

Appendix : A-1

NOMENCLATURE

W	:	width of the enclosure in m.
H	:	gap height in the enclosure in m.
AR	:	aspect ratio of the enclosure
T_s	:	bottom surface temperature in °C.
T_l	:	temperature of remaining surface in °C.
T	:	temperature of the fluid in °C.
T_o	:	reference temperature of the fluid in °C.
ΔT	:	temperature difference in °C.
ρ	:	fluid density in Kg/m^3 .
ρ_o	:	reference density of the fluid in Kg/m^3 .
x, y	:	cartesian co-ordinates in m.
x_i, x_j	:	cartesian co-ordinates in m.
u, v	:	Cartesian velocity components in m/s
u_i, u_j	:	cartesian velocity components in m/s
ϕ	:	enclosure inclination with reference to horizontal in degree.
X_i	:	specific body force in i-direction in Kg_f/m^3 .
δ	:	differential notation used in art.2
β	:	volumetric coefficient of thermal expansion in m^3/m^3 per °C temp. difference.
g	:	gravitational acceleration in m/s^2 .

A	:	area of the region of interest in m^2 .
I	:	line integral
γ	:	angle made by the normal n with the horizontal.
s	:	distance along the boundary in m .
χ	:	functional from the variational formulation
m	:	number of elements in the finite element grid.
e	:	any element considered
E	:	last element
$[K]$	:	$m \times m$ global conduction matrix
$[F]$	:	$m \times 1$ function vector
$[Q]$	:	$m \times 1$ generation vector.
$[D^e]$	:	$m \times 3$ element displacement matrix
$[D^e]^T$	:	transpose of $[D^e]$ matrix
$[K^e]$	:	3×3 element conduction matrix
$[\psi]$	:	$m \times 1$ stream function vector
$[\theta]$	:	$m \times 1$ temperature function vector
$[\omega]$	:	$m \times 1$ vorticity function vector
$[Q_\psi]$	:	$m \times 1$ stream function generation vector
$[Q_\theta]$	:	$m \times 1$ temperature function generation vector
$[Q_\omega]$	:	$m \times 1$ vorticity function generation vector.

ν	:	kinematic viscosity of the fluid in m^2/s .
α	:	thermal diffusivity of the fluid in m^2/s .
p	:	fluid pressure in Kg_f/m^2 .
ξ, η	:	non-dimensional cartesian co-ordinates.
u^*, v^*, P^*	:	parameters in non-dimensional form
ψ	:	stream function (dimensionless)
θ	:	dimensionless temperature of the fluid.
ω	:	vorticity function (dimensionless)
Pr	:	Prandtl number (dimensionless).
Ra	:	Rayleigh number (dimensionless)
Ra_{ov}	:	Rayleigh number for overflow condition.
Ra_{c1}	:	first critical Rayleigh Number
Ra_{c2}	:	second critical Rayleigh number.
Nu	:	Nusselt number, gap Nusselt number (dimensionless).
h	:	film coefficient, gap conductance in $\text{kcal}/\text{m}^2, \text{hr}, ^\circ\text{C}$.
n	:	direction normal to the enclosure boundary in m.
$A, B, C, D,$ E, F, G	:	coefficients of a p.d. equation.
λ	:	a parameter defining the type of a p.d. equation.
Q	:	generation term, source term.
F	:	normalised temperature function
$F_1, F_2, \dots$ $F_1, \dots, F_n$	:	normalised temperature function for n elements.

APPENDIX : A-2

VARIABLE NAMES USED IN THE PROGRAMME

A	:	A term of a generation function
AI,AJ,AK	:	Arrays defining element dimensions.
ALFA	:	Thermal diffusivity α in m^2/s
ALPHA	:	Intermediate variable for ψ , θ , ω , T_s , T_1 etc.
ANU	:	Kinematic viscosity ν in m^2/s
AR	:	Aspect ratio
AREA	:	area of the element
AVNU	:	Average value of Nusselt number
AVTEMP	:	Average value of temperature
B	:	Array for forming element stiffness matrix.
BCS	:	Subroutine giving boundary conditions
BI,BJ,BK	:	Arrays defining element dimensions.
BIG	:	Intermediate variable for ψ
BLANK	:	Intermediate variable for halting scroll on screen.

C	:	A term of a generation function
CEQNS	:	Name for a labelled common block
CHECK	:	Tolerance level for global convergence of θ .
CHECK 1	:	Error in ψ at the end of a global iteration.
CHECK 2	:	Error in θ at the end of a global iteration.
CHECK 3	:	Error in ω at the end of a global iteration.
CMESH	:	Name for a labelled common block
CMPAR	:	Name for a labelled common block.
CONDU	:	Thermal conductivity in Kcal/m.hr. $^{\circ}$ C.
D	:	A term of a generation function
DATA	:	Name for a labelled common block
DATA1	:	Name for a labelled common block
DATE	:	12 character date to be entered at execution time.
DELD	:	Variable giving differences of DELTA
DELN	:	Variable for Δn
DELTA	:	Variable designating a function to be determined.
DELX	:	Variable for Δx .
DELY	:	Variable for Δy .
DIMEN	:	Name for a labelled common block.
DPSY	:	Variable for $\Delta \psi$
DOMEGA	:	Variable for $\Delta \omega$

DT	:	Variable for ΔT
DTHETA	:	Variable for $\Delta \theta$
E	:	A term of generation function
ECK	:	Tolerance level for global convergence of Ψ and ω
ERROR	:	Error at the end of a local iteration.
ESTIFF	:	Variable containing element stiffness matrix
F	:	Variable designating global generation function.
FACT	:	Variable designating a factor.
FM	:	Variable designating element generation function
H	:	Gap height of the enclosure in m.
HAV	:	Average gap conductance in $\text{Kcal/m}^2 \cdot \text{hr.}^\circ\text{C}$
HSTART	:	Initial gap height in m.
HSTEP	:	Interval in gap height in m.
HSTOP	:	Final gap height in m.
I,J,K	:	Element node numbers, i,j,k.
IC	:	Contains OSTIFF storage information.

ICE	:	Counter for element j of a column of ESTIFF
ICMAX	:	Maximum value of IC
ICOL	:	Counter for element j of a column of OSTIFF
IFREQ	:	Frequency of obtaining local solution output
IJK	:	Matrix storing order of node numbers
IRE	:	Counter for element i of a row of ESTIFF
IROW	:	Counter for element i of a row of OSTIFF
IROWM	:	Counter for element i - NXPT
IROWM ₁	:	Counter for element i-1
IROWN	:	Counter for element i + NXPT
ITER	:	No.of iterations
IX	:	Variable giving x-wise location of nodal point.
IXM ₁	:	Variable giving IX-1
IY	:	Variable giving y-wise location of nodal point.
IYM ₁	:	Variable giving IY-1
IZZ	:	Counter for element i +1
KOUNT	:	Counter for directing the computer appropriately.
L	:	Variabale defining output unit number.

M	:	Element number
M1	:	Variable used in MESH Subroutine
M2	:	Variable used in MESH subroutine
MESH	:	Subroutine giving mesh co-ordinates
MODIFY	:	Subroutine modifying MESH for a given AR
MOUT	:	Variable deciding printing / not printing of a grid data.
MSHOUT	:	Subroutine giving print out of grid data for MOUT < > 0
NAP	:	Stores nodal point information for OSTIFF
NBP	:	Number of boundary points
NCYCLE	:	No.of cycles for a local solution
NEL	:	Number of elements
NEQN	:	Number of equations to be solved
NHIGH	:	Variable used in BCS subroutine
NLOW	:	Variable used in BCS subroutine
NNP	:	Number of nodal points
NPA	:	Stores nodal point information for OSTIFF
NPB	:	Stores nodal point numbers located on the boundary
NPI	:	Variable giving nodal point number corres- ponding to I

NPJ	:	Variable giving nodal point number corresponding to J
NPJ	:	Variable giving nodal point number corresponding to K
NSQ	:	Variable used in MESH subroutine
NTRIAL	:	No. of trials for a global solution
NXEL, NYEL	:	No. of x-wise and y-wise elements
NXPT, NYPT	:	No. of x-wise and y-wise nodal points
NXPTM1, NYPTM1	:	Variables for NXPT-1 and NYPT-1 respectively
NXPTM2	:	Variable for NXPT-2
OMEGA	:	Vorticity function ω
OMEGA1	:	Generation term for ω
OMEGAN	:	Recent value of ω
OMEGA0	:	Old value of ω
ORELAX	:	Over-relaxation factor
OSTIFF	:	Stores stiffness(conduction) matrix coefficients.
OUTPUT	:	Subroutine giving local solution output
PHI	:	Enclosure orientation with reference to horizontal in rad.
PHI1	:	Generation term for conduction
PHI1F	:	Subroutine that gives PHI1 function

PHID	:	Enclosure orientation in deg.
PR	:	Prandtl number
PSY	:	Stream function ψ
PSY1	:	Generation term for ψ
PSYN	:	Recent value of ψ
PSYO	:	Old value of ψ
PSYDEL	:	Differential stream function $\Delta\psi$
Q	:	Rate of heat transfer in Kcal/hr.
RA	:	Rayleigh number
SCALE	:	Variable designating W/H i.e. aspect ratio
SOLVE1	:	Subroutine giving local solutions of ψ , θ , ω
SUMD	:	Accumulated value of DELTA
SUMDD	:	Accumulated value of differences of DELTA
TCOND	:	Temperature for conduction solution
THETA	:	Temperature function θ
THETA1	:	Generation term for θ
THETAN	:	Recent value of θ
THETA0	:	Old value of θ

TITLE : 80 Character title to be entered at execution time.

TOLER : Tolerance level for local convergence

TREF : Reference temperature in °C

TS,TL : Temperatures °C

UNIT : Name for a labelled common block

W : Width of the enclosure in m.

XAI,YAI : Variables giving location of a nodal point

XDIFF : Variable for $x_j - x_i$

X,Y : Variables giving location of a nodal point

YDIFF : Variable for $y_k - y_i$

Z : A term of a generation function.

APPENDIX : A-3

NORMALISATION OF GOVERNING EQUATIONS

Governing equations for the present problem of free convection in rectangular enclosures, where Boussinesq approximation was used, were stated in an earlier article (eqns. 2.1, 2.2, 2.3 and 2.4). These equations are reproduced here, so as to analyse them for normalisation, which is more suitable for computerisation. These equations are :

i) Mass conservation equation :

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0 \quad \dots \quad (1)$$

ii) Momentum conservation equations :

$$u \frac{\partial u}{\partial x} + v \frac{\partial u}{\partial y} = -\frac{1}{\rho_0} \cdot \frac{\partial p}{\partial x} + \nu \left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} \right) \quad \dots \quad (2)$$

$$u \frac{\partial v}{\partial x} + v \frac{\partial v}{\partial y} = -\frac{1}{\rho_0} \cdot \frac{\partial p}{\partial y} + \beta g (T - T_0) + \nu \left(\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2} \right) \quad \dots \quad (3)$$

iii) Energy conservation equation :

$$u \frac{\partial T}{\partial x} + v \frac{\partial T}{\partial y} = \alpha \left(\frac{\partial^2 T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} \right) \quad \dots \quad (4)$$

Above equations are normalised i.e. converted into dimensionless form, by using normalising parameters, defined by :

$$\xi = x/H, \quad \eta = y/H$$

$$u^* = uH/\alpha, \quad v^* = vH/\alpha \quad \dots \quad (5)$$

$$p^* = pH^2/\rho_0\alpha^2, \quad \theta = (T-T_l)/(T_s-T_l) = \frac{(T-T_l)}{T_{ref}}$$

We shall normalise each of the above four equations, in turn now, using the above normalising parameters.

