000		2525.0	631.2600	.7702	.0000	
32.000		2573.3	697.3700	.7702	.0000	
34.000		2617.6	761.9100	.7702	.0000	
36.000		2658.2	825.0500	.7702	.0000	
38.000		2696.3	888.9200	.7702	.0000	
40.000	2731.0	951.6500	.7702	.0000		
41.370	3390.1	967.6100	.7111	.1257		
49.630	3357.7	967.6100	.4804	.4416		
59.440	1478.7	967.6100	.1704	.6619		
74.960	617.3	967.6100	.0165	.7763		
90.000	.000	1748.8	106.4600	.7702	.0000	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
90.000	2.000	1763.9	110.9400	.7702	.0000
	4.000	1783.8	117.0600	.7702	.0000
	6.000	1816.9	127.8200	.7702	.0000
	8.000	1879.3	150.2700	.7702	.0000
	10.000	1947.6	178.5300	.7702	.0000
	12.000	2019.5	212.1300	.7702	.0000
	14.000	2039.8	222.5400	.7702	.0000
	16.000	2023.2	213.9700	.7702	.0000
	18.000	2051.5	228.7700	.7702	.0000
	20.000	2209.7	323.3100	.7702	.0000
	22.000	2416.0	498.6700	.7702	.0000
	24.000	2467.5	558.3700	.7702	.0000
	26.000	2514.8	617.5900	.7702	.0000
	28.000	2557.5	674.7800	.7702	.0000
	30.000	2596.9	730.6100	.7702	.0000
	32.000	2634.1	786.6400	.7702	.0000
	34.000	2668.4	841.3600	.7702	.0000
	36.000	2698.7	893.1300	.7702	.0000
	38.000	2727.0	944.2400	.7702	.0000
	39.880	3460.2	967.6100	.7092	.1330
	48.230	3468.2	967.6100	.4945	.4295
	57.940	1671.7	967.6100	.1963	.6465
	73.640	649.6	967.6100	.0236	.7711
100.000	.000	1786.3	117.8500	.7702	.0000
	2.000	1788.1	118.4200	.7702	.0000
	4.000	1822.1	129.6000	.7702	.0000
	6.000	1888.2	153.7200	.7702	.0000
	8.000	1970.2	198.4300	.7702	.0000
	10.000	2031.3	218.1400	.7702	.0000
	12.000	2091.1	250.6600	.7702	.0000
	14.000	2159.3	291.4000	.7702	.0000
	16.000	2420.9	494.4900	.7702	.0000
	18.000	2459.4	541.9300	.7702	.0000
	20.000	2495.8	599.5100	.7702	.0000
	22.000	2529.9	635.0000	.7702	.0000
	24.000	2564.3	682.7400	.7702	.0000
	26.000	2596.8	729.6300	.7702	.0000
	28.000	2627.4	775.9200	.7702	.0000
	30.000	2656.9	821.5100	.7702	.0000
	32.000	2682.7	864.6600	.7702	.0000
	34.000	2706.5	906.7800	.7702	.0000
	36.000	2728.1	946.3300	.7702	.0000
	39.150	3552.3	967.6100	.7064	.1427
	47.620	3611.0	967.6100	.5118	.4141
	57.180	1973.8	967.6100	.2342	.6255
	73.180	716.0	967.6100	.0368	.7618
110.000	.000	1835.2	134.1400	.7702	.0000
	2.000	1858.3	142.4100	.7702	.0000
	4.000	1932.6	171.8000	.7702	.0000
	6.000	2017.7	211.2700	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
110.000	8.000	2074.7	241.4000	.7702	.0000
	10.000	2123.2	269.6200	.7702	.0000
	12.000	2231.8	340.1700	.7702	.0000
	14.000	2504.8	595.8300	.7702	.0000
	16.000	2570.4	681.7200	.7702	.0000
	18.000	2583.6	704.6900	.7702	.0000
	20.000	2601.6	733.5300	.7702	.0000
	22.000	2620.9	763.8900	.7702	.0000
	24.000	2642.0	797.4700	.7702	.0000
	26.000	2662.9	831.2600	.7702	.0000
	28.000	2682.6	864.1200	.7702	.0000
	30.000	2700.4	895.5100	.7702	.0000
	31.150	2793.6	967.6100	.7426	.0442
	36.770	3606.6	967.6100	.7047	.1486
	45.300	3693.3	967.6100	.5213	.4055
	54.720	2142.6	967.6100	.2555	.6118
	70.800	772.4	967.6100	.0471	.7548
	87.840	564.1	967.6100	.0021	.7884
120.000	.000	2053.4	229.7600	.7702	.0000
	2.000	2058.7	232.5700	.7702	.0000
	4.000	2112.4	263.1200	.7702	.0000
	6.000	2158.6	291.8700	.7702	.0000
	8.000	2680.0	793.4300	.7702	.0000
	10.000	2698.5	852.4000	.7702	.0000
	12.000	2716.8	899.0900	.7702	.0000
	14.000	2737.6	947.0400	.7702	.0000
	16.000	2656.0	861.0100	.7702	.0000
	18.000	2682.2	858.5400	.7702	.0000
	20.000	2686.1	867.2600	.7702	.0000
	22.000	2692.0	879.7600	.7702	.0000
	24.000	2702.1	897.4800	.7702	.0000
	26.000	2712.0	915.7200	.7702	.0000
	28.000	2721.1	932.6200	.7702	.0000
	31.180	2833.8	967.6100	.7414	.0493
	36.880	3656.3	967.6100	.7030	.1541
	45.470	3766.2	967.6100	.5290	.3980
	54.740	2297.6	967.6100	.2748	.5984
	70.850	837.3	967.6100	.0583	.7472
	88.080	568.2	967.6100	.0033	.7875
130.000	.000	2301.8	430.4800	.7702	.0000
	2.000	2301.8	480.4800	.7702	.0000
	4.000	2977.5	1336.2900	.7702	.0000
	6.000	2904.2	1231.7200	.7702	.0000
	8.000	2865.7	1179.2000	.7702	.0000
	10.000	2847.3	1156.5200	.7702	.0000
	12.000	2838.0	1147.9900	.7702	.0000
	14.000	2837.3	1153.7700	.7702	.0000
	16.000	2771.8	1022.8000	.7702	.0000
	18.000	2757.6	997.5100	.7702	.0000
	20.000	2749.6	984.6000	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
130.000	22.000	2745.7	977.1300	.7702	.0000
	24.000	2744.3	975.2300	.7702	.0000
	26.000	2743.7	974.5900	.7702	.0000
	27.520	2874.5	967.6100	.7401	.0543
	33.300	3702.2	967.6100	.7013	.1592
	41.950	3831.3	967.6100	.5354	.3917
	51.060	2447.0	967.6100	.2932	.5854
	67.150	909.9	967.6100	.0703	.7391
	64.590	574.2	967.6100	.0049	.7863
	135.000	.000	4617.7	8510.8500	.7627
2.940		3223.2	2097.2000	.7700	.0000
4.940		3053.2	1627.2300	.7702	.0000
6.940		2973.6	1439.4100	.7702	.0000
8.940		2925.9	1338.0800	.7702	.0000
10.940		2899.8	1287.6800	.7702	.0000
12.940		2883.6	1257.3600	.7702	.0000
14.940		2841.3	1167.0600	.7702	.0000
16.940		2797.7	1077.1500	.7702	.0000
18.940		2761.1	1045.0300	.7702	.0000
20.940		2770.0	1024.1100	.7702	.0000
22.940		2762.0	1009.2500	.7702	.0000
24.940		2756.2	998.3900	.7702	.0000
26.540		2895.0	967.6100	.7395	.0568
32.360		3723.9	967.6100	.7005	.1617
41.030		3861.2	967.6100	.5381	.3889
50.070		2519.8	967.6100	.3020	.5792
66.140	948.9	967.6100	.0765	.7349	
63.690	578.1	967.6100	.0059	.7855	
140.000	.000	4508.5	7254.6800	.7640	.0000
	2.940	3734.2	4767.6600	.7693	.0000
	4.940	3164.0	2017.2900	.7701	.0000
	6.940	3057.3	1895.7600	.7701	.0000
	8.940	2991.4	1518.7700	.7702	.0000
	10.940	2952.6	1422.9200	.7702	.0000
	12.940	2925.8	1361.4700	.7702	.0000
	14.940	2885.2	1267.8100	.7702	.0000
	16.940	2828.1	1141.7900	.7702	.0000
	18.940	2805.	1095.7300	.7702	.0000
	20.940	2788.6	1061.5900	.7702	.0000
	22.940	2775.7	1036.4000	.7702	.0000
	24.940	2764.7	1015.1700	.7702	.0000
	25.710	291.6	967.6100	.7389	.0592
	31.570	3744.7	967.6100	.6997	.1641
	40.260	3889.6	967.6100	.5406	.3862
	49.230	2591.4	967.6100	.3106	.5730
65.280	989.6	967.6100	.0828	.7306	
82.920	582.6	967.6100	.0071	.7847	
150.000	.000	4403.2	6197.3100	.7651	.0000
	2.940	4013.9	6253.6100	.7682	.0000
	4.940	3538.4	3681.1000	.7698	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
150.000	6.940	3203.0	2224.8000	.7701	.0000
	6.940	3101.0	1870.9800	.7701	.0000
	10.940	3038.6	1677.6500	.7702	.0000
	12.940	2989.6	1536.1200	.7702	.0000
	14.940	2945.6	1417.6800	.7702	.0000
	16.940	2875.1	1247.9100	.7702	.0000
	18.940	2842.2	1174.6600	.7702	.0000
	20.940	2814.0	1114.6000	.7702	.0000
	22.940	2799.0	1083.8000	.7702	.0000
	23.620	2777.3	967.6100	.7370	.0665
	29.600	3803.5	967.6100	.6972	.1710
	38.370	3966.3	967.6100	.5468	.3794
	47.120	2797.3	967.6100	.3351	.5553
	63.020	1120.5	967.6100	.1022	.7175
	60.980	600.6	967.6100	.0114	.7816
	160.000	.000	4343.9	5662.2200	.7658
2.940		4004.7	5654.2600	.7682	.0000
4.940		3843.0	5649.3100	.7689	.0000
6.940		3613.2	5668.2600	.7690	.0000
8.940		3426.8	3195.6000	.7699	.0000
10.940		3112.6	1923.5900	.7701	.0000
12.940		3048.9	1717.1300	.7702	.0000
14.940		2981.5	1517.6000	.7702	.0000
16.940		2912.9	1338.4800	.7702	.0000
18.940		2877.5	1255.0500	.7702	.0000
20.940		2846.1	1184.3700	.7702	.0000
21.360		3018.4	967.6100	.7358	.0712
27.420		3839.6	967.6100	.6956	.1453
36.230		4011.4	967.6100	.5500	.3757
44.850		2926.4	967.6100	.3502	.5441
60.620		1214.3	967.6100	.1154	.7085
78.780	616.8	967.6100	.0151	.7791	
170.000	.000	4284.4	5165.0500	.7664	.0000
	2.940	3985.5	5160.1500	.7683	.0000
	4.940	3809.5	5133.7300	.7690	.0000
	6.940	3751.6	5083.7500	.7692	.0000
	8.940	3694.1	4749.0000	.7694	.0000
	10.940	3490.2	3516.4200	.7699	.0000
	12.940	3098.8	1881.6200	.7701	.0000
	14.940	3044.7	1706.9500	.7702	.0000
	16.940	2966.6	1477.8500	.7702	.0000
	18.940	2891.5	1298.2200	.7702	.0000
	19.710	3059.1	967.6100	.7345	.0758
	25.840	3873.6	967.6100	.6939	.1795
	34.700	4052.2	967.6100	.5527	.3725
	43.190	3047.9	967.6100	.3643	.5336
	58.800	1312.5	967.6100	.1267	.6995
	77.160	637.1	967.6100	.0194	.7760
180.000	.000	4220.3	4671.3000	.7671	.0000
	2.940	3946.4	4654.6500	.7665	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
180.000	4.940	3774.6	4613.5300	.7691	.0000
	6.940	3701.4	4561.3300	.7694	.0000
	8.940	3668.5	4506.6200	.7695	.0000
	10.940	3667.5	4550.1600	.7695	.0000
	12.940	3595.8	4091.1900	.7698	.0000
	14.940	3069.2	1786.0700	.7701	.0000
	16.940	2983.7	1526.1800	.7702	.0000
	18.460	3099.5	967.6100	.7333	.0804
	24.670	3906.0	967.6100	.6923	.1835
	33.560	4068.5	967.6100	.5550	.3696
	41.930	3161.5	967.6100	.3774	.5237
	57.350	1414.4	967.6100	.1419	.6905
	75.920	661.7	967.6100	.0244	.7725
	200.000	.000	4050.3	3623.3300	.7681
200.000	2.940	3847.7	3636.9100	.7688	.0000
	4.940	3704.5	3732.5300	.7694	.0000
	6.940	3604.1	3708.2500	.7698	.0000
	8.940	3554.4	3600.8000	.7698	.0000
	10.940	3513.3	3478.7000	.7699	.0000
	12.940	3475.5	3343.1200	.7699	.0000
	14.940	3441.5	3176.2200	.7699	.0000
	16.600	3198.4	967.6100	.7303	.0912
	22.990	3979.5	967.6100	.6881	.1930
	31.970	4163.3	967.6100	.5592	.3641
	40.040	3408.8	967.6100	.4057	.5016
	54.940	1681.3	967.6100	.1747	.6681
	73.970	743.8	967.6100	.0397	.7620
	91.080	565.3	967.6100	.0024	.7883
220.000	.000	3920.8	2976.7800	.7686	.0000
220.000	2.940	3745.6	2953.8100	.7692	.0000
	4.940	3582.0	2841.9200	.7698	.0000
	6.940	3455.9	2715.0700	.7699	.0000
	8.940	3372.7	2612.6200	.7699	.0000
	10.940	3320.3	2503.6500	.7700	.0000
	12.940	3278.0	2385.1100	.7700	.0000
	14.940	3239.7	2253.5300	.7700	.0000
	16.940	3186.1	2063.2300	.7701	.0000
	18.940	3059.8	1648.6700	.7701	.0000
	20.940	2903.0	1234.8500	.7702	.0000
	21.720	3274.9	967.6100	.7279	.0995
	28.260	4032.1	967.6100	.6847	.2000
	37.290	4209.3	967.6100	.5615	.3509
	45.150	3569.5	967.6100	.4239	.4868
59.590	1901.6	967.6100	.2004	.6505	
78.890	830.9	967.6100	.0541	.7520	
96.410	573.5	967.6100	.0046	.7867	
240.000	.000	3649.3	1928.8100	.7696	.0000
240.000	2.940	3517.3	1918.0700	.7698	.0000
	4.940	3394.5	1902.1700	.7699	.0000
	6.940	3294.3	1875.0400	.7700	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
240.000	8.940	3213.0	1833.2800	.7700	.0000
	10.940	3145.6	1763.4600	.7701	.0000
	12.940	3088.1	1664.6700	.7701	.0000
	14.940	3033.7	1542.0300	.7702	.0000
	16.940	2985.6	1373.5600	.7702	.0000
	18.940	2832.5	1079.5700	.7702	.0000
	20.940	2699.5	838.1100	.7702	.0000
	21.570	2772.1	967.6100	.7452	.0406
	26.850	3348.7	967.6100	.7255	.1074
	33.530	4079.3	967.6100	.6913	.2066
	42.610	4245.7	967.6100	.5630	.3584
	50.770	3699.3	967.6100	.4366	.4783
	64.230	2122.3	967.6100	.2252	.6333
	83.680	935.5	967.6100	.0699	.7410
	101.640	587.3	967.6100	.0081	.7843
260.000	.000	3387.0	1263.2000	.7699	.0000
	2.940	3286.5	1250.0400	.7700	.0000
	4.940	3190.5	1235.6000	.7701	.0000
	6.940	3099.7	1216.9600	.7701	.0000
	8.940	3022.2	1190.7500	.7702	.0000
	10.940	2956.6	1157.3700	.7702	.0000
	12.940	2884.7	1082.5700	.7702	.0000
	14.940	2820.3	999.1900	.7702	.0000
	16.940	2730.6	862.8900	.7702	.0000
	18.940	2644.2	739.4700	.7702	.0000
	20.940	2551.9	620.5800	.7702	.0000
	22.940	2467.5	524.8100	.7702	.0000
	25.630	2340.3	467.0100	.7430	.0493
	31.030	3437.1	467.6100	.7225	.1169
	37.870	4131.5	467.6100	.6770	.2144
	47.000	4280.8	467.6100	.5641	.3504
	54.440	3824.6	467.6100	.4530	.4615
	67.830	2390.6	467.6100	.2548	.6126
	87.230	1087.2	467.6100	.0908	.7267
	105.790	616.0	467.6100	.0146	.7798
280.000	.000	3130.2	813.7400	.7701	.0000
	2.940	3060.0	812.2200	.7701	.0000
	4.940	2987.7	807.4100	.7702	.0000
	6.940	2913.3	746.9600	.7702	.0000
	8.940	2831.1	765.9800	.7702	.0000
	10.940	2758.7	732.3500	.7702	.0000
	12.940	2683.7	677.1600	.7702	.0000
	14.940	2605.4	612.6500	.7702	.0000
	16.940	2530.1	549.2100	.7702	.0000
	18.940	2461.2	491.0200	.7702	.0000
	20.940	2399.5	438.0700	.7702	.0000
	22.940	2339.0	391.0000	.7702	.0000
	24.940	2279.6	348.2500	.7702	.0000
	26.940	2400.9	451.6600	.7702	.0000
	28.640	2808.1	467.6100	.7412	.0563

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
280.000	34.190	3504.6	967.6100	.7200	.1242	
	41.150	4168.3	967.6100	.6755	.2202	
	50.310	4302.6	967.6100	.5644	.3554	
	57.600	3902.4	967.6100	.4620	.4531	
	70.540	2593.7	967.6100	.2768	.5969	
	89.770	1221.7	967.6100	.1079	.7149	
	109.820	650.6	967.6100	.0216	.7749	
	300.000	.000	2906.5	540.2500	.7702	.0000
	2.940	2848.6	537.3300	.7702	.0000	
	4.940	2779.6	523.8300	.7702	.0000	
6.940	2707.4	504.0900	.7702	.0000		
8.940	2642.1	487.7200	.7702	.0000		
10.940	2567.2	456.2300	.7702	.0000		
12.940	2493.6	423.5400	.7702	.0000		
14.940	2432.4	393.4500	.7702	.0000		
16.940	2366.2	360.2200	.7702	.0000		
18.940	2309.9	332.3400	.7702	.0000		
20.940	2256.3	305.7800	.7702	.0000		
22.940	2202.7	280.4500	.7702	.0000		
24.940	2200.8	254.0800	.7702	.0000		
26.940	2230.5	307.2700	.7702	.0000		
28.940	2470.8	512.9700	.7702	.0000		
31.270	2973.2	967.6100	.7389	.0649		
36.900	3584.9	967.6100	.7169	.1330		
44.010	4208.9	967.6100	.6692	.2271		
53.190	4324.1	967.6100	.5643	.3546		
60.310	3979.1	967.6100	.4710	.4445		
72.750	2826.5	967.6100	.3016	.5789		
91.590	1401.9	967.6100	.1292	.7001		
111.230	710.7	967.6100	.0326	.7672		
320.000	134.730	561.0	967.6100	.0010	.7893	
320.000	.000	2646.1	328.8700	.7702	.0000	
2.940	2610.6	332.6400	.7702	.0000		
4.940	2571.6	334.5200	.7702	.0000		
6.940	2509.0	319.0000	.7702	.0000		
8.940	2446.2	302.9100	.7702	.0000		
10.940	2387.8	288.1800	.7702	.0000		
12.940	2330.3	271.5800	.7702	.0000		
14.940	2274.8	257.3600	.7702	.0000		
16.940	2218.1	242.0200	.7702	.0000		
18.940	2174.0	229.6400	.7702	.0000		
20.940	2128.9	216.3300	.7702	.0000		
22.940	2082.6	201.0100	.7702	.0000		
24.940	2042.2	186.0600	.7702	.0000		
26.940	2360.9	370.0500	.7702	.0000		
28.940	2460.2	477.5300	.7702	.0000		
30.940	2514.0	561.9300	.7702	.0000		
32.840	3034.5	967.6100	.7370	.0717		
38.580	3645.6	967.6100	.7144	.1397		
45.790	4237.5	967.6100	.6657	.2323		

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
320.000	55.000	4337.8	967.6100	.5640	.3544	
	61.990	4029.5	967.6100	.4769	.4389	
	74.070	2992.4	967.6100	.3196	.5659	
	92.510	1553.1	967.6100	.1463	.6883	
	112.580	773.1	967.6100	.0430	.7600	
	136.560	563.8	967.6100	.0018	.7888	
	340.000	.000	2446.6	219.8900	.7702	.0000
		2.940	2399.4	211.7700	.7702	.0000
		4.940	2341.3	203.4700	.7702	.0000
		6.940	2304.5	196.8900	.7702	.0000
8.940		2260.1	191.3700	.7702	.0000	
10.940		2218.5	186.9600	.7702	.0000	
12.940		2175.1	180.8400	.7702	.0000	
14.940		2127.6	172.3000	.7702	.0000	
16.940		2097.2	165.5600	.7702	.0000	
18.940		2049.5	159.4000	.7702	.0000	
20.940		2010.8	152.0800	.7702	.0000	
22.940		1971.7	143.6100	.7702	.0000	
24.940		1937.2	136.6700	.7702	.0000	
26.940		2436.7	403.0800	.7702	.0000	
28.940		2481.5	477.7200	.7702	.0000	
30.940		2520.4	548.1400	.7702	.0000	
33.420		3096.1	967.6100	.7352	.0784	
39.270		3703.8	967.6100	.7119	.1463	
46.980		4262.9	967.6100	.6622	.2373	
55.800		4349.4	967.6100	.5636	.3544	
62.680		4071.6	967.6100	.4816	.4341	
74.430		3139.1	967.6100	.3353	.5542	
92.430		1708.2	967.6100	.1634	.6765	
112.440		847.7	967.6100	.0544	.7521	
137.320		562.4	967.6100	.0030	.7879	
360.000		.000	2199.4	130.0600	.7702	.0000
	2.940	2173.1	128.9400	.7702	.0000	
	4.940	2146.8	127.8500	.7702	.0000	
	6.940	2157.4	136.4300	.7702	.0000	
	8.940	2087.6	124.7100	.7702	.0000	
	10.940	2068.7	125.6000	.7702	.0000	
	12.940	2022.4	119.3600	.7702	.0000	
	14.940	2033.3	127.5000	.7702	.0000	
	16.940	2060.8	140.7100	.7702	.0000	
	18.940	1934.6	112.0000	.7702	.0000	
	20.940	2160.3	185.5400	.7702	.0000	
	22.940	2371.6	285.4300	.7702	.0000	
	24.940	2469.0	375.6500	.7702	.0000	
	26.940	2485.5	435.9600	.7702	.0000	
	28.940	2502.5	491.6000	.7702	.0000	
	30.940	2530.0	543.7000	.7702	.0000	
	33.540	3172.6	967.6100	.7329	.0867	
	39.520	3772.2	967.6100	.7086	.1543	
46.950	4291.1	967.6100	.6579	.2433		

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
360.000	56.170	4361.7	967.6100	.5629	.3546	
	62.940	4115.0	967.6100	.4867	.4292	
	74.310	3296.5	967.6100	.3523	.5413	
	91.730	1904.4	967.6100	.1844	.6619	
	112.410	956.3	967.6100	.0697	.7415	
	137.530	577.7	967.6100	.0052	.7864	
	380.000	.000	1990.4	90.6000	.7702	.0000
		2.940	1982.9	82.1700	.7702	.0000
		4.940	1966.9	82.5900	.7702	.0000
		6.940	1956.0	83.9000	.7702	.0000
8.940		1934.2	83.3200	.7702	.0000	
10.940		1912.1	82.6100	.7702	.0000	
12.940		1890.4	81.9200	.7702	.0000	
14.940		1868.5	81.1400	.7702	.0000	
16.940		1844.7	79.8200	.7702	.0000	
18.940		1821.6	78.5400	.7702	.0000	
400.000	20.940	2515.2	326.5400	.7702	.0000	
	22.940	2510.6	377.9300	.7702	.0000	
	24.940	2505.3	425.1000	.7702	.0000	
	26.940	2521.2	485.7800	.7702	.0000	
	28.940	2544.8	549.9700	.7702	.0000	
	30.940	2574.6	614.4000	.7702	.0000	
	32.650	3233.5	967.6100	.7310	.0931	
	32.720	3823.6	967.6100	.7060	.1605	
	46.240	4310.9	967.6100	.6545	.2479	
	55.470	4370.0	967.6100	.5622	.3550	
400.000	62.150	4143.0	967.6100	.4899	.4260	
	73.250	3403.7	967.6100	.3640	.5323	
	90.210	2060.1	967.6100	.2704	.6504	
	110.960	1053.5	967.6100	.0823	.7328	
	136.590	588.9	967.6100	.0077	.7847	
	.000	1858.2	57.9900	.7702	.0000	
	2.940	1842.9	57.5600	.7702	.0000	
	4.940	1827.6	57.2800	.7702	.0000	
	6.940	1815.1	57.4200	.7702	.0000	
	8.940	1798.3	57.0900	.7702	.0000	
400.000	10.940	1828.2	63.2900	.7702	.0000	
	12.940	1771.3	57.5900	.7702	.0000	
	14.940	2086.2	120.4000	.7702	.0000	
	16.940	2572.4	309.6100	.7702	.0000	
	18.940	2557.3	357.5200	.7702	.0000	
	20.940	2550.6	408.6400	.7702	.0000	
	22.940	2555.6	467.2800	.7702	.0000	
	24.940	2564.4	524.6800	.7702	.0000	
	26.570	2826.5	967.6100	.7438	.0479	
	31.590	3307.2	967.6100	.7286	.1010	
400.000	37.990	3884.0	967.6100	.7026	.1680	
	45.610	4332.9	967.6100	.6503	.2533	
	54.830	4378.9	967.6100	.5611	.3556	
	61.420	4174.1	967.6100	.4931	.4227	

FLOW FIELD (CONTINUED)

Z	R	T	F	F1	F2
400.000	72.210	3517.2	967.6100	.3766	.5224
	88.610	2248.9	967.6100	.2206	.6366
	109.290	1184.8	967.6100	.0982	.7218
	135.550	609.2	967.6100	.0118	.7818
420.000	.000	1744.8	42.9000	.7702	.0000
	2.940	1731.4	42.5100	.7702	.0000
	4.940	2191.4	101.1900	.7702	.0000
	6.940	2577.3	186.1500	.7702	.0000
	8.940	2769.2	281.5600	.7702	.0000
	10.940	2718.4	324.2900	.7702	.0000
	12.940	2682.3	366.8400	.7702	.0000
	14.940	2656.0	411.3800	.7702	.0000
	16.940	2636.3	457.2500	.7702	.0000
	18.940	2622.4	503.0300	.7702	.0000
	20.940	2614.2	548.9400	.7702	.0000
	22.940	2614.7	596.2500	.7702	.0000
	24.620	2877.2	967.6100	.7422	.0540
	29.920	3366.8	967.6100	.7267	.1072
	36.220	3929.1	967.6100	.6999	.1738
	43.910	4348.5	967.6100	.6470	.2575
	53.130	4385.0	967.6100	.5601	.3563
	59.640	4194.6	967.6100	.4951	.4205
	70.210	3594.3	967.6100	.3853	.5154
	86.180	2342.8	967.6100	.2356	.6261
	106.690	1245.3	967.6100	.1108	.7131
	133.440	631.4	967.6100	.0160	.7769
440.000	.000	5406.8	2402.6100	.7419	.0000
	2.940	3389.8	793.0700	.7699	.0000
	4.940	3121.4	625.8900	.7701	.0000
	6.940	2977.4	576.1700	.7702	.0000
	8.940	2879.2	563.5000	.7702	.0000
	10.940	2812.8	573.1100	.7702	.0000
	12.940	2761.9	590.0300	.7702	.0000
	14.940	2727.6	615.8500	.7702	.0000
	16.940	2703.9	645.5200	.7702	.0000
	18.940	2690.2	676.4300	.7702	.0000
	20.940	2685.6	711.9200	.7702	.0000
	22.190	2942.6	967.6100	.7402	.0615
	27.600	3438.2	967.6100	.7242	.1148
	34.010	3982.0	967.6100	.6965	.1809
	41.750	4366.0	967.6100	.6429	.2626
	50.990	4391.0	967.6100	.5588	.3572
	57.420	4216.3	967.6100	.4972	.4182
	67.750	3675.9	967.6100	.3947	.5077
	83.210	2561.1	967.6100	.2528	.6139
	103.400	1437.6	967.6100	.1261	.7025
	130.740	665.1	967.6100	.0224	.7745
	.000	5444.7	2548.6700	.7905	.0000
460.000	2.940	4530.4	2659.0600	.7637	.0000
	4.940	3803.9	2227.1700	.7690	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
460.000	6.940	3355.5	1525.6700	.7700	.0000
	8.940	3016.7	976.4300	.7702	.0000
	10.940	2918.4	899.7500	.7702	.0000
	12.940	2853.1	867.8400	.7702	.0000
	14.940	2810.5	857.9800	.7702	.0000
	16.940	2782.1	858.9100	.7702	.0000
	18.940	2765.8	868.3300	.7702	.0000
	19.260	2996.5	967.6100	.7386	.0675
	24.750	3493.8	967.6100	.7222	.1208
	31.240	4021.5	967.6100	.6937	.1864
	39.070	4378.5	967.6100	.6397	.2665
	48.280	4396.2	967.6100	.5577	.3581
	54.650	4231.2	967.6100	.4985	.4167
	64.800	3731.4	967.6100	.4012	.5023
	79.880	2685.2	967.6100	.2655	.6048
	99.750	1553.0	967.6100	.1379	.6942
	127.540	705.0	967.6100	.0284	.7703
480.000	.000	5531.6	2914.6600	.7372	.0000
	2.940	4696.3	2959.2500	.7613	.0000
	4.940	4067.3	2894.5700	.7680	.0000
	6.940	3768.5	2857.9200	.7691	.0000
	8.940	3386.7	2100.2300	.7699	.0000
	10.940	3151.6	1581.9400	.7701	.0000
	12.940	2956.3	1184.8400	.7702	.0000
	14.940	2898.6	1111.0000	.7702	.0000
	16.330	3050.7	967.6100	.7370	.0734
	21.910	3547.6	967.6100	.7202	.1267
	28.490	4058.7	967.6100	.6909	.1917
	36.370	4389.8	967.6100	.6365	.2702
	45.570	4400.2	967.6100	.5565	.3590
	51.860	4244.3	967.6100	.4996	.4154
	61.860	3780.0	967.6100	.4068	.4975
	76.600	2799.5	967.6100	.2770	.5965
	96.100	1666.5	967.6100	.1495	.6862
	124.300	749.0	967.6100	.0352	.7656
500.000	.000	5578.7	3139.1200	.7354	.0000
	2.940	4865.2	3163.2200	.7577	.0000
	4.940	4263.7	3129.0100	.7667	.0000
	6.940	3860.0	3059.3700	.7688	.0000
	8.940	3673.0	3054.7200	.7695	.0000
	10.940	3565.0	3020.4400	.7698	.0000
	12.940	3485.2	2936.2600	.7699	.0000
	13.640	3118.6	967.6100	.7350	.0807
	19.320	3613.1	967.6100	.7176	.1339
	25.990	4101.6	967.6100	.6873	.1982
	33.940	4402.5	967.6100	.6326	.2748
	43.120	4404.5	967.6100	.5549	.3602
	49.370	4258.4	967.6100	.5005	.4141
	59.170	3832.6	967.6100	.4129	.4922
	73.490	2926.6	967.6100	.2900	.5871

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FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
500.000	92.530	1811.4	967.6100	.1634	.6765
	121.140	813.7	967.6100	.0445	.7591
	170.250	563.3	967.6100	.0014	.7890
520.000	.000	5601.4	3259.5300	.7345	.0000
	2.940	4956.6	3214.7600	.7556	.0000
	4.940	4406.6	3205.6100	.7651	.0000
	5.980	2772.0	967.6100	.7455	.0417
	11.030	3172.8	967.6100	.7333	.0865
	16.790	3663.3	967.6100	.7155	.1396
	23.550	4133.6	967.6100	.6844	.2033
	31.540	4411.6	967.6100	.6296	.2784
	40.710	4407.5	967.6100	.5536	.3613
	46.910	4268.3	967.6100	.5011	.4134
	56.570	3869.2	967.6100	.4171	.4885
	70.590	3021.5	967.6100	.2992	.5804
	89.240	1924.7	967.6100	.1743	.6690
	118.100	872.6	967.6100	.0526	.7535
	167.950	565.9	967.6100	.0020	.7886
540.000	.000	5522.9	2875.0000	.7376	.0000
	2.940	4963.0	2886.5400	.7555	.0000
	4.940	4432.7	2871.3700	.7648	.0000
	6.530	2828.6	967.6100	.7437	.0487
	11.660	3240.1	967.6100	.7312	.0937
	17.520	3723.6	967.6100	.7127	.1466
	24.370	4170.7	967.6100	.6807	.2095
	32.410	4421.8	967.6100	.6257	.2827
	41.560	4410.7	967.6100	.5519	.3627
	47.700	4279.1	967.6100	.5014	.4127
	57.210	3909.2	967.6100	.4215	.4945
	70.890	3125.8	967.6100	.3096	.5727
	89.060	2062.2	967.6100	.1875	.6598
	118.100	954.3	967.6100	.0631	.7462
	169.850	570.6	967.6100	.0030	.7879
560.000	.000	5377.2	2293.6800	.7429	.0000
	2.940	4905.4	2318.2700	.7568	.0000
	4.940	4425.0	2281.7100	.7649	.0000
	6.940	4011.3	2245.4100	.7662	.0000
	9.940	3695.0	2196.8200	.7694	.0000
	10.070	2876.1	967.6100	.7423	.0543
	15.280	3293.4	967.6100	.7295	.0994
	21.220	3770.2	967.6100	.7105	.1521
	28.130	4198.1	967.6100	.6777	.2143
	36.210	4429.1	967.6100	.6227	.2861
	45.340	4413.0	967.6100	.5505	.3639
	51.440	4286.8	967.6100	.5016	.4123
	60.830	3937.3	967.6100	.4246	.4818
	74.260	3200.5	967.6100	.3171	.5671
	92.060	2168.5	967.6100	.1977	.6527
121.150	1025.2	967.6100	.0719	.7401	
172.590	575.7	967.6100	.0041	.7872	
580.000	.000	5184.2	1686.1000	.7496	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
580.000	2.940	4776.3	1686.7200	.7596	.0000
	4.940	4373.2	1689.5200	.7655	.0000
	6.940	3996.2	1669.9700	.7683	.0000
	8.940	3683.6	1639.6400	.7695	.0000
	10.940	3450.1	1604.4200	.7699	.0000
	13.630	2924.8	967.6100	.7408	.0599
	18.900	3346.1	967.6100	.7278	.1050
	24.920	3814.6	967.6100	.7062	.1575
	31.890	4223.6	967.6100	.6747	.2191
	40.000	4435.0	967.6100	.6197	.2894
	49.120	4415.0	967.6100	.5490	.3652
	55.180	4293.5	967.6100	.5015	.4121
	64.460	3962.4	967.6100	.4272	.4793
	77.660	3268.5	967.6100	.3239	.5619
	95.100	2271.1	967.6100	.2076	.6458
	124.160	1100.1	967.6100	.0808	.7339
	176.260	582.2	967.6100	.0054	.7863
600.000	.000	4965.6	1201.4300	.7554	.0000
	2.940	4640.7	1227.6900	.7624	.0000
	4.940	4275.0	1199.5800	.7665	.0000
	6.940	3940.8	1189.6900	.7665	.0000
	8.940	3648.9	1171.3600	.7696	.0000
	10.940	3515.5	1130.8900	.7699	.0000
	12.940	3357.0	1065.4300	.7700	.0000
	14.940	3230.8	1002.3700	.7700	.0000
	16.700	2986.8	967.6100	.7390	.0669
	22.070	3411.0	967.6100	.7256	.1120
	28.170	3868.3	967.6100	.7053	.1642
	35.220	4252.9	967.6100	.6709	.2249
	43.370	4443.2	967.6100	.6160	.2935
	52.470	4417.1	967.6100	.5471	.3668
	58.480	4301.1	967.6100	.5012	.4120
	67.630	3990.9	967.6100	.4302	.4766
	80.560	3345.1	967.6100	.3317	.5560
	97.580	2393.3	967.6100	.2194	.6374
	126.500	1198.1	967.6100	.0920	.7261
	179.380	592.6	967.6100	.0074	.7849
640.000	.000	4357.6	472.2300	.7656	.0000
	2.940	4163.3	465.3700	.7676	.0000
	4.940	3933.7	447.2100	.7685	.0000
	6.940	3724.4	434.4000	.7693	.0000
	8.940	3526.9	424.5600	.7698	.0000
	10.940	3318.1	405.6700	.7700	.0000
	12.940	3125.3	383.1100	.7701	.0000
	14.940	2945.7	356.3800	.7702	.0000
	16.940	2823.3	338.7300	.7702	.0000
	18.940	2698.0	318.7400	.7702	.0000
	20.880	3100.3	967.6100	.7356	.0794
	26.400	3524.4	967.6100	.7216	.1243
	32.660	3957.6	967.6100	.6998	.1759

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
640.000	39.830	4299.5	967.6100	.6638	.2349	
	48.030	4454.5	967.6100	.6093	.3006	
	57.090	4420.1	967.6100	.5435	.3698	
	63.020	4312.4	967.6100	.5004	.4123	
	71.970	4034.5	967.6100	.4344	.4725	
	84.480	3463.0	967.6100	.3439	.5466	
	100.790	2594.5	967.6100	.2392	.6235	
	129.220	1382.1	967.6100	.1119	.7123	
	183.410	619.4	967.6100	.0121	.7816	
	680.000	.000	3643.7	155.12 0	.7696	.0000
		2.940	3527.6	153.7800	.7698	.0000
		4.940	3400.1	150.3700	.7699	.0000
6.940		3275.5	145.8100	.7700	.0000	
8.940		3157.6	141.6600	.7701	.0000	
10.940		3052.3	144.0500	.7701	.0000	
12.940		2963.0	145.3800	.7702	.0000	
14.940		2862.4	145.6000	.7702	.0000	
16.940		2760.4	144.6000	.7702	.0000	
18.490		2838.9	967.6100	.7434	.0506	
23.570		3201.7	967.6100	.7325	.0904	
29.230		3620.9	967.6100	.7178	.1351	
35.620		4030.1	967.6100	.6947	.1861	
42.980		4334.6	967.6100	.6574	.2436	
51.120		4462.6	967.6100	.6035	.3067	
60.140		4421.9	967.6100	.5403	.3727	
66.000		4320.3	967.6100	.4993	.4128	
74.800		4066.1	967.6100	.4374	.4697	
86.960		3550.3	967.6100	.3531	.5394	
102.730		2752.5	967.6100	.2549	.6123	
130.570	1548.5	967.6100	.1288	.7006		
185.790	653.3	967.6100	.0176	.7778		
700.000	.000	3356.4	97.7400	.7700	.0000	
	2.940	3270.2	96.4100	.7700	.0000	
	4.940	3183.9	96.2400	.7701	.0000	
	6.940	3101.5	97.2300	.7701	.0000	
	8.940	3018.6	97.7400	.7702	.0000	
	10.940	2936.3	97.8800	.7702	.0000	
	12.940	2881.9	103.1300	.7702	.0000	
	14.940	3230.6	225.5500	.7700	.0000	
	16.940	3110.5	251.7800	.7701	.0000	
	18.940	3019.4	294.3600	.7702	.0000	
	25.200	3264.9	967.6100	.7305	.0972	
	30.940	3678.9	967.6100	.7153	.1418	
	37.410	4072.0	967.6100	.6914	.1923	
	44.720	4354.3	967.6100	.6534	.2488	
	52.980	4466.8	967.6100	.5999	.3104	
	61.980	4422.7	967.6100	.5382	.3744	
	67.800	4324.5	967.6100	.4966	.4133	
	76.510	4083.1	967.6100	.4390	.4681	
88.500	3597.9	967.6100	.3582	.5354		

ORIGINAL FILED IN 62-7068-1114

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
700.000	103.940	2841.6	967.6100	.2638	.6059
	131.360	1651.8	967.6100	.1390	.6935
	187.170	679.6	967.6100	.0217	.7749
720.000	233.550	561.6	967.6100	.0010	.7893
	.000	3129.3	65.8800	.7701	.0000
	2.940	3068.2	66.2800	.7701	.0000
	4.940	3096.0	77.9300	.7701	.0000
	6.940	3290.5	120.0900	.7700	.0000
	8.940	3527.2	203.4900	.7698	.0000
	10.940	3422.9	232.6800	.7699	.0000
	12.940	3305.7	260.3800	.7700	.0000
	14.940	3186.8	289.3200	.7701	.0000
	16.940	3069.4	318.9800	.7701	.0000
	18.940	2956.1	349.6300	.7702	.0000
	20.940	2864.5	387.3500	.7702	.0000
	21.110	2943.6	967.6100	.7402	.0629
	26.320	3315.1	967.6100	.7289	.1026
	32.120	3724.0	967.6100	.7132	.1471
	38.650	4103.8	967.6100	.6887	.1973
	46.000	4368.6	967.6100	.6501	.2530
54.270	4469.8	967.6100	.5971	.3134	
63.260	4423.2	967.6100	.5366	.3759	
69.050	4327.3	967.6100	.4979	.4138	
77.680	4095.5	967.6100	.4400	.4671	
89.540	3632.5	967.6100	.3620	.5324	
104.740	2907.9	967.6100	.2704	.6011	
131.810	1733.5	967.6100	.1468	.6881	
188.040	703.5	967.6100	.0252	.7725	
234.860	563.1	967.6100	.0013	.7891	
740.000	.000	2520.0	967.6100	.7560	.0000
	3.670	2520.0	967.6100	.7560	.0000
	8.200	2520.8	967.6100	.7560	.0003
	12.740	2545.6	967.6100	.7543	.0069
	17.340	2701.7	967.6100	.7477	.0336
	22.190	3003.6	967.6100	.7384	.0697
	27.480	3377.5	967.6100	.7268	.1094
	33.360	3778.7	967.6100	.7105	.1537
	39.950	4141.2	967.6100	.6852	.2033
	47.340	4384.9	967.6100	.6460	.2580
	55.630	4473.1	967.6100	.5935	.3170
	64.590	4423.6	967.6100	.5345	.3777
	70.350	4330.5	967.6100	.4970	.4144
	78.910	4109.4	967.6100	.4412	.4659
	90.600	3671.8	967.6100	.3662	.5289
	105.520	2984.8	967.6100	.2761	.5956
	132.150	1833.7	967.6100	.1562	.6816
188.830	736.9	967.6100	.0300	.7692	
236.240	565.7	967.6100	.0019	.7887	
760.000	.000	2521.5	967.6100	.7559	.0006
	4.240	2558.5	967.6100	.7536	.0098

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
760.000	8.870	2740.7	967.6100	.7464	.0390
	13.760	3052.3	967.6100	.7369	.0752
	19.110	3426.2	967.6100	.7251	.1148
	25.060	3821.0	967.6100	.7083	.1589
	31.690	4169.4	967.6100	.6823	.2081
	39.120	4396.9	967.6100	.6427	.2620
	47.420	4475.4	967.6100	.5907	.3198
	56.360	4423.8	967.6100	.5329	.3791
	62.090	4332.6	967.6100	.4963	.4149
	70.590	4119.6	967.6100	.4420	.4650
	82.160	3700.6	967.6100	.3693	.5264
	96.870	3042.0	967.6100	.2838	.5914
	123.150	1912.5	967.6100	.1635	.6765
	180.130	766.2	967.6100	.0340	.7664
	228.020	568.3	967.6100	.0025	.7883
780.000	.000	2522.9	967.6100	.7558	.0011
	1.250	2575.7	967.6100	.7527	.0134
	5.900	2782.2	967.6100	.7450	.0445
	10.840	3101.5	967.6100	.7354	.0807
	16.250	3475.7	967.6100	.7234	.1202
	22.260	3862.1	967.6100	.7060	.1641
	28.940	4196.1	967.6100	.6794	.2129
	36.400	4408.0	967.6100	.6394	.2659
	44.700	4477.4	967.6100	.5880	.3226
	53.630	4423.6	967.6100	.5312	.3806
	59.330	4334.2	967.6100	.4955	.4155
	67.770	4126.9	967.6100	.4426	.4643
	79.230	3727.2	967.6100	.3721	.5241
	93.740	3095.5	967.6100	.2892	.5875
	119.660	1989.1	967.6100	.1706	.6716
	176.890	797.7	967.6100	.0363	.7635
	225.280	571.7	967.6100	.0032	.7878
800.000	.000	2603.6	967.6100	.7514	.0187
	2.440	2836.9	967.6100	.7433	.0514
	7.450	3163.3	967.6100	.7335	.0875
	12.940	3535.9	967.6100	.7211	.1269
	19.010	3911.5	967.6100	.7031	.1706
	25.760	4227.3	967.6100	.6757	.2187
	33.250	4420.5	967.6100	.6353	.2707
	41.560	4479.5	967.6100	.5845	.3260
	50.460	4423.7	967.6100	.5291	.3824
	56.130	4337.0	967.6100	.4944	.4162
	64.500	4139.6	967.6100	.4433	.4635
	75.820	3757.8	967.6100	.3754	.5214
	90.100	3157.7	967.6100	.2953	.5829
	115.590	2082.4	967.6100	.1790	.6657
	173.030	839.9	967.6100	.0437	.7597
825.000	222.070	576.9	967.6100	.0043	.7870
	.000	2893.9	967.6100	.7415	.0583
	1.880	3225.5	967.6100	.7316	.0948

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
625.000	7.440	3595.0	967.6100	.7168	.1337
	13.580	3958.9	967.6100	.7001	.1770
	20.370	4256.2	967.6100	.6718	.2244
	27.900	4431.8	967.6100	.6312	.2754
	36.210	4481.2	967.6100	.5811	.3294
	45.100	4423.5	967.6100	.5270	.3842
	50.730	4338.8	967.6100	.4933	.4171
	59.040	4149.2	967.6100	.4438	.4629
	70.230	3785.7	967.6100	.3783	.5189
	84.290	3215.1	967.6100	.3010	.5787
	109.360	2172.5	967.6100	.1872	.6600
	166.910	884.7	967.6100	.0492	.7558
	216.600	583.5	967.6100	.0056	.7861
	650.000	.000	2964.0	967.6100	.7393
4.740		3300.2	967.6100	.7292	.1026
10.390		3664.4	967.6100	.7159	.1417
16.610		4013.0	967.6100	.6963	.1846
23.460		4288.1	967.6100	.6671	.2312
31.020		4443.9	967.6100	.6263	.2810
39.340		4482.8	967.6100	.5771	.3334
48.190		4422.9	967.6100	.5245	.3864
53.790		4340.6	967.6100	.4919	.4182
62.020		4159.6	967.6100	.4442	.4623
73.070		3810.1	967.6100	.3813	.5163
86.890		3278.4	967.6100	.3073	.5741
111.470		2270.2	967.6100	.1905	.6535
169.020		941.3	967.6100	.0560	.7511
219.500	593.4	967.6100	.0075	.7848	
675.000	.000	3025.1	967.6100	.7375	.0736
	2.640	3362.4	967.6100	.7271	.1095
	8.350	3720.7	967.6100	.7133	.1484
	14.630	4055.8	967.6100	.6930	.1909
	21.530	4312.4	967.6100	.6630	.2368
	29.110	4452.7	967.6100	.6222	.2855
	37.440	4483.7	967.6100	.5737	.3367
	46.270	4422.3	967.6100	.5224	.3883
	51.840	4341.8	967.6100	.4907	.4191
	60.020	4167.4	967.6100	.4445	.4620
	70.950	3839.2	967.6100	.3836	.5143
	84.580	3327.0	967.6100	.3120	.5705
	108.770	2358.9	967.6100	.2040	.6483
	166.220	990.4	967.6100	.0617	.7472
217.360	603.4	967.6100	.0094	.7835	
700.000	.000	3095.2	967.6100	.7352	.0821
	5.090	3436.7	967.6100	.7245	.1178
	10.830	3786.2	967.6100	.7101	.1564
	17.230	4104.2	967.6100	.6889	.1984
	24.180	4339.0	967.6100	.6581	.2434
	31.780	4462.1	967.6100	.6173	.2909
	40.100	4484.4	967.6100	.5698	.3405

ORIGINAL PAGE IS
OF POOR QUALITY

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
900.000	48.910	4421.5	967.6100	.5199	.3905	
	54.450	4343.0	967.6100	.4891	.4203	
	62.560	4175.6	967.6100	.4445	.4617	
	73.360	3864.5	967.6100	.3860	.5122	
	86.790	3380.7	967.6100	.3173	.5665	
	110.520	2453.2	967.6100	.2125	.6423	
	167.740	1051.2	967.6100	.0684	.7425	
	219.670	617.9	967.6100	.0119	.7817	
	950.000	.000	2683.6	967.6100	.7479	.0331
		2.980	2933.4	967.6100	.7399	.0648
8.030		3238.5	967.6100	.7308	.0979	
13.490		3571.0	967.6100	.7194	.1331	
19.410		3900.3	967.6100	.7037	.1711	
25.870		4184.7	967.6100	.6809	.2119	
32.900		4380.9	967.6100	.6488	.2552	
40.540		4476.2	967.6100	.6083	.3004	
48.860		4484.9	967.6100	.5626	.3475	
57.620		4419.5	967.6100	.5152	.3946	
1000.000	63.110	4344.5	967.6100	.4861	.4227	
	71.100	4189.1	967.6100	.4443	.4615	
	81.690	3905.0	967.6100	.3897	.5089	
	94.770	3467.6	967.6100	.3257	.5600	
	117.720	2612.5	967.6100	.2269	.6321	
	174.260	1165.8	967.6100	.0806	.7340	
	227.620	651.2	967.6100	.0174	.7780	
	.000	2612.1	967.6100	.7506	.0223	
	3.050	2804.1	967.6100	.7436	.0506	
	7.910	3073.2	967.6100	.7355	.0816	
1100.000	13.090	3380.3	967.6100	.7260	.1140	
	18.680	3701.7	967.6100	.7138	.1486	
	24.730	4005.7	967.6100	.6967	.1857	
	31.290	4254.5	967.6100	.6723	.2252	
	38.380	4415.0	967.6100	.6392	.2666	
	46.050	4486.8	967.6100	.5994	.3096	
	54.360	4484.2	967.6100	.5554	.3542	
	63.070	4417.0	967.6100	.5104	.3988	
	68.500	4345.1	967.6100	.4830	.4252	
	76.390	4200.0	967.6100	.4436	.4618	
1100.000	86.800	3939.0	967.6100	.3925	.5063	
	99.560	3542.7	967.6100	.3329	.5545	
	121.810	2754.2	967.6100	.2398	.6230	
	177.430	1282.5	967.6100	.0925	.7258	
	232.110	693.4	967.6100	.0237	.7736	
	276.670	563.4	967.6100	.0014	.7890	
	.000	2891.2	967.6100	.7395	.0674	
	3.090	3108.8	967.6100	.7334	.0902	
	10.180	3377.3	967.6100	.7253	.1176	
	15.620	3665.4	967.6100	.7149	.1477	
1100.000	21.440	3945.4	967.6100	.7004	.1801	
	27.690	4187.7	967.6100	.6803	.2147	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
1100.000	34.400	4363.9	967.6100	.6531	.2510	
	41.570	4464.3	967.6100	.6194	.2886	
	49.270	4499.5	967.6100	.5816	.3274	
	57.560	4480.0	967.6100	.5414	.3674	
	66.180	4410.7	967.6100	.5007	.4072	
	71.530	4344.1	967.6100	.4761	.4308	
	79.230	4215.6	967.6100	.4411	.4632	
	89.310	3992.1	967.6100	.3961	.5028	
	101.550	3658.5	967.6100	.3437	.5458	
	122.530	2987.9	967.6100	.2613	.6076	
	175.980	1515.9	967.6100	.1151	.7102	
	232.690	800.1	967.6100	.0379	.7637	
	281.190	575.4	967.6100	.0040	.7872	
	1200.000	.000	3317.0	967.6100	.7252	.1214
		5.590	3485.8	967.6100	.7201	.1368
10.910		3707.9	967.6100	.7119	.1584	
16.560		3942.6	967.6100	.6999	.1843	
22.570		4158.2	967.6100	.6830	.2130	
28.960		4327.8	967.6100	.6601	.2439	
35.760		4438.3	967.6100	.6316	.2763	
42.990		4493.9	967.6100	.5990	.3098	
50.700		4503.6	967.6100	.5640	.3445	
58.950		4472.5	967.6100	.5273	.3803	
67.490		4402.2	967.6100	.4906	.4159	
72.750		4339.7	967.6100	.4686	.4370	
80.310		4223.8	967.6100	.4373	.4660	
90.110		4028.4	967.6100	.3973	.5013	
101.890		3740.9	967.6100	.3509	.5399	
121.830	3164.6	967.6100	.2777	.5957		
172.990	1742.3	967.6100	.1360	.6956		
230.690	926.9	967.6100	.0526	.7535		
281.270	600.1	967.6100	.0088	.7839		

REMTECH INC.

40,000 FOOT PLUME PROPERTIES

A47

FLOW FIELD

Z	R	T	P	F1	F2
.000	.000	1404.5	39.4000	.7702	.0000
	2.000	1400.8	38.9500	.7702	.0000
	4.000	1651.9	81.3500	.7702	.0000
	6.000	1741.3	104.3000	.7702	.0000
	8.000	1758.1	109.1900	.7702	.0000
	10.000	1779.0	115.5500	.7702	.0000
	12.000	1803.3	123.3100	.7702	.0000
	14.000	1828.8	131.8900	.7702	.0000
	16.000	1857.0	141.9400	.7702	.0000
	18.000	1889.4	154.2000	.7702	.0000
	20.000	1924.2	168.2700	.7702	.0000
	22.000	1966.8	186.8900	.7702	.0000
	24.000	2017.4	211.0900	.7702	.0000
	26.000	2073.7	240.8000	.7702	.0000
	28.000	2133.5	275.9300	.7702	.0000
	30.000	2197.8	318.1100	.7702	.0000
	32.000	2261.6	364.6600	.7702	.0000
	34.000	2325.0	416.5800	.7702	.0000
	36.000	2385.6	474.1200	.7702	.0000
	38.000	2444.2	537.0500	.7702	.0000
	40.000	2501.4	604.7700	.7702	.0000
	42.000	2558.2	676.6300	.7702	.0000
	45.380	2613.8	757.6800	.7702	.0000
10.000	.000	1327.0	30.7000	.7702	.0000
	2.000	1723.4	99.2400	.7702	.0000
	4.000	1732.3	101.7300	.7702	.0000
	6.000	1737.4	103.1900	.7702	.0000
	8.000	1742.2	104.5400	.7702	.0000
	10.000	1751.9	107.3800	.7702	.0000
	12.000	1764.6	112.6500	.7702	.0000
	14.000	1792.4	119.7800	.7702	.0000
	16.000	1819.1	128.5800	.7702	.0000
	18.000	1849.9	139.3500	.7702	.0000
	20.000	1888.9	154.0100	.7702	.0000
	22.000	1933.4	172.1900	.7702	.0000
	24.000	1985.2	195.4700	.7702	.0000
	26.000	2041.8	223.6000	.7702	.0000
	28.000	2102.1	257.0200	.7702	.0000
	30.000	2164.3	295.5500	.7702	.0000
	32.000	2225.0	337.4200	.7702	.0000
	34.000	2287.0	384.9400	.7702	.0000
	36.000	2347.4	436.3900	.7702	.0000
	38.000	2403.0	492.1200	.7702	.0000
	40.000	2456.9	551.4900	.7702	.0000
	42.000	2501.7	615.1300	.7702	.0000
	44.000	2421.8	512.0700	.7702	.0000
	46.000	2341.2	430.6700	.7702	.0000
	53.920	729.5	406.2500	.0817	.7047
20.000	.000	2284.6	383.0200	.7702	.0000
	2.000	1834.8	134.0000	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
20.000	4.000	1783.3	116.9100	.7702	.0000
	6.000	1734.0	102.2000	.7702	.0000
	8.000	1733.2	102.0000	.7702	.0000
	10.000	1735.7	102.7000	.7702	.0000
	12.000	1747.1	105.9800	.7702	.0000
	14.000	1766.6	111.7500	.7702	.0000
	16.000	1793.1	120.0100	.7702	.0000
	18.000	1820.0	130.9400	.7702	.0000
	20.000	1866.9	146.3200	.7702	.0000
	22.000	1916.9	165.2600	.7702	.0000
	24.000	1971.5	189.0300	.7702	.0000
	26.000	2028.9	216.9000	.7702	.0000
	28.000	2087.9	248.0000	.7702	.0000
	30.000	2145.9	283.7400	.7702	.0000
	32.000	2205.4	323.4000	.7702	.0000
	34.000	2262.7	365.7400	.7702	.0000
	36.000	2320.7	412.8400	.7702	.0000
	38.000	2373.8	462.2300	.7702	.0000
	40.000	2405.9	495.2200	.7702	.0000
	42.000	2394.0	482.8000	.7702	.0000
	44.000	2346.2	435.2900	.7702	.0000
	46.000	2300.0	395.5000	.7702	.0000
	48.000	2278.5	376.1500	.7702	.0000
	55.380	968.5	406.2600	.1647	.6179
30.000	03.610	556.3	406.2600	.0090	.7806
	.000	1964.1	185.6700	.7702	.0000
	2.000	1904.4	160.1400	.7702	.0000
	4.000	1780.9	116.1500	.7702	.0000
	6.000	1742.1	104.5300	.7702	.0000
	8.000	1727.5	100.3900	.7702	.0000
	10.000	1728.3	100.6100	.7702	.0000
	12.000	1734.6	102.3900	.7702	.0000
	14.000	1751.0	107.1100	.7702	.0000
	16.000	1777.8	115.1800	.7702	.0000
	18.000	1816.2	127.5900	.7702	.0000
	20.000	1860.6	143.2500	.7702	.0000
	22.000	1912.8	163.5600	.7702	.0000
	24.000	1969.3	186.0100	.7702	.0000
	26.000	2024.9	214.8400	.7702	.0000
	28.000	2081.2	244.9900	.7702	.0000
	30.000	2138.3	276.4200	.7702	.0000
	32.000	2194.3	315.7000	.7702	.0000
34.000	2250.2	356.1700	.7702	.0000	
36.000	2303.2	398.1500	.7702	.0000	
38.000	2316.5	409.3000	.7702	.0000	
40.000	2314.8	407.8900	.7702	.0000	
42.000	2285.1	383.3700	.7702	.0000	
44.000	2255.1	359.8800	.7702	.0000	
46.000	2238.9	347.0300	.7702	.0000	
48.000	2261.5	364.7500	.7702	.0000	

ORIGINAL PAGE IS
OF POOR QUALITY

FLOW FIELD (CONTINUED)

Z	K	T	F	F1	F2	
30.000	49.780	2374.3	406.2600	.7006	.0579	
	56.480	1186.1	406.2600	.2252	.5546	
	64.110	591.1	406.2600	.0251	.7638	
40.000	.000	1691.4	90.7400	.7702	.0000	
	2.000	1865.0	144.4000	.7702	.0000	
	4.000	1903.1	159.6100	.7702	.0000	
	6.000	1765.4	111.3700	.7702	.0000	
	8.000	1732.1	101.6700	.7702	.0000	
	10.000	1726.9	100.2200	.7702	.0000	
	12.000	1735.7	102.6900	.7702	.0000	
	14.000	1751.5	107.2500	.7702	.0000	
	16.000	1782.7	116.7100	.7702	.0000	
	18.000	1826.9	131.2300	.7702	.0000	
	20.000	1971.2	147.2200	.7702	.0000	
	22.000	1927.5	169.6800	.7702	.0000	
	24.000	1978.4	192.2200	.7702	.0000	
	26.000	2031.8	218.3600	.7702	.0000	
	28.000	2085.0	247.2000	.7702	.0000	
	30.000	2138.1	278.7900	.7702	.0000	
	32.000	2190.7	313.2700	.7702	.0000	
	34.000	2242.0	349.9800	.7702	.0000	
	36.000	2295.0	391.3700	.7702	.0000	
	38.000	2244.0	366.7000	.7702	.0000	
	40.000	2229.1	340.4100	.7702	.0000	
	42.000	2189.8	312.4400	.7702	.0000	
	44.000	2161.5	293.1100	.7702	.0000	
	46.000	2184.5	309.5000	.7702	.0000	
	48.000	2237.3	348.4700	.7702	.0000	
	50.000	2501.9	397.0900	.7702	.0000	
	51.370	2442.0	456.2600	.6829	.0764	
	52.150	1407.1	456.2600	.2716	.5060	
	53.340	668.5	406.2600	.0539	.7337	
	50.000	.000	1894.7	150.2600	.7702	.0000
		2.000	1812.2	126.2700	.7702	.0000
		4.000	1834.4	133.8400	.7702	.0000
		6.000	1863.4	144.2900	.7702	.0000
		8.000	1747.6	106.1000	.7702	.0000
10.000		1733.7	102.1300	.7702	.0000	
12.000		1741.6	104.3800	.7702	.0000	
14.000		1764.3	111.0600	.7702	.0000	
16.000		1746.2	121.0200	.7702	.0000	
18.000		1843.1	136.9300	.7702	.0000	
20.000		1893.5	155.5000	.7702	.0000	
22.000		1945.9	177.5500	.7702	.0000	
24.000		1997.1	201.1100	.7702	.0000	
26.000		2049.4	227.6100	.7702	.0000	
28.000	2103.4	257.7600	.7702	.0000		
30.000	2152.0	287.6000	.7702	.0000		
32.000	2194.0	315.9000	.7702	.0000		
34.000	2255.6	323.5600	.7702	.0000		

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
50.000	36.000	2176.2	303.4300	.7702	.0000	
	38.000	2146.6	284.1800	.7702	.0000	
	40.000	2129.0	273.1500	.7702	.0000	
	42.000	2103.9	258.1100	.7702	.0000	
	44.000	2096.1	253.5600	.7702	.0000	
	46.000	2160.0	292.7800	.7702	.0000	
	48.000	2218.3	332.0700	.7702	.0000	
	50.000	2273.2	374.3700	.7702	.0000	
	52.470	2517.0	406.2600	.6638	.0964	
	59.390	1646.2	406.2600	.3114	.4646	
	66.220	813.2	406.2600	.0273	.6983	
	80.190	546.6	406.2600	.0036	.7863	
	60.000	.000	1818.6	128.3900	.7702	.0000
		2.000	1821.4	129.3500	.7702	.0000
		4.000	1794.2	120.3700	.7702	.0000
		6.000	1816.6	127.7400	.7702	.0000
8.000		1833.8	133.6400	.7702	.0000	
10.000		1756.5	108.7300	.7702	.0000	
12.000		1767.7	112.0800	.7702	.0000	
14.000		1794.0	120.3100	.7702	.0000	
16.000		1834.0	133.6900	.7702	.0000	
18.000		1880.1	150.5800	.7702	.0000	
20.000		1929.3	170.4100	.7702	.0000	
22.000		1976.4	191.3100	.7702	.0000	
24.000		2028.1	216.4600	.7702	.0000	
26.000		2076.9	242.5800	.7702	.0000	
28.000		2124.0	270.0900	.7702	.0000	
30.000		2169.3	298.8600	.7702	.0000	
32.000		2177.4	304.2400	.7702	.0000	
34.000		2151.5	287.2800	.7702	.0000	
36.000		2125.6	271.1000	.7702	.0000	
38.000		2118.5	266.8000	.7702	.0000	
40.000		2112.2	262.9900	.7702	.0000	
42.000		2104.3	258.3400	.7702	.0000	
44.000		2083.8	246.4800	.7702	.0000	
46.000		2145.8	283.6700	.7702	.0000	
48.000	2201.0	320.3800	.7702	.0000		
50.000	2254.0	359.0700	.7702	.0000		
53.560	2573.5	406.2600	.6568	.1094		
60.700	1903.6	406.2600	.3483	.4448		
67.540	948.0	406.2600	.1306	.6537		
80.970	556.8	406.2600	.0061	.7815		
70.000	.000	1778.6	115.4300	.7702	.0000	
	2.000	1789.6	118.9000	.7702	.0000	
	4.000	1792.5	119.8300	.7702	.0000	
	6.000	1789.8	118.9500	.7702	.0000	
	8.000	1824.2	130.3000	.7702	.0000	
	10.000	1821.0	129.2700	.7702	.0000	
	14.000	1818.7	128.4300	.7702	.0000	
14.000	1845.8	137.8700	.7702	.0000		