Normalisation of mass conservation equation :

Multiplying eqn. 1 by the factor H/α which remains invariant in the cartesian co-ordinate system, during differentiation, we get,

$$\begin{aligned} \frac{\partial u^*}{\partial x} + \frac{\partial v^*}{\partial y} &= 0 \\ \text{i.e. } \frac{\partial u^*}{\partial \xi} \cdot \frac{\partial \xi}{\partial x} + \frac{\partial v^*}{\partial \eta} \cdot \frac{\partial \eta}{\partial y} &= 0 \\ \text{i.e. } \frac{1}{H} \left\{ \frac{\partial u^*}{\partial \xi} + \frac{\partial v^*}{\partial \eta} \right\} &= 0 \\ \text{i.e. } \frac{\partial u^*}{\partial \xi} + \frac{\partial v^*}{\partial \eta} &= 0 \quad \dots \quad (6) \end{aligned}$$

Above equation is the mass conservation equation, in dimensionless form. The equation can still, be further normalised.

Let $u^* = \partial\psi/\partial\eta$ and $v^* = -\partial\psi/\partial\xi$ where ψ is the stream function, defined by u^* & v^* . It may be varified that above hypothesis is satisfied by eqn. (6), on substitution in it.

Now we introduce a circulation parameter, or vorticity function ω , defined by :

$$\omega = \frac{\partial v^*}{\partial \xi} - \frac{\partial u^*}{\partial \eta} \quad \dots \quad (7)$$

Substituting $v^* = -\frac{\partial \psi}{\partial \xi}$ and $u^* = \frac{\partial \psi}{\partial \eta}$ in the above equation, and simplifying, we obtain :

$$\frac{\partial^2 \psi}{\partial \xi^2} + \frac{\partial^2 \psi}{\partial \eta^2} = -\omega \quad \dots \quad (8)$$

Above equation is the normalised form of mass conservation equation, used in the present analysis, stated as eqn. 2.5, in an earlier article.

Normalisation of momentum conservation equations :

There are two momentum conservation equations e.g. x - momentum equation (eqn.2) and y - momentum equation (eqn.3), which are to be normalised simultaneously.

Now, as $\theta = (T-T_1)/(T_s-T_1) = (T-T_1)/T_{ref}$,

$$T = \theta T_{ref} + T_1 \text{ and } T_{ref} = T_s - T_1$$

Also, as $T_0 = (T_s+T_1)/2$, we get :

$$(T-T_0) = \theta T_{ref} + T_1 - T_s/2 - T_1/2 = \theta T_{ref} - \frac{1}{2} (T_s+T_1)$$

$$\text{i.e. } (T-T_0) = T_{ref} (\theta - \frac{1}{2}) \quad \dots \quad (9)$$

Now,

$$\frac{\partial p}{\partial x} = \frac{\partial \{p^* \rho_0 \alpha^2 / H^2\}}{\partial \xi} \cdot \frac{\partial \xi}{\partial x} = \frac{\rho_0 \alpha^2}{H^3} \cdot \frac{\partial p^*}{\partial \xi} \quad \dots \quad (10)$$

Similarly,

$$\frac{\partial p}{\partial y} = \frac{\rho_0 \alpha^2}{H^3} \cdot \frac{\partial p^*}{\partial \eta} \quad \dots \quad (11)$$

Also, $u^* = uH/\alpha = \frac{\partial \psi}{\partial \eta}$ gives us,

$$u = \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \eta} \quad \text{i.e.} \quad \frac{\partial u}{\partial x} = \frac{\partial u}{\partial \xi} \cdot \frac{\partial \xi}{\partial x} \quad \text{giving,}$$

$$\frac{\partial u}{\partial x} = \frac{\alpha}{H^2} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} \quad \dots \quad (12)$$

$$\therefore \frac{\partial^2 u}{\partial x^2} = \frac{\partial}{\partial x} \left(\frac{\partial u}{\partial x} \right) = \frac{\partial}{\partial \xi} \left(\frac{\alpha}{H^2} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} \right) \cdot \frac{\partial \xi}{\partial x}$$

$$\therefore \frac{\partial^2 u}{\partial x^2} = \frac{\alpha}{H^3} \cdot \frac{\partial^3 \psi}{\partial \xi^2 \partial \eta} \quad \dots \quad (13)$$

Also, $\frac{\partial u}{\partial y} = \frac{\partial u}{\partial \eta} \cdot \frac{\partial \eta}{\partial y}$ giving,

$$\frac{\partial u}{\partial y} = \frac{\alpha}{H^2} \cdot \frac{\partial^2 \psi}{\partial \eta^2} \quad \dots \quad (14)$$

$$\frac{\partial^2 u}{\partial y^2} = \frac{\alpha}{H^3} \cdot \frac{\partial^3 \psi}{\partial \eta^3} \quad \dots \quad (15)$$

Substituting eqns. (9) to (15) in eqn. (2), stated earlier, we obtain:

$$\begin{aligned} \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \eta} \cdot \frac{\alpha}{H^2} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} - \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \xi} \cdot \frac{\alpha}{H^2} \cdot \frac{\partial^2 \psi}{\partial \eta^2} \\ = -\frac{1}{\xi_0} \cdot \frac{\xi_0 \alpha^2}{H^3} \cdot \frac{\partial P^*}{\partial \xi} + \nu \left\{ \frac{\alpha}{H^3} \cdot \frac{\partial^3 \psi}{\partial \xi^2 \partial \eta} + \frac{\alpha}{H^3} \cdot \frac{\partial^3 \psi}{\partial \eta^3} \right\} \end{aligned}$$

Multiplying the above equation by H^3/α^2 on both the sides, we get,

$$\frac{\partial \psi}{\partial \eta} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} - \frac{\partial \psi}{\partial \xi} \cdot \frac{\partial^2 \psi}{\partial \eta^2} = -\frac{\partial P^*}{\partial \xi} + \frac{\nu}{\alpha} \left\{ \frac{\partial^3 \psi}{\partial \xi^2 \partial \eta} + \frac{\partial^3 \psi}{\partial \eta^3} \right\}$$

As $\frac{v}{\alpha} = Pr$, above equation can be re-arranged to obtain,

$$\frac{\partial p^*}{\partial \xi} = Pr \left\{ \frac{\partial^3 \psi}{\partial \xi^2 \partial \eta} + \frac{\partial^3 \psi}{\partial \eta^3} \right\} + \frac{\partial \psi}{\partial \xi} \cdot \frac{\partial^2 \psi}{\partial \eta^2} - \frac{\partial \psi}{\partial \eta} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta}$$

Differentiating the above equation with respect to η , we obtain,

$$\begin{aligned} \frac{\partial^2 p^*}{\partial \xi \partial \eta} = Pr & \left\{ \frac{\partial^4 \psi}{\partial \xi^2 \partial \eta^2} + \frac{\partial^4 \psi}{\partial \eta^4} \right\} + \frac{\partial \psi}{\partial \xi} \cdot \frac{\partial^3 \psi}{\partial \eta^3} + \frac{\partial^2 \psi}{\partial \eta^2} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} \\ & - \frac{\partial \psi}{\partial \eta} \cdot \frac{\partial^3 \psi}{\partial \xi \partial \eta^2} - \frac{\partial^2 \psi}{\partial \xi \partial \eta} \cdot \frac{\partial^2 \psi}{\partial \eta^2} \dots \end{aligned} \quad (16)$$

We shall now obtain a similar relation by normalising eqn.3, as under:

We have, from eqn.5 and definitions of u^* and v^* ,

$$u = \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \eta} \quad \dots \quad (17)$$

and

$$v = - \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \xi} \quad \dots \quad (18)$$

Therefore,

$$\frac{\partial v}{\partial x} = - \frac{\alpha}{H^2} \cdot \frac{\partial^2 \psi}{\partial \xi^2} \quad \dots \quad (19)$$

$$\frac{\partial v}{\partial y} = - \frac{\alpha}{H^2} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} \quad \dots \quad (20)$$

$$\frac{\partial^2 v}{\partial x^2} = \frac{\partial}{\partial x} \left(\frac{\partial v}{\partial x} \right) = - \frac{\alpha}{H^3} \cdot \frac{\partial^3 \psi}{\partial \xi^3} \quad \dots \quad (21)$$

$$\frac{\partial^2 v}{\partial y^2} = \frac{\partial}{\partial y} \left(\frac{\partial v}{\partial y} \right) = - \frac{\alpha}{H^3} \cdot \frac{\partial^3 \psi}{\partial \xi \partial \eta^2} \quad \dots \quad (22)$$

Also,

$$\frac{\partial p}{\partial y} = \frac{\rho_0 \alpha^2}{H^3} \cdot \frac{\partial p^*}{\partial \eta} \quad \dots \quad (23)$$

And

$$g\beta (T-T_0) = g\beta T_{ref} \cdot (\theta - \frac{1}{2}) \quad \dots \quad (24)$$

Substituting eqns.17 to 24 in eqn.3, we obtain,

$$\begin{aligned} & - \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \eta} \cdot \frac{\alpha}{H^2} \cdot \frac{\partial^2 \psi}{\partial \xi^2} + \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \xi} \cdot \frac{\alpha}{H^2} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} \\ & = - \frac{1}{\rho_0} \cdot \frac{\rho_0 \alpha^2}{H^3} \cdot \frac{\partial p^*}{\partial \eta} + g\beta T_{ref} \left(\theta - \frac{1}{2} \right) + \nu \left\{ - \frac{\alpha}{H^3} \cdot \frac{\partial^3 \psi}{\partial \xi^3} - \frac{\alpha}{H^3} \cdot \frac{\partial^3 \psi}{\partial \xi \partial \eta^2} \right\} \end{aligned}$$

Multiplying the above equation by H^3/α^2 on both the sides, we get,

$$\frac{\partial \psi}{\partial \xi} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} - \frac{\partial \psi}{\partial \eta} \cdot \frac{\partial^2 \psi}{\partial \xi^2} = - \frac{\partial p^*}{\partial \eta} + \frac{g\beta T_{ref} H^3}{\alpha^2} \cdot \left(\theta - \frac{1}{2} \right) - \frac{\nu}{\alpha} \left\{ \frac{\partial^3 \psi}{\partial \xi^3} + \frac{\partial^3 \psi}{\partial \xi \partial \eta^2} \right\}$$

$$\text{As } \frac{g\beta T_{ref} H^3}{\alpha^2} = \frac{g\beta T_{ref} H^3}{\nu \alpha} \cdot \frac{\nu}{\alpha} = Ra \cdot Pr \quad \text{and}$$