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
70.000	16.000	1888.9	153.9900	.7702	.0000
	18.000	1928.6	170.1500	.7702	.0000
	20.000	1984.0	194.8700	.7702	.0000
	22.000	2018.4	211.5600	.7702	.0000
	24.000	2024.9	214.6600	.7702	.0000
	26.000	2082.4	245.6700	.7702	.0000
	28.000	2144.5	282.8300	.7702	.0000
	30.000	2128.9	273.0900	.7702	.0000
	32.000	2104.4	256.6900	.7702	.0000
	34.000	2081.0	244.8900	.7702	.0000
	36.000	2057.2	231.7600	.7702	.0000
	38.000	2033.4	219.2000	.7702	.0000
	40.000	2036.2	220.6500	.7702	.0000
	42.000	2017.2	210.9900	.7702	.0000
	44.000	2045.6	225.6000	.7702	.0000
	46.000	2120.0	267.6900	.7702	.0000
	48.000	2182.8	307.8600	.7702	.0000
	50.000	2228.6	340.0500	.7702	.0000
	53.760	2750.5	406.2600	.6912	.1215
	61.750	2749.1	406.2600	.4491	.4375
69.880	1305.2	406.2600	.1786	.6276	
80.000	83.700	584.6	406.2600	.0176	.7723
	.000	1771.7	113.3200	.7702	.0000
	2.000	1775.8	114.5600	.7702	.0000
	4.000	1787.1	118.0900	.7702	.0000
	6.000	1800.5	122.4100	.7702	.0000
	8.000	1829.8	132.2300	.7702	.0000
	10.000	1891.2	154.9000	.7702	.0000
	12.000	1930.5	170.9400	.7702	.0000
	14.000	1916.6	165.1200	.7702	.0000
	16.000	1948.0	178.7500	.7702	.0000
	18.000	1987.7	196.0000	.7702	.0000
	20.000	2026.1	215.4400	.7702	.0000
	22.000	2064.1	235.5300	.7702	.0000
	24.000	2102.6	257.3300	.7702	.0000
	26.000	2113.6	263.8700	.7702	.0000
	28.000	2091.8	251.0600	.7702	.0000
	30.000	2069.5	236.4600	.7702	.0000
	32.000	2046.1	225.6200	.7702	.0000
	34.000	2022.3	213.5400	.7702	.0000
	36.000	1999.5	202.2500	.7702	.0000
38.000	1981.1	193.4700	.7702	.0000	
40.000	1962.8	185.0900	.7702	.0000	
42.000	1942.5	196.8700	.7702	.0000	
44.000	2064.3	235.6300	.7702	.0000	
46.000	2115.8	265.1700	.7702	.0000	
48.000	2189.1	312.1300	.7702	.0000	
50.000	2236.2	345.6500	.7702	.0000	
54.250	2889.3	406.2600	.6919	.1307	
62.540	2999.2	406.2600	.4742	.4233	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
80.000	71.000	1674.1	406.2600	.2220	.6115
	85.460	630.4	406.2600	.0293	.7623
90.000	.000	1767.1	111.9100	.7702	.0000
	4.000	1791.1	119.3600	.7702	.0000
	6.000	1633.1	133.3800	.7702	.0000
	8.000	1898.5	157.7800	.7702	.0000
	10.000	1941.4	175.6100	.7702	.0000
	12.000	2016.4	210.5700	.7702	.0000
	14.000	2037.8	221.4800	.7702	.0000
	16.000	2021.6	213.1800	.7702	.0000
	18.000	2051.3	226.6000	.7702	.0000
	20.000	2079.6	244.1300	.7702	.0000
	22.000	2103.9	256.0900	.7702	.0000
	24.000	2084.3	246.7800	.7702	.0000
	26.000	2060.7	233.6600	.7702	.0000
	28.000	2037.4	221.2800	.7702	.0000
	30.000	2014.3	209.5300	.7702	.0000
	32.000	1991.6	198.4600	.7702	.0000
	34.000	1977.8	191.9300	.7702	.0000
	36.000	1949.3	179.0500	.7702	.0000
	38.000	1928.1	169.4400	.7702	.0000
	40.000	1903.6	155.4200	.7702	.0000
	42.000	2030.1	217.5100	.7702	.0000
	44.000	2089.6	249.9100	.7702	.0000
	46.000	2142.5	281.5400	.7702	.0000
	48.000	2191.4	313.7200	.7702	.0000
	50.000	2237.4	346.5700	.7702	.0000
	54.300	2980.9	406.2600	.6912	.1371
	62.760	3132.6	406.2600	.4895	.4120
	71.420	2019.7	406.2600	.2603	.6024
	86.550	645.3	406.2600	.0406	.7540
	103.270	542.6	406.2600	.0012	.7888
100.000	.000	1786.9	118.0500	.7702	.0000
	4.000	1835.5	134.2200	.7702	.0000
	6.000	1896.4	156.9400	.7702	.0000
	8.000	1977.5	191.6000	.7702	.0000
	10.000	2031.5	218.2300	.7702	.0000
	12.000	2080.8	244.7900	.7702	.0000
	14.000	2139.8	279.9000	.7702	.0000
	16.000	2101.6	256.7200	.7702	.0000
	18.000	2113.0	263.5000	.7702	.0000
	20.000	2096.6	253.8100	.7702	.0000
	22.000	2065.4	236.5000	.7702	.0000
	24.000	2038.5	221.6600	.7702	.0000
	26.000	2012.7	208.7300	.7702	.0000
	28.000	1987.7	196.5800	.7702	.0000
	30.000	1965.4	186.4600	.7702	.0000
	32.000	1946.0	177.5900	.7702	.0000
	34.000	1927.5	169.6800	.7702	.0000
	36.000	1902.4	159.5600	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
100.000	38.000	1947.8	176.3800	.7702	.0000
	40.000	1991.0	198.1600	.7702	.0000
	42.000	2053.6	229.6300	.7702	.0000
	44.000	2105.1	258.8000	.7702	.0000
	46.000	2154.7	289.3400	.7702	.0000
	48.000	2198.8	318.6700	.7702	.0000
	50.000	2242.7	350.5700	.7702	.0000
	54.450	3056.9	406.2600	.6904	.1427
	63.050	3240.7	406.2600	.5021	.4019
	71.630	2199.2	406.2600	.2815	.5908
	86.930	753.8	406.2600	.0531	.7458
	103.830	545.4	406.2600	.0023	.7879
	110.000	.000	1834.3	133.8100	.7702
2.000		1875.0	148.6500	.7702	.0000
4.000		1945.4	177.3300	.7702	.0000
6.000		2021.2	212.9700	.7702	.0000
8.000		2072.4	240.0900	.7702	.0000
10.000		2116.7	265.6800	.7702	.0000
12.000		2152.5	297.9600	.7702	.0000
14.000		2196.6	317.4700	.7702	.0000
16.000		2205.6	323.7000	.7702	.0000
18.000		2150.5	286.6600	.7702	.0000
20.000		2079.2	243.9000	.7702	.0000
22.000		2047.6	226.7500	.7702	.0000
24.000		2019.6	212.1800	.7702	.0000
26.000		1992.9	199.0500	.7702	.0000
28.000		1966.4	186.7000	.7702	.0000
30.000		2020.3	212.5500	.7702	.0000
32.000		2003.3	204.1200	.7702	.0000
34.000		2001.6	203.2500	.7702	.0000
36.000		2013.7	209.2000	.7702	.0000
38.000		2015.6	210.2000	.7702	.0000
40.000		2017.4	211.0700	.7702	.0000
42.000		2076.8	242.5500	.7702	.0000
44.000		2124.2	270.2100	.7702	.0000
46.000	2168.4	298.2300	.7702	.0000	
48.680	2366.6	406.2600	.7380	.0448	
54.470	3157.4	406.2600	.6890	.1502	
63.230	3369.9	406.2600	.5162	.3897	
71.620	2405.3	406.2600	.3074	.5726	
86.950	871.3	406.2600	.0730	.7328	
104.130	553.3	406.2600	.0047	.7859	
120.000	.000	2025.1	214.9600	.7702	.0000
	2.000	2082.1	245.5500	.7702	.0000
	4.000	2125.5	271.0600	.7702	.0000
	6.000	2160.3	292.9600	.7702	.0000
	8.000	2190.4	313.0100	.7702	.0000
	10.000	2217.1	331.7400	.7702	.0000
	12.000	2194.4	316.1600	.7702	.0000
14.000	2198.4	318.5400	.7702	.0000	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
120.000	16.000	2126.3	271.5100	.7702	.0000
	18.000	2073.1	240.4900	.7702	.0000
	20.000	2030.4	217.6400	.7702	.0000
	22.000	1994.2	199.6800	.7702	.0000
	24.000	1961.0	184.5500	.7702	.0000
	26.000	1934.4	172.5800	.7702	.0000
	28.000	1908.5	161.7900	.7702	.0000
	30.000	1883.5	151.9000	.7702	.0000
	32.000	1858.7	142.5600	.7702	.0000
	34.000	1857.7	142.1700	.7702	.0000
	36.000	1933.1	172.0500	.7702	.0000
	38.000	2006.1	205.4900	.7702	.0000
	40.000	2056.6	231.4600	.7702	.0000
	42.000	2103.6	257.9300	.7702	.0000
	44.000	2146.0	283.6000	.7702	.0000
	46.000	2183.8	308.5700	.7702	.0000
	48.720	2407.9	406.2600	.7370	.0495
	54.610	3213.9	406.2600	.6881	.1547
	63.460	3441.7	406.2600	.5230	.3832
	71.720	2531.4	406.2600	.3236	.5605
	87.000	957.6	406.2600	.0868	.7239
	104.450	561.5	406.2600	.0071	.7841
130.000	.000	2534.3	646.7600	.7702	.0000
	2.000	2382.5	471.0200	.7702	.0000
	4.000	2319.9	412.1700	.7702	.0000
	6.000	2297.7	393.0000	.7702	.0000
	8.000	2297.0	393.0100	.7702	.0000
	10.000	2261.0	364.3900	.7702	.0000
	12.000	2211.6	327.9400	.7702	.0000
	14.000	2162.8	294.6000	.7702	.0000
	16.000	2118.2	266.6100	.7702	.0000
	18.000	2073.2	240.5400	.7702	.0000
	20.000	2001.1	203.0400	.7702	.0000
	22.000	1966.6	186.8700	.7702	.0000
	24.000	1932.6	171.8400	.7702	.0000
	26.000	1901.8	159.1000	.7702	.0000
	28.000	1874.1	148.3000	.7702	.0000
	30.000	1852.4	140.2600	.7702	.0000
	32.000	1821.1	129.2800	.7702	.0000
	34.000	1875.7	148.9000	.7702	.0000
	36.000	1971.8	189.1700	.7702	.0000
	38.000	2030.8	217.8800	.7702	.0000
	40.000	2089.4	249.7000	.7702	.0000
	42.000	2131.4	274.6700	.7702	.0000
	44.000	2169.7	299.1300	.7702	.0000
	46.000	2206.5	324.2300	.7702	.0000
	48.270	2449.4	406.2600	.7359	.0542
	54.250	3264.8	406.2600	.6870	.1589
	63.180	3505.3	406.2600	.5266	.3778
	71.310	2651.6	406.2600	.3390	.5487

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
130.000	86.500	1049.6	406.2600	.1008	.7147
	104.160	572.6	406.2600	.0101	.7819
145.000	.000	2750.1	988.3500	.7702	.0000
	2.000	2701.3	846.7000	.7702	.0000
	4.000	2634.5	789.2500	.7702	.0000
	6.000	2421.9	512.3300	.7702	.0000
	8.000	2314.7	412.0600	.7702	.0000
	10.000	2237.2	346.3900	.7702	.0000
	12.000	2183.0	308.0100	.7702	.0000
	14.000	2134.1	276.3000	.7702	.0000
	16.000	2085.0	247.1900	.7702	.0000
	18.000	2052.0	228.9700	.7702	.0000
	20.000	2016.0	210.3600	.7702	.0000
	22.000	1949.0	178.9100	.7702	.0000
	24.000	1894.2	156.0800	.7702	.0000
	26.000	1860.9	143.3500	.7702	.0000
	28.000	1829.3	132.0600	.7702	.0000
	30.000	1833.4	133.5100	.7702	.0000
	32.000	1942.2	175.9400	.7702	.0000
	34.000	2015.0	209.6700	.7702	.0000
	36.000	2059.9	233.2500	.7702	.0000
	38.000	2102.2	257.0900	.7702	.0000
	40.000	2140.0	279.9800	.7702	.0000
	42.000	2173.7	301.7900	.7702	.0000
	44.000	2205.0	323.1300	.7702	.0000
	46.000	2234.5	344.3700	.7702	.0000
	47.340	2511.7	406.2600	.7342	.0609
	53.470	3332.6	406.2600	.6453	.1649
	62.510	3588.6	406.2600	.5350	.3712
	70.450	2821.3	406.2600	.3606	.5316
	85.440	1197.1	406.2600	.1220	.7009
	103.410	596.4	406.2600	.0156	.7777
160.000	.000	2764.6	1016.4400	.7702	.0000
	2.000	2694.2	886.2600	.7702	.0000
	4.000	2610.3	752.6500	.7702	.0000
	6.000	2542.2	657.1800	.7702	.0000
	8.000	2439.4	531.6700	.7702	.0000
	10.000	2306.0	400.5100	.7702	.0000
	12.000	2173.9	301.8900	.7702	.0000
	14.000	2102.6	256.9900	.7702	.0000
	16.000	2057.0	231.6400	.7702	.0000
	18.000	2013.4	209.0600	.7702	.0000
	20.000	1971.4	188.9900	.7702	.0000
	22.000	1923.6	168.1200	.7702	.0000
	24.000	1874.9	146.6000	.7702	.0000
	26.000	1828.2	131.6900	.7702	.0000
	28.000	1871.5	147.3000	.7702	.0000
	30.000	2011.1	207.9000	.7702	.0000
	32.000	2054.3	230.2000	.7702	.0000
	34.000	2092.5	251.4700	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
160.000	36.000	2125.1	270.7900	.7702	.0000
	38.000	2157.5	291.1300	.7702	.0000
	40.000	2186.0	310.0200	.7702	.0000
	42.000	2213.9	329.4600	.7702	.0000
	44.000	2238.0	346.9700	.7702	.0000
	46.450	2593.8	406.2600	.7318	.0695
	52.750	3412.0	406.2600	.6828	.1722
	61.910	3682.0	406.2600	.5412	.3644
	69.620	3023.7	406.2600	.3862	.5106
	81.250	1408.5	406.2600	.1503	.6822
160.000	102.640	642.7	406.2600	.0256	.7705
	.000	2333.6	424.0200	.7702	.0000
	2.000	2356.7	445.4200	.7702	.0000
	4.000	2380.4	468.8700	.7702	.0000
	6.000	2373.2	461.6500	.7702	.0000
	8.000	2367.7	456.1300	.7702	.0000
	10.000	2346.3	435.3400	.7702	.0000
	12.000	2278.1	377.8400	.7702	.0000
	14.000	2168.7	298.4700	.7702	.0000
	16.000	2037.0	221.0700	.7702	.0000
160.000	18.000	1983.0	194.3700	.7702	.0000
	20.000	1937.6	173.9700	.7702	.0000
	22.000	1897.0	157.1700	.7702	.0000
	24.000	1855.8	141.4900	.7702	.0000
	26.000	2110.6	262.0400	.7702	.0000
	28.000	2121.6	266.6900	.7702	.0000
	30.000	2141.7	281.0700	.7702	.0000
	32.000	2162.4	294.2900	.7702	.0000
	34.000	2182.8	307.8400	.7702	.0000
	36.000	2203.1	321.8000	.7702	.0000
160.000	38.000	2220.8	334.3900	.7702	.0000
	40.000	2240.9	349.1100	.7702	.0000
	42.000	2259.8	363.5100	.7702	.0000
	44.560	2674.1	406.2600	.7295	.0776
	51.040	3481.6	406.2600	.6801	.1791
	60.310	3758.9	406.2600	.5458	.3594
	67.800	3197.5	406.2600	.4079	.4921
	82.010	1633.3	406.2600	.1765	.6637
	100.780	708.2	406.2600	.0385	.7617
	117.900	545.9	406.2600	.0021	.7584
200.000	.000	2155.1	289.0200	.7702	.0000
	2.000	2153.2	286.3800	.7702	.0000
	4.000	2148.1	285.0900	.7702	.0000
	6.000	2144.0	282.9000	.7702	.0000
	8.000	2157.4	291.0800	.7702	.0000
	10.000	2167.0	297.3100	.7702	.0000
	12.000	2172.1	300.7100	.7702	.0000
	14.000	2173.8	301.8100	.7702	.0000
	16.000	2151.7	287.4400	.7702	.0000
	18.000	2111.0	261.6200	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
200.000	20.000	2107.0	257.6500	.7702	.0000
	22.000	2212.6	325.3600	.7702	.0000
	24.000	2238.0	345.7800	.7702	.0000
	26.000	2251.9	356.9300	.7702	.0000
	28.000	2270.3	371.6100	.7702	.0000
	30.000	2261.1	364.5200	.7702	.0000
	32.000	2249.8	355.8600	.7702	.0000
	34.000	2256.5	360.9800	.7702	.0000
	36.000	2263.7	366.5000	.7702	.0000
	38.000	2272.4	373.2500	.7702	.0000
	40.000	2282.0	380.8800	.7702	.0000
	42.000	2291.8	388.7800	.7702	.0000
	43.190	2752.0	406.2600	.7272	.0853
	49.840	3544.0	406.2600	.6773	.1857
	59.190	3822.4	406.2600	.5493	.3555
	66.490	3343.3	406.2600	.4257	.4763
	80.240	1864.8	406.2600	.2063	.6453
	99.300	793.9	406.2600	.0534	.7514
	116.820	553.0	406.2600	.0042	.7869
220.000	.000	1987.5	196.4800	.7702	.0000
	2.000	1985.8	195.6800	.7702	.0000
	4.000	1987.6	196.5400	.7702	.0000
	6.000	1996.2	200.6500	.7702	.0000
	8.000	1992.6	198.9500	.7702	.0000
	10.000	1998.9	201.9400	.7702	.0000
	12.000	1993.8	199.4800	.7702	.0000
	14.000	2002.5	203.7000	.7702	.0000
	16.000	2011.0	207.9000	.7702	.0000
	18.000	2360.8	436.5300	.7702	.0000
	20.000	2470.1	557.3300	.7702	.0000
	22.000	2465.1	556.0600	.7702	.0000
	24.000	2371.6	458.8200	.7702	.0000
	26.000	2358.5	446.7600	.7702	.0000
	28.000	2354.5	443.2000	.7702	.0000
	30.000	2347.2	436.2100	.7702	.0000
	32.000	2329.2	420.1300	.7702	.0000
	34.000	2311.1	404.7300	.7702	.0000
	36.000	2309.3	403.2700	.7702	.0000
	38.000	2307.1	401.4300	.7702	.0000
	40.360	2845.4	406.2600	.7243	.0945
	47.210	3614.0	406.2600	.6737	.1934
	56.660	3886.0	406.2600	.5524	.3519
	63.740	3490.2	406.2600	.4432	.4602
	76.890	2146.0	406.2600	.2393	.6225
	96.100	927.5	406.2600	.0742	.7372
	114.170	569.8	406.2600	.0066	.7837
240.000	.000	1852.6	140.3200	.7702	.0000
	2.000	1856.5	141.7500	.7702	.0000
	4.000	1861.4	143.5500	.7702	.0000
	6.000	1863.2	144.2000	.7702	.0000

ORIGINAL PAGE IS
OF POOR QUALITY

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
240.000	8.000	1864.1	144.5700	.7702	.0000
	10.000	1864.0	144.7300	.7702	.0000
	12.000	1943.9	173.2200	.7702	.0000
	14.000	2095.8	245.1700	.7702	.0000
	16.000	2399.7	463.8400	.7702	.0000
	18.100	2445.6	521.0700	.7702	.0000
	20.000	2491.0	582.1400	.7702	.0000
	22.000	2532.5	635.2400	.7702	.0000
	24.000	2565.8	687.2600	.7702	.0000
	26.000	2469.7	565.8800	.7702	.0000
	28.000	2417.8	507.6600	.7702	.0000
	30.000	2403.0	492.1900	.7702	.0000
	32.000	2390.9	475.6100	.7702	.0000
	33.110	2350.9	406.2600	.7441	.0376
	38.510	2917.0	406.2600	.7220	.1014
	45.520	3664.3	406.2600	.6708	.1992
	55.030	3926.8	406.2600	.5542	.3499
	61.940	3583.7	406.2600	.4542	.4498
	74.640	2359.1	406.2600	.2641	.6047
	93.770	1052.6	406.2600	.0919	.7251
	112.310	592.1	406.2600	.0138	.7800
270.000	.000	1719.4	96.1600	.7702	.0000
	2.000	1717.6	97.6600	.7702	.0000
	4.000	1714.1	96.7200	.7702	.0000
	6.000	2460.5	421.1600	.7702	.0000
	8.000	2449.3	456.1800	.7702	.0000
	10.000	2451.1	447.4300	.7702	.0000
	12.000	2459.5	513.7800	.7702	.0000
	14.000	2469.4	535.0600	.7702	.0000
	16.000	2479.7	558.9800	.7702	.0000
	18.000	2490.0	575.3600	.7702	.0000
	20.000	2504.6	601.2500	.7702	.0000
	22.000	2519.4	623.4700	.7702	.0000
	24.000	2537.5	649.2400	.7702	.0000
	26.000	2553.9	672.0000	.7702	.0000
	28.000	2571.0	696.1200	.7702	.0000
	30.210	2440.7	406.2600	.7412	.0482
	35.810	3035.2	406.2600	.7178	.1131
	43.050	3742.6	406.2600	.6656	.2088
	52.660	3982.6	406.2600	.5562	.3476
	59.330	3708.4	416.2600	.4687	.4358
	71.280	2695.7	406.2600	.3029	.5758
	89.930	1301.6	416.2600	.1237	.7033
	109.330	657.3	406.2600	.0272	.7707
280.000	.000	2761.1	591.0100	.7702	.0000
	2.000	2761.1	591.0100	.7702	.0000
	4.000	2549.3	515.3700	.7702	.0000
	6.000	2574.2	572.9400	.7702	.0000
	8.000	2517.3	550.5400	.7702	.0000
	10.000	2503.8	556.5200	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
280.000	12.000	2493.8	560.5800	.7702	.0000
	14.000	2493.7	570.8800	.7702	.0000
	16.000	2495.6	582.3300	.7702	.0000
	18.000	2501.3	594.6000	.7702	.0000
	20.000	2507.9	606.9900	.7702	.0000
	22.000	2514.9	618.7300	.7702	.0000
	24.000	2526.3	634.8700	.7702	.0000
	26.000	2537.7	650.6200	.7702	.0000
	28.000	2549.9	667.2700	.7702	.0000
	29.640	2467.8	406.2600	.7403	.0512
	35.290	3068.3	406.2600	.7166	.1163
	42.610	3762.9	406.2600	.6642	.2114
	52.230	3996.0	406.2600	.5565	.3472
	58.850	3737.9	406.2600	.4721	.4326
	70.610	2781.4	406.2600	.3128	.5682
	89.060	1378.2	406.2600	.1329	.6970
	290.000	108.690	685.1	406.2600	.0320
.000		4073.1	2080.5300	.7680	.0000
2.660		3200.6	1541.2200	.7701	.0000
4.660		2717.1	770.7900	.7702	.0000
6.660		2617.6	672.9700	.7702	.0000
8.660		2567.7	632.6600	.7702	.0000
10.660		2538.7	612.6100	.7702	.0000
12.660		2521.4	603.1700	.7702	.0000
14.660		2514.8	603.1300	.7702	.0000
16.660		2510.2	604.3500	.7702	.0000
18.660		2510.7	608.9400	.7702	.0000
20.660		2509.5	610.5600	.7702	.0000
22.660		2512.3	615.9900	.7702	.0000
24.660		2517.2	623.1400	.7702	.0000
26.660		2521.9	629.9600	.7702	.0000
28.780		2495.4	406.2600	.7394	.0543
34.490		3100.1	406.2600	.7154	.1195
41.870	3782.3	406.2600	.6627	.2139	
51.510	4008.4	406.2600	.5568	.3469	
58.070	3764.6	406.2600	.4751	.4296	
69.640	2862.0	406.2600	.3221	.5610	
87.870	1456.7	406.2600	.1421	.6906	
107.730	712.2	406.2600	.0371	.7638	
310.000	131.540	543.7	406.2600	.0012	.7891
	.000	3886.0	1566.6000	.7687	.0000
	2.660	3464.7	1591.0600	.7699	.0000
	4.660	3188.4	1588.2300	.7701	.0000
	6.660	3093.4	1609.0000	.7701	.0000
	8.660	2801.9	1008.6000	.7702	.0000
	10.660	2619.2	732.8400	.7702	.0000
	12.660	2574.6	680.4000	.7702	.0000
	14.660	2553.0	656.4300	.7702	.0000
	16.660	2535.8	637.7800	.7702	.0000
18.660	2518.6	620.0600	.7702	.0000	

FLOW FIELD (CONTINUED)

Z	R	I	P	F1	F2
310.000	20.660	2506.4	607.0200	.7702	.0000
	22.660	2495.3	595.2700	.7702	.0000
	24.660	2486.9	585.9700	.7702	.0000
	26.660	2478.4	576.2400	.7702	.0000
	28.370	2565.0	406.2600	.7373	.0618
	34.220	3176.6	406.2600	.7123	.1272
	41.760	3827.5	406.2600	.6591	.2201
	51.440	4036.1	406.2600	.5573	.3464
	57.870	3622.9	406.2600	.4816	.4232
	69.020	3041.2	406.2600	.3427	.5447
	86.660	1658.9	406.2600	.1652	.6747
	106.980	799.5	406.2600	.0514	.7539
	131.430	548.1	406.2600	.0024	.7883
340.000	.000	3748.0	1257.4800	.7692	.0000
	2.660	3472.3	1270.6000	.7699	.0000
	4.660	3249.5	1256.5500	.7700	.0000
	6.660	3106.0	1255.6300	.7701	.0000
	8.660	2971.5	1239.8600	.7702	.0000
	10.660	2916.7	1234.7900	.7702	.0000
	12.660	2895.2	1228.1300	.7702	.0000
	14.660	2792.0	1139.2800	.7702	.0000
	16.660	2548.7	659.2800	.7702	.0000
	18.660	2506.9	616.1500	.7702	.0000
	20.660	2471.7	566.4200	.7702	.0000
	22.660	2438.0	528.7000	.7702	.0000
	24.660	2409.2	497.9600	.7702	.0000
	26.660	2388.6	476.8200	.7702	.0000
	29.210	2651.8	406.2600	.7346	.0707
	35.230	3263.3	406.2600	.7086	.1362
	42.940	3875.5	406.2600	.6547	.2271
	52.650	4064.5	406.2600	.5574	.3463
	58.950	3880.0	406.2600	.4878	.4172
	69.650	3217.2	406.2600	.3631	.5280
	86.530	1906.9	406.2600	.1927	.6556
	107.200	930.2	406.2600	.0705	.7406
	132.420	558.0	406.2600	.0049	.7865
360.000	.000	3651.8	1074.3000	.7696	.0000
	2.660	3460.0	1086.5000	.7699	.0000
	4.660	3242.2	1074.2400	.7700	.0000
	6.660	3105.6	1074.4000	.7701	.0000
	8.660	2949.1	1052.5700	.7702	.0000
	10.660	2867.1	1036.8100	.7702	.0000
	12.660	2812.0	1019.4300	.7702	.0000
	14.660	2781.4	998.2900	.7702	.0000
	16.660	2752.0	956.8700	.7702	.0000
	18.660	2724.2	916.2900	.7702	.0000
	20.660	2622.5	759.5600	.7702	.0000
	22.660	2407.6	495.7500	.7702	.0000
	24.660	2372.6	460.3000	.7702	.0000
	26.660	2333.2	423.1700	.7702	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
360.000	29.840	2723.6	406.2600	.7323	.0779
	36.000	3331.2	406.2600	.7054	.1434
	43.840	3912.2	406.2600	.6512	.2326
	52.560	4084.9	406.2600	.5573	.3465
	59.780	3919.2	406.2600	.4918	.4132
	70.150	3336.4	406.2600	.3771	.5163
	86.410	2109.6	406.2600	.2148	.6401
	107.130	1057.1	406.2600	.0874	.7290
	133.000	572.0	406.2600	.0081	.7843
380.000	.000	3544.3	402.6300	.7698	.0000
	2.660	3376.5	915.4800	.7699	.0000
	4.660	3196.8	905.0000	.7701	.0000
	6.660	3048.9	643.6800	.7702	.0000
	8.660	2903.2	874.3900	.7702	.0000
	10.660	2811.4	855.9700	.7702	.0000
	12.660	2737.0	825.0300	.7702	.0000
	14.660	2679.4	789.6900	.7702	.0000
	16.660	2651.3	774.4000	.7702	.0000
	18.660	2629.1	754.4700	.7702	.0000
	20.660	2612.0	736.2100	.7702	.0000
	22.660	2584.3	700.2600	.7702	.0000
	24.660	2556.0	666.2900	.7702	.0000
	25.050	2329.6	406.2600	.7460	.0343
	30.250	2760.7	406.2600	.7305	.0836
	36.530	3382.9	406.2600	.7029	.1490
	44.460	3938.9	406.2600	.6464	.2369
	54.210	4099.5	406.2600	.5569	.3469
	60.350	3946.1	406.2600	.4944	.4106
	70.480	3416.9	406.2600	.3867	.5082
	86.260	2264.5	406.2600	.2317	.6280
	106.870	1167.7	406.2600	.1010	.7196
	133.260	588.3	406.2600	.0115	.7819
400.000	.000	3414.7	733.2300	.7699	.0000
	2.660	3255.7	731.9300	.7700	.0000
	4.660	3116.4	730.7100	.7701	.0000
	6.660	2940.7	716.4100	.7702	.0000
	8.660	2851.9	694.5400	.7702	.0000
	10.660	2762.3	681.1700	.7702	.0000
	12.660	2663.5	652.5400	.7702	.0000
	14.660	2607.6	645.4700	.7702	.0000
	16.660	2572.4	634.6800	.7702	.0000
	18.660	2536.2	614.5800	.7702	.0000
	20.660	2504.2	585.7800	.7702	.0000
	22.660	2477.1	559.2700	.7702	.0000
	25.100	2342.0	406.2600	.7442	.0407
	30.410	2851.2	406.2600	.7282	.0906
	36.420	3444.2	406.2600	.6996	.1558
	44.860	3969.6	406.2600	.6450	.2420
	54.630	4115.9	406.2600	.5564	.3475
	65.680	3975.6	406.2600	.4971	.4079

MINIMAL PAGE SIZE
FOR EXCELLENT QUALITY

FLOW FIELD (CONTINUED)

Z	W	T	P	F1	F2
400.000	70.550	3502.8	406.2600	.3970	.4994
	85.770	2445.5	406.2600	.2513	.6138
	106.100	1313.9	406.2600	.1179	.7078
	133.120	616.7	406.2600	.0169	.7782
400.000	.000	3057.4	395.7300	.7701	.0000
	2.660	2962.4	395.7300	.7702	.0000
	4.660	2895.9	405.1000	.7702	.0000
	6.660	2796.6	427.7100	.7702	.0000
	8.660	2701.1	425.8400	.7702	.0000
	10.660	2577.7	394.4400	.7702	.0000
	12.660	2538.7	416.7100	.7702	.0000
	14.660	2465.0	405.6000	.7702	.0000
	16.660	2413.2	394.8200	.7702	.0000
	18.660	2370.2	384.7500	.7702	.0000
	20.660	2344.2	386.0400	.7702	.0000
	22.660	2383.0	436.9800	.7702	.0000
	24.660	2406.6	473.0900	.7702	.0000
	26.660	2425.0	499.6900	.7702	.0000
	27.710	2473.6	406.2600	.7413	.0511
	33.190	2961.3	406.2600	.7244	.1016
	39.410	3535.0	406.2600	.6944	.1663
	46.010	4013.6	406.2600	.6395	.2498
	57.790	4138.1	406.2600	.5552	.3489
	63.730	4015.4	406.2600	.5005	.4046
	73.240	3613.5	406.2600	.4104	.4877
	87.650	2700.0	406.2600	.2789	.5934
	107.280	1557.7	406.2600	.1441	.6897
	135.240	684.3	406.2600	.0265	.7701
400.000	.000	2866.0	278.3800	.7702	.0000
	2.660	2771.4	273.2000	.7702	.0000
	4.660	2674.0	264.5100	.7702	.0000
	6.660	2591.1	261.2000	.7702	.0000
	8.660	2509.6	256.4400	.7702	.0000
	10.660	2434.3	250.5300	.7702	.0000
	12.660	2365.5	246.6300	.7702	.0000
	14.660	2336.7	263.4600	.7702	.0000
	16.660	2361.5	308.0500	.7702	.0000
	18.660	2368.5	339.8600	.7702	.0000
	20.660	2365.0	360.6000	.7702	.0000
	22.660	2356.7	377.1500	.7702	.0000
	24.660	2356.0	399.6200	.7702	.0000
	26.660	2354.5	415.8300	.7702	.0000
	28.660	2333.5	400.0800	.7702	.0000
	30.660	2291.0	370.1200	.7702	.0000
	32.870	2583.6	406.2600	.7379	.0628
	36.560	3080.3	406.2600	.7199	.1136
	45.380	3627.0	406.2600	.6985	.1776
	53.740	4056.4	406.2600	.6336	.2581
	63.520	4158.6	406.2600	.5535	.3507
	69.350	4050.9	406.2600	.5031	.4020

FLOW FIELD (CONTINUED)

Z	R	T	F	F1	F2
480.000	78.530	3706.0	406.2600	.4217	.4776
	92.160	2932.7	406.2600	.3039	.5744
	110.940	1833.7	406.2600	.1720	.6703
	139.620	796.1	406.2600	.0454	.7584
540.000	169.020	545.1	406.2600	.0014	.7890
	.000	2397.1	109.1900	.7702	.0000
	2.660	2384.2	119.0700	.7702	.0000
	4.660	2373.1	131.7100	.7702	.0000
	6.660	2545.6	217.9600	.7702	.0000
	8.660	2520.5	246.3700	.7702	.0000
	10.660	2487.0	257.1700	.7702	.0000
	12.660	2429.0	267.9600	.7702	.0000
	14.660	2382.3	274.1900	.7702	.0000
	16.660	2334.2	264.1500	.7702	.0000
	18.660	2285.3	253.3000	.7702	.0000
	20.660	2234.3	241.5300	.7702	.0000
	22.660	2180.4	228.4200	.7702	.0000
	24.660	2124.0	214.0700	.7702	.0000
	26.660	2074.7	204.1700	.7702	.0000
	28.660	2035.0	197.3900	.7702	.0000
30.660	2042.7	209.2600	.7702	.0000	
32.030	2353.1	406.2600	.7456	.0373	
37.190	2746.6	406.2600	.7324	.0794	
43.160	3241.3	476.2600	.7132	.1304	
50.260	3743.2	406.2600	.6798	.1930	
58.800	4107.7	406.2600	.6252	.2692	
68.560	4182.4	406.2600	.5504	.3540	
74.250	4090.1	406.2600	.5049	.4001	
83.050	3806.2	406.2600	.4330	.4673	
95.780	3185.0	406.2600	.3308	.5531	
113.090	2209.2	416.2600	.2091	.6442	
142.260	1017.4	406.2600	.0745	.7362	
194.100	557.6	406.2600	.0041	.7871	
580.000	.000	2955.9	327.6100	.7702	.0000
	2.660	2811.9	302.9500	.7702	.0000
	4.660	2676.0	267.8700	.7702	.0000
	6.660	2585.2	261.6700	.7702	.0000
	8.660	2527.5	260.2800	.7702	.0000
	10.660	2466.6	255.9300	.7702	.0000
	12.660	2414.3	246.6400	.7702	.0000
	14.660	2356.9	236.3800	.7702	.0000
	16.660	2288.6	223.7000	.7702	.0000
	18.660	2224.4	211.1600	.7702	.0000
	20.660	2163.9	198.5900	.7702	.0000
	22.660	2110.5	186.7700	.7702	.0000
	24.660	2073.0	180.6400	.7702	.0000
	26.660	2039.3	175.4200	.7702	.0000
	28.660	2043.3	192.4100	.7702	.0000
	30.650	2068.4	213.7000	.7702	.0000
32.580	2404.0	406.2600	.7439	.0434	

FLOW FIELD (CONTINUED)

Z R T P F1 F2

560.000	37.830	2809.2	406.2600	.7307	.0857	
	43.910	3249.5	406.2600	.7105	.1367	
	51.110	3783.1	406.2600	.6764	.1987	
	59.710	4124.8	406.2600	.6220	.2733	
	69.450	4190.2	406.2600	.5490	.3554	
	75.090	4102.4	406.2600	.5051	.3998	
	83.770	3838.5	406.2600	.4363	.4643	
	96.220	3261.9	406.2600	.3391	.5465	
	113.040	2340.6	406.2600	.2223	.6347	
	142.100	1117.5	406.2600	.0864	.7299	
	194.790	566.2	406.2600	.0059	.7859	
	580.000	.000	3075.4	408.9200	.7701	.0000
		2.660	2980.2	414.3900	.7702	.0000
		4.660	2890.5	429.2800	.7702	.0000
6.660		2654.5	303.5500	.7702	.0000	
8.660		2562.1	274.1300	.7702	.0000	
10.660		2464.4	246.0700	.7702	.0000	
12.660		2360.1	216.1500	.7702	.0000	
14.660		2271.9	196.0500	.7702	.0000	
16.660		2187.8	176.8000	.7702	.0000	
18.660		2126.0	165.4200	.7702	.0000	
20.660		2083.2	159.4400	.7702	.0000	
22.660		2066.0	161.8200	.7702	.0000	
24.660		2034.5	158.9400	.7702	.0000	
26.660		2074.4	183.6700	.7702	.0000	
28.660		2107.2	208.3400	.7702	.0000	
30.660		2135.5	232.1900	.7702	.0000	
33.130		2446.9	406.2600	.7425	.0482	
38.460		2859.0	406.2600	.7291	.0907	
44.620		3344.6	406.2600	.7083	.1416	
51.890		3813.5	406.2600	.6737	.2031	
60.540		4137.6	406.2600	.6195	.2765	
70.270		4195.9	406.2600	.5478	.3566	
75.870		4111.3	406.2600	.5051	.3997	
84.460		3860.4	406.2600	.4365	.4621	
96.690		3317.2	406.2600	.3451	.5416	
113.150		2439.5	406.2600	.2323	.6275	
142.030	1201.0	406.2600	.0960	.7232		
195.370	575.1	406.2600	.0076	.7847		
600.000	.000	2978.8	340.3700	.7702	.0000	
	2.660	2875.1	328.2100	.7702	.0000	
	4.660	2775.6	312.2700	.7702	.0000	
	6.660	2670.2	291.7100	.7702	.0000	
	8.660	2548.7	255.0600	.7702	.0000	
	10.660	2419.7	221.4100	.7702	.0000	
	12.660	2306.2	190.7800	.7702	.0000	
	14.660	2209.2	167.4400	.7702	.0000	
	16.660	2123.0	148.7100	.7702	.0000	
	18.660	2117.5	155.0000	.7702	.0000	
	20.660	2035.2	137.3400	.7702	.0000	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
600.000	22.660	2051.6	151.2300	.7702	.0000
	24.660	2096.9	178.5700	.7702	.0000
	26.660	2122.0	201.1600	.7702	.0000
	28.660	2138.3	220.7000	.7702	.0000
	30.660	2154.6	240.3900	.7702	.0000
	32.710	2502.3	406.2600	.7408	.0543
	38.130	2920.6	406.2600	.7270	.0970
	44.390	3399.1	406.2600	.7055	.1477
	51.750	3849.3	406.2600	.6703	.2086
	60.440	4152.5	406.2600	.6163	.2804
	70.160	4202.6	406.2600	.5463	.3581
	75.720	4121.5	406.2600	.5050	.3998
	84.200	3885.1	406.2600	.4410	.4598
	96.190	3379.5	406.2600	.3520	.5360
	112.220	2554.7	406.2600	.2442	.6189
140.780	1308.7	406.2600	.1060	.7149	
194.890	589.2	406.2600	.0101	.7830	
620.000	.000	2722.2	210.3700	.7702	.0000
	2.660	2657.7	208.4700	.7702	.0000
	4.660	2591.0	202.6500	.7702	.0000
	6.660	2522.7	201.9500	.7702	.0000
	8.660	2457.5	198.3400	.7702	.0000
	10.660	2392.3	191.1900	.7702	.0000
	12.660	2327.0	183.9300	.7702	.0000
	14.660	2230.5	164.0200	.7702	.0000
	16.660	2119.9	139.6300	.7702	.0000
	18.660	2056.0	130.2200	.7702	.0000
	20.660	2127.3	164.3900	.7702	.0000
	22.660	2156.3	188.8200	.7702	.0000
	24.660	2159.4	204.9100	.7702	.0000
	26.660	2163.6	220.6800	.7702	.0000
	28.660	2169.5	236.5600	.7702	.0000
31.280	2547.0	406.2600	.7394	.0592	
36.780	2969.3	406.2600	.7252	.1019	
43.120	3441.3	406.2600	.7032	.1525	
50.540	3876.5	406.2600	.6676	.2128	
59.270	4163.8	406.2600	.6138	.2835	
68.970	4207.6	406.2600	.5451	.3594	
74.500	4129.0	406.2600	.5048	.3999	
82.900	3903.1	406.2600	.4427	.4581	
94.720	3424.7	406.2600	.3570	.5319	
110.420	2640.3	406.2600	.2531	.6123	
138.670	1396.6	406.2600	.1174	.7084	
193.360	603.2	406.2600	.0126	.7813	
640.000	.000	2484.0	131.1000	.7702	.0000
	2.660	2441.7	132.5700	.7702	.0000
	4.660	2396.4	132.1700	.7702	.0000
	6.660	2352.2	133.6700	.7702	.0000
	8.660	2309.6	134.2500	.7702	.0000
	10.660	2266.0	134.5200	.7702	.0000

ORIGINAL PAGE IS
OF POOR QUALITY

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
640.000	12.660	2221.0	133.5400	.7702	.0000
	14.660	2170.5	130.6800	.7702	.0000
	16.660	2123.4	128.3200	.7702	.0000
	18.660	2346.4	228.0900	.7702	.0000
	20.660	2351.7	260.7500	.7702	.0000
	22.660	2273.5	245.5100	.7702	.0000
	24.660	2223.2	238.5400	.7702	.0000
	26.660	2211.1	248.2500	.7702	.0000
	28.660	2205.7	258.6800	.7702	.0000
	30.660	2593.6	406.2600	.7360	.0640
	36.430	3017.4	406.2600	.7234	.1069
	42.850	3482.2	406.2600	.7009	.1573
	50.330	3902.4	406.2600	.6648	.2171
	59.090	4174.5	406.2600	.6113	.2866
	68.780	4212.3	406.2600	.5438	.3607
	74.280	4136.0	406.2600	.5045	.4001
	82.600	3919.6	406.2600	.4443	.4566
	94.250	3466.3	406.2600	.3617	.5281
	109.660	2720.1	406.2600	.2614	.6061
	137.560	1485.1	406.2600	.1267	.7019
192.800	619.7	406.2600	.0153	.7793	
680.000	.000	2189.2	70.1500	.7702	.0000
	2.660	2151.4	69.3800	.7702	.0000
	4.660	2113.2	68.6000	.7702	.0000
	6.660	2082.0	69.2400	.7702	.0000
	8.660	2060.2	70.9500	.7702	.0000
	10.660	2053.0	75.6800	.7702	.0000
	12.660	1986.0	68.5900	.7702	.0000
	14.660	2200.6	129.6400	.7702	.0000
	16.660	2392.4	229.2000	.7702	.0000
	18.790	2155.8	406.2600	.7535	.0093
	23.480	2352.3	406.2600	.7457	.0377
	28.570	2698.5	406.2600	.7347	.0749
	34.300	3123.2	406.2600	.7193	.1178
	40.850	3569.5	406.2600	.6956	.1679
	48.490	3956.3	406.2600	.6587	.2263
	57.320	4196.4	406.2600	.6057	.2933
	66.980	4222.0	406.2600	.5409	.3636
	72.410	4150.2	406.2600	.5037	.4008
	80.570	3952.5	406.2600	.4473	.4537
	91.890	3548.2	406.2600	.3709	.5204
106.690	2879.9	406.2600	.2764	.5935	
133.730	1683.6	406.2600	.1467	.6880	
190.080	666.8	406.2600	.0228	.7742	
236.730	543.8	406.2600	.0010	.7893	
720.000	.000	1459.2	41.2200	.7702	.0000
	2.660	1932.8	40.9900	.7702	.0000
	4.660	1919.0	42.1300	.7702	.0000
	6.660	1885.7	41.1100	.7702	.0000
	9.070	2115.1	406.2600	.7560	.0000

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
720.000	13.610	2120.5	406.2600	.7556	.0017
	18.190	2196.3	406.2600	.7515	.0165
	22.960	2442.8	406.2600	.7427	.0483
	28.190	2804.3	406.2600	.7312	.0858
	34.090	3225.0	406.2600	.7150	.1287
	40.820	3650.4	406.2600	.6900	.1782
	48.540	4085.2	406.2600	.6525	.2353
	57.410	4215.8	406.2600	.6002	.2997
	67.040	4230.5	406.2600	.5379	.3666
	72.410	4162.5	406.2600	.5027	.4017
	80.430	3980.8	406.2600	.4497	.4515
	91.460	3616.8	406.2600	.3787	.5138
	105.720	3015.5	406.2600	.2929	.5824
	131.980	1877.2	406.2600	.1654	.6750
	189.080	727.8	406.2600	.0317	.7680
	236.830	548.2	406.2600	.0021	.7886
	740.000	.000	2115.0	406.2600	.7560
4.540		2115.0	406.2600	.7560	.0000
9.070		2115.2	406.2600	.7560	.0001
13.610		2123.9	406.2600	.7553	.0026
18.200		2220.5	406.2600	.7505	.0204
23.010		2465.3	406.2600	.7414	.0531
28.310		2851.2	406.2600	.7296	.0906
34.280		3269.0	406.2600	.7130	.1335
41.070		3684.3	406.2600	.6875	.1827
48.840		4025.5	406.2600	.6497	.2392
57.740		4223.7	406.2600	.5978	.3025
67.340		4234.0	406.2600	.5366	.3679
72.690		4167.2	406.2600	.5021	.4021
80.650		3992.1	406.2600	.4506	.4506
91.570		3643.5	406.2600	.3817	.5113
105.610		3069.1	406.2600	.2987	.5780
131.370		1960.4	406.2600	.1733	.6695
188.850	759.1	406.2600	.0360	.7650	
237.120	551.1	406.2600	.0027	.7881	
800.000	.000	2115.0	406.2600	.7560	.0000
	4.540	2115.0	406.2600	.7560	.0000
	9.070	2116.6	406.2600	.7559	.0006
	13.620	2153.4	406.2600	.7536	.0091
	18.290	2332.4	406.2600	.7463	.0360
	23.280	2640.0	406.2600	.7365	.0698
	28.810	3013.9	406.2600	.7238	.1074
	35.010	3415.7	406.2600	.7056	.1500
	42.000	3793.7	406.2600	.6785	.1982
	49.900	4088.5	406.2600	.6401	.2523
	58.850	4247.9	406.2600	.5895	.3119
	68.400	4244.6	406.2600	.5319	.3726
	73.660	4182.0	406.2600	.5000	.4041
	81.450	4026.1	406.2600	.4529	.4484
	91.990	3723.1	406.2600	.3906	.5036

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
800.000	105.390	3230.2	406.2600	.3159	.5646	
	129.830	2233.4	406.2600	.1990	.6514	
	187.710	885.2	406.2600	.0523	.7537	
	237.880	567.6	406.2600	.0061	.7858	
	850.000	.000	2115.0	406.2600	.7560	.0000
		4.540	2115.1	406.2600	.7560	.0001
		9.080	2122.5	406.2600	.7554	.0023
		13.650	2205.9	406.2600	.7510	.0186
		18.410	2440.9	406.2600	.7427	.0490
		23.560	2765.8	406.2600	.7325	.0830
		29.260	3138.5	406.2600	.7189	.1206
		35.630	3523.1	406.2600	.6994	.1628
		42.750	3870.4	406.2600	.6712	.2099
50.750		4131.3	406.2600	.6325	.2622	
59.730		4264.0	406.2600	.5831	.3190	
69.230		4251.5	406.2600	.5281	.3763	
74.430		4191.6	406.2600	.4981	.4058	
900.000	82.080	4048.1	406.2600	.4540	.4474	
	92.390	3774.2	406.2600	.3960	.4989	
	105.350	3334.0	406.2600	.3269	.5559	
	128.840	2426.1	406.2600	.2170	.6386	
	186.430	907.6	406.2600	.0656	.7445	
	238.150	589.2	406.2600	.0102	.7829	
	950.000	.000	2115.0	406.2600	.7560	.0000
		4.540	2116.0	406.2600	.7559	.0004
		9.080	2142.1	406.2600	.7541	.0071
		13.700	2287.9	406.2600	.7477	.0310
		18.580	2559.1	406.2600	.7389	.0624
		23.900	2893.1	406.2600	.7281	.0964
		29.760	3259.1	406.2600	.7136	.1338
36.280		3623.2	406.2600	.6924	.1754	
43.520		3939.3	406.2600	.6637	.2214	
51.590		4168.7	406.2600	.6250	.2717	
60.590		4277.8	406.2600	.5769	.3258	
70.040		4257.5	406.2600	.5243	.3800	
75.190		4199.9	406.2600	.4959	.4078	
82.730	4067.0	406.2600	.4545	.4468		
92.820	3817.8	406.2600	.4004	.4950		
105.410	3422.4	406.2600	.3362	.5485		
128.040	2598.2	406.2600	.2334	.6268		
184.920	1117.3	406.2600	.0788	.7353		
238.160	620.1	406.2600	.0155	.7793		
950.000	.000	2115.3	406.2600	.7560	.0002	
	4.540	2121.2	406.2600	.7555	.0020	
	9.100	2188.1	406.2600	.7517	.0162	
	13.790	2392.4	406.2600	.7440	.0445	
	18.820	2683.8	406.2600	.7349	.0760	
	24.290	3020.2	406.2600	.7235	.1099	
	30.310	3375.1	406.2600	.7079	.1470	
	36.960	3715.8	406.2600	.6860	.1878	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2	
950.000	44.310	4001.6	406.2600	.6561	.2325	
	52.440	4201.5	406.2600	.6175	.2809	
	61.450	4289.7	406.2600	.5707	.3325	
	70.850	4262.8	406.2600	.5205	.3837	
	75.940	4207.2	406.2600	.4936	.4099	
	83.380	4083.5	406.2600	.4546	.4466	
	93.280	3855.4	406.2600	.4039	.4919	
	105.550	3498.3	406.2600	.3441	.5421	
	127.390	2749.8	406.2600	.2480	.6162	
	163.260	1240.5	406.2600	.0917	.7263	
	237.940	660.4	406.2600	.0218	.7749	
	284.340	544.2	406.2600	.0011	.7892	
	1000.000	.000	2117.8	406.2600	.7557	.0011
		4.540	2141.2	406.2600	.7541	.0072
9.140		2267.4	406.2600	.7483	.0291	
13.940		2510.8	406.2600	.7401	.0586	
19.110		2812.7	406.2600	.7306	.0899	
24.730		3145.9	406.2600	.7184	.1235	
30.890		3485.8	406.2600	.7018	.1601	
37.660		3801.1	406.2600	.6768	.2000	
45.100		4057.6	406.2600	.6483	.2433	
53.280		4230.1	406.2600	.6100	.2897	
62.300		4299.9	406.2600	.5645	.3389	
71.650		4267.4	406.2600	.5166	.3874	
76.700		4213.7	406.2600	.4911	.4122	
84.040		4097.8	406.2600	.4543	.4467	
93.760	3887.7	406.2600	.4067	.4893		
105.740	3563.4	406.2600	.3509	.5366		
126.870	2881.8	406.2600	.2609	.6067		
161.550	1365.1	406.2600	.1043	.7175		
237.500	709.6	406.2600	.0289	.7649		
284.870	548.3	406.2600	.0021	.7885		
1100.000	.000	2201.3	406.2600	.7503	.0219	
	4.590	2289.7	406.2600	.7468	.0348	
	9.350	2503.2	406.2600	.7398	.0603	
	14.410	2774.9	406.2600	.7313	.0885	
	19.950	3076.7	406.2600	.7208	.1186	
	25.750	3389.0	406.2600	.7069	.1511	
	32.160	3689.2	406.2600	.6882	.1862	
	39.130	3950.5	406.2600	.6635	.2239	
	46.700	4182.4	406.2600	.6324	.2642	
	54.960	4276.5	406.2600	.5950	.3067	
	63.960	4315.9	406.2600	.5525	.3513	
	73.220	4274.4	406.2600	.5067	.3948	
	78.180	4223.8	406.2600	.4957	.4170	
	85.360	4120.7	406.2600	.4528	.4478	
94.770	3939.1	406.2600	.4105	.4858		
106.250	3666.1	406.2600	.3613	.5280		
126.130	3094.1	406.2600	.2821	.5906		
178.260	1613.4	406.2600	.1285	.7007		

FLOW FIELD (CONTINUED)

Z	R	T	P	F1	F2
1100.000	235.960	829.3	406.2600	.0443	.7592
	285.440	564.5	406.2600	.0055	.7862
1200.000	.000	2526.7	406.2600	.7371	.0709
	4.800	2607.7	406.2600	.7349	.0784
	9.790	2810.0	406.2600	.729	.0973
	15.100	3065.6	406.2600	.7204	.1216
	20.790	3341.9	406.2600	.7087	.1492
	26.910	3616.5	406.2600	.6932	.1795
	33.510	3867.0	406.2600	.6727	.2122
	41.630	4075.6	406.2600	.6470	.2472
	48.310	4226.8	406.2600	.6160	.2842
	56.610	4311.1	406.2600	.5801	.3229
	65.590	4326.7	406.2600	.5406	.3632
	74.750	4278.3	406.2600	.5005	.4024
	79.630	4229.8	406.2600	.4797	.4224
	86.650	4136.0	406.2600	.4500	.4500
	95.810	3975.6	406.2600	.4121	.4841
	106.860	3739.5	406.2600	.3683	.5220
	125.710	3250.8	406.2600	.2981	.5765
	175.330	1852.8	406.2600	.1511	.6850
	233.600	967.1	406.2600	.0598	.7484
	285.300	595.6	406.2600	.0113	.7822

ORIGINAL PAGE IS
OF POOR QUALITY

REMTECH INC.

VACUUM PLUME

A72

FLOW FIELD

Z	ETA	R	T	P	F1
-123.000	.000	.000	3400.000	4.7520	.7500
		75.200	3400.000	4.7520	.7500
-123.000	50.000	.000	3400.000	4.7520	.7500
		69.300	3400.000	4.7520	.7500
-123.000	77.600	.000	3029.000	2.8800	.7500
		97.300	3029.000	2.8800	.7500
-123.000	110.000	.000	3029.000	2.8800	.7500
		59.000	3029.000	2.8800	.7500
-38.000	.000	.000	3063.000	3.0200	.7500
		75.200	3063.000	3.0200	.7500
-38.000	50.000	.000	3063.000	3.0200	.7500
		69.300	3063.000	3.0200	.7500
-38.000	77.600	.000	2581.000	1.4400	.7500
		97.300	2581.000	1.4400	.7500
-38.000	110.000	.000	2581.000	1.4400	.7500
		59.000	2581.000	1.4400	.7500
-.010	.000	.000	2639.000	1.5800	.7500
		75.200	2639.000	1.5800	.7500
-.010	50.000	.000	2639.000	1.5800	.7500
		69.300	2639.000	1.5800	.7500
-.010	77.600	.000	1.000	.0010	.7500
		97.300	1.000	.0010	.7500
-.010	110.000	.000	1.000	.0010	.7500
		59.000	1.000	.0010	.7500
5.000	.000	.000	1240.200	32.0110	.7560
		5.000	1375.930	78.6370	.7560
		10.000	1672.370	119.1430	.7560
		15.000	1735.660	142.0380	.7560
		20.000	1816.300	176.5430	.7560
		25.000	1929.370	239.3830	.7560
		30.000	2044.840	314.6130	.7560
		35.000	2186.830	430.3830	.7560
		40.000	2284.520	558.8390	.7560
		45.000	2159.660	622.2800	.7560
		50.000	100.000	.0010	.7560
		51.952	376.040	.0010	.7560
		51.960	1725.810	.0010	.6000
		51.962	1725.810	.0010	.6000

INNER SHOCK POINT IS NUMBER 12

5.000	10.050	.000	1240.200	32.0110	.7560
		5.000	1375.420	78.5610	.7560
		10.000	1672.240	119.1250	.7560
		15.000	1735.570	142.0430	.7560
		20.000	1816.180	176.5150	.7560
		25.000	1929.260	239.3710	.7560
		30.000	2044.710	314.5810	.7560
		35.000	2186.480	430.0910	.7560
		40.000	2283.160	557.3040	.7560
		45.000	2151.600	617.0020	.7560
		50.000	100.000	.0010	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
5.000	10.050	52.321	309.630	.0010	.7560
		52.330	2401.070	.0010	.6000
		52.331	2401.070	.0010	.6000

INNER SHOCK POINT IS NUMBER 17

5.000	20.100	.000	1240.200	32.0110	.7560
		5.000	1373.910	78.3360	.7560
		10.000	1671.890	119.0710	.7560
		15.000	1735.300	142.0540	.7560
		20.000	1815.800	176.4300	.7560
		25.000	1928.940	239.3320	.7560
		30.000	2044.330	314.4810	.7560
		35.000	2185.460	429.2250	.7560
		40.000	2279.130	552.7610	.7560
		45.000	2127.980	601.4430	.7560
		50.000	100.000	.0010	.7560
		52.697	399.490	.0010	.7560
		52.705	3141.650	.3280	.6000
		52.707	3141.650	.3280	.6000

INNER SHOCK POINT IS NUMBER 12

5.000	30.150	.000	1240.200	32.0110	.7560
		5.000	1371.420	77.9630	.7560
		10.000	1671.270	118.9830	.7560
		15.000	1734.850	142.0720	.7560
		20.000	1815.180	176.2830	.7560
		25.000	1928.400	239.2570	.7560
		30.000	2043.700	314.3010	.7560
		35.000	2183.770	427.8070	.7560
		40.000	2272.600	545.3940	.7560
		45.000	2090.500	576.4310	.7560
		50.000	100.000	.0010	.7560
		53.804	368.860	.0010	.7560
		53.812	3716.820	.6140	.6000
		53.814	3716.820	.6140	.6000

INNER SHOCK POINT IS NUMBER 12

5.000	46.550	.000	1240.200	32.0110	.7560
		5.000	1365.440	77.0580	.7560
		10.000	1669.810	118.7630	.7560
		15.000	1733.770	142.1020	.7560
		20.000	1813.640	175.8960	.7560
		25.000	1927.040	239.0250	.7560
		30.000	2042.170	313.7900	.7560
		35.000	2179.730	424.4200	.7560
		40.000	2257.380	528.1520	.7560
		45.000	2007.300	519.1010	.7560
		50.000	100.000	.0010	.7560
		67.649	100.000	.0010	.7560
		67.659	2589.070	.3740	.6000
		67.903	2584.220	.3730	.6000

INNER SHOCK POINT IS NUMBER 12

5.000	62.940	.000	1240.200	32.0110	.7560
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FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
5.000	62.940	5.000	1357.400	75.8230	.7560
		10.000	1667.830	118.4550	.7560
		15.000	1732.280	142.1210	.7560
		20.000	1811.470	175.3090	.7560
		25.000	1925.120	238.6080	.7560
		30.000	2040.070	312.9400	.7560
		35.000	2174.310	419.9300	.7560
		40.000	2238.070	506.1700	.7560
		45.000	1912.670	449.0910	.7560
		50.000	100.000	.0010	.7560
		77.538	100.000	.0010	.7560
		77.548	984.810	.0010	.6000
		77.556	984.490	.0010	.6000

INNER SHOCK POINT IS NUMBER 12

5.000	63.940	.000	1240.200	32.0110	.7560
		5.000	1356.850	75.7390	.7560
		10.000	1667.700	118.4330	.7560
		15.000	1732.180	142.1210	.7560
		20.000	1811.320	175.2660	.7560
		25.000	1924.980	238.5760	.7560
		30.000	2039.920	312.8760	.7560
		35.000	2173.940	419.6280	.7560
		40.000	2236.810	504.7290	.7560
		45.000	1907.020	444.6530	.7560
		50.000	100.000	.0010	.7560
		55.000	961.920	212.1700	.7560
		59.783	416.390	5.8520	.7560
5.000	180.000	.000	1240.200	32.0110	.7560
		5.000	1302.220	66.8330	.7560
		10.000	1654.150	116.0220	.7560
		15.000	1721.270	141.6350	.7560
		20.000	1801.200	175.1670	.7560
		25.000	1909.360	233.2670	.7560
		30.000	2024.390	303.0590	.7560
		35.000	2138.150	391.0450	.7560
		40.000	2149.000	400.8630	.7560
		45.000	2012.290	293.5240	.7560
		50.000	917.620	19.6000	.7560
		55.000	584.450	2.0590	.7560
		60.000	489.840	.9360	.7560
14.170	.000	.000	1155.700	23.4990	.7560
		5.000	1533.750	89.6610	.7560
		10.000	1662.920	124.9660	.7560
		15.000	1735.960	151.6250	.7560
		20.000	1815.140	183.0720	.7560
		25.000	1933.010	246.0330	.7560
		30.000	2043.210	315.9050	.7560
		35.000	2144.560	395.5250	.7560
		40.000	2127.310	382.6630	.7560
		45.000	1840.160	240.5230	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
14.170	.000	50.000	851.590	24.1490	.7560
		55.000	628.290	3.5730	.7560
		60.000	485.810	.9260	.7560
		65.000	411.280	.7470	.7560
		70.000	332.030	.5570	.7560
		72.858	284.450	.4430	.7560
		72.868	4740.830	168.8890	.7560
		75.162	4740.830	168.8890	.7560

INNER SHOCK POINT IS NUMBER 16

14.170	1.540	.000	1155.700	23.4990	.7560
		5.000	1533.770	89.6560	.7560
		10.000	1662.920	124.9640	.7560
		15.000	1735.950	151.6240	.7560
		20.000	1815.130	183.0670	.7560
		25.000	1933.000	246.0280	.7560
		30.000	2043.200	315.8990	.7560
		35.000	2144.550	395.5170	.7560
		40.000	2127.370	382.6740	.7560
		45.000	1840.220	240.5410	.7560
		50.000	851.770	24.1690	.7560
		55.000	628.350	3.5750	.7560
		60.000	485.840	.9260	.7560
		65.000	411.320	.7470	.7560
		70.000	332.090	.5770	.7560
		72.303	293.900	.4660	.7560
		72.313	4740.830	168.8890	.7560
		74.041	4740.830	168.8890	.7560

INNER SHOCK POINT IS NUMBER 16

14.170	2.040	.000	1155.700	23.4990	.7560
		5.000	1533.700	89.6520	.7560
		10.000	1662.910	124.9630	.7560
		15.000	1735.950	151.6220	.7560
		20.000	1815.130	183.0640	.7560
		25.000	1933.000	246.0250	.7560
		30.000	2043.200	315.8940	.7560
		35.000	2144.550	395.5110	.7560
		40.000	2127.330	382.6830	.7560
		45.000	1840.270	240.5540	.7560
		50.000	851.870	24.1830	.7560
		55.000	628.400	3.5760	.7560
		60.000	485.860	.9260	.7560
		65.000	411.350	.7470	.7560
		70.000	332.140	.5570	.7560
		71.930	300.210	.4810	.7560
		71.940	2780.260	6.0200	.6020
		73.696	2730.090	5.8660	.6020

INNER SHOCK POINT IS NUMBER 16

14.170	11.180	.000	1155.700	23.4990	.7560
		5.000	1532.260	89.3840	.7560
		10.000	1662.690	124.8810	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
14.170	11.180	15.000	1735.710	151.5360	.7560
		20.000	1814.720	182.8480	.7560
		25.000	1932.590	245.7970	.7560
		30.000	2042.810	315.5740	.7560
		35.000	2144.030	395.1020	.7560
		40.000	2128.090	393.2700	.7560
		45.000	1843.610	241.4610	.7560
		50.000	858.960	25.1750	.7560
		55.000	631.760	3.6530	.7560
		60.000	487.400	.9300	.7560
		65.000	413.590	.7530	.7560
		66.574	389.440	.6950	.7560
		66.584	3510.010	8.4120	.6020
		68.769	3468.840	8.2700	.6020

INNER SHOCK POINT IS NUMBER 15

14.170	20.320	.000	1155.700	23.4990	.7560
		5.000	1528.610	88.7040	.7560
		10.000	1662.120	124.6720	.7560
		15.000	1735.110	151.3160	.7560
		20.000	1813.700	182.2990	.7560
		25.000	1931.560	245.2190	.7560
		30.000	2041.830	314.7650	.7560
		35.000	2142.740	394.0690	.7560
		40.000	2130.030	384.7750	.7560
		45.000	1851.940	243.7270	.7560
		50.000	876.900	27.7280	.7560
		55.000	640.240	3.8460	.7560
		60.000	491.200	.9390	.7560
		63.343	443.430	.6240	.7560
		63.353	4160.510	10.7780	.6020
		65.937	4137.360	10.6900	.6020

INNER SHOCK POINT IS NUMBER 14

14.170	30.460	.000	1155.700	23.4990	.7560
		5.000	1522.820	87.6260	.7560
		10.000	1661.210	124.3430	.7560
		15.000	1734.160	150.9690	.7560
		20.000	1812.070	181.4310	.7560
		25.000	1929.920	244.3040	.7560
		30.000	2040.280	313.4900	.7560
		35.000	2140.700	392.4440	.7560
		40.000	2133.160	387.1970	.7560
		45.000	1864.760	247.2150	.7560
		50.000	904.960	31.8670	.7560
		55.000	653.500	4.1470	.7560
		60.000	496.950	.9530	.7560
		62.084	468.370	.8840	.7560
		62.094	4227.890	11.5000	.6030
		65.093	4227.930	11.5020	.6030

INNER SHOCK POINT IS NUMBER 14

14.170	43.950	.000	1155.700	23.4990	.7560
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FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
14.170	43.950	5.000	1511.310	85.4820	.7560
		10.000	1659.430	123.6910	.7560
		15.000	1732.280	150.2820	.7560
		20.000	1808.860	179.7130	.7560
		25.000	1926.670	242.4910	.7560
		30.000	2037.250	310.9830	.7560
		35.000	2136.720	389.2620	.7560
		40.000	2139.550	392.1500	.7560
		45.000	1888.990	253.8010	.7560
		50.000	959.490	40.3710	.7560
		55.000	679.170	4.7260	.7560
		60.000	507.440	.9780	.7560
		64.472	449.360	.8390	.7560
		64.482	3986.650	11.5270	.6030
		67.068	3956.040	12.4570	.6030

INNER SHOCK POINT IS NUMBER 14

14.170	57.430	.000	1155.700	23.4990	.7560
		5.000	1496.150	82.6580	.7560
		10.000	1657.100	122.8400	.7560
		15.000	1729.830	149.3880	.7560
		20.000	1804.650	177.4700	.7560
		25.000	1922.410	240.1240	.7560
		30.000	2033.330	307.7440	.7560
		35.000	2131.610	385.1720	.7560
		40.000	2148.310	398.9400	.7560
		45.000	1918.570	261.8380	.7560
		50.000	1028.990	51.9680	.7560
		55.000	711.420	5.4460	.7560
		60.000	519.640	1.0070	.7560
		65.000	459.580	.8630	.7560
		70.000	397.830	.7150	.7560
		71.134	383.590	.6810	.7560
		71.144	3159.640	9.4920	.6060
		73.338	3112.000	9.3590	.6060

INNER SHOCK POINT IS NUMBER 16

14.170	70.920	.000	1155.700	23.4990	.7560
		5.000	1477.850	79.2500	.7560
		10.000	1654.310	121.8250	.7560
		15.000	1726.910	148.3240	.7560
		20.000	1816.020	189.9380	.7560
		25.000	1917.300	237.2990	.7560
		30.000	2028.730	303.9310	.7560
		35.000	2125.650	380.3890	.7560
		40.000	2159.400	407.5340	.7560
		45.000	1951.140	270.7090	.7560
		50.000	1109.820	46.3370	.7560
		55.000	747.650	6.2390	.7560
		60.000	532.360	1.0380	.7560
		65.000	477.270	.9060	.7560
		70.000	421.310	.7710	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
14.170	70.920	75.700	364.460	.6750	.7560
		80.000	306.680	.4960	.7560
		84.531	253.510	.3690	.7560
		84.541	2247.970	5.2960	.6160
		86.144	2206.040	5.1250	.6170

INNER SHOCK POINT IS NUMBER 18

14.170	84.410	.000	1155.700	23.4990	.7560
		5.000	1457.110	75.3860	.7560
		10.000	1651.210	120.6910	.7560
		15.000	1723.670	147.1390	.7560
		20.000	1812.320	186.8090	.7560
		25.000	1911.590	234.1470	.7560
		30.000	2023.690	299.7350	.7560
		35.000	2119.170	375.1640	.7560
		40.000	2172.630	417.7880	.7560
		45.000	1984.710	279.8420	.7560
		50.000	1197.870	82.8730	.7560
		55.000	784.140	7.0070	.7560
		60.000	544.670	1.0670	.7560
		65.000	494.160	.9460	.7560
		70.000	443.430	.8240	.7560
		75.000	392.470	.7020	.7560
		80.000	341.290	.5790	.7560
		85.000	289.870	.4560	.7560
		90.000	238.230	.3320	.7560
		95.000	186.360	.2080	.7560
		100.000	134.260	.0830	.7560
		105.000	100.000	.0010	.7560
		110.000	100.000	.0010	.7560
		111.740	100.000	.0010	.7560
		111.750	929.870	.0010	.6380
		111.846	927.270	.0010	.6380