$\frac{\nu}{\alpha} = Pr$, above equation can be re-arranged to obtain,

$$\begin{aligned} \frac{\partial p^*}{\partial \eta} & = - Pr \left\{ \frac{\partial^3 \psi}{\partial \xi \partial \eta^2} + \frac{\partial^3 \psi}{\partial \xi^3} \right\} + Ra \cdot Pr \cdot \left(\theta - \frac{1}{2} \right) \\ & \quad + \frac{\partial \psi}{\partial \eta} \cdot \frac{\partial^2 \psi}{\partial \xi^2} - \frac{\partial \psi}{\partial \xi} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} \end{aligned}$$

Differentiating the above equation with respect to ξ , we get,

$$\begin{aligned} \frac{\partial^2 p^*}{\partial \xi \partial \eta} = & -Pr \left\{ \frac{\partial^4 \psi}{\partial \xi^2 \partial \eta^2} + \frac{\partial^4 \psi}{\partial \xi^4} \right\} + Ra \cdot Pr \cdot \frac{\partial \theta}{\partial \xi} + \frac{\partial \psi}{\partial \eta} \cdot \frac{\partial^3 \psi}{\partial \xi^3} \\ & + \frac{\partial^2 \psi}{\partial \xi^2} \cdot \frac{\partial^2 \psi}{\partial \xi \partial \eta} - \frac{\partial \psi}{\partial \xi} \cdot \frac{\partial^3 \psi}{\partial \xi^2 \partial \eta} - \frac{\partial^2 \psi}{\partial \xi \partial \eta} \cdot \frac{\partial^2 \psi}{\partial \xi^2} \\ & \dots \end{aligned} \quad (25)$$

Subtracting eqn. 16 from eqn. 25, we obtain,

$$\begin{aligned} 0 = & -Pr \left\{ \frac{\partial^4 \psi}{\partial \xi^4} + 2 \frac{\partial^4 \psi}{\partial \xi^2 \partial \eta^2} + \frac{\partial^4 \psi}{\partial \eta^4} \right\} + Ra \cdot Pr \cdot \frac{\partial \theta}{\partial \xi} \\ & + \frac{\partial \psi}{\partial \eta} \left\{ \frac{\partial^3 \psi}{\partial \xi^3} + \frac{\partial^3 \psi}{\partial \xi \partial \eta^2} \right\} + \frac{\partial^2 \psi}{\partial \xi \partial \eta} \left\{ \frac{\partial^2 \psi}{\partial \xi^2} - \frac{\partial^2 \psi}{\partial \eta^2} \right\} \\ & - \frac{\partial \psi}{\partial \xi} \left\{ \frac{\partial^3 \psi}{\partial \xi^2 \partial \eta} + \frac{\partial^3 \psi}{\partial \eta^3} \right\} - \frac{\partial^2 \psi}{\partial \xi \partial \eta} \left\{ \frac{\partial^2 \psi}{\partial \xi^2} - \frac{\partial^2 \psi}{\partial \eta^2} \right\} \\ & \dots \end{aligned} \quad (26)$$

Now, we have, from eqn.8 earlier, which defines ω ,

$$\omega = - \frac{\partial^2 \psi}{\partial \xi^2} - \frac{\partial^2 \psi}{\partial \eta^2} \quad \dots \quad (27)$$

This gives,

$$\frac{\partial \omega}{\partial \xi} = - \left\{ \frac{\partial^3 \psi}{\partial \xi^3} + \frac{\partial^3 \psi}{\partial \xi \partial \eta^2} \right\} \quad \dots \quad (28)$$

and

$$\frac{\partial \omega}{\partial \eta} = - \left\{ \frac{\partial^3 \psi}{\partial \xi^2 \partial \eta} + \frac{\partial^3 \psi}{\partial \eta^3} \right\} \quad \dots \quad (29)$$

Differentiating eqn.28 with respect to ξ and eqn.29 with respect to η , we get,

$$\frac{\partial^2 \omega}{\partial \xi^2} = - \left\{ \frac{\partial^4 \psi}{\partial \xi^4} + \frac{\partial^4 \psi}{\partial \xi^2 \partial \eta^2} \right\} \quad \dots \quad (30)$$

and

$$\frac{\partial^2 \omega}{\partial \eta^2} = - \left\{ \frac{\partial^4 \psi}{\partial \xi^2 \partial \eta^2} + \frac{\partial^4 \psi}{\partial \eta^4} \right\} \quad \dots \quad (31)$$

Adding the above two equations, on both sides,

$$\frac{\partial^2 \omega}{\partial \xi^2} + \frac{\partial^2 \omega}{\partial \eta^2} = - \left\{ \frac{\partial^4 \psi}{\partial \xi^4} + 2 \frac{\partial^4 \psi}{\partial \xi^2 \partial \eta^2} + \frac{\partial^4 \psi}{\partial \eta^4} \right\} \quad \dots \quad (32)$$

Substituting eqns. 28, 29 and 32 in eqn. 26,

$$0 = \text{Pr} \left(\frac{\partial^2 \omega}{\partial \xi^2} + \frac{\partial^2 \omega}{\partial \eta^2} \right) + \text{Ra} \cdot \text{Pr} \frac{\partial \theta}{\partial \xi} + \frac{\partial \psi}{\partial \eta} \left(- \frac{\partial \omega}{\partial \xi} \right) \\ - \frac{\partial \psi}{\partial \xi} \left(- \frac{\partial \omega}{\partial \eta} \right) + \left(\frac{\partial^2 \psi}{\partial \xi^2} - \frac{\partial^2 \psi}{\partial \eta^2} \right) \left(\frac{\partial^2 \psi}{\partial \xi \partial \eta} - \frac{\partial^2 \psi}{\partial \xi \partial \eta} \right)$$

Therefore,

$$\frac{\partial^2 \omega}{\partial \xi^2} + \frac{\partial^2 \omega}{\partial \eta^2} = \frac{1}{\text{Pr}} \left(\frac{\partial \psi}{\partial \eta} \cdot \frac{\partial \omega}{\partial \xi} - \frac{\partial \psi}{\partial \xi} \cdot \frac{\partial \omega}{\partial \eta} \right) - \text{Ra} \cdot \frac{\partial \theta}{\partial \xi} \quad \dots \quad (33)$$

Above equation is the momentum conservation equation in dimensionless form, which is so normalised as to make it suitable for computer

application. It is interesting to note that the above equation is free from pressure term and that the equation represents both x-momentum and y-momentum conservations in a coupled manner. The equation is most non-linear because of the coupling of stream function and vorticity function gradients, which indicates a complex behaviour of convective flow patterns. This equation has been used in the present analysis, appearing as eqn.2.7, in an earlier article.

Normalisation of energy conservation equation :

The energy conservation equation stated earlier, eqn.4, is normalised now, as under :

We have, from eqn.5,

$$\theta = (T - T_1) / (T_s - T_1) = (T - T_1) / T_{ref} \text{ where } T_{ref} = T_s - T_1.$$

From above, we get,

$$T = \theta T_{ref} + T_1 \quad \dots \quad (34)$$

Differentiating above equation with respect to x ,

$$\frac{\partial T}{\partial x} = \frac{\partial}{\partial \xi} (\theta T_{ref} + T_1) \frac{\partial \xi}{\partial x} = \frac{T_{ref}}{H} \cdot \frac{\partial \theta}{\partial \xi} \quad \dots \quad (35)$$

Differentiating above, again, with respect to x ,

$$\frac{\partial^2 T}{\partial x^2} = \frac{T_{ref}}{H^2} \cdot \frac{\partial^2 \theta}{\partial \xi^2} \quad \dots \quad (36)$$

Similarly, differentiations with respect to y , results in,

$$\frac{\partial T}{\partial y} = \frac{T_{ref}}{H} \cdot \frac{\partial \theta}{\partial \eta} \quad \dots \quad (37)$$

$$\frac{\partial^2 \tau}{\partial y^2} = \frac{T_{ref}}{H^2} \cdot \frac{\partial^2 \theta}{\partial \eta^2} \quad \dots \quad (38)$$

Also, from eqn.5 and definitions of u^* and v^* , we obtain,

$$u = \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \eta} \quad \dots \quad (39)$$

and

$$v = - \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \xi} \quad \dots \quad (40)$$

Substituting eqns. 35 to 40 in eqn.4, we obtain,

$$\begin{aligned} \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \eta} \cdot \frac{T_{ref}}{H} \cdot \frac{\partial \theta}{\partial \xi} - \frac{\alpha}{H} \cdot \frac{\partial \psi}{\partial \xi} \cdot \frac{T_{ref}}{H} \cdot \frac{\partial \theta}{\partial \eta} \\ = \alpha \left\{ \frac{T_{ref}}{H^2} \cdot \frac{\partial^2 \theta}{\partial \xi^2} + \frac{T_{ref}}{H^2} \cdot \frac{\partial^2 \theta}{\partial \eta^2} \right\} \end{aligned}$$

Multiplying above equation by $H^2/\alpha T_{ref}$ on both the sides, we get, after re-arranging,

$$\frac{\partial^2 \theta}{\partial \xi^2} + \frac{\partial^2 \theta}{\partial \eta^2} = \left(\frac{\partial \psi}{\partial \eta} \cdot \frac{\partial \theta}{\partial \xi} - \frac{\partial \psi}{\partial \xi} \cdot \frac{\partial \theta}{\partial \eta} \right) \quad \dots \quad (41)$$

Above equation is the energy conservation equation in dimensionless form, used in the present analysis, as stated earlier in the form of eqn.2.6.

APPENDIX : A-4

GAUSS - SEIDEL METHOD OF MATRIX ITERATIONS

The Gauss-Seidel Method is an iterative technique for solving sets of simultaneous, linear, algebraic equations of the following general form :

$$\begin{array}{rcl}
 a_{11} \cdot x_1 + a_{12} \cdot x_2 + \dots \dots + a_{1n} \cdot x_n & = & b_1 \\
 a_{21} \cdot x_1 + a_{22} \cdot x_2 + \dots \dots + a_{2n} \cdot x_n & = & b_2 \\
 \vdots & & \vdots \\
 a_{n1} \cdot x_1 + a_{n2} \cdot x_2 + \dots \dots + a_{nn} \cdot x_n & = & b_n
 \end{array} \quad \dots \quad (1)$$

Above equations can also be represented in the matrix form :

$$\begin{bmatrix} a_{11} & a_{12} & \dots & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & \dots & a_{2n} \\ \vdots & \vdots & & & \vdots \\ a_{n1} & a_{n2} & \dots & \dots & a_{nn} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ \vdots \\ b_n \end{bmatrix} \quad (2)$$

Alternate compact form is also available, namely,

$$AX = B \quad \dots \quad (3)$$

The method involves expressing each unknown as a function of the others, given by :

$$x_i^m = \frac{1}{a_{ii}} \left(b_i - \sum_{j=1}^{i-1} a_{ij} x_j^m - \sum_{j=i+1}^n a_{ij} x_j^{m-1} \right) \quad \dots \quad (4)$$

In the above, superscripts m and $m-1$ denote iteration numbers. It may be noted that in the above computational algorithm, most up-to-date values of the unknowns are used for updating the value of a selected unknown x_i . It is also clear that all the diagonal coefficients a_{ii} should be non-zero for avoiding overflow during computations.