INNER SHOCK POINT IS NUMBER 24

14.170	85.410	.000	1155.700	23.4990	.7560
		5.000	1455.490	75.0860	.7560
		10.000	1650.970	120.6030	.7560
		15.000	1723.420	147.0480	.7560
		20.000	1811.890	186.5670	.7560
		25.000	1911.140	233.9040	.7560
		30.000	2023.290	299.4150	.7560
		35.000	2118.690	374.7660	.7560
		40.000	2173.690	418.6080	.7560
		45.000	1997.190	280.5150	.7560
		50.000	1204.560	84.1630	.7560
		55.000	786.710	7.0600	.7560
		60.000	545.550	1.0690	.7560
14.170	180.000	.000	1155.700	23.4990	.7560
		5.000	1340.470	53.6620	.7560
		10.000	1634.850	114.7220	.7560
		15.000	1706.840	140.9960	.7560

ORIGINAL PAGE IS
OF POOR QUALITY

FLOW FIELD (CONTINUED)

7	ETA	R	T	P	F1
14.170	186.000	20.000	1778.370	167.1070	.7560
		25.000	1881.380	217.7500	.7560
		30.000	1998.290	278.9960	.7560
		35.000	2090.870	351.7690	.7560
		40.000	2177.270	420.7610	.7560
		45.000	2030.360	314.5110	.7560
		50.000	1552.270	150.2490	.7560
		55.000	933.450	22.3060	.7560
		60.000	732.080	7.9330	.7560
23.330	.000	.000	1199.110	40.9420	.7560
		5.000	1675.340	116.6030	.7560
		10.000	1692.130	123.4720	.7560
		15.000	1723.540	135.4590	.7560
		20.000	1810.390	174.3220	.7560
		25.000	1929.370	236.9750	.7560
		30.000	2051.590	316.4540	.7560
		35.000	2143.830	392.1310	.7560
		40.000	2135.420	387.4960	.7560
		45.000	1781.800	236.1660	.7560
		50.000	1306.360	72.7550	.7560
		55.000	835.210	11.6680	.7560
		60.000	633.590	2.3730	.7560
		65.000	538.190	1.0520	.7560
		70.000	492.590	.9420	.7560
		70.283	490.000	.9360	.7560
		70.293	5050.670	254.4440	.7560
		75.162	5050.670	254.4440	.7560

INNER SHOCK POINT IS NUMBER 16

23.330	3.320	.000	1199.110	40.9420	.7560
		5.000	1675.340	116.6020	.7560
		10.000	1692.110	123.4650	.7560
		15.000	1723.510	135.4440	.7560
		20.000	1810.330	174.2900	.7560
		25.000	1929.300	236.9320	.7560
		30.000	2051.530	316.4120	.7560
		35.000	2143.830	392.1220	.7560
		40.000	2135.500	387.5550	.7560
		45.000	1782.060	236.2460	.7560
		50.000	1306.790	72.8250	.7560
		55.000	835.670	11.6870	.7560
		60.000	633.790	2.3760	.7560
		65.000	538.200	1.0520	.7560
		69.570	505.790	.9740	.7560
		69.580	5050.670	254.4440	.7560
		72.949	5050.670	254.4440	.7560

INNER SHOCK POINT IS NUMBER 15

23.330	3.820	.000	1199.110	40.9420	.7560
		5.000	1675.340	116.6010	.7560
		10.000	1692.110	123.4620	.7560
		15.000	1723.500	135.4390	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
23.330	3.820	20.000	1810.320	174.2790	.7560
		25.000	1929.280	236.9180	.7560
		30.000	2051.510	316.3980	.7560
		35.000	2143.830	392.1190	.7560
		40.000	2135.570	387.5740	.7560
		45.000	1782.140	236.2720	.7560
		50.000	1306.910	72.8470	.7560
		55.000	875.820	11.6930	.7560
		60.000	633.860	2.3770	.7560
		65.000	538.320	1.0520	.7560
		68.231	508.920	.9810	.7560
		69.241	3865.940	21.7110	.6690
		72.534	3794.320	20.3900	.6680

INNER SHOCK POINT IS NUMBER 15

23.330	12.470	.000	1199.110	40.9420	.7560
		5.000	1675.330	116.5840	.7560
		10.000	1691.910	123.3630	.7560
		15.000	1723.100	135.2510	.7560
		20.000	1809.560	173.8730	.7560
		25.000	1928.390	236.3650	.7560
		30.000	2050.890	315.8600	.7560
		35.000	2143.740	392.0050	.7560
		40.000	2136.530	388.3320	.7560
		45.000	1785.390	237.2970	.7560
		50.000	1312.220	73.7270	.7560
		55.000	841.730	11.9400	.7560
		60.000	636.480	2.4160	.7560
		63.570	552.460	1.0860	.7560
		63.580	3856.190	53.7980	.6720
		68.260	3812.280	51.7550	.6720

INNER SHOCK POINT IS NUMBER 14

23.330	21.630	.000	1199.110	40.9420	.7560
		5.000	1675.320	116.5480	.7560
		10.000	1691.490	123.1470	.7560
		15.000	1722.220	134.8410	.7560
		20.000	1807.910	172.9810	.7560
		25.000	1926.420	235.1440	.7560
		30.000	2049.510	314.6690	.7560
		35.000	2143.590	391.7820	.7560
		40.000	2138.720	389.9840	.7560
		45.000	1792.560	239.5540	.7560
		50.000	1323.770	75.6190	.7560
		55.000	854.640	12.4800	.7560
		60.000	642.220	2.5000	.7560
		60.690	633.840	2.4380	.7560
		60.700	4140.870	69.6660	.6760
		65.792	4130.840	68.9180	.6760

INNER SHOCK POINT IS NUMBER 14

23.330	30.780	.000	1199.110	40.9420	.7560
		5.000	1630.080	107.7300	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
23.330	30.780	10.000	1690.860	172.8260	.7560
		15.000	1720.900	134.2240	.7560
		20.000	1805.400	171.6360	.7560
		25.000	1923.420	233.2800	.7560
		30.000	2047.390	312.8360	.7560
		35.000	2143.460	391.5170	.7560
		40.000	2142.010	392.4570	.7560
		45.000	1973.490	242.9890	.7560
		50.000	1341.030	78.3790	.7560
		55.000	874.070	13.2920	.7560
		59.511	656.940	2.6730	.7560
		59.521	4135.610	72.0480	.6790
		65.097	4135.570	72.0670	.6790

INNER SHOCK POINT IS NUMBER 13

23.330	45.950	.000	1199.110	40.9420	.7560
		5.000	1631.380	108.0110	.7560
		10.000	1689.460	122.0990	.7560
		15.000	1717.850	132.7990	.7560
		20.000	1799.530	168.4950	.7560
		25.000	1916.300	228.8230	.7560
		30.000	2042.240	308.3940	.7560
		35.000	2143.650	391.2490	.7560
		40.000	2149.550	398.1230	.7560
		45.000	1829.440	251.1490	.7560
		50.000	1380.430	84.3480	.7560
		55.000	919.070	15.1640	.7560
		60.000	671.250	2.9240	.7560
		62.673	637.490	2.6470	.7560
		62.683	4006.350	64.0030	.6840
		67.697	3983.610	61.5300	.6840

INNER SHOCK POINT IS NUMBER 14

23.330	61.170	.000	1199.110	40.9420	.7560
		5.000	1664.490	114.5920	.7560
		10.000	1687.760	121.2030	.7560
		15.000	1713.960	130.9730	.7560
		20.000	1791.790	164.3990	.7560
		25.000	1906.710	222.7800	.7560
		30.000	2035.050	302.2250	.7560
		35.000	2151.520	395.9320	.7560
		40.000	2159.060	405.2530	.7560
		45.000	1864.240	262.1250	.7560
		50.000	1429.780	91.0520	.7560
		55.000	961.970	14.2450	.7560
		60.000	698.100	3.3200	.7560
		65.000	567.340	1.1220	.7560
		70.000	525.240	1.0210	.7560
		71.447	513.020	.9910	.7560
		71.457	3910.480	22.1350	.6900
		76.030	3878.800	19.5560	.6910

INNER SHOCK POINT IS NUMBER 16

23.33	76.280	.000	1199.110	40.9420	.7560
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FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
23.330	76.280	5.000	1627.830	108.8000	.7560
		10.000	1686.000	120.2390	.7560
		15.000	1709.530	128.8920	.7560
		20.000	1786.430	161.3340	.7560
		25.000	1895.070	215.3760	.7560
		30.000	2025.940	294.4280	.7560
		35.000	2146.590	391.5340	.7560
		40.000	2169.620	413.1330	.7560
		45.000	1906.040	275.4880	.7560
		50.000	1484.060	97.1370	.7560
		55.000	1031.210	17.7110	.7560
		60.000	730.540	3.8060	.7560
		65.000	580.760	1.1540	.7560
		70.000	540.200	1.0570	.7560
		75.000	499.550	.9590	.7560
		80.000	458.790	.8610	.7560
		85.000	417.930	.7630	.7560
		90.000	376.980	.6650	.7560
		90.399	373.710	.6570	.7560
		90.409	3530.830	3.8920	.7130
		94.184	3486.030	3.6260	.7170

INNER SHOCK POINT IS NUMBER 20

23.330	91.450	.000	1199.110	40.9420	.7560
		5.000	1585.710	102.1590	.7560
		10.000	1684.420	119.3150	.7560
		15.000	1704.960	126.7260	.7560
		20.000	1776.080	156.2010	.7560
		25.000	1881.980	206.9590	.7560
		30.000	2015.150	285.2260	.7560
		35.000	2140.640	386.2870	.7560
		40.000	2188.030	427.4130	.7560
		45.000	1957.700	281.9700	.7560
		50.000	1537.810	101.2830	.7560
		55.000	1100.050	21.4830	.7560
		60.000	905.850	12.7630	.7560
		65.000	650.430	2.5240	.7560
		70.000	555.810	1.0940	.7560
		75.000	516.820	1.0000	.7560
		80.000	477.830	.9070	.7560
		135.000	100.000	.0010	.7560
		135.929	100.000	.0010	.6640
		136.188	100.000	.0010	.6640

INNER SHOCK POINT IS NUMBER 18

23.330	92.450	.000	1199.110	40.9420	.7560
		5.000	1582.780	101.6980	.7560
		10.000	1684.330	119.2580	.7560
		15.000	1704.660	126.5850	.7560
		20.000	1775.350	155.8390	.7560
		25.000	1881.090	206.3800	.7560
		30.000	2007.690	283.1520	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
23.330	92.450	35.000	2140.270	385.9160	.7560
		40.000	2188.010	427.3510	.7560
		45.000	1960.270	283.6950	.7560
		50.000	1541.210	101.4620	.7560
		55.000	1104.460	21.7370	.7560
		60.000	900.570	12.3230	.7560
		65.000	648.200	2.4490	.7560
		70.000	556.870	1.0960	.7560
		75.000	517.950	1.0030	.7560
		80.000	479.080	.9100	.7560
23.330	180.000	.000	1199.110	40.9420	.7560
		5.000	1383.990	70.5010	.7560
		10.000	1682.400	117.2830	.7560
		15.000	1689.440	119.8530	.7560
		20.000	1736.190	137.1970	.7560
		25.000	1838.470	182.0280	.7560
		30.000	1968.790	256.9780	.7560
		35.000	2098.490	351.6090	.7560
		40.000	2170.860	411.8970	.7560
		45.000	2078.480	357.5800	.7560
		50.000	1700.110	127.5210	.7560
		55.000	1287.360	44.0710	.7560
		60.000	965.100	15.4310	.7560
		65.000	739.710	5.3790	.7560
		70.000	647.500	3.2330	.7560
		75.000	584.530	1.8250	.7560
		80.000	521.070	1.1270	.7560
32.500	.000	.000	1421.960	78.4370	.7560
		5.000	1688.270	119.2920	.7560
		10.000	1676.380	115.9220	.7560
		15.000	1727.570	133.7170	.7560
		20.000	1822.410	175.2720	.7560
		25.000	1943.100	241.6450	.7560
		30.000	2067.470	326.2170	.7560
		35.000	2152.720	395.9440	.7560
		40.000	2126.580	383.0730	.7560
		45.000	1779.420	168.1410	.7560
		50.000	1392.420	64.2440	.7560
		55.000	1050.170	21.1560	.7560
		60.000	788.800	6.9160	.7560
		65.000	651.730	3.1420	.7560
		67.707	626.350	2.9370	.7560
		67.717	4891.750	307.5000	.7560
		75.162	4891.750	307.5000	.7560
		INNER SHOCK POINT IS NUMBER 15			
32.500	5.160	.000	1421.960	78.4370	.7560
		5.000	1688.280	119.2980	.7560
		10.000	1676.310	115.8950	.7560
		15.000	1727.460	133.6910	.7560
		20.000	1822.250	175.2020	.7560

FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
32.500	5.160	25.000	1942.900	241.5240	.7560
		30.000	2067.280	326.0620	.7560
		35.000	2152.710	395.9250	.7560
		40.000	2127.020	383.3230	.7560
		45.000	1779.960	168.4690	.7560
		50.000	1393.150	64.3860	.7560
		55.000	1050.880	21.2080	.7560
		60.000	789.400	6.9400	.7560
		64.808	653.920	3.1670	.7560
		64.818	4891.750	307.5000	.7560
		71.730	4891.750	307.5000	.7560

INNER SHOCK POINT IS NUMBER 14

32.500	5.660	.000	1421.960	78.4370	.7560
		5.000	1688.290	119.2990	.7560
		10.000	1678.290	115.8900	.7560
		15.000	1727.440	133.6850	.7560
		20.000	1822.220	175.1880	.7560
		25.000	1942.850	241.4990	.7560
		30.000	2067.240	326.0310	.7560
		35.000	2152.700	395.9210	.7560
		40.000	2127.110	383.3730	.7560
		45.000	1780.060	168.5360	.7560
		50.000	1393.300	64.4150	.7560
		55.000	1051.030	21.2180	.7560
		60.000	789.520	6.9450	.7560
		64.503	656.870	3.1920	.7560
		64.513	3813.040	58.8060	.7260
		71.444	3778.430	57.1720	.7250

INNER SHOCK POINT IS NUMBER 14

32.500	13.820	.000	1421.960	78.4370	.7560
		5.000	1688.390	119.3350	.7560
		10.000	1677.860	115.7320	.7560
		15.000	1727.010	133.5280	.7560
		20.000	1821.280	174.7710	.7560
		25.000	1941.640	240.7740	.7560
		30.000	2066.100	325.1120	.7560
		35.000	2152.640	395.8080	.7560
		40.000	2129.680	384.8540	.7560
		45.000	1783.220	170.4820	.7560
		50.000	1397.660	65.2570	.7560
		55.000	1055.250	21.5240	.7560
		60.000	793.120	7.0850	.7560
		60.520	772.930	6.4540	.7560
		60.530	3817.320	90.4220	.7280
		67.777	3834.490	83.2300	.7270

INNER SHOCK POINT IS NUMBER 14

32.500	22.480	.000	1421.960	78.4370	.7560
		5.000	1688.590	119.4040	.7560
		10.000	1677.000	115.4210	.7560
		15.000	1726.150	133.2190	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
32.500	22.480	20.000	1819.470	173.9520	.7560
		25.000	1939.260	239.3510	.7560
		30.000	2063.860	323.3130	.7560
		35.000	2152.550	395.6060	.7560
		40.000	2134.710	387.7430	.7560
		45.000	1789.400	174.2800	.7560
		50.000	1406.170	66.9050	.7560
		55.000	1063.510	22.1270	.7560
		58.006	877.670	9.8870	.7560
		58.016	3829.370	111.2860	.7290
		65.656	3831.890	109.2270	.7290

INNER SHOCK POINT IS NUMBER 13

32.500	31.140	.000	1421.960	78.4370	.7560
		5.000	1688.890	119.5060	.7560
		10.000	1676.000	115.0600	.7560
		15.000	1724.890	132.7660	.7560
		20.000	1816.730	172.7560	.7560
		25.000	1935.790	237.2760	.7560
		30.000	2060.610	320.7020	.7560
		35.000	2152.480	395.3560	.7560
		40.000	2134.440	387.1870	.7560
		45.000	1798.340	179.7600	.7560
		50.000	1418.480	69.2960	.7560
		55.000	1075.470	23.0100	.7560
		56.940	956.360	15.0660	.7560
		56.950	3806.740	129.7600	.7310
		65.104	3806.710	129.4770	.7310

INNER SHOCK POINT IS NUMBER 13

32.500	47.200	.000	1421.960	78.4370	.7560
		5.000	1689.680	119.7810	.7560
		10.000	1676.870	115.3460	.7560
		15.000	1721.570	131.5640	.7560
		20.000	1809.610	169.5960	.7560
		25.000	1926.660	231.8210	.7560
		30.000	2052.140	313.9050	.7560
		35.000	2152.620	394.9450	.7560
		40.000	2130.740	383.8940	.7560
		45.000	1821.450	193.8560	.7560
		50.000	1450.280	75.5100	.7560
		55.000	1106.560	25.3530	.7560
		60.000	837.130	8.8810	.7560
		60.588	814.670	8.1060	.7560
		60.598	3776.390	98.5630	.7340
		68.139	3772.690	93.0360	.7340

INNER SHOCK POINT IS NUMBER 14

32.500	63.270	.000	1421.960	78.4370	.7560
		5.000	1690.790	120.1590	.7560
		10.000	1677.970	115.7390	.7560
		15.000	1717.060	129.9360	.7560
		20.000	1800.060	165.3540	.7560

FLCW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
32.500	63.270	25.000	1914.500	224.5460	.7560
		30.000	2041.030	304.9910	.7560
		35.000	2153.540	394.9420	.7560
		40.000	2126.740	380.2090	.7560
		45.000	1851.420	211.9460	.7560
		50.000	1491.430	83.6360	.7560
		55.000	1147.140	28.5260	.7560
		60.000	872.400	10.4180	.7560
		65.000	704.690	4.4760	.7560
		70.000	659.220	4.0940	.7560
		70.628	653.520	4.0470	.7560
		70.638	3659.780	45.1360	.7370
		77.846	3644.210	31.3590	.7380

INNER SHOCK POINT IS NUMBER 16

32.500	79.330	.000	1421.960	78.4370	.7560
		5.000	1681.510	118.9010	.7560
		10.000	1679.390	116.2290	.7560
		15.000	1711.590	127.9600	.7560
		20.000	1788.610	160.2620	.7560
		25.000	1900.060	215.8930	.7560
		30.000	2028.050	294.6050	.7560
		35.000	2140.670	384.4670	.7560
		40.000	2123.340	376.8400	.7560
		45.000	1885.790	232.4340	.7560
		50.000	1538.550	93.0600	.7560
		55.000	1194.120	32.3650	.7560
		60.000	913.770	12.3320	.7560
		65.000	780.390	10.1820	.7560
		70.000	685.820	4.7430	.7560
		75.000	596.140	2.2360	.7560
		80.000	514.530	1.1600	.7560
		85.000	453.550	.7920	.7560
		90.000	401.160	.6080	.7560
		93.397	374.490	.5440	.7560
		93.407	3255.880	4.7650	.7480
		99.870	3180.350	3.4880	.7510

INNER SHOCK POINT IS NUMBER 20

32.500	95.390	.000	1421.960	78.4370	.7560
		5.000	1640.840	112.5750	.7560
		10.000	1681.020	116.7910	.7560
		15.000	1705.480	125.7500	.7560
		20.000	1776.000	154.6410	.7560
		25.000	1884.290	206.4360	.7560
		30.000	2013.700	283.8020	.7560
		35.000	2125.230	372.0250	.7560
		40.000	2121.230	374.3630	.7560
		45.000	1921.800	253.5640	.7560
		50.000	1587.760	103.0580	.7560
		55.000	1243.830	36.6360	.7560
		60.000	961.590	14.9930	.7560

FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
32.500	95.390	65.000	774.140	6.6640	.7560
		70.000	714.300	5.4760	.7560
		75.000	616.620	2.5020	.7560
		80.000	526.930	1.2280	.7560
		155.680	167.250	.1640	.7560
		155.780	100.000	.0010	.7440
		156.288	100.000	.0010	.7440

INNER SHOCK POINT IS NUMBER 18

32.500	96.390	.000	1421.960	78.4370	.7560
		5.000	1638.190	112.1610	.7560
		10.000	1681.120	116.8280	.7560
		15.000	1705.090	125.6080	.7560
		20.000	1775.200	154.2820	.7560
		25.000	1883.290	205.8360	.7560
		30.000	2012.690	283.1950	.7560
		35.000	2124.260	371.2480	.7560
		40.000	2121.150	374.2470	.7560
		45.000	1924.070	254.8610	.7560
		50.000	1590.800	103.6820	.7560
		55.000	1246.930	36.9090	.7560
		60.000	965.160	15.2450	.7560
		65.000	777.110	6.7780	.7560
		70.000	716.090	5.4800	.7560
		75.000	617.910	2.5180	.7560
		80.000	527.720	1.2320	.7560
32.500	180.000	.000	1421.960	78.4370	.7560
		5.000	1460.420	84.5060	.7560
		10.000	1687.590	119.0640	.7560
		15.000	1682.610	117.4690	.7560
		20.000	1733.860	136.0550	.7560
		25.000	1835.200	191.1120	.7560
		30.000	1957.490	250.1570	.7560
		35.000	2073.990	330.9440	.7560
		40.000	2126.000	374.7670	.7560
		45.000	2036.370	318.1600	.7560
		50.000	1740.650	143.7140	.7560
		55.000	1421.970	65.4610	.7560
		60.000	1147.620	29.5520	.7560
		65.000	933.530	13.6900	.7560
		70.000	810.870	7.8150	.7560
		75.000	688.050	3.4430	.7560
		80.000	639.200	3.0720	.7560
41.670	.000	.000	1608.700	109.3990	.7560
		5.000	1690.760	120.1880	.7560
		10.000	1683.650	117.9130	.7560
		15.000	1741.140	138.8550	.7560
		20.000	1845.590	186.0630	.7560
		25.000	1965.570	254.9230	.7560
		30.000	2073.390	329.9270	.7560
		35.000	2104.180	357.4040	.7560

FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
41.670	.000	40.000	1994.670	287.9300	.7560
		45.000	1727.900	136.2150	.7560
		50.000	1426.970	65.0700	.7560
		55.000	1155.600	30.0960	.7560
		60.000	934.660	13.6860	.7560
		65.000	804.310	7.6550	.7560
		45.132	802.800	7.6300	.7560
		65.142	4633.330	413.3330	.7560
		75.162	4633.330	413.3330	.7560

INNER SHOCK POINT IS NUMBER 15

41.670	7.050	.000	1608.700	109.3890	.7560
		5.000	1690.820	120.2090	.7560
		10.000	1693.460	117.8420	.7560
		15.000	1740.940	138.7820	.7560
		20.000	1845.200	185.8900	.7560
		25.000	1965.110	254.6430	.7560
		30.000	2073.020	329.6270	.7560
		35.000	2104.410	357.5480	.7560
		40.000	1995.400	288.3560	.7560
		45.000	1729.010	136.7940	.7560
		50.000	1428.370	65.3600	.7560
		55.000	1157.030	30.2230	.7560
		60.000	935.930	13.7500	.7560
		61.091	894.980	11.5430	.7560
		61.101	4633.330	413.3330	.7560
		77.686	4633.330	413.3330	.7560

INNER SHOCK POINT IS NUMBER 14

41.670	7.550	.000	1608.700	109.3890	.7560
		5.000	1690.820	120.2120	.7560
		10.000	1683.430	117.8320	.7560
		15.000	1740.910	138.7710	.7560
		20.000	1845.150	185.8650	.7560
		25.000	1965.040	254.6020	.7560
		30.000	2072.960	329.5830	.7560
		35.000	2104.440	357.5690	.7560
		40.000	1995.610	288.4180	.7560
		45.000	1729.160	136.8790	.7560
		50.000	1428.570	65.4030	.7560
		55.000	1157.240	30.2410	.7560
		60.000	936.120	13.7590	.7560
		60.820	905.350	12.1000	.7560
		60.830	3533.720	104.8250	.7550
		70.429	3525.840	91.6200	.7550

INNER SHOCK POINT IS NUMBER 14

41.670	15.210	.000	1608.700	109.3890	.7560
		5.000	1691.030	120.2840	.7560
		10.000	1682.750	117.5840	.7560
		15.000	1740.200	138.5160	.7560
		20.000	1843.810	185.2600	.7560
		25.000	1963.420	253.6230	.7560

FLOW FIELD (CONTINUED)

Z	ETA	r	T	P	F1
41.670	15.210	30.000	2071.640	328.5370	.7560
		35.000	2105.250	358.0770	.7560
		40.000	1998.470	289.8980	.7560
		45.000	1732.690	138.8950	.7560
		50.000	1433.440	66.4150	.7560
		55.000	1162.230	30.6850	.7560
		57.470	1035.330	19.1750	.7560
		57.480	3533.940	132.2110	.7550
		67.322	3540.140	125.4170	.7550

INNER SHOCK POINT IS NUMBER 13

41.670	23.370	.000	1608.700	109.3890	.7560
		5.000	1691.410	120.4150	.7560
		10.000	1681.520	117.1380	.7560
		15.000	1738.950	138.0580	.7560
		20.000	1841.410	184.1750	.7560
		25.000	1960.520	251.8690	.7560
		30.000	2069.280	326.6700	.7560
		35.000	2106.720	359.0130	.7560
		40.000	2003.550	292.5210	.7560
		45.000	1738.990	142.4680	.7560
		50.000	1442.170	68.2200	.7560
		55.000	1171.110	31.4810	.7560
		55.312	1154.940	29.9680	.7560
		55.322	3513.560	154.5950	.7550
		65.529	3516.450	151.4150	.7550

INNER SHOCK POINT IS NUMBER 13

41.670	31.530	.000	1608.700	109.3890	.7560
		5.000	1691.940	120.6000	.7560
		10.000	1679.800	116.5090	.7560
		15.000	1737.170	137.4120	.7560
		20.000	1838.030	182.6470	.7560
		25.000	1956.450	249.4050	.7560
		30.000	2065.980	324.0620	.7560
		35.000	2108.870	360.3810	.7560
		40.000	2010.620	296.1450	.7560
		45.000	1747.730	147.4110	.7560
		50.000	1454.130	70.7370	.7560
		54.371	1215.870	35.6660	.7560
		54.381	3494.390	175.7360	.7550
		65.115	3494.560	175.0360	.7550

INNER SHOCK POINT IS NUMBER 12

41.670	48.150	.000	1608.700	109.3890	.7560
		5.000	1693.570	121.1400	.7560
		10.000	1674.790	114.6810	.7560
		15.000	1732.020	135.5390	.7560
		20.000	1828.300	178.2440	.7560
		25.000	1944.780	242.3400	.7560
		30.000	2056.640	316.6840	.7560
		35.000	2115.480	364.6470	.7560
		40.000	2028.660	305.2720	.7560

FLOW FIELD (CONTINUED)

Z	ETA	D	T	P	F1
41.670	48.150	45.000	1772.170	161.0820	.7560
		50.000	1497.740	77.8320	.7560
		55.000	1219.450	35.8540	.7560
		59.352	1052.160	20.1520	.7560
		59.762	3503.880	135.0740	.7550
		69.500	3505.620	127.4140	.7550
INNER SHOCK POINT IS NUMBER 13					
41.670	64.770	.000	1608.700	109.3890	.7560
		5.000	1695.670	121.8910	.7560
		10.000	1675.300	114.8760	.7560
		15.000	1725.010	132.9890	.7560
		20.000	1815.190	172.3060	.7560
		25.000	1929.190	232.8920	.7560
		30.000	2044.420	307.0420	.7560
		35.000	2125.340	371.1220	.7560
		40.000	2033.310	307.8400	.7560
		45.000	1803.410	178.2220	.7560
		50.000	1530.660	87.0420	.7560
		55.000	1263.760	40.2660	.7560
		60.000	1033.020	18.9510	.7560
		65.000	865.260	9.2100	.7560
		69.199	815.190	8.2640	.7560
		69.209	3440.130	65.5410	.7550
		79.239	3393.670	51.1620	.7550
INNER SHOCK POINT IS NUMBER 15					
41.670	81.390	.000	1608.700	109.3890	.7560
		5.000	1698.390	122.8350	.7560
		10.000	1676.320	115.8820	.7560
		15.000	1716.490	129.8880	.7560
		20.000	1799.470	165.1710	.7560
		25.000	1910.690	221.6640	.7560
		30.000	2030.260	295.9100	.7560
		35.000	2121.360	367.2800	.7560
		40.000	2040.690	312.2810	.7560
		45.000	1838.460	196.9460	.7560
		50.000	1578.720	97.5750	.7560
		55.000	1315.540	45.5940	.7560
		60.000	1081.780	21.8080	.7560
		65.000	991.060	19.7160	.7560
		70.000	834.390	8.7430	.7560
		75.000	686.440	3.6310	.7560
		80.000	556.370	1.4540	.7560
		85.000	468.950	.7580	.7560
		90.000	399.250	.4550	.7560
		94.719	360.440	.3600	.7560
		94.729	3056.860	9.4350	.7560
		104.305	2958.360	4.4160	.7560
INNER SHOCK POINT IS NUMBER 20					
41.670	96.010	.000	1608.700	109.3890	.7560
		5.000	1682.390	170.5500	.7560

ORIGINAL PAGE IS
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FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
41.670	98.010	10.000	1681.780	117.0820	.7560
		15.000	1706.960	126.4190	.7560
		20.000	1782.190	157.3100	.7560
		25.000	1890.590	209.4470	.7560
		30.000	2013.520	283.9440	.7560
		35.000	2104.780	354.1550	.7560
		40.000	2050.890	318.7250	.7560
		45.000	1874.110	215.3650	.7560
		50.000	1627.490	108.5350	.7560
		55.000	1369.360	51.4810	.7560
		60.000	1137.400	25.9610	.7560
		65.000	956.240	13.2780	.7560
		70.000	805.210	9.4580	.7560
		75.000	710.290	3.9380	.7560
		80.000	571.950	1.5470	.7560
		172.944	172.960	.1560	.7560
		172.954	2260.970	.0010	.7320
		173.807	2245.310	.0010	.7320

INNER SHOCK POINT IS NUMBER 18

41.670	99.010	.000	1608.700	109.3890	.7560
		5.000	1681.050	120.3510	.7560
		10.000	1682.000	117.1570	.7560
		15.000	1706.370	126.2040	.7560
		20.000	1781.110	156.8260	.7560
		25.000	1889.360	208.7010	.7560
		30.000	2012.270	283.1910	.7560
		35.000	2103.720	353.3710	.7560
		40.000	2051.570	319.1710	.7560
		45.000	1876.220	216.4760	.7560
		50.000	1630.350	109.1880	.7560
		55.000	1372.570	51.8430	.7560
		60.000	1141.060	26.3020	.7560
		65.000	959.530	13.4540	.7560
		70.000	867.090	9.5020	.7560
		75.000	711.770	3.9580	.7560
		80.000	572.930	1.5530	.7560
41.670	180.000	.000	1608.700	109.3890	.7560
		5.000	1591.310	106.8610	.7560
		10.000	1694.890	121.6220	.7560
		15.000	1673.670	114.2730	.7560
		20.000	1733.220	136.0160	.7560
		25.000	1831.310	179.6830	.7560
		30.000	1947.720	244.0260	.7560
		35.000	2054.910	314.9480	.7560
		40.000	2097.760	350.0090	.7560
		45.000	1973.230	262.3750	.7560
		50.000	1758.290	151.2230	.7560
		55.000	1532.990	83.4930	.7560
		60.000	1317.610	44.6540	.7560
		65.000	1125.350	23.3100	.7560

FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
41.670	180.000	70.000	968.990	12.1230	.7560
		75.000	854.870	7.9390	.7560
		80.000	683.030	3.2340	.7560
50.830	.000	.000	1703.000	124.4940	.7560
		5.000	1691.610	120.5560	.7560
		10.000	1697.690	123.2650	.7560
		15.000	1766.510	149.9090	.7560
		20.000	1872.280	199.0690	.7560
		25.000	1986.930	267.7930	.7560
		30.000	2071.710	327.6330	.7560
		35.000	2038.540	306.4720	.7560
		40.000	1883.490	209.0750	.7560
		45.000	1695.740	123.7890	.7560
		50.000	1485.110	69.2630	.7560
		55.000	1273.550	38.0540	.7560
		60.000	1081.620	19.7610	.7560
		62.557	1056.240	19.6880	.7560
		62.567	4446.670	495.0000	.7560
		75.162	4446.670	495.0000	.7560

INNER SHOCK POINT IS NUMBER 14

50.830	9.000	.000	1703.000	124.4940	.7560
		5.000	1691.710	120.5890	.7560
		10.000	1697.290	123.1180	.7560
		15.000	1765.820	149.5870	.7560
		20.000	1871.560	198.7410	.7560
		25.000	1986.090	267.2760	.7560
		30.000	2071.060	327.1370	.7560
		35.000	2039.410	307.1080	.7560
		40.000	1884.610	209.5210	.7560
		45.000	1697.330	124.1990	.7560
		50.000	1487.160	69.7380	.7560
		55.000	1275.900	38.3210	.7560
		57.454	1176.510	26.9290	.7560
		57.464	4446.670	495.0000	.7560
		69.723	4446.670	495.0000	.7560

INNER SHOCK POINT IS NUMBER 13

50.830	9.500	.000	1703.000	124.4940	.7560
		5.000	1691.720	120.5930	.7560
		10.000	1697.250	123.1010	.7560
		15.000	1765.740	149.5500	.7560
		20.000	1871.490	198.7030	.7560
		25.000	1985.990	267.2170	.7560
		30.000	2070.980	327.0800	.7560
		35.000	2039.510	307.1800	.7560
		40.000	1884.740	209.5720	.7560
		45.000	1697.510	124.2460	.7560
		50.000	1487.390	69.7930	.7560
		55.000	1276.170	38.3510	.7560
		57.215	1185.440	27.6090	.7560
		57.225	3293.900	150.0930	.7550