In order to test for convergence as the number of iterations is increased, the changes in the unknowns between successive iterations are compared with their current values. Thus, an appropriate criterion for convergence is,

$$e_r = \sum_{i=1}^n |\Delta x_i| / \sum_{i=1}^n |x_i^m| < \infty \quad \dots \quad (5)$$

In the above, $\Delta x_i = x_i^m - x_i^{m-1}$, e_r = relative error and ∞ = suitably small tolerance.

The choice of starting values for the unknowns does not normally affect whether the Gauss-Seidel process converges, and often has comparatively little effect on the number of iterations required. It is possible to predict whether convergence is likely to be achieved with a particular set of equations by testing it for "diagonal dominance". For example, if matrix A is diagonally dominant, then,

$$|a_{ii}| \geq \sum_{\substack{j=1 \\ j \neq i}}^n |a_{ij}| \quad \text{for } i = 1, 2, \dots, n \quad \dots \quad (6)$$

Above inequality should be satisfied for at least one row. It may be noted that while diagonal dominance is a sufficient condition for ensuring convergence, it may be relaxed to a certain extent.

It is possible to speedup convergence by employing over-relaxation. Eqn.(4) provides new estimates x_i^m , which, for convergence, are closer to the required solutions than the estimates x_i^{m-1} . Over-relaxation applies a certain amount of extrapolation from these two sets of estimates towards the final solutions. Thus, if $\tilde{x}_i^m$ are the values obtained from eqn. (4), the extrapolated values after the m th iteration are

$$x_i^m = x_i^{m-1} + \omega (\tilde{x}_i^m - x_i^{m-1}) \quad \dots \quad (7)$$

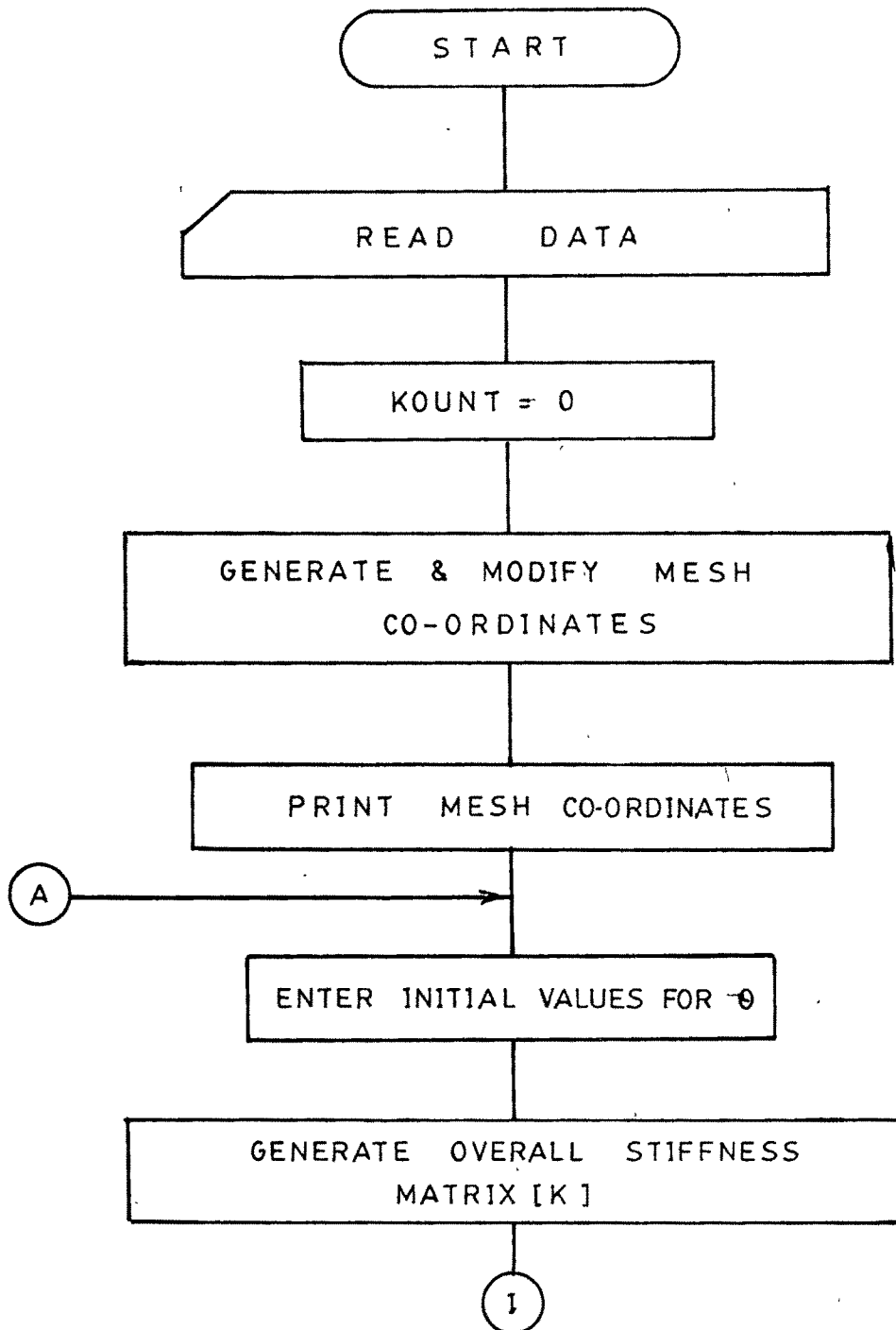
In the above, ω is the over-relaxation factor, which is same for all the equations and its value lies between 1 and 2. It may be noted that over-relaxation should be used for accelerating convergence rather than for promoting convergence in an otherwise divergent equations. Too large a value for ω , causes divergence sometimes and an optimum value for ω is different for different equations and should be found from numerical experiments.

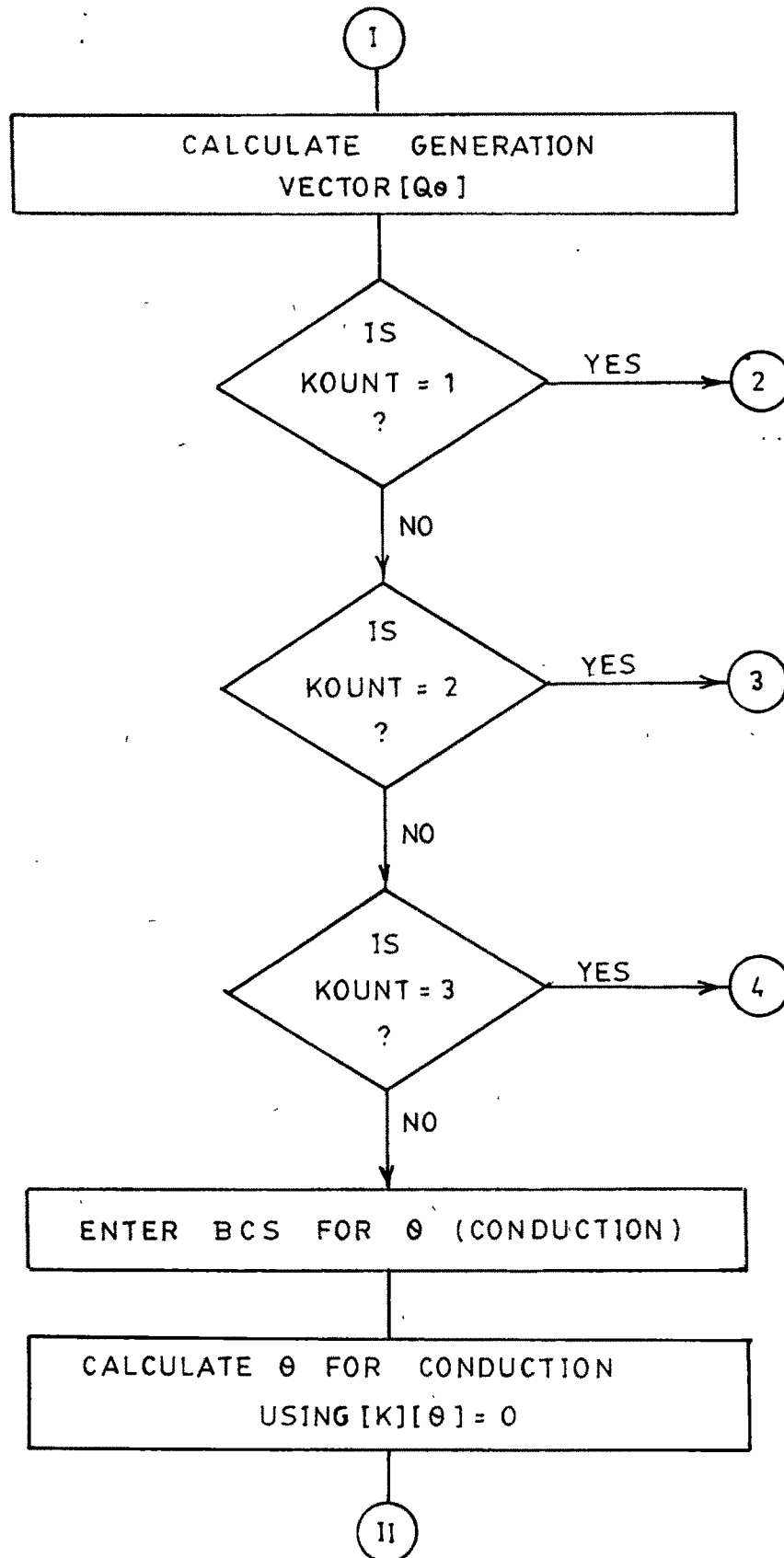
Eqns. (7) and (4) can be rewritten as :