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
50.830	9.500	69.492	3291.170	133.2000	.7550
INNER SHOCK POINT IS NUMBER 17					
50.930	16.650	.000	1703.000	124.4940	.7560
		5.000	1691.940	120.6700	.7560
		10.000	1696.340	122.7630	.7560
		15.000	1764.150	148.8090	.7560
		20.000	1869.830	197.9480	.7560
		25.000	1984.050	266.0300	.7560
		30.000	2069.490	325.9480	.7560
		35.000	2041.520	308.6410	.7560
		40.000	1897.400	210.7240	.7560
		45.000	1701.150	125.1850	.7560
		50.000	1492.090	70.8820	.7560
		54.439	1305.270	42.1080	.7560
		54.449	3282.300	172.0900	.7550
		66.898	3288.730	164.5440	.7550
INNER SHOCK POINT IS NUMBER 12					
50.830	24.310	.000	1703.000	124.4940	.7560
		5.000	1692.320	120.7970	.7560
		10.000	1694.830	122.1980	.7560
		15.000	1761.510	147.5730	.7560
		20.000	1867.090	196.6890	.7560
		25.000	1980.840	264.0610	.7560
		30.000	2067.040	324.0880	.7560
		35.000	2044.850	311.0590	.7560
		40.000	1892.000	212.8910	.7560
		45.000	1707.140	126.7370	.7560
		50.000	1499.810	72.6800	.7560
		52.617	1390.370	53.4020	.7560
		52.627	3265.920	191.3680	.7560
		65.414	3268.740	188.0440	.7560
INNER SHOCK POINT IS NUMBER 12					
50.930	31.960	.000	1703.000	124.4940	.7560
		5.000	1692.820	120.9700	.7560
		10.000	1692.760	121.4260	.7560
		15.000	1757.910	145.8900	.7560
		20.000	1863.350	194.9770	.7560
		25.000	1976.500	261.3960	.7560
		30.000	2063.780	321.6120	.7560
		35.000	2049.370	314.3270	.7560
		40.000	1898.210	215.8130	.7560
		45.000	1714.860	129.0250	.7560
		50.000	1510.120	75.0970	.7560
		51.805	1435.120	59.4720	.7560
		51.815	3250.410	209.6840	.7560
		65.125	3250.570	208.6080	.7560
INNER SHOCK POINT IS NUMBER 12					
50.830	45.550	.000	1703.000	124.4940	.7560
		5.000	1694.030	121.3830	.7560
		10.000	1697.770	119.5550	.7560

ORIGINAL PAGE IS
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FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
50.830	45.550	15.000	1752.170	143.6340	.7560
		20.000	1854.420	190.8720	.7560
		25.000	1966.210	255.0710	.7560
		30.000	2056.320	315.9200	.7560
		35.000	2060.110	322.0500	.7560
		40.000	1912.920	222.7010	.7560
		45.000	1730.620	136.6800	.7560
		50.000	1531.490	80.3890	.7560
		54.727	1341.140	46.2380	.7560
		54.737	3254.840	179.3030	.7560
		67.565	3255.970	171.2200	.7560

INNER SHOCK POINT IS NUMBER 12

50.830	59.140	.000	1703.000	124.4940	.7560
		5.000	1695.600	121.9190	.7560
		10.000	1681.160	117.0750	.7560
		15.000	1745.450	141.1680	.7560
		20.000	1842.820	185.5190	.7560
		25.000	1953.020	246.9590	.7560
		30.000	2047.310	308.9980	.7560
		35.000	2073.950	331.8900	.7560
		40.000	1930.970	231.7480	.7560
		45.000	1750.690	146.3570	.7560
		50.000	1555.440	86.6360	.7560
		55.000	1356.060	48.2980	.7560
		60.000	1165.830	25.5630	.7560
		61.658	1107.980	20.9070	.7560
		61.668	3238.830	131.8360	.7560
		74.526	3225.430	108.3590	.7560

INNER SHOCK POINT IS NUMBER 14

50.830	72.730	.000	1703.000	124.4940	.7560
		5.000	1697.480	122.5590	.7560
		10.000	1680.640	116.8180	.7560
		15.000	1737.290	138.1570	.7560
		20.000	1828.980	179.1050	.7560
		25.000	1937.550	237.4330	.7560
		30.000	2037.520	301.4120	.7560
		35.000	2090.260	343.3460	.7560
		40.000	1947.660	244.1160	.7560
		45.000	1774.050	157.5130	.7560
		50.000	1583.240	93.8460	.7560
		55.000	1386.100	52.4770	.7560
		60.000	1194.750	27.9880	.7560
		65.000	1022.750	14.1710	.7560
		70.000	860.150	7.3480	.7560
		75.000	701.160	3.5110	.7560
		75.435	637.380	3.2340	.7560
		75.445	3137.620	61.0860	.7560
		88.617	3066.490	35.3300	.7560

INNER SHOCK POINT IS NUMBER 17

50.830	86.330	.000	1703.000	124.4940	.7560
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FLOW FIELD (CONTINUED)

Z	ETA	D	T	P	F1
50.830	86.330	5.000	1699.610	123.2870	.7560
		10.000	1683.670	117.8610	.7560
		15.000	1727.960	134.6880	.7560
		20.000	1813.480	171.8780	.7560
		25.000	1920.550	226.9490	.7560
		30.000	2027.740	293.7350	.7560
		35.000	2084.430	338.6510	.7560
		40.000	1966.040	257.5140	.7560
		45.000	1799.470	169.5210	.7560
		50.000	1613.360	101.6150	.7560
		55.000	1418.630	57.0240	.7560
		60.000	1226.080	30.6630	.7560
		65.000	1056.520	16.7250	.7560
		70.000	895.600	8.8970	.7560
		75.000	739.120	4.4040	.7560
		80.000	609.860	2.1080	.7560
		85.000	514.130	1.1190	.7560
		90.000	430.300	.5850	.7560
		95.000	375.120	.3530	.7560
		100.000	329.350	.2110	.7560
		104.690	279.890	.1200	.7560
		104.700	2785.890	7.6020	.7550
		117.388	2700.720	5.8640	.7530

INNER SHOCK POINT IS NUMBER 22

50.830	99.920	.000	1703.000	124.4940	.7560
		5.000	1700.970	123.7580	.7560
		10.000	1686.780	118.9250	.7560
		15.000	1717.810	130.8940	.7560
		20.000	1797.020	164.1640	.7560
		25.000	1902.890	216.0340	.7560
		30.000	2013.900	284.3610	.7560
		35.000	2071.180	328.5240	.7560
		40.000	1985.150	271.2110	.7560
		45.000	1825.590	181.7100	.7560
		50.000	1644.160	109.5110	.7560
		55.000	1451.860	61.6920	.7560
		60.000	1260.570	34.7830	.7560
		65.000	1091.230	19.5690	.7560
		70.000	931.650	10.5370	.7560
		75.000	777.710	5.3700	.7560
		80.000	641.820	2.6150	.7560
		85.000	544.580	1.4330	.7560
		90.000	459.880	.8160	.7560
		188.217	141.500	.0120	.7560
		188.227	2262.510	.0010	.7370
		189.535	2256.880	.0010	.7370

INNER SHOCK POINT IS NUMBER 20

50.830	100.920	.000	1703.000	124.4940	.7560
		5.000	1701.020	123.7730	.7560
		10.000	1687.010	119.0030	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
50.830	100.920	15.000	1717.050	130.6070	.7560
		20.000	1795.790	163.5880	.7560
		25.000	1901.590	215.2300	.7560
		30.000	2012.530	283.5180	.7560
		35.000	2070.260	327.8170	.7560
		40.000	1986.560	272.2100	.7560
		45.000	1827.500	182.5950	.7560
		50.000	1646.410	110.0850	.7560
		55.000	1454.280	62.0330	.7560
		60.000	1263.200	35.1470	.7560
		65.000	1093.760	19.7790	.7560
		70.000	934.270	10.6590	.7560
		75.000	780.510	5.4420	.7560
		80.000	644.170	2.6540	.7560
		85.000	546.810	1.4570	.7560
		90.000	462.180	.8360	.7560
50.830	180.000	.000	1703.000	124.4940	.7560
		5.000	1704.450	125.0280	.7560
		10.000	1698.500	122.9040	.7560
		15.000	1684.400	118.1760	.7560
		20.000	1743.840	140.9490	.7560
		25.000	1838.420	183.8410	.7560
		30.000	1945.620	242.1980	.7560
		35.000	2033.920	299.0950	.7560
		40.000	2056.310	320.1230	.7560
		45.000	1915.670	226.3790	.7560
		50.000	1748.930	146.9170	.7560
		55.000	1570.000	89.7860	.7560
		60.000	1398.200	52.6610	.7560
		65.000	1214.080	30.1430	.7560
		70.000	1058.320	16.8520	.7560
		75.000	913.660	9.7680	.7560
		80.000	774.100	5.5490	.7560
		85.000	663.670	3.2100	.7560
		90.000	574.400	1.9460	.7560
60.000	.000	.000	1689.680	119.8470	.7560
		5.000	1698.280	123.1150	.7560
		10.000	1737.270	138.8200	.7560
		15.000	1816.100	172.9550	.7560
		20.000	1915.400	222.7090	.7560
		25.000	2008.320	280.9250	.7560
		30.000	2028.340	298.4010	.7560
		35.000	1950.710	251.3390	.7560
		40.000	1808.850	173.7940	.7560
		45.000	1646.150	108.9090	.7560
		50.000	1470.300	64.3510	.7560
		55.000	1292.070	38.9160	.7560
		59.982	1129.780	22.7840	.7560
		59.992	4320.000	540.0000	.7560
		75.162	4320.000	540.0000	.7560
		INNER SHOCK POINT IS NUMBER 13			
60.000	11.000	.000	1689.680	119.8470	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
60.000	11.000	5.000	1698.160	123.0730	.7560
		10.000	1736.520	138.5120	.7560
		15.000	1814.990	172.3950	.7560
		20.000	1914.320	222.0280	.7560
		25.000	2007.140	280.1840	.7560
		30.000	2028.070	298.1370	.7560
		35.000	1952.120	252.2480	.7560
		40.000	1810.710	174.6050	.7560
		45.000	1648.340	109.4550	.7560
		50.000	1472.690	64.7070	.7560
		53.913	1333.540	44.8260	.7560
		53.923	4320.000	540.0000	.7560
		60.842	4320.000	540.0000	.7560

INNER SHOCK POINT IS NUMBER 12

60.000	11.500	.000	1689.680	119.8470	.7560
		5.000	1698.150	123.0690	.7560
		10.000	1736.450	138.4840	.7560
		15.000	1814.880	172.3430	.7560
		20.000	1914.220	221.9650	.7560
		25.000	2007.030	280.1150	.7560
		30.000	2028.040	298.1120	.7560
		35.000	1952.250	252.3320	.7560
		40.000	1810.880	174.6800	.7560
		45.000	1648.540	109.5050	.7560
		50.000	1472.910	64.7640	.7560
		53.705	1341.210	45.9210	.7560
		53.715	3044.710	194.9250	.7560
		60.638	3049.760	176.2460	.7560

INNER SHOCK POINT IS NUMBER 12

60.000	18.150	.000	1689.690	119.8470	.7560
		5.000	1697.970	123.0000	.7560
		10.000	1735.220	137.9850	.7560
		15.000	1813.070	171.4350	.7560
		20.000	1912.430	220.9160	.7560
		25.000	2005.110	278.9170	.7560
		30.000	2027.620	297.6970	.7560
		35.000	1954.530	253.7990	.7560
		40.000	1813.880	175.9870	.7560
		45.000	1652.080	110.3850	.7560
		50.000	1476.770	65.7460	.7560
		51.441	1425.790	57.9920	.7560
		51.451	3031.690	211.4270	.7560
		66.510	3037.900	203.5470	.7560

INNER SHOCK POINT IS NUMBER 12

60.000	25.290	.000	1689.690	119.8470	.7560
		5.000	1697.690	122.8910	.7560
		10.000	1733.300	137.2010	.7560
		15.000	1810.230	170.0110	.7560
		20.000	1909.450	219.4490	.7560
		25.000	2002.130	277.0490	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
60.000	25.290	30.000	2026.990	297.0750	.7560
		35.000	1958.090	256.0820	.7560
		40.000	1818.540	178.0190	.7560
		45.000	1657.590	111.7530	.7560
		49.927	1485.340	67.9260	.7560
		49.937	3018.750	227.8930	.7560
		65.317	3021.260	224.6840	.7560
		INNER SHOCK POINT IS NUMBER 11			
60.000	32.440	.000	1689.680	119.8470	.7560
		5.000	1697.310	122.7450	.7560
		10.000	1730.750	136.1640	.7560
		15.000	1806.490	168.1330	.7560
		20.000	1905.530	217.5170	.7560
		25.000	1998.230	274.6020	.7560
		30.000	2026.240	296.3100	.7560
		35.000	1962.760	259.0630	.7560
		40.000	1824.640	180.6670	.7560
		45.000	1664.780	113.5370	.7560
		49.243	1517.110	76.0030	.7560
		49.253	3006.430	243.6320	.7560
		65.150	3006.510	242.0900	.7560
		INNER SHOCK POINT IS NUMBER 11			
60.000	46.230	.000	1689.680	119.8470	.7560
		5.000	1696.290	122.3580	.7560
		10.000	1724.140	133.4620	.7560
		15.000	1796.830	163.2760	.7560
		20.000	1895.450	212.5310	.7560
		25.000	1988.290	268.3660	.7560
		30.000	2024.710	294.6130	.7560
		35.000	1974.710	266.6190	.7560
		40.000	1840.150	187.3520	.7560
		45.000	1682.830	118.3820	.7560
		50.000	1510.450	74.2770	.7560
		50.297	1430.700	58.6980	.7560
		50.302	3007.880	215.1160	.7560
		67.792	3008.320	205.2790	.7560
		INNER SHOCK POINT IS NUMBER 12			
60.000	60.020	.000	1689.680	119.8470	.7560
		5.000	1694.890	121.8280	.7560
		10.000	1715.370	129.8780	.7560
		15.000	1787.010	159.0680	.7560
		20.000	1882.350	206.0230	.7560
		25.000	1975.600	260.3860	.7560
		30.000	2023.530	292.9700	.7560
		35.000	1990.050	276.1930	.7560
		40.000	1859.870	195.7660	.7560
		45.000	1703.940	127.7980	.7560
		50.000	1535.520	80.5800	.7560
		55.000	1363.350	49.0110	.7560
		59.394	1217.190	30.5820	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
60.000	60.020	59.404	3002.900	167.2460	.7560
		75.173	2997.660	135.1150	.7560

INNER SHOCK POINT IS NUMBER 13

60.000	73.810	.000	1689.600	119.8470	.7560
		5.000	1693.110	121.1510	.7560
		10.000	1706.270	126.1560	.7560
		15.000	1775.900	154.5640	.7560
		20.000	1866.700	177.2140	.7560
		25.000	1960.770	251.0440	.7560
		30.000	2023.250	291.7990	.7560
		35.000	2008.110	287.2630	.7560
		40.000	1879.510	207.1890	.7560
		45.000	1728.360	138.5420	.7560
		50.000	1564.410	87.7910	.7560
		55.000	1394.900	53.5190	.7560
		60.000	1229.370	31.7320	.7560
		65.000	1078.210	18.2620	.7560
		70.000	936.200	10.7830	.7560
		73.641	834.770	7.2950	.7560
		73.651	2944.430	84.5500	.7560
		90.194	2880.080	43.0260	.7560

INNER SHOCK POINT IS NUMBER 16

60.000	87.600	.000	1689.600	119.8470	.7560
		5.000	1690.940	120.3290	.7560
		10.000	1704.170	125.3370	.7560
		15.000	1763.160	149.3780	.7560
		20.000	1849.140	189.4040	.7560
		25.000	1944.540	240.7960	.7560
		30.000	2024.320	291.4420	.7560
		35.000	2014.260	290.1720	.7560
		40.000	1899.790	220.1000	.7560
		45.000	1754.760	149.9700	.7560
		50.000	1595.470	95.4810	.7560
		55.000	1428.790	58.3920	.7560
		60.000	1262.380	34.8420	.7560
		65.000	1113.480	21.0810	.7560
		70.000	973.190	12.6930	.7560
		75.000	836.710	7.3630	.7560
		80.000	717.390	4.2050	.7560
		85.000	620.760	2.5090	.7560
		90.000	536.200	1.5020	.7560
		95.000	471.750	.9340	.7560
		100.000	411.170	.5470	.7560
		104.829	353.380	.3150	.7560
		104.839	2623.490	9.9160	.7560
		121.465	2459.580	3.9470	.7560

INNER SHOCK POINT IS NUMBER 22

60.000	101.390	.000	1689.600	119.8470	.7560
		5.000	1688.910	119.5590	.7560
		10.000	1701.520	124.3420	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
60.000	101.390	15.000	1749.290	143.7070	.7560
		20.000	1830.470	179.9860	.7560
		25.000	1927.760	230.1700	.7560
		30.000	2015.800	285.6150	.7560
		35.000	2012.690	287.9330	.7560
		40.000	1920.770	233.1530	.7560
		45.000	1781.670	161.4100	.7560
		50.000	1626.930	103.2000	.7560
		55.000	1463.100	63.3570	.7560
		60.000	1298.410	39.4690	.7560
		65.000	1149.710	24.3640	.7560
		70.000	1010.460	14.7060	.7560
		75.000	876.600	8.6330	.7560
		80.000	753.130	4.9180	.7560
		85.000	654.310	2.9440	.7560
		90.000	569.610	1.8480	.7560
		95.000	501.550	1.1600	.7560
		201.016	188.350	.0290	.7560
		202.036	1829.220	.0010	.7460
		203.924	1818.740	.0010	.7460

INNER SHOCK POINT IS NUMBER 21

60.000	102.390	.000	1689.680	119.8470	.7560
		5.000	1698.920	119.5660	.7560
		10.000	1701.320	124.2640	.7560
		15.000	1748.260	143.2830	.7560
		20.000	1829.100	179.2930	.7560
		25.000	1926.540	229.4000	.7560
		30.000	2014.520	284.8070	.7560
		35.000	2012.640	287.8200	.7560
		40.000	1922.290	234.0850	.7560
		45.000	1783.600	162.2220	.7560
		50.000	1629.190	103.7490	.7560
		55.000	1465.550	63.7130	.7560
		60.000	1301.060	39.8490	.7560
		65.000	1152.300	24.6010	.7560
		70.000	1013.120	14.8530	.7560
		75.000	879.440	8.7270	.7560
		80.000	755.710	4.9710	.7560
		85.000	656.720	2.9770	.7560
		90.000	572.100	1.8760	.7560
		95.000	503.720	1.1770	.7560
		100.000	440.500	.6980	.7560
60.000	180.000	.000	1689.680	119.8470	.7560
		5.000	1690.520	120.1750	.7560
		10.000	1688.120	119.2860	.7560
		15.000	1705.760	125.9220	.7560
		20.000	1768.850	151.7580	.7560
		25.000	1858.820	194.2210	.7560
		30.000	1953.710	246.2880	.7560
		35.000	2021.750	289.9830	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
60.000	180.000	40.000	1990.290	273.9370	.7560
		45.000	1868.670	202.3720	.7560
		50.000	1727.900	138.4540	.7560
		55.000	1577.440	90.3030	.7560
		60.000	1423.030	57.4860	.7560
		65.000	1271.380	36.0360	.7560
		70.000	1135.250	22.5320	.7560
		75.000	1010.040	14.3830	.7560
		80.000	889.380	8.8940	.7560
		85.000	782.080	5.4780	.7560
		90.000	690.080	3.3980	.7560
		95.000	610.280	2.1320	.7560
		100.000	542.600	1.3370	.7560
80.000	.000	.000	1692.400	121.0690	.7560
		5.000	1771.790	154.4350	.7560
		10.000	1849.150	190.0870	.7560
		15.000	1917.420	224.9120	.7560
		20.000	1967.060	253.5700	.7560
		25.000	1977.100	262.7520	.7560
		30.000	1883.860	207.0020	.7560
		35.000	1782.560	158.3940	.7560
		40.000	1673.580	116.8620	.7560
		45.000	1556.570	83.6990	.7560
		50.000	1433.280	58.7300	.7560
		54.363	1323.460	42.0470	.7560
		54.373	4107.500	520.0000	.7560
		75.162	4107.500	520.0000	.7560
		INNER SHOCK POINT IS NUMBER 12			
80.000	15.570	.000	1692.400	121.0690	.7560
		5.000	1770.270	153.7750	.7560
		10.000	1847.280	189.2010	.7560
		15.000	1915.700	223.9660	.7560
		20.000	1966.380	253.0580	.7560
		25.000	1979.790	264.3530	.7560
		30.000	1886.610	208.6910	.7560
		35.000	1785.680	159.8800	.7560
		40.000	1677.120	118.0970	.7560
		45.000	1560.530	84.5910	.7560
		46.559	1522.460	76.0760	.7560
		46.569	4107.500	520.0000	.7560
		67.223	4107.500	520.0000	.7560
		INNER SHOCK POINT IS NUMBER 11			
80.000	16.030	.000	1692.400	121.0690	.7560
		5.000	1770.110	153.7320	.7560
		10.000	1847.160	189.1430	.7560
		15.000	1915.580	223.9040	.7560
		20.000	1966.340	253.0750	.7560
		25.000	1979.970	264.4580	.7560
		30.000	1886.790	208.8010	.7560
		35.000	1785.880	159.9770	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
80.000	16.030	40.000	1677.350	118.1770	.7560
		45.000	1560.800	84.6490	.7560
		46.410	1526.370	76.9500	.7560
		46.420	2694.960	213.0780	.7560
		67.074	2701.780	205.1680	.7560
		INNER SHOCK POINT IS NUMBER 11			
80.000	21.580	.000	1692.400	121.0690	.7560
		5.000	1768.760	153.1620	.7560
		10.000	1845.560	188.3800	.7560
		15.000	1914.110	223.0950	.7560
		20.000	1965.790	252.5950	.7560
		25.000	1982.280	265.8310	.7560
		30.000	1889.150	210.2470	.7560
		35.000	1788.550	161.2470	.7560
		40.000	1680.390	119.2330	.7560
		45.000	1564.230	85.4110	.7560
		45.043	1563.190	85.1790	.7560
		45.053	2688.690	220.3140	.7560
		65.801	2692.830	215.5470	.7560
		INNER SHOCK POINT IS NUMBER 11			
80.000	27.620	.000	1692.400	121.0690	.7560
		5.000	1766.820	152.3500	.7560
		10.000	1843.280	187.2950	.7560
		15.000	1912.020	221.9510	.7560
		20.000	1965.010	252.0010	.7560
		25.000	1985.550	267.7730	.7560
		30.000	1892.490	212.2910	.7560
		35.000	1792.330	163.0400	.7560
		40.000	1684.670	120.7200	.7560
		44.097	1591.040	91.3830	.7560
		44.107	2692.190	227.7350	.7560
		65.147	2683.380	226.3820	.7560
		INNER SHOCK POINT IS NUMBER 10			
80.000	33.670	.000	1692.400	121.0690	.7560
		5.000	1764.420	151.3410	.7560
		10.000	1840.450	185.9490	.7560
		15.000	1909.460	220.5450	.7560
		20.000	1964.100	251.2910	.7560
		25.000	1984.070	266.7120	.7560
		30.000	1896.600	214.8040	.7560
		35.000	1796.980	165.2410	.7560
		40.000	1689.930	122.5450	.7560
		43.666	1607.430	95.0160	.7560
		43.676	2675.910	234.8570	.7560
		65.225	2676.330	232.6490	.7560
		INNER SHOCK POINT IS NUMBER 10			
80.000	47.670	.000	1692.400	121.0690	.7560
		5.000	1757.060	148.2490	.7560
		10.000	1831.860	181.8480	.7560
		15.000	1901.800	216.3480	.7560

ORIGINAL PAGE IS
OF HIGH QUALITY

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
80.000	47.670	20.000	1961.610	249.3110	.7560
		25.000	1979.550	263.4730	.7560
		30.000	1908.980	222.3180	.7560
		35.000	1810.900	171.7930	.7560
		40.000	1705.650	127.9630	.7560
		45.000	1592.830	91.7170	.7560
		46.972	1547.550	81.6580	.7560
		46.882	2679.330	216.7170	.7560
		69.316	2681.240	206.5890	.7560

INNER SHOCK POINT IS NUMBER 11

80.000	61.690	.000	1692.400	121.0690	.7560
		5.000	1747.270	144.1220	.7560
		10.000	1820.550	176.4300	.7560
		15.000	1892.020	210.9940	.7560
		20.000	1951.100	243.4690	.7560
		25.000	1974.500	259.7750	.7560
		30.000	1924.940	231.9070	.7560
		35.000	1828.700	180.0950	.7560
		40.000	1725.670	134.7980	.7560
		45.000	1615.200	96.9510	.7560
		50.000	1495.070	70.0120	.7560
		54.056	1396.010	53.0370	.7560
		54.066	2676.590	183.7440	.7560
		76.489	2665.200	142.6710	.7560

INNER SHOCK POINT IS NUMBER 12

80.000	75.690	.000	1692.400	121.0690	.7560
		5.000	1735.120	138.9950	.7560
		10.000	1806.740	169.7860	.7560
		15.000	1877.950	204.0820	.7560
		20.000	1938.090	236.3290	.7560
		25.000	1969.630	256.0620	.7560
		30.000	1943.850	243.1350	.7560
		35.000	1849.600	189.7250	.7560
		40.000	1746.550	143.2080	.7560
		45.000	1639.290	105.3150	.7560
		50.000	1522.240	76.0270	.7560
		55.000	1401.540	53.6580	.7560
		60.000	1282.530	37.2500	.7560
		65.000	1170.140	25.0000	.7560
		68.662	1093.830	19.0330	.7560
		69.672	2640.400	113.2400	.7560
		93.177	2566.770	62.1160	.7560

INNER SHOCK POINT IS NUMBER 15

80.000	89.700	.000	1692.400	121.0690	.7560
		5.000	1720.750	132.9190	.7560
		10.000	1789.660	162.0010	.7560
		15.000	1860.790	195.8940	.7560
		20.000	1924.030	228.6360	.7560
		25.000	1965.540	252.7380	.7560
		30.000	1964.900	255.4650	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
80.000	89.700	35.000	1871.810	201.0960	.7560
		40.000	1771.910	154.1410	.7560
		45.000	1665.470	114.2790	.7560
		50.000	1551.740	82.4770	.7560
		55.000	1432.490	58.5190	.7560
		60.000	1312.700	40.6550	.7560
		65.000	1200.550	27.9810	.7560
		70.000	1096.390	19.2180	.7560
		75.000	996.480	12.9470	.7560
		80.000	899.370	8.5470	.7560
		85.000	807.090	5.5920	.7560
		90.000	725.350	3.7280	.7560
		95.000	649.090	2.4780	.7560
		100.000	574.450	1.6120	.7560
		102.430	539.940	1.2690	.7560
		102.440	2403.480	24.1500	.7560
		129.993	2275.040	7.5820	.7560

INNER SHOCK POINT IS NUMBER 22

80.000	103.700	.000	1692.400	121.0690	.7560
		5.000	1704.350	125.9660	.7560
		10.000	1769.030	153.3840	.7560
		15.000	1842.130	186.9340	.7560
		20.000	1909.680	220.7840	.7560
		25.000	1962.670	250.1060	.7560
		30.000	1970.410	258.0380	.7560
		35.000	1893.800	214.1550	.7560
		40.000	1796.020	165.2520	.7560
		45.000	1692.290	123.3300	.7560
		50.000	1581.930	88.9900	.7560
		55.000	1463.870	63.3160	.7560
		60.000	1345.030	45.2870	.7560
		65.000	1232.460	31.5690	.7560
		70.000	1127.130	21.6370	.7560
		75.000	1027.690	14.6510	.7560
		80.000	931.810	9.7280	.7560
		85.000	837.770	6.3880	.7560
		90.000	756.550	4.4250	.7560
		95.000	679.740	2.9890	.7560
		100.000	605.950	1.9680	.7560
		227.239	288.390	.1720	.7560
		228.249	1253.810	.0010	.7560
		231.936	1226.480	.0010	.7560

INNER SHOCK POINT IS NUMBER 22

80.000	104.700	.000	1692.400	121.0690	.7560
		5.000	1703.100	125.4380	.7560
		10.000	1767.470	152.7270	.7560
		15.000	1840.760	186.2740	.7560
		20.000	1908.670	220.2280	.7560
		25.000	1962.570	249.9490	.7560
		30.000	1970.060	257.7570	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
80.000	104.700	35.000	1895.370	215.0820	.7560
		40.000	1797.740	166.0360	.7560
		45.000	1694.190	123.9660	.7560
		50.000	1584.070	89.4470	.7560
		55.000	1466.060	63.7970	.7560
		60.000	1347.330	45.6340	.7560
		65.000	1234.700	31.8220	.7560
		70.000	1129.290	21.8080	.7560
		75.000	1029.870	14.7710	.7560
		80.000	934.080	9.8130	.7560
		85.000	840.150	6.4700	.7560
		90.000	758.760	4.4770	.7560
		95.000	681.910	3.0260	.7560
		100.000	608.150	1.9940	.7560
		105.000	540.090	1.2960	.7560
		110.000	481.370	.8510	.7560
80.000	180.000	.000	1692.400	121.0690	.7560
		5.000	1667.690	112.3790	.7560
		10.000	1687.800	119.4650	.7560
		15.000	1758.660	149.1040	.7560
		20.000	1844.310	188.1650	.7560
		25.000	1915.050	223.8710	.7560
		30.000	1963.110	250.4320	.7560
		35.000	1958.940	251.1720	.7560
		40.000	1875.920	204.5990	.7560
		45.000	1777.680	157.2390	.7560
		50.000	1674.760	117.3640	.7560
		55.000	1566.090	85.2250	.7560
		60.000	1450.790	61.1500	.7560
		65.000	1336.640	43.9980	.7560
		70.000	1229.060	31.1150	.7560
		75.000	1129.140	21.7750	.7560
		80.000	1035.840	15.1510	.7560
		85.000	946.670	10.4240	.7560
		90.000	858.220	6.9910	.7560
		95.000	781.260	4.9700	.7560
		100.000	727.250	3.4550	.7560
		105.000	636.570	2.3730	.7560
		110.000	576.570	1.6260	.7560
100.000	.000	.000	1807.860	173.6550	.7560
		5.000	1937.100	236.9290	.7560
		10.000	1976.320	259.1820	.7560
		15.000	1968.170	253.9440	.7560
		20.000	1908.610	220.1250	.7560
		25.000	1823.130	175.4400	.7560
		30.000	1741.510	139.7120	.7560
		35.000	1660.090	110.0500	.7560
		40.000	1573.650	86.0200	.7560
		45.000	1477.840	66.3430	.7560
		48.744	1405.270	53.9760	.7560

FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
100.000	.000	48.754	3917.500	425.0000	.7560
		75.162	3917.500	425.0000	.7560
		INNER SHOCK POINT IS NUMBER 11			
100.000	20.260	.000	1807.860	173.6550	.7560
		5.000	1932.440	234.6710	.7560
		10.000	1974.320	258.0350	.7560
		15.000	1969.230	254.5990	.7560
		20.000	1913.910	223.1120	.7560
		25.000	1828.200	177.7460	.7560
		30.000	1746.680	141.5900	.7560
		35.000	1665.360	112.0100	.7560
		39.718	1584.260	88.9850	.7560
		39.728	3917.500	425.0000	.7560
		66.044	3917.500	425.0000	.7560
		INNER SHOCK POINT IS NUMBER 9			
100.000	20.760	.000	1807.860	173.6550	.7560
		5.000	1932.210	234.5590	.7560
		10.000	1974.270	257.9780	.7560
		15.000	1969.290	254.6320	.7560
		20.000	1914.170	223.2610	.7560
		25.000	1828.450	177.8610	.7560
		30.000	1746.930	141.6830	.7560
		35.000	1665.670	112.1080	.7560
		39.618	1586.280	89.5450	.7560
		39.628	2447.990	197.6000	.7560
		65.947	2451.820	193.6650	.7560
		INNER SHOCK POINT IS NUMBER 9			
100.000	25.260	.000	1807.860	173.6550	.7560
		5.000	1929.870	233.4250	.7560
		10.000	1973.220	257.4090	.7560
		15.000	1969.840	254.9690	.7560
		20.000	1916.820	224.7560	.7560
		25.000	1831.000	179.0140	.7560
		30.000	1749.520	142.6210	.7560
		35.000	1668.260	117.0850	.7560
		38.869	1602.090	93.9180	.7560
		39.979	2445.150	200.5160	.7560
		65.315	2447.120	198.4940	.7560
		INNER SHOCK POINT IS NUMBER 9			
100.000	30.260	.000	1807.860	173.6550	.7560
		5.000	1926.750	231.9100	.7560
		10.000	1971.890	256.6540	.7560
		15.000	1970.580	255.4280	.7560
		20.000	1920.360	226.7500	.7560
		25.000	1834.380	180.5490	.7560
		30.000	1752.960	143.8680	.7560
		35.000	1671.760	114.3840	.7560
		38.342	1614.990	97.4820	.7560
		38.352	2442.110	203.6360	.7560
		65.092	2442.010	203.7460	.7560
		INNER SHOCK POINT IS NUMBER 9			
100.000	35.260	.000	1807.860	173.6550	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
100.000	35.260	5.000	1923.090	230.1300	.7560
		10.000	1970.350	255.7760	.7560
		15.000	1971.480	255.9770	.7560
		20.000	1924.520	229.0860	.7560
		25.000	1838.350	182.3460	.7560
		30.000	1757.010	145.5270	.7560
		35.000	1675.870	115.9010	.7560
		39.114	1623.340	99.7820	.7560
		39.124	2439.150	206.6800	.7560
		65.366	2439.640	204.1170	.7560

INNER SHOCK POINT IS NUMBER 9

100.000	49.270	.000	1807.860	173.6550	.7560
		5.000	1909.980	223.7560	.7560
		10.000	1964.940	252.7080	.7560
		15.000	1974.850	258.0380	.7560
		20.000	1939.320	237.3870	.7560
		25.000	1852.480	198.7350	.7560
		30.000	1771.410	152.1440	.7560
		35.000	1690.390	121.2400	.7560
		40.000	1606.490	95.1890	.7560
		41.356	1583.120	88.7890	.7560
		41.366	2441.130	196.3010	.7560
		68.952	2442.870	187.1210	.7560