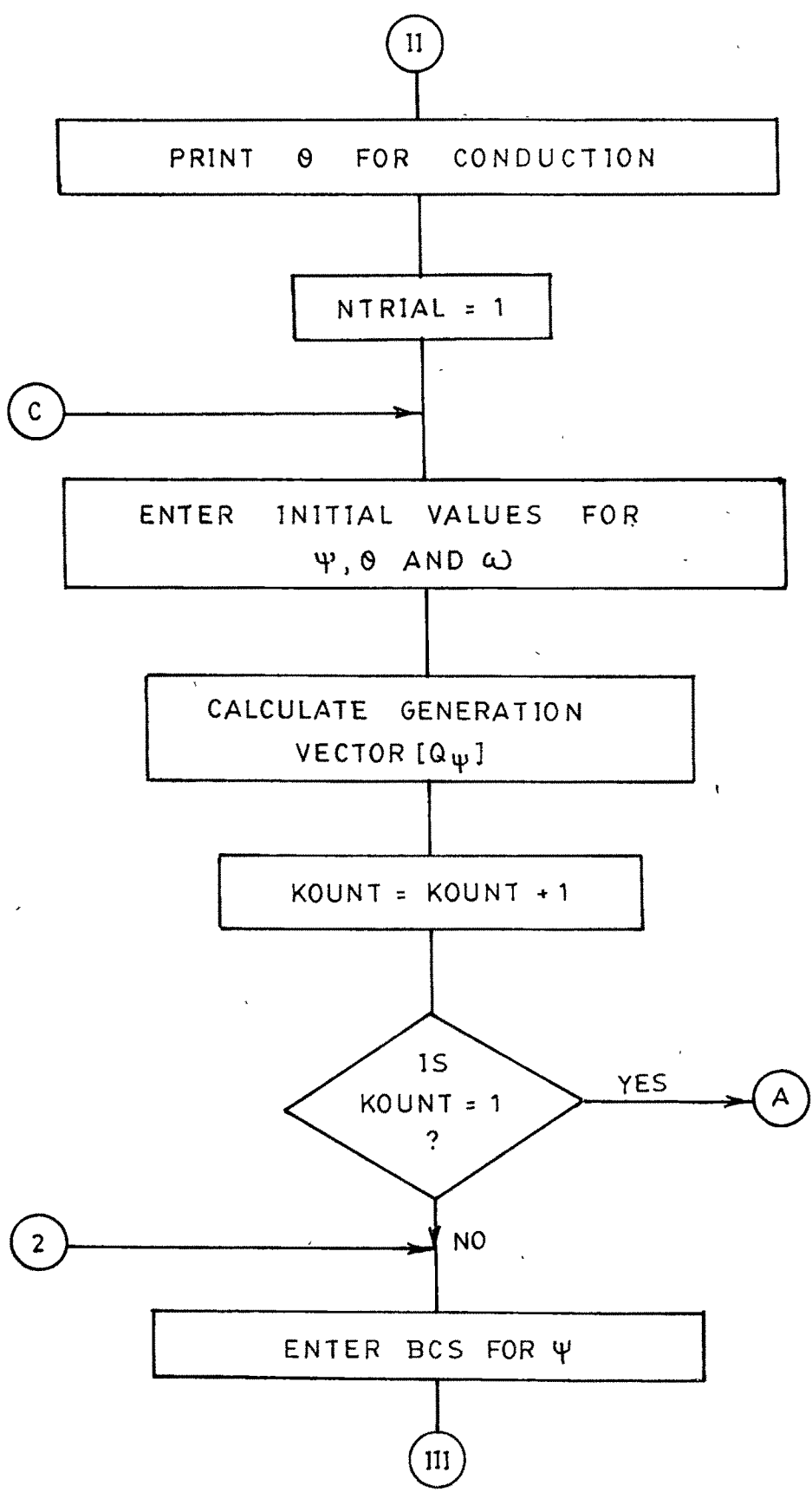
$$x_i^m = x_i^{m-1} + \omega \Delta x_i \quad \dots \quad (8)$$

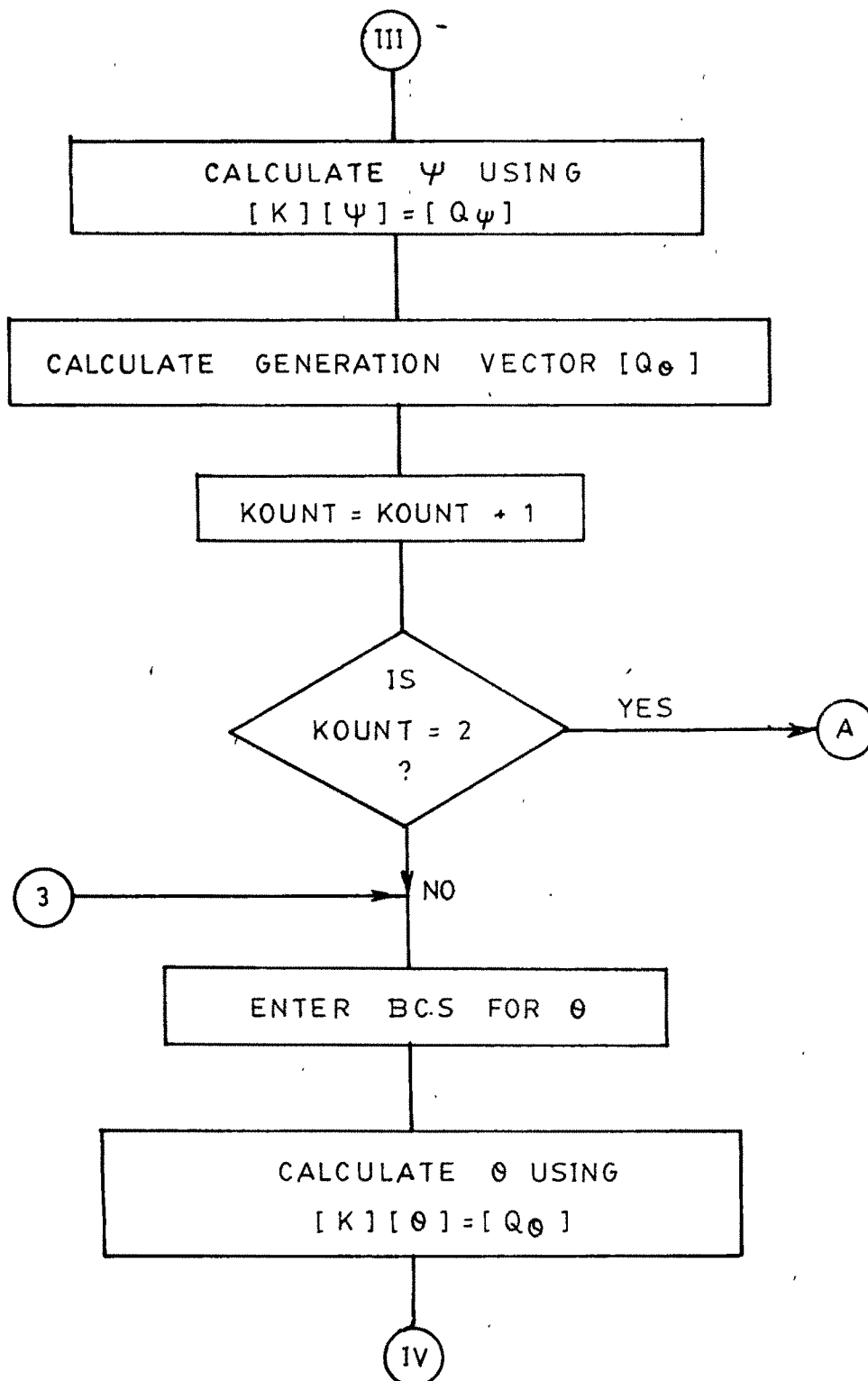
$$\Delta x_i = \frac{1}{a_{ii}} \left\{ b_i - \sum_{j=1}^n a_{ij} x_j \right\} \quad \dots \quad (9)$$

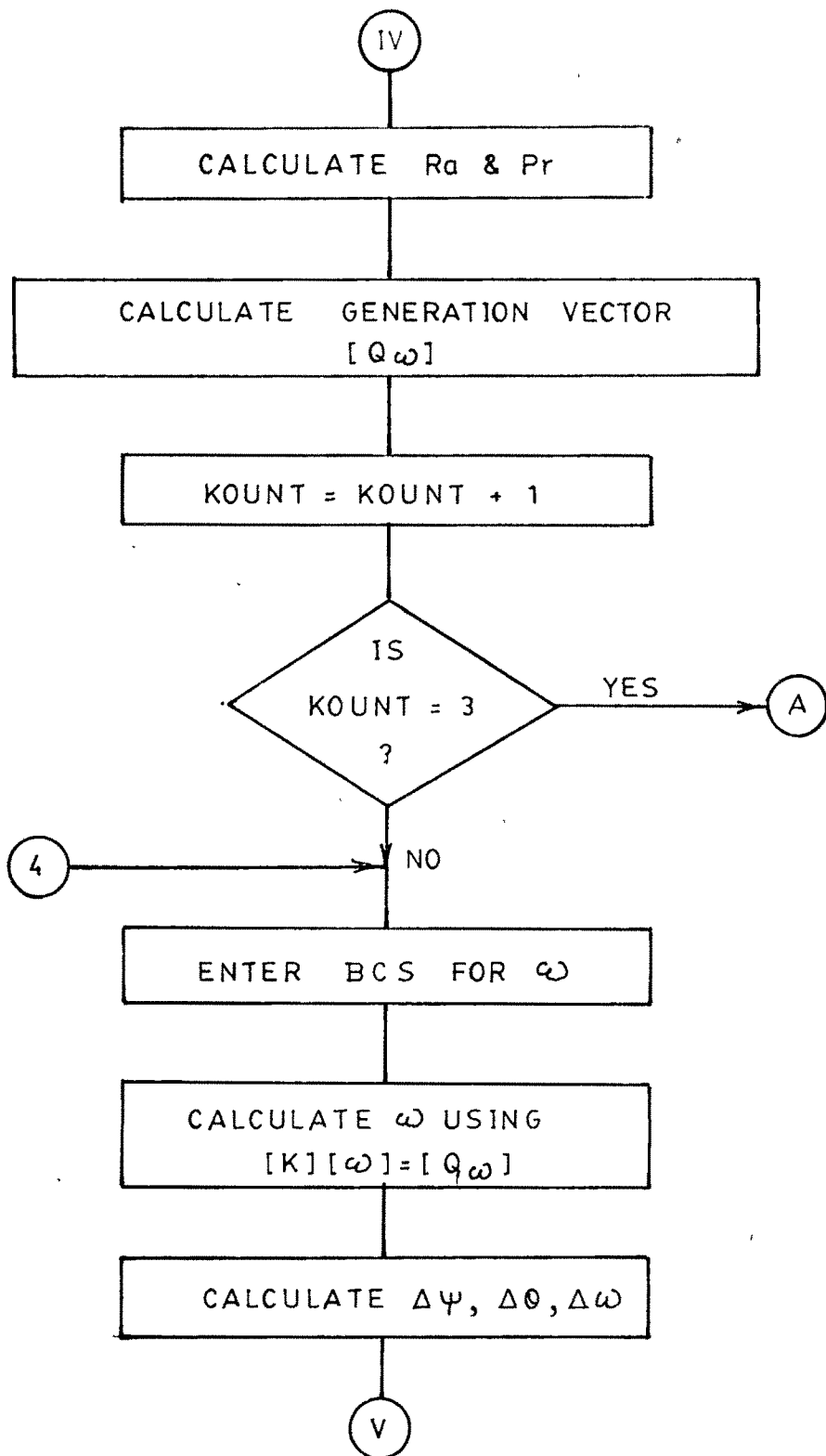
Above formulations are more convenient for computer application.

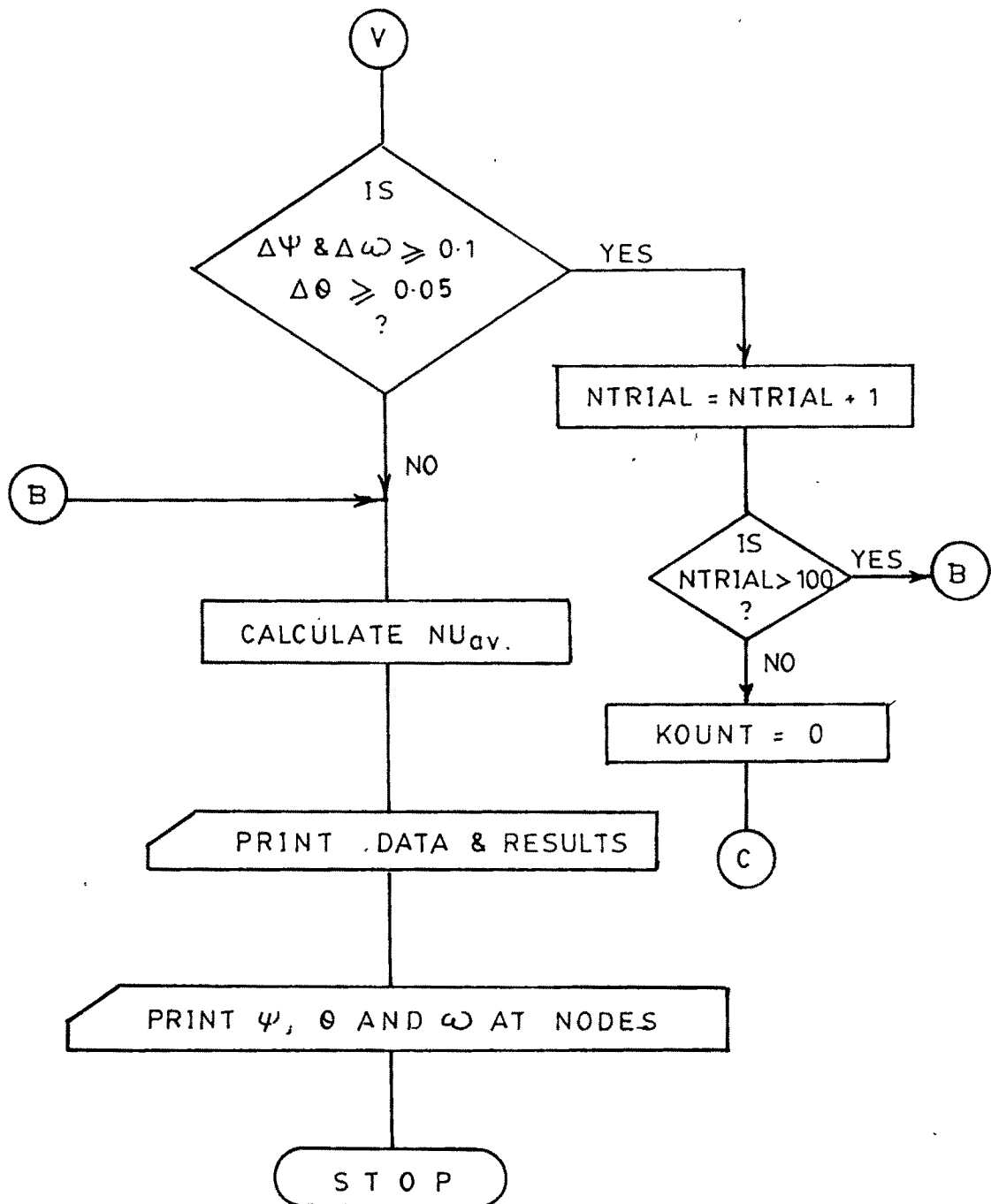
APPENDIX: A-5FLOW CHART











A 6

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1: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
2: C
3: C          FREE CONVECTION FROM RECTANGULAR ENCLOSURES          C
4: C
5: C          CST FINITE ELEMENT SOLUTION - PROGRAMMED BY H.J. SHUKLA C
6: C
7: C          Ph.D. RESEARCH PROJECT - GUIDE : PROF. N.C. PATEL    C
8: C
9: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
10: C
11: C
12: C          DIMENSION TITLE(20),PHI1(100),B(2,3),ESTIFF(3,3),IJK(3)
13: C          DIMENSION PSY(121),THETA(121),OMEGA(121)
14: C          DIMENSION PSY0(121),THETA0(121),OMEGA0(121)
15: C          DIMENSION PSY1(200),THETA1(200),OMEGA1(200)
16: C          DIMENSION PSYN(121),THETAN(121),OMEGAN(121)
17: C          DIMENSION DPSY(121),DTHETA(121),DOMEGA(121)
18: C          DIMENSION TCOND(121),DATE(3)
19: C          COMMON /CMESH/ NPB(40),AI(200),AJ(200),AK(200),BI(200),BJ(200),
20: C          1 BK(200),AREA(200),NPI(200),NPJ(200),NPK(200),X(121),Y(121),NBP,
21: C          2 NEL,NNP,MOUT
22: C          3 /CEQNS/OSTIFF(121,9),NPA(121,9),DELTA(121),F(121),NAP(121)
23: C          COMMON /DATA/TOLER
24: C          COMMON /CMPAR/NXPT,NYPT/UNIT/L
25: C          COMMON /DIMEN/H,W
26: C          COMMON /DATA/TS,TL
27: C
28: C          COMPUTER/PROGRAMMER INTERACTION FOR DATA INPUT
29: C
30: C          WRITE(1,41000)
31: C          41000 FORMAT(1X,'ENTER DATE (DD-MM-YYYY)')
32: C          READ(1,51000)DATE
33: C          51000 FORMAT(3A4)
34: C          WRITE(1,11)
35: C          11 FORMAT(1X,'WHAT IS YOUR OUTPUT UNIT CODE?')
36: C          READ(1,901)I
37: C          901 FORMAT(I1)
38: C          A9U=16.0E-06
39: C          ALFA=22.86E-06
40: C          13 FORMAT(1X,'WHAT IS TS,TL,SCALE?')
41: C          TS=100.0
42: C          TL=0.0
43: C          WRITE(1,11111)
44: C          11111 FORMAT(1X,'GIVE HSTART,HSTOP,HSTEP (X.XXX X.XXX X.XXXX)')
45: C          READ(1,11112)HSTART,HSTOP,HSTEP
46: C          11112 FORMAT(F6.4,1X,F6.4,1X,F6.4)
47: C          SCALE=HSTART
48: C          903 FORMAT(3(2X,F8.4))
49: C          WRITE(1,11113)
50: C          11113 FORMAT(1X,'GIVE ENCLOSURE INCLINATION (XX.XXX)')
51: C          READ(1,11114)PHID
52: C          11114 FORMAT(F5.1)

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53:      PHI=PHID*22.0/(7.0*180.0)
54:      WRITE(1,903)TS,TL,SCALE
55:      TREF=TS-TL
56:      AVTEMP=0.5*(TS+TL)+273.0
57:      WRITE(1,14)
58: 14      FORMAT(1X,'WHAT IS TITLE OF YOUR PROGRAM?')
59:      1      READ(1,51)TITLE
60:      51      FORMAT(20A4)
61:  C
62:  C      MESH GENERATION AND MODIFICATION
63:  C
64:      KOUNT=0
65:      CALL MESH
66:      CALL MODIFY
67:      CALL PHIF(PHI,NEL)
68:      WRITE(1,8889)
69: 8889     FORMAT(1X,'GIVE TOLERANCES CHECK AND ECK (4.XXX X.XXX)')
70:      READ(1,8887)CHECK,ECK
71: 8887     FORMAT(F5.3,1X,F5.5)
72:      WRITE(L,1803)
73:      WRITE(L,61)TITLE
74:      WRITE(L,1803)
75:      WRITE(L,61000)DATE
76: 61000    FORMAT(25X,'OUTPUT OBTAINED ON ',3A4)
77: 10000    FORMAT(1H2)
78:      61      FORMAT(20A4)
79:      DO 11115 I=1,NNP
80:      XAI=X(I)
81:      YAI=Y(I)
82:      X(I)=XAI*COS(PHI)-YAI*SIN(PHI)
83: 11115    Y(I)=XAI*SIN(PHI)+YAI*COS(PHI)
84:      DO 2 M=1,NEL
85:      I=NPJ(M)
86:      J=NPJ(M)
87:      K=NPJ(M)
88:      AI(I)=-X(J)+X(K)
89:      AJ(I)=-X(K)+X(I)
90:      AK(I)=-X(I)+X(J)
91:      BI(M)=Y(J)-Y(K)
92:      BJ(M)=Y(K)-Y(I)
93:      BK(M)=Y(I)-Y(J)
94:      AREA(M)=0.5*(AK(M)*BJ(M)-AJ(M)*BK(M))
95:      IF (AREA(M),67.0,0)60 TO 2
96:      WRITE(1,62)M
97: 62      FORMAT(1X,'ELEMENT NUMBER ',I3,' HAS NEGATIVE AREA')
98: 2      CONTINUE
99:  C
100:  C      OUTPUT OF MESH GEOMETRY DATA
101:  C
102:      CALL MSHOUT
103: 1000     CONTINUE
104:  C

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05: C      FORMATION OF ELEMENT AND GLOBAL CONDUCTIVITY/STIFFNESS MATRICES
06: C
07: C      DO 4 IROW=1,NNP
08: C      DO 3 IC=1,9
09: C      OSTIFF(IROW,IC)=0.0
10: C      3  NPA(IROW,IC)=0
11: C      NPA(IROW,1)=IROW
12: C      F(IROW)=0.0
13: C      4  DELTA(IROW)=0.0
14: C      DO 9 M=1,NEL
15: C      IJK(1)=NPI(M)
16: C      IJK(2)=NPJ(M)
17: C      IJK(3)=NPK(M)
18: C      FM=+PHI1(M)*AREA(M)/3.0
19: C      B(1,1)=BI(M)
20: C      B(1,2)=BJ(M)
21: C      B(1,3)=BK(M)
22: C      B(2,1)=AI(M)
23: C      B(2,2)=AJ(M)
24: C      B(2,3)=AK(M)
25: C      FACT=0.25/AREA(M)
26: C      DO 8 IRE=1,3
27: C      DO 5 ICE=1,3
28: C      ESTIFF(IRE,ICE)=FACT*(B(1,IRE)*B(1,ICE)+B(2,IRE)*B(2,ICE))
29: C      IROW=IJK(IRE)
30: C      ICOL=IJK(ICE)
31: C      DO 5 IC=1,9
32: C      IF(NPA(IROW,IC).EQ.ICOL)GO TO 7
33: C      IF(NPA(IROW,IC).EQ.0)GO TO 6
34: C      5  CONTINUE
35: C      WRITE(1,63)IROW
36: C      63  FORMAT(1X,'NODE',15,'HAS MORE THAN 8 ADJACENT NODES-STOP')
37: C      STOP
38: C      6  NPA(IROW,IC)=ICOL
39: C      NPA(IROW)=IC
40: C      7  OSTIFF(IROW,IC)=OSTIFF(IROW,IC)+ESTIFF(IRE,ICE)
41: C      9  CONTINUE
42: C      DO 9 IRE=1,3
43: C      IROW=IJK(IRE)
44: C      7  F(IROW)=F(IROW)+FM
45: C      IF(COUNT.EQ.1)GO TO 1001
46: C      IF(COUNT.EQ.2)GO TO 2001
47: C      IF(COUNT.EQ.3)GO TO 3001
48: C      WRITE(1,1503)
49: C
50: C      CALL FOR BOUNDARY CONDITIONS
51: C
52: C      CALL BCS
53: C      WRITE(1,1503)
54: C
55: C      CONDUCTION TEMPERATURE SOLUTION  K * DELTA T = V
56: C