INNER SHOCK POINT IS NUMBER 10

100.000	63.260	.000	1807.860	173.6550	.7560
		5.000	1892.880	215.4240	.7560
		10.000	1958.110	248.8670	.7560
		15.000	1979.610	260.9350	.7560
		20.000	1957.760	247.6910	.7560
		25.000	1872.180	199.9030	.7560
		30.000	1789.880	160.5670	.7560
		35.000	1708.930	127.9980	.7560
		40.000	1626.440	100.6560	.7560
		45.000	1539.320	77.8070	.7560
		48.344	1474.290	65.7340	.7560
		48.354	2439.440	178.2640	.7560
		77.856	2420.710	135.4330	.7560

INNER SHOCK POINT IS NUMBER 11

100.000	77.290	.000	1807.860	173.6550	.7560
		5.000	1872.090	205.2670	.7560
		10.000	1950.130	244.4190	.7560
		15.000	1984.310	263.8200	.7560
		20.000	1962.920	250.8610	.7560
		25.000	1895.670	213.1150	.7560
		30.000	1811.760	170.4590	.7560
		35.000	1730.790	135.8790	.7560
		40.000	1649.790	106.9630	.7560
		45.000	1564.060	83.8150	.7560
		50.000	1469.440	64.8580	.7560
		55.000	1375.290	49.5830	.7560

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FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
100.000	77.290	60.000	1283.720	37.2370	.7560
		62.660	1235.630	31.6170	.7560
		67.670	2413.860	126.6700	.7560
		95.956	2334.940	67.3750	.7560

INNER SHOCK POINT IS NUMBER 14

100.000	91.300	.000	1807.860	173.6550	.7560
		5.000	1847.980	193.4530	.7560
		10.000	1941.270	239.5250	.7560
		15.000	1973.540	257.7560	.7560
		20.000	1969.750	255.0220	.7560
		25.000	1922.090	227.8550	.7560
		30.000	1836.180	181.3940	.7560
		35.000	1755.050	145.2310	.7560
		40.000	1674.110	115.6840	.7560
		45.000	1589.930	90.8790	.7560
		50.000	1492.220	70.3710	.7560
		55.000	1404.080	53.7610	.7560
		60.000	1312.690	40.6090	.7560
		65.000	1223.260	30.1690	.7560
		70.000	1139.910	22.4310	.7560
		75.000	1062.700	16.6410	.7560
		80.000	986.090	12.1260	.7560
		85.000	908.210	8.5520	.7560
		90.000	836.120	6.1780	.7560
		95.000	764.630	4.4530	.7560
		97.238	735.530	3.8400	.7560
		97.248	2245.640	28.6590	.7560
		135.525	1949.670	5.3830	.7560

INNER SHOCK POINT IS NUMBER 21

100.000	105.310	.000	1807.860	173.6550	.7560
		5.000	1820.980	180.1930	.7560
		10.000	1904.640	221.6140	.7560
		15.000	1962.610	251.7050	.7560
		20.000	1978.170	260.1190	.7560
		25.000	1950.300	243.4680	.7560
		30.000	1863.380	195.4900	.7560
		35.000	1780.700	156.7790	.7560
		40.000	1699.380	124.7550	.7560
		45.000	1616.680	98.0470	.7560
		50.000	1529.740	75.9740	.7560
		55.000	1433.760	58.3600	.7560
		60.000	1342.620	44.8380	.7560
		65.000	1253.490	33.6910	.7560
		70.000	1168.570	24.9480	.7560
		75.000	1089.500	18.4360	.7560
		80.000	1015.470	13.5900	.7560
		85.000	937.070	9.6980	.7560
		90.000	865.160	7.1270	.7560
		95.000	794.900	5.1950	.7560
		100.000	729.620	3.7490	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
100.000	105.310	105.000	670.490	2.6940	.7560
		110.000	614.950	1.9140	.7560
		115.000	567.100	1.3990	.7560
		120.000	516.750	.9950	.7560
		125.000	472.050	.7090	.7560
		130.000	432.010	.5100	.7560
		250.133	394.090	.3620	.7560
		250.143	1058.490	.0060	.7560
		256.614	1028.750	.0010	.7560

INNER SHOCK POINT IS NUMBER 28

100.000	106.310	.000	1807.860	173.6550	.7560
		5.000	1818.960	179.1970	.7560
		10.000	1901.810	220.2300	.7560
		15.000	1961.830	251.2800	.7560
		20.000	1978.830	260.5140	.7560
		25.000	1952.270	244.5580	.7560
		30.000	1865.400	196.6180	.7560
		35.000	1782.540	157.6020	.7560
		40.000	1701.180	125.3990	.7560
		45.000	1618.590	98.5520	.7560
		50.000	1531.900	76.3690	.7560
		55.000	1435.950	58.7650	.7560
		60.000	1344.730	45.1440	.7560
		65.000	1255.610	33.9370	.7560
		70.000	1170.590	25.1250	.7560
		75.000	1091.390	18.5630	.7560
		80.000	1017.480	13.6940	.7560
		85.000	939.160	9.8030	.7560
		90.000	867.190	7.1960	.7560
		95.000	797.000	5.2470	.7560
		100.000	731.570	3.7980	.7560
		105.000	672.360	2.7220	.7560
		110.000	616.680	1.9350	.7560
		115.000	568.850	1.4180	.7560
		120.000	518.650	1.0100	.7560
100.000	180.000	.000	1807.860	173.6550	.7560
		5.000	1718.720	134.7190	.7560
		10.000	1739.210	143.5400	.7560
		15.000	1845.360	192.9510	.7560
		20.000	1956.850	249.3260	.7560
		25.000	1996.320	265.0960	.7560
		30.000	1952.020	244.6160	.7560
		35.000	1872.770	201.1570	.7560
		40.000	1786.230	159.5100	.7560
		45.000	1703.040	126.1560	.7560
		50.000	1620.000	98.8090	.7560
		55.000	1534.100	76.7900	.7560
		60.000	1439.350	59.5200	.7560
		65.000	1349.640	45.8560	.7560
		70.000	1263.030	34.7730	.7560

FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
100.000	180.000	75.000	1180.160	25.9570	.7560
		80.000	1102.850	19.3580	.7560
		85.000	1031.470	14.5030	.7560
		90.000	956.930	10.6590	.7560
		95.000	887.730	7.9040	.7560
		100.000	821.760	5.8940	.7560
		105.000	759.140	4.3790	.7560
		110.000	700.840	3.2090	.7560
		115.000	647.260	2.3570	.7560
		120.000	599.660	1.7610	.7560
120.000	.000	.000	2044.260	306.6550	.7560
		5.000	2067.140	323.8460	.7560
		10.000	1989.850	267.9820	.7560
		15.000	1879.970	203.5970	.7560
		20.000	1791.840	161.2430	.7560
		25.000	1712.140	129.0800	.7560
		30.000	1636.230	103.4430	.7560
		35.000	1561.070	82.8850	.7560
		40.000	1484.140	67.0190	.7560
		43.126	1432.480	58.3970	.7560
		43.136	3745.000	337.5000	.7560
		75.162	3745.000	337.5000	.7560
		INNER SHOCK POINT IS NUMBER 10			
120.000	25.120	.000	2044.260	306.6550	.7560
		5.000	2071.800	327.2750	.7560
		10.000	1998.800	273.4770	.7560
		15.000	1890.810	209.9540	.7560
		20.000	1800.910	165.4130	.7560
		25.000	1720.700	132.2350	.7560
		30.000	1644.760	105.9360	.7560
		33.350	1594.850	91.1570	.7560
		33.360	3745.000	337.5000	.7560
		65.328	3745.000	337.5000	.7560
		INNER SHOCK POINT IS NUMBER 8			
120.000	25.620	.000	2044.260	306.6550	.7560
		5.000	2071.990	327.4120	.7560
		10.000	1999.150	273.6660	.7560
		15.000	1891.250	210.2100	.7560
		20.000	1801.280	165.5790	.7560
		25.000	1721.040	132.3610	.7560
		30.000	1645.100	106.0350	.7560
		33.289	1596.110	91.5310	.7560
		33.299	2263.370	171.4820	.7560
		65.282	2264.530	170.0050	.7560
		INNER SHOCK POINT IS NUMBER 8			
120.000	29.210	.000	2044.260	306.6550	.7560
		5.000	2073.440	328.4760	.7560
		10.000	2001.130	275.1300	.7560
		15.000	1894.620	212.1900	.7560
		20.000	1804.080	166.8660	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
120.000	29.210	25.000	1723.690	133.3330	.7560
		30.000	1647.730	106.8010	.7560
		32.928	1604.160	93.9150	.7560
		32.938	2262.380	172.7420	.7560
		65.098	2262.590	172.4740	.7560
		INNER SHOCK POINT IS NUMBER 8			
120.000	33.300	.000	2044.260	306.6550	.7560
		5.000	2075.310	329.8550	.7560
		10.000	2003.700	277.0320	.7560
		15.000	1899.010	214.7610	.7560
		20.000	1807.720	168.5300	.7560
		25.000	1727.100	134.5880	.7560
		30.000	1651.130	107.7890	.7560
		32.681	1611.290	96.0210	.7560
		32.691	2261.290	174.1470	.7560
		65.199	2260.420	175.2690	.7560
		INNER SHOCK POINT IS NUMBER 8			
120.000	37.380	.000	2044.260	306.6550	.7560
		5.000	2077.430	331.4110	.7560
		10.000	2006.620	279.1840	.7560
		15.000	1903.960	217.6670	.7560
		20.000	1811.800	170.4010	.7560
		25.000	1730.950	135.9970	.7560
		30.000	1654.950	108.8970	.7560
		32.602	1616.330	97.5030	.7560
		32.612	2260.210	175.5340	.7560
		65.635	2259.990	172.5750	.7560
		INNER SHOCK POINT IS NUMBER 8			
120.000	51.210	.000	2044.260	306.6550	.7560
		5.000	2086.330	337.9530	.7560
		10.000	2018.990	288.3110	.7560
		15.000	1924.940	229.9640	.7560
		20.000	1828.910	178.2020	.7560
		25.000	1746.990	141.8510	.7560
		30.000	1670.950	113.7410	.7560
		35.000	1596.900	91.7420	.7560
		35.789	1585.200	88.2910	.7560
		35.799	2259.730	169.4410	.7560
		65.819	2257.860	159.7190	.7560
		INNER SHOCK POINT IS NUMBER 9			
120.000	65.030	.000	2044.260	306.6550	.7560
		5.000	2081.500	334.3630	.7560
		10.000	2035.230	300.2750	.7560
		15.000	1952.300	246.0030	.7560
		20.000	1850.790	198.1190	.7560
		25.000	1768.200	150.3120	.7560
		30.000	1691.870	121.4380	.7560
		35.000	1617.360	97.7120	.7560
		40.000	1542.730	78.8270	.7560
		42.388	1506.590	71.4690	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
120.000	65.030	42.398	2258.830	161.4400	.7560
		79.491	2234.840	171.6290	.7560
		INNER SHOCK POINT IS NUMBER 10			
120.000	78.860	.000	2044.260	306.6550	.7560
		5.000	2071.120	326.6340	.7560
		10.000	2055.270	315.0160	.7560
		15.000	1985.780	265.6220	.7560
		20.000	1881.620	204.6180	.7560
		25.000	1795.150	162.6010	.7560
		30.000	1716.430	130.4070	.7560
		35.000	1641.320	104.6040	.7560
		40.000	1567.380	83.6550	.7560
		45.000	1491.940	68.4720	.7560
		50.000	1411.860	54.9240	.7560
		55.000	1336.720	43.9050	.7560
		55.943	1323.130	42.0590	.7560
		55.953	2240.020	128.4380	.7560
		99.927	2145.740	65.3580	.7560
		INNER SHOCK POINT IS NUMBER 13			
120.000	92.690	.000	2044.260	306.6550	.7560
		5.000	2059.260	317.7570	.7560
		10.000	2078.940	332.4090	.7560
		15.000	2016.010	296.0530	.7560
		20.000	1921.760	228.1480	.7560
		25.000	1825.470	176.2910	.7560
		30.000	1743.860	140.2890	.7560
		35.000	1668.030	112.6430	.7560
		40.000	1594.080	90.8080	.7560
		45.000	1519.200	73.8610	.7560
		50.000	1441.460	59.7450	.7560
		55.000	1363.350	47.4850	.7560
		60.000	1292.130	37.9170	.7560
		65.000	1221.590	29.9260	.7560
		70.000	1153.410	23.4920	.7560
		75.000	1087.640	18.2990	.7560
		80.000	1023.010	14.0870	.7560
		85.000	959.210	10.6750	.7560
		89.897	900.150	8.1240	.7560
		89.907	2114.690	43.3450	.7560
		141.819	1767.840	7.2000	.7560
		INNER SHOCK POINT IS NUMBER 19			
120.000	106.500	.000	2044.260	306.6550	.7560
		5.000	2046.200	307.9280	.7560
		10.000	2079.950	332.9610	.7560
		15.000	2045.830	307.9560	.7560
		20.000	1966.210	254.1910	.7560
		25.000	1858.290	191.0830	.7560
		30.000	1775.440	153.5970	.7560
		35.000	1697.480	123.3940	.7560
		40.000	1622.330	98.9830	.7560

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FLOW FIELD (CONTINUED)

Z	ETA	D	T	P	F1
120.000	106.500	45.000	1547.800	79.5100	.7560
		50.000	1472.030	64.7220	.7560
		55.000	1391.950	51.6880	.7560
		60.000	1319.590	41.5800	.7560
		65.000	1249.200	33.0530	.7560
		70.000	1180.390	25.9220	.7560
		75.000	1113.970	20.1830	.7560
		80.000	1049.950	15.5990	.7560
		85.000	986.020	12.0110	.7560
		90.000	925.640	9.2240	.7560
		95.000	868.950	7.1690	.7560
		100.000	812.460	5.5670	.7560
		105.000	754.830	4.1890	.7560
		110.000	703.560	3.1660	.7560
		115.000	654.600	2.3990	.7560
		120.000	610.650	1.8280	.7560
		125.000	570.130	1.3950	.7560
		130.000	531.640	1.0600	.7560
		268.176	494.900	.7000	*****
		268.186	898.770	.0140	.7560
		278.901	846.970	.0010	.7560

INNER SHOCK POINT IS NUMBER 28

120.000	107.500	.000	2044.260	306.6550	.7560
		5.000	2045.210	307.1870	.7560
		10.000	2078.460	331.8410	.7560
		15.000	2048.000	309.5550	.7560
		20.000	1969.510	256.1190	.7560
		25.000	1861.570	192.9990	.7560
		30.000	1777.860	154.7020	.7560
		35.000	1699.640	124.1820	.7560
		40.000	1624.390	99.5780	.7560
		45.000	1549.870	79.9200	.7560
		50.000	1474.230	65.0790	.7560
		55.000	1394.170	52.0510	.7560
		60.000	1321.550	41.8460	.7560
		65.000	1251.160	33.2750	.7560
		70.000	1182.300	26.0940	.7560
		75.000	1115.830	20.3170	.7560
		80.000	1051.860	15.7310	.7560
		85.000	987.980	12.1210	.7560
		90.000	927.530	9.3060	.7560
		95.000	870.740	7.2250	.7560
		100.000	814.400	5.6150	.7560
		105.000	756.620	4.2250	.7560
		110.000	705.400	3.2030	.7560
		115.000	656.430	2.4280	.7560
		120.000	612.320	1.8490	.7560
		125.000	571.730	1.4110	.7560
		130.000	533.230	1.0720	.7560
120.000	108.000	.000	2044.260	306.6550	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
120.000	180.000	5.000	1945.880	244.1720	.7560
		10.000	1905.210	224.1210	.7560
		15.000	2032.970	299.0720	.7560
		20.000	2086.630	338.0050	.7560
		25.000	2016.940	287.0430	.7560
		30.000	1910.200	221.7010	.7560
		35.000	1808.060	168.5170	.7560
		40.000	1722.990	132.7160	.7560
		45.000	1644.400	105.3100	.7560
		50.000	1568.240	84.1120	.7560
		55.000	1491.590	68.5870	.7560
		60.000	1412.910	55.1700	.7560
		65.000	1337.970	44.0750	.7560
		70.000	1268.060	35.1650	.7560
		75.000	1199.640	27.6360	.7560
		80.000	1134.500	21.7840	.7560
		85.000	1071.930	17.1580	.7560
		90.000	1010.210	13.3620	.7560
		95.000	951.020	10.3400	.7560
		100.000	894.970	8.0290	.7560
		105.000	840.260	6.2900	.7560
		110.000	784.650	4.8710	.7560
		115.000	734.590	3.7960	.7560
		120.000	697.470	2.9420	.7560
		125.000	643.400	2.2700	.7560
		130.000	602.750	1.7530	.7560
140.000	.000	.000	2134.520	388.2050	.7560
		5.000	2009.690	283.6400	.7560
		10.000	1900.930	216.3840	.7560
		15.000	1797.950	159.0970	.7560
		20.000	1700.460	124.2430	.7560
		25.000	1625.450	99.9190	.7560
		30.000	1551.680	81.2260	.7560
		35.000	1479.090	66.4490	.7560
		37.507	1443.080	59.9830	.7560
		37.517	3580.000	266.5000	.7560
		75.162	3580.000	266.5000	.7560
		INNER SHOCK POINT IS NUMBER 9			
140.000	30.060	.000	2134.520	388.2050	.7560
		5.000	2019.090	290.0030	.7560
		10.000	1916.600	224.5220	.7560
		15.000	1802.200	164.9510	.7560
		20.000	1715.600	130.2920	.7560
		25.000	1639.000	104.2490	.7560
		27.380	1603.930	93.1940	.7560
		27.390	3580.000	266.5000	.7560
		65.091	3580.000	266.5000	.7560
		INNER SHOCK POINT IS NUMBER 7			
140.000	30.560	.000	2134.520	388.2050	.7560
		5.000	2019.400	290.2150	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
140.000	30.560	10.000	1917.120	224.7940	.7560
		15.000	1802.870	165.2750	.7560
		20.000	1716.100	130.4930	.7560
		25.000	1639.450	104.3920	.7560
		27.348	1604.840	93.4020	.7560
		27.358	2117.150	146.0130	.7560
		65.094	2117.120	146.1690	.7560
INNER SHOCK POINT IS NUMBER 7					
140.000	33.490	.000	2134.570	388.2050	.7560
		5.000	2021.340	291.5280	.7560
		10.000	1920.370	226.4770	.7560
		15.000	1806.660	167.2830	.7560
		20.000	1719.230	131.7400	.7560
		25.000	1642.250	105.2820	.7560
		27.206	1609.790	94.9200	.7560
27.216	2117.010	146.6030	.7560		
65.212	2116.780	147.5820	.7560		
INNER SHOCK POINT IS NUMBER 7					
140.000	36.930	.000	2134.520	388.2050	.7560
		5.000	2023.830	293.2130	.7560
		10.000	1924.530	228.6360	.7560
		15.000	1811.590	169.8600	.7560
		20.000	1723.240	133.3390	.7560
		25.000	1645.830	106.4220	.7560
		27.131	1614.530	96.4400	.7560
27.141	2116.850	147.2870	.7560		
65.570	2115.770	146.4660	.7560		
INNER SHOCK POINT IS NUMBER 7					
140.000	40.370	.000	2134.570	388.2050	.7560
		5.000	2026.550	295.0540	.7560
		10.000	1929.090	230.9990	.7560
		15.000	1816.990	172.6770	.7560
		20.000	1727.670	135.0850	.7560
		25.000	1649.740	107.6660	.7560
		27.154	1618.180	97.6050	.7560
27.164	2116.690	147.9690	.7560		
66.172	2114.550	144.4850	.7560		
INNER SHOCK POINT IS NUMBER 7					
140.000	57.140	.000	2134.520	388.2050	.7560
		5.000	2043.070	306.2140	.7560
		10.000	1955.080	246.6310	.7560
		15.000	1849.810	189.7710	.7560
		20.000	1754.230	145.6457	.7560
		25.000	1673.360	115.1500	.7560
		30.000	1600.840	92.3820	.7560
31.371	1581.070	87.8790	.7560		
31.781	2113.810	143.2960	.7560		
73.142	2103.190	127.2340	.7560		
INNER SHOCK POINT IS NUMBER 8					
140.000	73.910	.000	2134.570	388.2050	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
140.000	73.910	5.000	2064.480	320.7280	.7560
		10.000	1987.470	268.5870	.7560
		15.000	1892.790	212.0860	.7560
		20.000	1788.870	159.3400	.7560
		25.000	1705.970	126.4730	.7560
		30.000	1632.210	102.0710	.7560
		35.000	1560.030	83.0590	.7560
		40.000	1488.260	68.0320	.7560
		41.296	1469.940	64.7790	.7560
		41.306	2107.290	133.2750	.7560
		90.343	2050.030	82.9230	.7560

INNER SHOCK POINT IS NUMBER 10

140.000	90.670	.000	2134.520	388.2050	.7560
		5.000	2099.830	354.3630	.7560
		10.000	2027.150	295.4520	.7560
		15.000	1944.360	239.4290	.7560
		20.000	1841.470	185.4420	.7560
		25.000	1748.950	143.4940	.7560
		30.000	1669.110	113.6870	.7560
		35.000	1597.030	91.2750	.7560
		40.000	1524.600	75.0900	.7560
		45.000	1453.650	61.8900	.7560
		50.000	1384.970	50.8570	.7560
		55.000	1319.670	41.6180	.7560
		60.000	1257.860	33.8710	.7560
		65.000	1196.160	27.4810	.7560
		67.986	1153.250	23.4350	.7560
		67.996	2049.340	73.0640	.7560
		137.896	1751.770	14.2310	.7560

INNER SHOCK POINT IS NUMBER 15

140.000	107.440	.000	2134.520	388.2750	.7560
		5.000	2141.510	395.0090	.7560
		10.000	2076.160	371.3110	.7560
		15.000	1997.710	275.5380	.7560
		20.000	1904.460	218.0040	.7560
		25.000	1796.960	162.4570	.7560
		30.000	1713.210	129.3820	.7560
		35.000	1637.380	103.6540	.7560
		40.000	1564.690	83.9430	.7560
		45.000	1492.190	68.6370	.7560
		50.000	1421.180	56.1680	.7560
		55.000	1354.380	46.3360	.7560
		60.000	1291.480	38.0090	.7560
		65.000	1231.150	31.0020	.7560
		70.000	1173.340	25.1970	.7560
		75.000	1118.190	20.4600	.7560
		80.000	1063.480	16.5010	.7560
		85.000	1010.200	13.3000	.7560
		90.000	959.810	10.7070	.7560
		95.000	907.590	8.5190	.7560

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FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
140.000	107.440	100.000	854.650	6.7080	.7560
		105.000	806.890	5.3800	.7560
		110.000	760.650	4.3100	.7560
		115.000	718.210	3.4540	.7560
		120.000	676.100	2.7260	.7560
		125.000	636.160	2.1390	.7560
		130.000	599.740	1.6900	.7560
		282.085	565.950	1.3400	.7560
		282.095	776.250	.0180	.7560
		299.366	637.070	.0010	.7560

INNER SHOCK POINT IS NUMBER 28

140.000	108.440	.000	2134.520	388.2050	.7560
		5.000	2144.110	397.5490	.7560
		10.000	2080.410	335.4540	.7560
		15.000	2001.090	277.8180	.7560
		20.000	1908.370	220.0220	.7560
		25.000	1800.910	164.5020	.7560
		30.000	1716.140	130.5340	.7560
		35.000	1639.830	104.4170	.7560
		40.000	1567.090	84.4700	.7560
		45.000	1494.500	69.0390	.7560
		50.000	1423.480	56.5720	.7560
		55.000	1356.540	46.6540	.7560
		60.000	1293.480	38.2650	.7560
		65.000	1233.090	31.2080	.7560
		70.000	1175.180	25.3580	.7560
		75.000	1120.050	20.5950	.7560
		80.000	1065.390	16.6380	.7560
		85.000	1012.100	13.4120	.7560
		90.000	961.640	10.7940	.7560
		95.000	909.650	8.5940	.7560
		100.000	856.490	6.7600	.7560
		105.000	808.760	5.4230	.7560
		110.000	762.560	4.3530	.7560
		115.000	720.040	3.4890	.7560
		120.000	677.960	2.7550	.7560
		125.000	637.890	2.1610	.7560
		130.000	601.370	1.7060	.7560
		135.000	567.700	1.3540	.7560
		140.000	532.020	1.0510	.7560
140.000	180.000	.000	2134.520	388.2050	.7560
		5.000	2290.100	565.3800	.7560
		10.000	2442.980	811.0610	.7560
		15.000	2286.800	553.2300	.7560
		20.000	2125.600	379.4860	.7560
		25.000	1996.330	274.5260	.7560
		30.000	1892.560	206.4340	.7560
		35.000	1769.510	151.2090	.7560
		40.000	1679.740	116.5590	.7560
		45.000	1603.930	93.2030	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
140.000	140.000	50.000	1528.360	75.8250	.7560
		55.000	1454.690	61.9760	.7560
		60.000	1384.730	50.7020	.7560
		65.000	1319.560	41.5530	.7560
		70.000	1258.300	33.8700	.7560
		75.000	1200.190	27.7190	.7560
		80.000	1145.550	22.7490	.7560
		85.000	1092.000	18.5560	.7560
		90.000	1039.420	15.0200	.7560
		95.000	988.690	12.1020	.7560
		100.000	940.690	9.7480	.7560
		105.000	897.250	7.7490	.7560
		110.000	839.810	6.2780	.7560
		115.000	794.530	5.0970	.7560
		120.000	751.250	4.1140	.7560
		125.000	710.340	3.2960	.7560
		130.000	669.480	2.6010	.7560
		135.000	632.790	2.0910	.7560
		140.000	599.460	1.6920	.7560
160.000	.000	.000	2108.890	365.0080	.7560
		5.000	1941.300	241.7560	.7560
		10.000	1819.730	174.7140	.7560
		15.000	1720.070	132.1160	.7560
		20.000	1629.550	101.1970	.7560
		25.000	1550.260	80.1170	.7560
		30.000	1477.160	65.9630	.7560
		31.888	1450.720	61.2630	.7560
		31.898	3427.500	205.5000	.7560
		75.162	3427.500	205.5000	.7560
		INNER SHOCK POINT IS NUMBER			
160.000	34.990	.000	2108.890	365.0080	.7560
		5.000	1960.670	254.2120	.7560
		10.000	1839.790	184.1780	.7560
		15.000	1741.970	139.9840	.7560
		20.000	1650.690	107.1590	.7560
		21.714	1623.370	99.5420	.7560
		21.724	3427.500	205.5000	.7560
		65.739	3427.500	205.5000	.7560
		INNER SHOCK POINT IS NUMBER			
160.000	35.490	.000	2108.890	365.0080	.7560
		5.000	1961.220	254.5660	.7560
		10.000	1840.350	184.4480	.7560
		15.000	1742.600	140.2790	.7560
		20.000	1651.390	107.4090	.7560
		21.704	1624.140	99.7450	.7560
		21.714	2001.160	125.2430	.7560
		65.791	2000.970	126.1010	.7560
		INNER SHOCK POINT IS NUMBER			
160.000	39.910	.000	2108.890	365.0080	.7560
		5.000	1966.420	257.9120	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
160.000	39.910	10.000	1845.750	186.9950	.7560
		15.000	1748.510	142.3300	.7560
		20.000	1657.920	109.7650	.7560
		21.684	1630.170	101.3350	.7560
		21.694	2001.210	125.7730	.7560
		66.077	1998.760	124.0910	.7560
		INNER SHOCK POINT IS NUMBER 6			
160.000	44.830	.000	2108.890	365.0080	.7560
		5.000	1972.890	262.0710	.7560
		10.000	1852.470	190.1630	.7560
		15.000	1755.980	144.9720	.7560
		20.000	1666.060	112.6970	.7560
		21.815	1635.170	102.6720	.7560
		21.925	2001.260	126.3640	.7560
		67.335	1996.210	121.7990	.7560
		INNER SHOCK POINT IS NUMBER 6			
160.000	60.680	.000	2108.890	365.0080	.7560
		5.000	1998.330	278.4260	.7560
		10.000	1879.020	202.6690	.7560
		15.000	1797.710	159.5850	.7560
		20.000	1698.210	124.2590	.7560
		25.000	1614.690	97.2180	.7560
		25.725	1603.090	94.2730	.7560
		25.735	1998.000	123.4030	.7560
		75.681	1978.860	105.9580	.7560
		INNER SHOCK POINT IS NUMBER 7			
160.000	76.570	.000	2108.890	365.0080	.7560
		5.000	2030.270	298.9190	.7560
		10.000	1926.250	232.1270	.7560
		15.000	1828.410	178.7860	.7560
		20.000	1738.860	138.8370	.7560
		25.000	1652.040	107.6970	.7560
		30.000	1575.200	86.7590	.7560
		34.539	1508.930	72.1050	.7560
		34.549	1992.790	118.7580	.7560
		94.591	1913.970	70.1520	.7560
		INNER SHOCK POINT IS NUMBER 8			
160.000	92.360	.000	2108.890	365.0080	.7560
		5.000	2067.480	322.8540	.7560
		10.000	1986.100	270.5970	.7560
		15.000	1876.650	201.4790	.7560
		20.000	1789.700	160.5390	.7560
		25.000	1702.270	125.7130	.7560
		30.000	1618.840	98.2730	.7560
		35.000	1542.650	78.5430	.7560
		40.000	1471.670	64.9620	.7560
		45.000	1405.170	53.9280	.7560
		50.000	1343.170	44.8120	.7560
		55.000	1285.650	37.2670	.7560
		59.400	1238.260	31.6110	.7560

FLOW FIELD (CONTINUED)

Z	EIA	P	T	P	F1
160.000	92.360	59.410	1954.680	77.2070	.7560
		140.310	1613.690	13.4210	.7560

INNER SHOCK POINT IS NUMBER 13

160.000	108.200	.000	2108.890	365.0080	.7560
		5.000	2170.450	387.2150	.7560
		10.000	2054.940	314.8190	.7560
		15.000	1955.380	250.9290	.7560
		20.000	1848.540	188.1960	.7560
		25.000	1757.930	145.6290	.7560
		30.000	1670.730	114.4450	.7560
		35.000	1590.130	90.7260	.7560
		40.000	1515.140	73.2570	.7560
		45.000	1444.550	60.1780	.7560
		50.000	1378.850	49.7620	.7560
		55.000	1319.130	41.5290	.7560
		60.000	1263.870	34.6610	.7560
		65.000	1211.470	28.9020	.7560
		70.000	1161.010	24.0550	.7560
		75.000	1112.480	19.9880	.7560
		80.000	1065.050	16.6140	.7560
		85.000	1018.580	13.7610	.7560
		90.000	972.320	11.2980	.7560
		95.000	927.040	9.2400	.7560
		100.000	883.300	7.5900	.7560
		105.000	840.160	6.2640	.7560
		110.000	797.950	5.1730	.7560
		115.000	757.010	4.2780	.7560
		120.000	717.910	3.4490	.7560
		125.000	680.770	2.7930	.7560
		130.000	645.640	2.2600	.7560
		135.000	614.180	1.8510	.7560
		290.569	751.490	.0400	.7560
		318.380	421.200	.0010	.7560

INNER SHOCK POINT IS NUMBER 28

160.000	109.200	.000	2108.890	365.0080	.7560
		5.000	2134.600	391.4830	.7560
		10.000	2059.560	317.7840	.7560
		15.000	1960.870	254.4560	.7560
		20.000	1852.400	190.0080	.7560
		25.000	1761.890	147.4900	.7560
		30.000	1674.370	115.7470	.7560
		35.000	1593.210	91.5320	.7560
		40.000	1517.920	73.7840	.7560
		45.000	1447.050	60.5730	.7560
		50.000	1381.340	50.1580	.7560
		55.000	1321.350	41.8330	.7560
		60.000	1265.830	34.8980	.7560
		65.000	1213.340	29.0930	.7560
		70.000	1162.850	24.2100	.7560
		75.000	1114.290	20.1160	.7560

FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
160.000	109.200	80.000	1066.880	16.7430	.7560
		85.000	1070.390	13.8690	.7560
		90.000	974.140	11.3890	.7560
		95.000	928.810	9.3100	.7560
		100.000	885.110	7.6460	.7560
		105.000	841.990	6.3180	.7560
		110.000	799.790	5.2700	.7560
		115.000	758.800	4.2780	.7560
		120.000	719.630	3.4810	.7560
		125.000	682.380	2.8190	.7560
		130.000	647.160	2.2800	.7560
		135.000	615.730	1.8710	.7560
		140.000	585.730	1.5430	.7560
160.000	180.000	.000	2108.890	365.0080	.7560
		5.000	2348.920	612.4320	.7560
		10.000	2469.150	788.4540	.7560
		15.000	2409.350	698.5390	.7560
		20.000	2225.410	485.5890	.7560
		25.000	2012.940	288.0400	.7560
		30.000	1862.010	194.2440	.7560
		35.000	1759.570	146.5500	.7560
		40.000	1662.940	111.7700	.7560
		45.000	1576.690	87.2740	.7560
		50.000	1498.190	69.9750	.7560
		55.000	1426.010	57.1690	.7560
		60.000	1359.760	47.0050	.7560
		65.000	1299.700	38.9090	.7560
		70.000	1245.750	32.5280	.7560
		75.000	1194.390	27.1860	.7560
		80.000	1145.110	22.7000	.7560
		85.000	1097.570	18.9160	.7560
		90.000	1051.360	15.7080	.7560
		95.000	1006.230	13.0200	.7560
		100.000	960.390	10.7030	.7560
		105.000	918.190	8.8710	.7560
		110.000	876.950	7.3930	.7560
		115.000	835.390	6.1450	.7560
		120.000	794.650	5.0740	.7560
		125.000	754.380	4.1620	.7560
		130.000	717.510	3.4230	.7560
		135.000	682.020	2.8040	.7560
		140.000	649.280	2.3050	.7560
180.000	.000	.000	2074.800	330.9640	.7560
		5.000	1909.070	220.6450	.7560
		10.000	1773.590	154.4580	.7560
		15.000	1667.360	113.5100	.7560
		20.000	1574.420	86.7360	.7560
		25.000	1488.940	68.0730	.7560
		26.270	1469.780	64.7060	.7560
		26.280	3282.500	159.0000	.7560