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157:      TOLER=0.0001
158:      CALL SOLVE1(NNP)
159:      WRITE(I,1803)
160:      WRITE(I,1806)
161: 1806      FORMAT(22X,'CONDUCTION TEMPERATURE DISTRIBUTION')
162:      CALL OUTPUT
163:      WRITE(I,1903)
164:      DO 555 IROW=1,NNP
165:          TCOND(IROW)=DELTA(IROW)
166: 555      CONTINUE
167:      NTRIAL=1
168:      DO 40 IROW=1,NNP
169:          DO 30 IC=1,P
170:              OSTIFF(IROW,IC)=0.0
171:              NPA(IROW,IC)=0.0
172: 30          CONTINUE
173:              NPA(IROW,1)=IROW
174:              F(IROW)=0.0
175:              PSY(IROW)=0.0
176:              THETA(IROW)=DELTA(IROW)*TREF-TL*TRCF
177:              OMEGA(IROW)=0.0
178:              PSY0(IROW)=PSY(IROW)
179:              THETA0(IROW)=THETA(IROW)
180:              OMEGA0(IROW)=OMEGA(IROW)
181: 40          CONTINUE
182: 0
183: 0      STREAM FUNCTION SOLUTION K & PS - TOL
184: 0
185:      DO 10 M=1,NEL
186:          I=NP1(M)
187:          J=NPJ(M)
188:          K=NP3(M)
189:          PSY1(M)=-(OMEGA(I)*OMEGA(J)+OMEGA(K))*1.0
190: 10      CONTINUE
191:          KCUNT=1
192:          DO 900 M=1,NEL
193:              PHI1(M)=PSY1(M)
194: 900          CONTINUE
195:          IF(KCUNT.EQ.1.GO TO 1000)
196: 1000      CONTINUE
197:          FACT=1.0510
198:          DO 20 I=1,NBP
199:              IROW=NPB(I)
200:              OSTIFF(IROW,1)=OSTIFF(IROW,1)*FACT
201:              ALPHA=PSY(IROW)
202:              F(IROW)=ALPHA*OSTIFF(IROW,1)
203: 20          CONTINUE
204:          TOLER=1.0
205:          CALL SOLVE1(NNP)
206:          DO 800 IROW=1,NNP
207:              PSY(IROW)=DELTA(IROW)
208:              PSYN(IROW)=PSY(IROW)

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209: 800      CONTINUE
210: C
211: C      CONVECTION TEMPERATURE SOLUTION   A * THETA = THETA1
212: C
213: DO 70 M=1,NEL
214: I=NPI(M)
215: J=NPJ(M)
216: K=MPK(M)
217: XDIFF=X(J)-X(I)
218: YDIFF=Y(K)-Y(I)
219: Z=(THETA(J)-THETA(I))/XDIFF
220: A=(PSY(K)-PSY(I))/YDIFF
221: C=(PSY(J)-PSY(I))/XDIFF
222: D=(THETA(K)-THETA(I))/YDIFF
223: THETA1(M)=AXZ-CXD
224: 70      CONTINUE
225: KOUNT=KOUNT+1
226: DO 801 N=1,NEL
227: PHI1(N)=THETA1(N)
228: 801     CONTINUE
229: IF(KOUNT.EQ.2)GO TO 1000
230: 2001    CONTINUE
231: FACT=1.0E10
232: DO 50 I=1,NBP
233: IROW=NPB(I)
234: OSTIFF(IROW,1)=OSTIFF(IROW,1)*FACT
235: ALPHA=THETA(IROW)
236: F(IROW)=ALPHA*OSTIFF(IROW,1)
237: 50      CONTINUE
238: TOLER=0.001
239: CALL SOLVEL(NNF)
240: DO 700 IROW=1,NBP
241: THETA(IROW)=DELTA(IROW)
242: THETAN(IROW)=THETA(IROW)
243: 700     CONTINUE
244: C
245: C      VORTICITY FUNCTION SOLUTION   K * OMEGA = OMEGA1
246: C
247: RA=9.81*HXXHXHTREF/(G*TEMP*ANU*ALFA)
248: RA=RAXSCALEXSCALEXSCALE
249: PR=ANU/ALFA
250: DO 110 M=1,NEL
251: I=NPI(M)
252: J=NPJ(M)
253: K=MPK(M)
254: XDIFF=X(J)-X(I)
255: YDIFF=Y(K)-Y(I)
256: A=(PSY(K)-PSY(I))/YDIFF
257: Z=(OMEGA(J)-OMEGA(I))/XDIFF
258: C=(PSY(J)-PSY(I))/XDIFF
259: D=(OMEGA(K)-OMEGA(I))/YDIFF

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260:      E=(THETA(J)-THETA(I))/XDIFF
261:      OMEGA1(N)=(AK7-CKD)/PR - E*RA
262: 110    CONTINUE
263:      KOUNT=KOUNT+1
264:      DO 701 M=1,NEL
265:      PH11(N)=OMEGA1(N)
266: 701    CONTINUE
267:      IF(KOUNT.EQ.3) GO TO 1000
268: 3001   CONTINUE
269:      DO 30 I=1,NNP
270:      IROW=NPB(I)
271:      NXPTM1=NXPT-1
272:      NYPTM1=NYPT-1
273:      DELX=W/FLOAT(NXPTM1)
274:      DELY=H/FLOAT(NYPTM1)
275:      DELN=DELX
276:      IF(IROW).LE.NXPT.OR.IROW.GT.(NXPT+NYPT-NXPT)) DELN=DELY
277:      IZ7=IROW+1
278:      IF(IROW.EQ.NNP) IZ7=IROW
279:      BIG=PSY(IZ7)
280:      IROWM1=IROW-1
281:      IF(PSY(IROWM1).GT.BIG) BIG=PSY(IROWM1)
282:      IF(IROW.GT.NXPT) PSYDEL=BIG
283:      IROWN=IROW+NXPT
284:      IF(IROW.LE.NXPT) PSYDEL=PSY(IROWN)
285:      IROWM=IROW-NXPT
286:      IF(IROW.GT.(NXPT+NYPT-NXPT)) PSYDEL=PSY(IROWM)
287:      OMEGA(IROW)=-2.*PSYDEL/(DELX*DELY)
288: 50     CONTINUE
289:      FACT=1.0E10
290:      DO 120 I=1,NNP
291:      IROW=NPB(I)
292:      CSTIFF(IROW,1)=CSTIFF(IROW,1)*FACT
293:      ALPHA=OMEGA(IROW)
294:      F(IROW)=ALPHA*CSTIFF(IROW,1)
295: 120    CONTINUE
296:      TOLER=1.0
297:      CALL SOLVE1(NNP)
298:      DO 600 IROW=1,NNP
299:      OMEGA(IROW)=DELTA(IROW)
300:      OMEGAN(IROW)=OMEGA(IROW)
301: 600    CONTINUE
302:      DO 500 IROW=1,NNP
303:      IF(PSYN(IROW).EQ.0.0) PSYN(IROW)=1.0E-10
304:      IF(THETAN(IROW).EQ.0.0) THETAN(IROW)=1.0E-10
305:      IF(OMEGAN(IROW).EQ.0.0) OMEGAN(IROW)=1.0E-10
306:      DPSY(IROW)=1.0-PSYN(IROW)*PSYN(IROW)
307:      DTHETA(IROW)=1.0-THETA0(IROW)*THETAN(IROW)
308:      DOMEGA(IROW)=1.0-OMEGA0(IROW)*OMEGAN(IROW)
309: 500    CONTINUE
310:      CHECK1=0.0
311:      CHECK2=0.0

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312:      CHECK3=0.0
313:      DO 31000 IROW=1,NNP
314:      DO 31000 I=1,NBP
315: 31000    IF(IROW.EQ.NPB(I))GO TO 21000
316:      IF(DPSY(IROW).GT.CHECK1)CHECK1=DPSY(IROW)
317:      IF(DTHETA(IROW).GT.CHECK2)CHECK2=DTHETA(IROW)
318:      IF(DOMEGA(IROW).GT.CHECK3)CHECK3=DOMEGA(IROW)
319: 21000    CONTINUE
320:      WRITE(L,1803)
321:      WRITE(L,1804)CHECK1,CHECK2,CHECK3
322:      WRITE(L,1805)NTRIAL
323: 1805    FORMAT(25X,'NUMBER OF OUTER ITERATIONS=',I)
324: 1804    FORMAT(4X,'PSY ERROR=',1PE10.4,4X,'THETA ERROR=',1PE10.4,4X,
325: 1      'OMEGA ERROR=',1PE10.4)
326: C
327: C      CHECK FOR ITERATION AND OUTPUT OF RESULTS
328: C
329:      DO 400 IROW=1,NNP
330:      DO 333 I=1,NBP
331: 333    IF(IROW.EQ.NPB(I))GO TO 400
332:      IF(DPSY(IROW).GE.ECK.OR.DTHETA(IROW).GE.CHECK.OR.DOMEGA(IROW)
333: 1      .GE.ECK)-GO TO 999
334: 400    CONTINUE
335:      DT=0.0
336:      DO 410 IROW=1,NXPT
337:      IF(IROW.EQ.1.OR.IROW.EQ.NXPT) GO TO 410
338:      IROWN=IROW+NXPT
339:      DT=DT+THETA(IROW)-THETA(IROWN)
340: 410    CONTINUE
341:      NXPTMR=NXPT-2
342:      DT=DT/FLOAT(NXPTMR)
343:      CONDU=0.023
344:      Q=CONDU*(DT*TREF)/(DELY*SCALE)
345:      HAV=Q/TREF
346:      AVNU=HAV*HXSCALE/CONDU
347:      H=HXSCALE
348:      W=WXSCALE
349:      AR=W/H
350:      WRITE(L,1803)
351: 1803    FORMAT(//1X,79(1X)//)
352:      WRITE(L,93000)
353: 93000    FORMAT(17X,'RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS')
354:      WRITE(L,21111)PHID
355: 21111    FORMAT(22X,'ENCLOSURE INCLINATION =',F5.1,' DEGREES')
356:      WRITE(L,2100)
357: 2100    FORMAT(10X,' H',17X,' W',15X,' TS',15X,' TL
358:      WRITE(L,6007)H,W,TS,TL
359: 6007    FORMAT(4(5X,1PE12.4))
360:      WRITE(L,1804)CHECK1,CHECK2,CHECK3
361:      WRITE(L,1805)NTRIAL
362:      WRITE(L,2200)
363: 2200    FORMAT(11X,' RA',15X,' PR',15X,' NU',15X,' AR')