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FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
180.000	.000	75.162	3282.500	159.0000	.7560
		INNER SHOCK POINT IS NUMBER			7
180.000	39.850	.000	2074.800	330.9640	.7560
		5.000	1937.370	239.4500	.7560
		10.000	1808.650	170.090	.7560
		15.000	1698.500	124.0900	.7560
		16.252	1675.600	116.3090	.7560
		16.262	3282.500	159.0000	.7560
		66.065	3282.500	159.0000	.7560
		INNER SHOCK POINT IS NUMBER			5
180.000	40.350	.000	2074.800	330.9640	.7560
		5.000	1938.070	239.9170	.7560
		10.000	1809.530	171.2200	.7560
		15.000	1699.280	124.3540	.7560
		16.255	1676.350	116.5640	.7560
		16.265	1906.240	107.9780	.7560
		66.168	1904.390	107.1040	.7560
		INNER SHOCK POINT IS NUMBER			5
180.000	43.930	.000	2074.800	330.9640	.7560
		5.000	1943.340	243.4230	.7560
		10.000	1816.140	174.3080	.7560
		15.000	1705.130	126.3410	.7560
		16.314	1681.350	118.2620	.7560
		16.324	1906.270	108.2250	.7560
		67.065	1902.930	105.8180	.7560
		INNER SHOCK POINT IS NUMBER			5
180.000	46.020	.000	2074.800	330.9640	.7560
		5.000	1949.850	247.7490	.7560
		10.000	1824.350	178.1360	.7560
		15.000	1712.380	128.8000	.7560
		16.459	1686.240	119.9230	.7560
		16.469	1976.300	108.5100	.7560
		68.448	1901.200	104.3080	.7560
		INNER SHOCK POINT IS NUMBER			5
180.000	52.110	.000	2074.800	330.9640	.7560
		5.000	1956.870	252.4200	.7560
		10.000	1833.250	182.2910	.7560
		15.000	1720.230	131.4640	.7560
		16.694	1690.240	121.2810	.7560
		16.704	1906.320	108.8020	.7560
		70.255	1899.290	102.6680	.7560
		INNER SHOCK POINT IS NUMBER			5
180.000	66.220	.000	2074.800	330.9640	.7560
		5.000	1985.020	271.1530	.7560
		10.000	1869.460	199.1940	.7560
		15.000	1758.540	147.4840	.7560
		20.000	1666.450	113.2020	.7560
		20.221	1662.580	111.8980	.7560
		20.231	1974.360	107.0780	.7560
		80.752	1872.310	85.8850	.7560
		INNER SHOCK POINT IS NUMBER			6
180.000	80.470	.000	2074.800	330.9640	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
180.000	80.470	5.000	2018.360	293.3560	.7560
		10.000	1917.990	226.5110	.7560
		15.000	1812.050	172.4540	.7560
		20.000	1709.280	127.7390	.7560
		25.000	1623.400	98.5950	.7560
		27.785	1576.660	87.2550	.7560
		27.795	1901.110	104.2290	.7560
		102.268	1783.500	55.0400	.7560

INNER SHOCK POINT IS NUMBER 7

180.000	94.650	.000	2074.800	330.9640	.7560
		5.000	2055.790	318.3010	.7560
		10.000	1980.860	268.3640	.7560
		15.000	1874.740	201.7360	.7560
		20.000	1768.100	152.0010	.7560
		25.000	1675.400	116.2410	.7560
		30.000	1589.940	90.3340	.7560
		35.000	1505.630	70.9650	.7560
		40.000	1433.110	58.3020	.7560
		45.000	1368.720	48.4210	.7560
		47.173	1319.580	41.5830	.7560
		49.183	1867.460	78.0380	.7560
		152.050	1471.290	10.2570	.7560

INNER SHOCK POINT IS NUMBER 11

180.000	108.840	.000	2074.800	330.9640	.7560
		5.000	2095.470	345.5680	.7560
		10.000	2050.920	315.0750	.7560
		15.000	1956.630	252.1660	.7560
		20.000	1845.160	188.0140	.7560
		25.000	1732.120	135.4610	.7560
		30.000	1646.340	106.3940	.7560
		35.000	1560.360	83.4780	.7560
		40.000	1479.350	66.3690	.7560
		45.000	1407.370	54.0630	.7560
		50.000	1345.010	44.9630	.7560
		55.000	1289.300	37.7090	.7560
		60.000	1238.440	31.7610	.7560
		65.000	1190.790	26.8330	.7560
		70.000	1145.270	22.6740	.7560
		75.000	1101.500	19.1530	.7560
		80.000	1059.510	16.2530	.7560
		85.000	1018.740	13.7570	.7560
		90.000	978.150	11.5700	.7560
		95.000	938.390	9.6890	.7560
		100.000	900.290	8.1440	.7560
		105.000	861.040	6.8790	.7560
		110.000	822.080	5.7860	.7560
		115.000	784.350	4.8490	.7560
		120.000	748.110	4.0430	.7560
		125.000	713.620	3.3550	.7560
		130.000	681.230	2.7870	.7560

NEW... IS
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FLOW FIELD (CONTINUED)

Z	ETA	P	T	P	F1
180.000	108.840	297.050	651.560	2.3380	.7560
		297.060	762.450	.0960	.7560
		336.205	415.830	.0010	.7560

INNER SHOCK POINT IS NUMBER 28

180.000	109.840	.000	2074.800	330.9640	.7560
		5.000	2097.900	348.1200	.7560
		10.000	2056.090	318.5300	.7560
		15.000	1963.030	256.4370	.7560
		20.000	1850.870	190.6830	.7560
		25.000	1737.280	137.6610	.7560
		30.000	1650.510	107.8100	.7560
		35.000	1564.350	84.4000	.7560
		40.000	1482.650	66.9440	.7560
		45.000	1410.110	54.4630	.7560
		50.000	1347.740	45.3620	.7560
		55.000	1291.740	38.0120	.7560
		60.000	1240.520	31.9900	.7560
		65.000	1192.740	27.0160	.7560
		70.000	1147.120	22.8230	.7560
		75.000	1103.360	19.3030	.7560
		80.000	1061.300	16.3770	.7560
		85.000	1020.480	13.8600	.7560
		90.000	979.930	11.6590	.7560
		95.000	940.000	9.7600	.7560
		100.000	902.060	8.2010	.7560
		105.000	862.830	6.9360	.7560
		110.000	823.880	5.8360	.7560
		115.000	786.110	4.8900	.7560
		120.000	749.810	4.0780	.7560
		125.000	715.230	3.3840	.7560
		130.000	682.740	2.8110	.7560
		135.000	653.100	2.3610	.7560
		140.000	624.480	1.9810	.7560
180.000	180.000	.000	2074.800	330.9640	.7560
		5.000	2215.290	471.2500	.7560
		10.000	2273.430	542.5820	.7560
		15.000	2269.810	538.8050	.7560
		20.000	2211.790	466.9670	.7560
		25.000	2083.790	337.3130	.7560
		30.000	1921.890	228.4690	.7560
		35.000	1778.670	157.2240	.7560
		40.000	1667.570	113.5930	.7560
		45.000	1572.950	86.3760	.7560
		50.000	1483.690	67.0890	.7560
		55.000	1406.670	53.9070	.7560
		60.000	1341.990	44.5620	.7560
		65.000	1284.720	37.1310	.7560
		80.000	1139.080	22.1590	.7560
		90.000	1053.960	15.8900	.7560
		105.000	936.360	9.6000	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
180.000	180.000	110.000	898.870	8.1000	.7560
		115.000	860.580	6.8610	.7560
		120.000	872.520	5.7900	.7560
		125.000	786.320	4.8900	.7560
		130.000	751.390	4.1080	.7560
		135.000	718.330	3.4410	.7560
		140.000	687.700	2.8910	.7560
200.000	.000	.000	2007.700	286.2000	.7560
		5.000	1893.490	212.3380	.7560
		10.000	1732.100	135.6370	.7560
		15.000	1623.790	99.5620	.7560
		20.000	1528.070	76.2070	.7560
		20.651	1515.960	73.5840	.7560
		20.661	3140.000	125.0000	.7560
		75.162	3140.000	125.0000	.7560
		INNER SHOCK POINT IS NUMBER			6
200.000	44.570	.000	2007.700	286.2000	.7560
		5.000	1926.800	228.8870	.7560
		10.000	1788.280	162.3250	.7560
		10.891	1762.320	149.9820	.7560
		10.901	3140.000	125.0000	.7560
		67.254	3140.000	125.0000	.7560
		INNER SHOCK POINT IS NUMBER			4
200.000	45.070	.000	2007.700	286.2000	.7560
		5.000	1927.370	229.2440	.7560
		10.000	1789.530	162.9170	.7560
		10.900	1763.360	150.4790	.7560
		10.910	1827.460	93.6900	.7560
		67.410	1823.980	91.9590	.7560
		INNER SHOCK POINT IS NUMBER			4
200.000	51.490	.000	2007.700	286.2000	.7560
		5.000	1934.200	234.1320	.7560
		10.000	1806.680	171.0660	.7560
		11.095	1775.930	156.4500	.7560
		11.105	1827.630	93.9350	.7560
		69.954	1820.830	90.0050	.7560
		INNER SHOCK POINT IS NUMBER			4
200.000	58.410	.000	2007.700	286.2000	.7560
		5.000	1942.500	240.0100	.7560
		10.000	1827.480	180.9520	.7560
		11.477	1787.690	162.0380	.7560
		11.487	1827.820	94.2130	.7560
		74.003	1809.280	84.4690	.7560
		INNER SHOCK POINT IS NUMBER			4
200.000	65.330	.000	2007.700	286.2000	.7560
		5.000	1951.620	246.4730	.7560
		10.000	1850.610	191.9380	.7560
		12.068	1797.340	166.6180	.7560
		12.078	1828.020	94.5160	.7560
		70.782	1794.560	77.5790	.7560
		INNER SHOCK POINT IS NUMBER			4
200.000	80.010	.000	2007.700	286.2000	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
200.000	80.010	5.000	1973.340	261.8680	.7560
		10.000	1906.840	218.6640	.7560
		15.000	1788.860	162.5650	.7560
		16.727	1744.370	141.4170	.7560
		16.737	1825.790	93.0980	.7560
		101.285	1715.470	52.2110	.7560
		INNER SHOCK POINT IS NUMBER 5			
200.000	94.690	.000	2007.700	286.2000	.7560
		5.000	1997.540	279.0160	.7560
		10.000	1954.680	248.6750	.7560
		15.000	1870.800	201.4970	.7560
		20.000	1748.790	143.4850	.7560
		25.000	1651.140	108.6660	.7560
		30.000	1561.270	83.3360	.7560
		30.479	1553.310	91.6180	.7560
		30.489	1809.960	81.7260	.7560
		152.269	1414.250	11.3750	.7560
		INNER SHOCK POINT IS NUMBER 8			
200.000	109.380	.000	2007.700	286.2000	.7560
		5.000	2023.100	297.1290	.7560
		10.000	2000.670	281.2640	.7560
		15.000	1948.150	244.1030	.7560
		20.000	1851.100	192.0860	.7560
		25.000	1725.320	133.1160	.7560
		30.000	1629.400	101.5480	.7560
		35.000	1541.070	78.9630	.7560
		40.000	1459.250	62.7820	.7560
		45.000	1382.760	50.2620	.7560
		50.000	1319.900	41.5710	.7560
		55.000	1265.750	34.8500	.7560
		60.000	1216.790	29.4320	.7560
		65.000	1171.510	25.0000	.7560
		70.000	1128.870	21.2970	.7560
		75.000	1088.610	18.2760	.7560
		80.000	1050.530	15.6740	.7560
		85.000	1013.780	13.4670	.7560
		90.000	978.090	11.5500	.7560
		95.000	942.990	9.8750	.7560
		100.000	907.840	8.3980	.7560
		105.000	872.580	7.2380	.7560
		110.000	837.150	6.1960	.7560
		115.000	802.870	5.2900	.7560
		120.000	769.740	4.5050	.7560
		125.000	737.950	3.8220	.7560
		130.000	708.050	3.2390	.7560
		269.809	680.010	2.7650	.7560
		269.819	835.340	.3110	.7560
		353.032	498.460	.0010	.7560
		INNER SHOCK POINT IS NUMBER 28			
200.000	110.380	.000	2007.700	286.2000	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
200.000	110.300	5.000	2024.860	298.3740	.7560
		10.000	2003.970	283.5660	.7560
		15.000	1952.300	247.0410	.7560
		20.000	1858.360	195.5370	.7560
		25.000	1730.600	134.8570	.7560
		30.000	1634.740	103.3070	.7560
		35.000	1545.490	79.9120	.7560
		40.000	1463.260	63.4470	.7560
		45.000	1385.920	50.6990	.7560
		50.000	1323.040	42.0060	.7560
		55.000	1268.320	35.1610	.7560
		60.000	1219.030	29.6630	.7560
		65.000	1173.560	25.1820	.7560
		70.000	1130.790	21.4430	.7560
		75.000	1090.520	18.3720	.7560
		80.000	1052.330	15.7930	.7560
		85.000	1015.500	13.5650	.7560
		90.000	979.760	11.6330	.7560
		95.000	944.690	9.9460	.7560
		100.000	909.550	8.4540	.7560
		105.000	874.310	7.2950	.7560
		110.000	838.910	6.2470	.7560
		115.000	804.530	5.3330	.7560
		120.000	771.470	4.5420	.7560
		125.000	739.520	3.8530	.7560
		130.000	709.620	3.2690	.7560
		135.000	681.520	2.7910	.7560
		140.000	654.240	2.3770	.7560
200.000	180.000	.000	2007.700	286.2000	.7560
		5.000	2049.370	316.3260	.7560
		10.000	2046.750	314.8340	.7560
		15.000	2038.820	308.8200	.7560
		20.000	2043.360	312.8350	.7560
		25.000	2033.980	305.3100	.7560
		30.000	1957.490	251.0070	.7560
		35.000	1827.740	180.7610	.7560
		40.000	1688.290	121.0650	.7560
		45.000	1577.760	86.7050	.7560
		50.000	1488.320	67.6510	.7560
		55.000	1404.690	53.7640	.7560
		60.000	1324.470	43.5890	.7560
		65.000	1274.840	35.9520	.7560
		70.000	1222.890	30.0520	.7560
		75.000	1175.810	25.3650	.7560
		80.000	1132.030	21.5750	.7560
		85.000	1091.310	18.4440	.7560
		90.000	1052.820	15.8280	.7560
		95.000	1015.910	13.5880	.7560
		100.000	980.320	11.6570	.7560
		105.000	945.820	9.9920	.7560

FLOW FIELD (CONTINUED)

Z	ETA	R	T	P	F1
200.000	180.000	110.000	911.070	8.5190	.7560
		115.000	876.700	7.3720	.7560
		120.000	842.270	6.3420	.7560
		125.000	808.710	5.4370	.7560
		130.000	776.480	4.6560	.7560
		135.000	745.690	3.9810	.7560
		140.000	716.490	3.3950	.7560

CALCULATION TIME 43.00000 SECONDS

*****AXISYMMETRIC FLOW FIELD STARTS HERE*****

ORIGINAL PAGE IS
OF POOR QUALITY

FLOW FIELD

Z	R	T	P	F1
200.000	.000	7555.0	123.6000	.7560
	20.000	7193.0	116.3000	.7560
	40.000	2914.0	102.2000	.7560
	60.000	2744.0	91.5800	.7560
	80.000	2338.0	74.2700	.7560
	100.000	2251.0	25.3800	.7560
	120.000	2192.0	18.6700	.7560
	140.000	2171.0	13.4200	.7560
	160.000	2070.0	9.6340	.7560
	180.000	2013.0	6.7340	.7560
	200.000	1958.0	4.7440	.7560
	220.000	1897.0	3.3220	.7560
	240.000	1835.0	2.3020	.7560
	260.000	1771.0	1.6280	.7560
	280.000	1716.0	1.2270	.7560
	300.000	1656.0	.8953	.7560
	320.000	1600.0	.6647	.7560
	340.000	1542.0	.4996	.7560
	360.000	1498.0	.3824	.7560
	380.000	1435.0	.2953	.7560
400.000	1387.0	.2325	.7560	
235.000	.000	3330.0	90.1400	.7560
	20.000	3041.0	79.0800	.7560
	40.000	2728.0	71.9900	.7560
	60.000	2613.0	61.1600	.7560
	80.000	2419.0	41.4000	.7560
	100.000	2144.0	21.1800	.7560
	120.000	2071.0	16.0100	.7560
	140.000	2014.0	12.1700	.7560
	160.000	1960.0	9.0400	.7560
	180.000	1915.0	6.7780	.7560
	200.000	1866.0	4.9750	.7560
	220.000	1819.0	3.5970	.7560
	240.000	1763.0	2.5680	.7560
	260.000	1720.0	2.0200	.7560
	280.000	1669.0	1.5070	.7560
	300.000	1621.0	1.1400	.7560
	320.000	1572.0	.8677	.7560
	340.000	1520.0	.6668	.7560
	360.000	1471.0	.5184	.7560
	380.000	1422.0	.4043	.7560
400.000	1378.0	.3206	.7560	
270.000	.000	3135.0	54.6600	.7560
	20.000	2896.0	55.4400	.7560
	40.000	2662.0	51.0400	.7560
	60.000	2497.0	45.7900	.7560
	80.000	2375.0	38.0100	.7560
	100.000	2272.0	26.7400	.7560
	120.000	1985.0	13.9100	.7560
	140.000	1924.0	10.7600	.7560

FLOW FIELD (CONTINUED)

Z	R	T	P	F1
270.000	160.000	1873.0	8.2670	.7560
	180.000	1827.0	6.4590	.7560
	200.000	1780.0	4.7540	.7560
	220.000	1743.0	3.7920	.7560
	240.000	1705.0	2.9200	.7560
	260.000	1662.0	2.2700	.7560
	280.000	1622.0	1.7200	.7560
	300.000	1579.0	1.3280	.7560
	320.000	1532.0	1.0320	.7560
	340.000	1488.0	.8112	.7560
	360.000	1444.0	.6399	.7560
	380.000	1402.0	.5094	.7560
	400.000	1362.0	.4090	.7560
300.000	.000	3016.0	42.8200	.7560
	20.000	2775.0	41.4800	.7560
	40.000	2566.0	39.2600	.7560
	60.000	2401.0	35.7100	.7560
	80.000	2286.0	30.9700	.7560
	100.000	2202.0	25.7500	.7560
	120.000	2080.0	18.0100	.7560
	140.000	1860.0	9.7480	.7560
	160.000	1807.0	7.6820	.7560
	180.000	1763.0	6.0930	.7560
	200.000	1725.0	4.8220	.7560
	220.000	1685.0	3.7670	.7560
	240.000	1649.0	2.9570	.7560
	260.000	1615.0	2.3390	.7560
	280.000	1577.0	1.8320	.7560
	300.000	1538.0	1.4510	.7560
	320.000	1497.0	1.1490	.7560
	340.000	1456.0	.9105	.7560
	360.000	1418.0	.7317	.7560
	380.000	1380.0	.5893	.7560
	400.000	1342.0	.4764	.7560
330.000	.000	7880.0	73.0000	.7560
	20.000	2668.0	71.7800	.7560
	40.000	2474.0	70.4400	.7560
	60.000	2320.0	78.2800	.7560
	80.000	2205.0	75.1000	.7560
	100.000	2124.0	71.6700	.7560
	120.000	2059.0	18.0100	.7560
	130.000	2050.0	17.2800	.7560
	140.000	1988.0	13.8500	.7560
	160.000	1755.0	7.1040	.7560
	180.000	1709.0	5.6890	.7560
	200.000	1670.0	4.5790	.7560
	220.000	1635.0	3.6940	.7560
	240.000	1599.0	2.9440	.7560
	260.000	1564.0	2.3570	.7560
	280.000	1530.0	1.9010	.7560

FLOW FIELD (CONTINUED)

Z	R	T	P	F1
330.000	300.000	1492.0	1.5250	.7560
	320.000	1460.0	1.2330	.7560
	340.000	1425.0	.9972	.7560
	360.000	1389.0	.8056	.7560
	380.000	1355.0	.6583	.7560
355.000	400.000	1322.0	.5396	.7560
	.000	779.0	26.7700	.7560
	20.000	2584.0	26.0900	.7560
	40.000	2400.0	24.0900	.7560
	60.000	2257.0	23.5000	.7560
	80.000	2143.0	21.1200	.7560
	100.000	2064.0	18.6700	.7560
	120.000	2001.0	15.9500	.7560
	130.000	1985.0	15.7400	.7560
	140.000	1952.0	13.2900	.7560
	160.000	1877.0	8.8850	.7560
	180.000	1670.0	5.3820	.7560
	200.000	1628.0	4.3560	.7560
	220.000	1595.0	3.5690	.7560
	240.000	1561.0	2.9100	.7560
260.000	1524.0	2.3530	.7560	
280.000	1491.0	1.9170	.7560	
300.000	1459.0	1.5630	.7560	
320.000	1426.0	1.2740	.7560	
340.000	1397.0	1.0480	.7560	
360.000	1365.0	.8603	.7560	
380.000	1333.0	.7056	.7560	
400.000	1304.0	.5837	.7560	
390.000	.000	2680.0	21.9000	.7560
	20.000	2503.0	21.5100	.7560
	40.000	2334.0	20.7000	.7560
	60.000	2200.0	19.5400	.7560
	80.000	2088.0	17.9400	.7560
	100.000	2008.0	16.0500	.7560
	120.000	1948.0	14.0900	.7560
	140.000	1896.0	11.9800	.7560
	150.000	1890.0	11.5200	.7560
	160.000	1856.0	10.0200	.7560
	180.000	1694.0	7.0020	.7560
	200.000	1595.0	4.1740	.7560
	220.000	1556.0	3.4300	.7560
	240.000	1521.0	2.8320	.7560
	260.000	1487.0	2.3330	.7560
	280.000	1456.0	1.9210	.7560
	300.000	1425.0	1.5820	.7560
	320.000	1395.0	1.3020	.7560
	340.000	1366.0	1.0780	.7560
	360.000	1339.0	.8987	.7560
380.000	1312.0	.7476	.7560	
400.000	1284.0	.6211	.7560	
410.000	.000	2570.0	17.4800	.7560

FLOW FIELD (CONTINUED)

Z	R	T	D	F1
410.000	20.000	2410.0	17.2300	.7560
	40.000	2251.0	16.8300	.7560
	60.000	2132.0	15.9200	.7560
	80.000	2028.0	14.8200	.7560
	100.000	1949.0	13.4900	.7560
	120.000	1887.0	12.0300	.7560
	140.000	1838.0	10.5300	.7560
	160.000	1796.0	9.0000	.7560
	180.000	1763.0	7.6250	.7560
	190.000	1755.0	7.2000	.7560
	200.000	1711.0	6.0650	.7560
	220.000	1513.0	3.2680	.7560
	240.000	1479.0	2.7290	.7560
	260.000	1446.0	2.2720	.7560
	280.000	1415.0	1.8930	.7560
	300.000	1388.0	1.5870	.7560
	320.000	1361.0	1.3260	.7560
	340.000	1333.0	1.1050	.7560
	360.000	1307.0	.9246	.7560
	380.000	1284.0	.7804	.7560
400.000	1260.0	.6587	.7560	
435.000	.000	2485.0	14.6900	.7560
	20.000	2378.0	14.4900	.7560
	40.000	2275.0	14.3100	.7560
	60.000	2090.0	13.5700	.7560
	80.000	1990.0	12.6600	.7560
	100.000	1904.0	11.7300	.7560
	120.000	1842.0	10.5800	.7560
	140.000	1792.0	9.3940	.7560
	160.000	1752.0	8.2140	.7560
	180.000	1718.0	7.0530	.7560
	200.000	1687.0	5.9930	.7560
	220.000	1658.0	5.0390	.7560
	240.000	1447.0	2.6390	.7560
	260.000	1415.0	2.2170	.7560
	280.000	1384.0	1.8600	.7560
	300.000	1357.0	1.5670	.7560
	320.000	1333.0	1.3290	.7560
	340.000	1309.0	1.1210	.7560
	360.000	1284.0	.9437	.7560
	380.000	1260.0	.7968	.7560
400.000	1239.0	.6791	.7560	
460.000	.000	2398.0	12.2300	.7560
	20.000	2271.0	12.2500	.7560
	40.000	2150.0	12.1700	.7560
	60.000	2033.0	11.6400	.7560
	80.000	1936.0	10.9700	.7560
	100.000	1861.0	10.2100	.7560
	120.000	1800.0	9.3370	.7560
	140.000	1750.0	8.3610	.7560

ORIGINAL PAGE IS
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FLOW FIELD (CONTINUED)

Z	R	T	D	F1	
460.000	160.000	1711.0	7.4440	.7560	
	180.000	1678.0	6.5080	.7560	
	200.000	1648.0	5.6020	.7560	
	220.000	1620.0	4.7950	.7560	
	240.000	1512.0	3.3140	.7560	
	260.000	1387.0	2.1590	.7560	
	280.000	1358.0	1.8270	.7560	
	300.000	1329.0	1.5430	.7560	
	320.000	1306.0	1.3160	.7560	
	340.000	1284.0	1.1240	.7560	
	360.000	1262.0	.9573	.7560	
	380.000	1239.0	.8126	.7560	
	400.000	1218.0	.6914	.7560	
	495.000	.000	2325.0	10.4400	.7560
		20.000	2210.0	10.5400	.7560
		40.000	2097.0	10.4700	.7560
60.000		1990.0	10.0900	.7560	
80.000		1895.0	9.4930	.7560	
100.000		1821.0	8.9060	.7560	
120.000		1762.0	8.2490	.7560	
140.000		1713.0	7.4840	.7560	
160.000		1672.0	6.7080	.7560	
180.000		1639.0	5.9570	.7560	
200.000		1611.0	5.2290	.7560	
220.000		1584.0	4.5200	.7560	
240.000		1555.0	3.9860	.7560	
260.000		1523.0	3.3280	.7560	
280.000		1332.0	1.7850	.7560	
300.000		1306.0	1.5220	.7560	
320.000	1208.0	1.2940	.7560		
340.000	1260.0	1.1160	.7560		
360.000	1240.0	.9595	.7560		
380.000	1219.0	.8241	.7560		
400.000	1198.0	.7060	.7560		
510.000	.000	2257.0	8.9920	.7560	
	20.000	2153.0	9.1200	.7560	
	40.000	2047.0	9.0350	.7560	
	60.000	1947.0	8.7610	.7560	
	80.000	1856.0	8.2970	.7560	
	100.000	1784.0	7.8130	.7560	
	120.000	1726.0	7.2930	.7560	
	140.000	1678.0	6.7040	.7560	
	160.000	1638.0	6.0670	.7560	
	180.000	1603.0	5.4330	.7560	
	200.000	1575.0	4.8370	.7560	
	220.000	1547.0	4.2500	.7560	
	240.000	1510.0	3.6950	.7560	
	260.000	1470.0	3.2020	.7560	
	280.000	1433.0	2.7580	.7560	
	300.000	1295.0	1.4960	.7560	

FLOW FIELD (CONTINUED)

Z	R	T	P	F1
510.000	320.000	1260.0	1.2820	.7560
	340.000	1238.0	1.1020	.7560
	360.000	1218.0	.9547	.7560
530.000	380.000	1199.0	.8265	.7560
	400.000	1180.0	.7151	.7560
	.000	2218.0	8.2330	.7560
	20.000	2110.0	8.1630	.7560
	40.000	2009.0	8.0420	.7560
	60.000	1914.0	7.8530	.7560
	80.000	1828.0	7.4950	.7560
	100.000	1756.0	7.0700	.7560
	120.000	1698.0	6.6190	.7560
	140.000	1652.0	6.1390	.7560
	160.000	1612.0	5.6010	.7560
	180.000	1576.0	5.0450	.7560
	200.000	1545.0	4.5330	.7560
	220.000	1517.0	4.0220	.7560
	240.000	1491.0	3.5390	.7560
260.000	1465.0	3.0820	.7560	
280.000	1437.0	2.6870	.7560	
300.000	1388.0	2.1540	.7560	
320.000	1244.0	1.2670	.7560	
340.000	1221.0	1.0910	.7560	
360.000	1201.0	.9474	.7560	
380.000	1183.0	.8243	.7560	
400.000	1165.0	.7172	.7560	
555.000	.000	2160.0	7.2150	.7560
	20.000	2059.0	7.1410	.7560
	40.000	1963.0	7.0440	.7560
	60.000	1874.0	6.8720	.7560
	80.000	1793.0	6.6060	.7560
	100.000	1724.0	6.2650	.7560
	120.000	1666.0	5.8870	.7560
	140.000	1620.0	5.4980	.7560
	160.000	1581.0	5.0690	.7560
	180.000	1542.0	4.6160	.7560
	200.000	1508.0	4.1650	.7560
	220.000	1482.0	3.7470	.7560
	240.000	1457.0	3.3320	.7560
	260.000	1433.0	2.9390	.7560
	280.000	1410.0	2.5850	.7560
300.000	1384.0	2.2580	.7560	
320.000	1363.0	1.9580	.7560	
340.000	1203.0	1.0790	.7560	
360.000	1182.0	.9393	.7560	
380.000	1164.0	.8196	.7560	
400.000	1146.0	.7161	.7560	
575.000	.000	2117.0	6.5290	.7560
	20.000	2020.0	6.4490	.7560
	40.000	1929.0	6.3480	.7560

FLOW FIELD (CONTINUED)

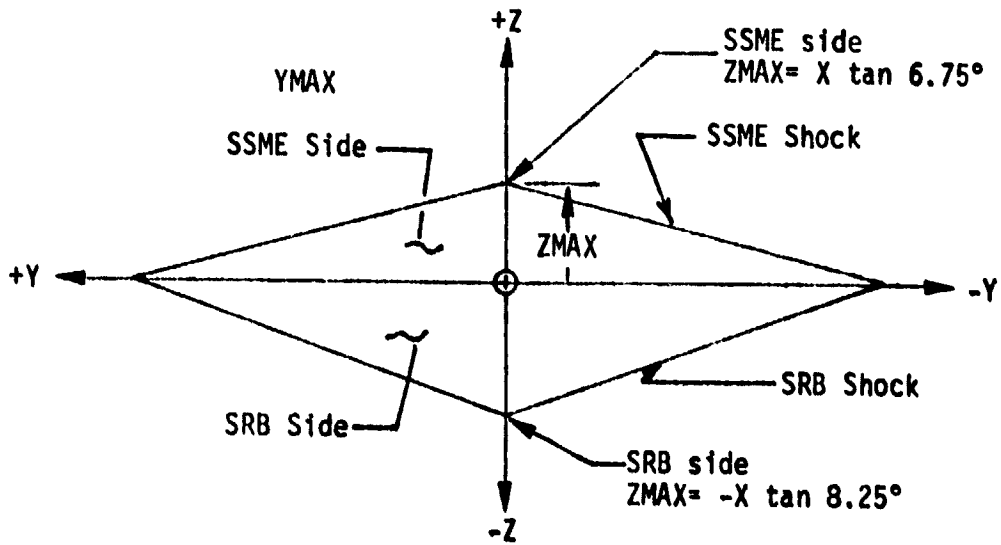
Z	R	T	P	F1
575.000	60.000	1842.0	6.1950	.7560
	80.000	1766.0	5.9890	.7560
	100.000	1700.0	5.7120	.7560
	120.000	1642.0	5.3800	.7560
	140.000	1596.0	5.0350	.7560
	160.000	1554.0	4.6800	.7560
	180.000	1516.0	4.2950	.7560
	200.000	1482.0	3.8980	.7560
	220.000	1455.0	3.5250	.7560
	240.000	1431.0	3.1650	.7560
	260.000	1409.0	2.8180	.7560
	280.000	1387.0	2.4910	.7560
	300.000	1363.0	2.1970	.7560
	320.000	1341.0	1.9230	.7560
	340.000	1323.0	1.6730	.7560
	595.000	360.000	1169.0	.9280
380.000		1150.0	.8153	.7560
400.000		1131.0	.7142	.7560
.000		2073.0	5.8800	.7560
20.000		1995.0	5.9590	.7560
40.000		1896.0	5.7460	.7560
60.000		1812.0	5.6050	.7560
80.000		1710.0	5.4390	.7560
100.000		1676.0	5.2190	.7560
120.000		1620.0	4.9280	.7560
140.000		1572.0	4.6270	.7560
160.000		1529.0	4.3180	.7560
180.000		1492.0	3.9940	.7560
200.000		1458.0	3.6470	.7560
220.000		1430.0	3.3150	.7560
240.000		1406.0	2.9960	.7560
260.000	1385.0	2.6910	.7560	
280.000	1364.0	2.3960	.7560	
300.000	1343.0	2.1290	.7560	
320.000	1321.0	1.8800	.7560	
330.000	1318.0	1.7600	.7560	
340.000	1302.0	1.6500	.7560	
360.000	1229.0	1.1900	.7560	
380.000	1136.0	.8088	.7560	
390.000	1116.0	.7340	.7560	
400.000	1118.0	.7121	.7560	

NG - GAS TEMP RANGE OF 100.0 TO 232.7 IS OUTSIDE THE RANGE OF COEFFICIENT TABLE

CALCULATION TIME 15.0000 SECONDS

ORIGINAL PAGE IS
OF POOR QUALITY

SSME/SRB PLUME INTERSECTION
AT 100,000 FEET



PLUME NOMENCLATURE