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364:      WRITE(L,6007)RA,PR,AVNH,OR
365:      WRITE(L,94000)HAW
366: 94000  FORMAT(17X,'GAP CONDUCTANCE =',1PE11.4,' RCAL/M.N.HR.DEG.C')
367:      WRITE(L,1803)
368:      H=H/SCALE
369:      W=W/SCALE
370:      DO 222 IROW=1,NNP
371: 222    THETA(IROW)=THETA(IROW)*TREF - TL
372:      WRITE(L,91000)
373: 91000  FORMAT(1X,'PRESS RETURN TO CONTINUE')
374:      READ(L,92000)BLANK
375: 92000  FORMAT(F8.4)
376:      WRITE(L,1802)
377:      WRITE(L,12000)
378: 12000  FORMAT(28X,'TEMPERATURE DISTRIBUTION')//4(3X,1X,2,2X,4HTEMP,4X)//
379:      WRITE(L,6001)(IROW,THETA(IROW),IROW=1,NNP)
380: 6001   FORMAT(4(1X,13,4X,1PE12.7))
381: 1802   FORMAT(1X,1H )
382:      WRITE(L,1802)
383:      WRITE(L,15000)
384: 15000  FORMAT(26X,'STREAM FUNCTION DISTRIBUTION')//4(3X,1H1,8X,4HPSI ,
385: 1       4X)//
386: 6002   FORMAT(4(1X,13,4X,1PE12.4))
387:      WRITE(L,1802)
388:      WRITE(L,18000)
389: 18000  FORMAT(24X,'VORTICITY FUNCTION DISTRIBUTION')//4(3X,1H1,8X,
390: 1       5HOMEGA,3X)//
391:      WRITE(L,6003)(IROW,OMEGA(IROW),IROW=1,NNP)
392: 6003   FORMAT(4(1X,13,4X,1PE12.4))
393:      WRITE(L,1803)
394:      WRITE(L,1802)
395:      WRITE(L,1802)
396:      WRITE(L,1802)
397:      WRITE(L,1802)
398:      WRITE(L,1802)
399:      DO 353 IROW=1,NNP
400: 353    DELTA(IROW)=TCOND(IROW)
401:      SCALE=SCALE+HSTEP
402:      IF(SCALE.LE.HSTOP) GO TO 555
403:      STOP
404: 999    CONTINUE
405:      NTRIAL=NTRIAL+1
406:      IF(NTRIAL.GT.100) GO TO 400
407:      DO 300 IROW=1,NNP
408:      PSY0(IROW)=PSYN(IROW)
409:      THETA0(IROW)=THETA(IROW)
410:      OMEGA0(IROW)=OMEGA(IROW)
411: 300    CONTINUE
412:      WRITE(L,6008)NTRIAL
413: 6008   FORMAT(1X,79(1HX)'PSY',1ITERATION ,1X,79(1HX)
414:      WRITE(L,1802)
415:      GO TO 40
416:      END

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A7

162

HORIZONTAL ENCLOSURE AB - 100 BA = 1.000E+04 MESH SIZE = A BY A

OUTPUT OBTAINED ON 29-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 50

NUMBER OF NODAL POINTS = 36

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	20.0000	0.0000	3	40.0000	0.0000
4	60.0000	0.0000	5	80.0000	0.0000	6	100.0000	0.0000
7	0.0000	.2000	8	20.0000	.2000	9	40.0000	.2000
10	60.0000	.2000	11	80.0000	.2000	12	100.0000	.2000
13	0.0000	.4000	14	20.0000	.4000	15	40.0000	.4000
16	60.0000	.4000	17	80.0000	.4000	18	100.0000	.4000
19	0.0000	.6000	20	20.0000	.6000	21	40.0000	.6000
22	60.0000	.6000	23	80.0000	.6000	24	100.0000	.6000
25	0.0000	.8000	26	20.0000	.8000	27	40.0000	.8000
28	60.0000	.8000	29	80.0000	.8000	30	100.0000	.8000
31	0.0000	1.0000	32	20.0000	1.0000	33	40.0000	1.0000
34	60.0000	1.0000	35	80.0000	1.0000	36	100.0000	1.0000

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	8	7	2.0000E+00	2	1	2	8	2.0000E+00
3	2	9	8	2.0000E+00	4	2	3	9	2.0000E+00
5	3	10	9	2.0000E+00	6	3	4	10	2.0000E+00
7	4	11	10	2.0000E+00	9	4	5	11	2.0000E+00
9	5	12	11	2.0000E+00	10	5	6	12	2.0000E+00
11	6	13	12	2.0000E+00	12	6	7	13	2.0000E+00
13	7	14	13	2.0000E+00	14	7	8	14	2.0000E+00
15	8	15	14	2.0000E+00	16	8	9	15	2.0000E+00
17	9	16	15	2.0000E+00	18	9	10	16	2.0000E+00
19	10	17	16	2.0000E+00	20	10	11	17	2.0000E+00
21	11	18	17	2.0000E+00	22	11	12	18	2.0000E+00
23	12	19	18	2.0000E+00	24	12	13	19	2.0000E+00
25	13	20	19	2.0000E+00	26	13	14	20	2.0000E+00
27	14	21	20	2.0000E+00	28	14	15	21	2.0000E+00
29	15	22	21	2.0000E+00	30	15	16	22	2.0000E+00
31	16	23	22	2.0000E+00	32	16	17	23	2.0000E+00
33	17	24	23	2.0000E+00	34	17	18	24	2.0000E+00
35	18	25	24	2.0000E+00	36	18	19	25	2.0000E+00
37	19	26	25	2.0000E+00	38	19	20	26	2.0000E+00
39	20	27	26	2.0000E+00	40	20	21	27	2.0000E+00
41	21	28	27	2.0000E+00	42	21	22	28	2.0000E+00
43	22	29	28	2.0000E+00	44	22	23	29	2.0000E+00
45	23	30	29	2.0000E+00	46	23	24	30	2.0000E+00
47	24	31	30	2.0000E+00	48	24	25	31	2.0000E+00
49	25	32	31	2.0000E+00	50	25	26	32	2.0000E+00
51	26	33	32	2.0000E+00	52	26	27	33	2.0000E+00
53	27	34	33	2.0000E+00	54	27	28	34	2.0000E+00
55	28	35	34	2.0000E+00	56	28	29	35	2.0000E+00
57	29	36	35	2.0000E+00	58	29	30	36	2.0000E+00
59	30	37	36	2.0000E+00	60	30	31	37	2.0000E+00
61	31	38	37	2.0000E+00	62	31	32	38	2.0000E+00
63	32	39	38	2.0000E+00	64	32	33	39	2.0000E+00
65	33	40	39	2.0000E+00	66	33	34	40	2.0000E+00
67	34	41	40	2.0000E+00	68	34	35	41	2.0000E+00
69	35	42	41	2.0000E+00	70	35	36	42	2.0000E+00
71	36	43	42	2.0000E+00	72	36	37	43	2.0000E+00
73	37	44	43	2.0000E+00	74	37	38	44	2.0000E+00
75	38	45	44	2.0000E+00	76	38	39	45	2.0000E+00
77	39	46	45	2.0000E+00	78	39	40	46	2.0000E+00
79	40	47	46	2.0000E+00	80	40	41	47	2.0000E+00
81	41	48	47	2.0000E+00	82	41	42	48	2.0000E+00
83	42	49	48	2.0000E+00	84	42	43	49	2.0000E+00
85	43	50	49	2.0000E+00	86	43	44	50	2.0000E+00
87	44	51	50	2.0000E+00	88	44	45	51	2.0000E+00
89	45	52	51	2.0000E+00	90	45	46	52	2.0000E+00
91	46	53	52	2.0000E+00	92	46	47	53	2.0000E+00
93	47	54	53	2.0000E+00	94	47	48	54	2.0000E+00
95	48	55	54	2.0000E+00	96	48	49	55	2.0000E+00
97	49	56	55	2.0000E+00	98	49	50	56	2.0000E+00
99	50	57	56	2.0000E+00	100	50	51	57	2.0000E+00
101	51	58	57	2.0000E+00	102	51	52	58	2.0000E+00
103	52	59	58	2.0000E+00	104	52	53	59	2.0000E+00
105	53	60	59	2.0000E+00	106	53	54	60	2.0000E+00
107	54	61	60	2.0000E+00	108	54	55	61	2.0000E+00
109	55	62	61	2.0000E+00	110	55	56	62	2.0000E+00
111	56	63	62	2.0000E+00	112	56	57	63	2.0000E+00
113	57	64	63	2.0000E+00	114	57	58	64	2.0000E+00
115	58	65	64	2.0000E+00	116	58	59	65	2.0000E+00
117	59	66	65	2.0000E+00	118	59	60	66	2.0000E+00
119	60	67	66	2.0000E+00	120	60	61	67	2.0000E+00
121	61	68	67	2.0000E+00	122	61	62	68	2.0000E+00
123	62	69	68	2.0000E+00	124	62	63	69	2.0000E+00
125	63	70	69	2.0000E+00	126	63	64	70	2.0000E+00
127	64	71	70	2.0000E+00	128	64	65	71	2.0000E+00
129	65	72	71	2.0000E+00	130	65	66	72	2.0000E+00
131	66	73	72	2.0000E+00	132	66	67	73	2.0000E+00
133	67	74	73	2.0000E+00	134	67	68	74	2.0000E+00
135	68	75	74	2.0000E+00	136	68	69	75	2.0000E+00
137	69	76	75	2.0000E+00	138	69	70	76	2.0000E+00
139	70	77	76	2.0000E+00	140	70	71	77	2.0000E+00
141	71	78	77	2.0000E+00	142	71	72	78	2.0000E+00
143	72	79	78	2.0000E+00	144	72	73	79	2.0000E+00
145	73	80	79	2.0000E+00	146	73	74	80	2.0000E+00
147	74	81	80	2.0000E+00	148	74	75	81	2.0000E+00
149	75	82	81	2.0000E+00	150	75	76	82	2.0000E+00
151	76	83	82	2.0000E+00	152	76	77	83	2.0000E+00
153	77	84	83	2.0000E+00	154	77	78	84	2.0000E+00
155	78	85	84	2.0000E+00	156	78	79	85	2.0000E+00
157	79	86	85	2.0000E+00	158	79	80	86	2.0000E+00
159	80	87	86	2.0000E+00	160	80	81	87	2.0000E+00
161	81	88	87	2.0000E+00	162	81	82	88	2.0000E+00
163	82	89	88	2.0000E+00	164	82	83	89	2.0000E+00
165	83	90	89	2.0000E+00	166	83	84	90	2.0000E+00
167	84	91	90	2.0000E+00	168	84	85	91	2.0000E+00
169	85	92	91	2.0000E+00	170	85	86	92	2.0000E+00
171	86	93	92	2.0000E+00	172	86	87	93	2.0000E+00
173	87	94	93	2.0000E+00	174	87	88	94	2.0000E+00
175	88	95	94	2.0000E+00	176	88	89	95	2.0000E+00
177	89	96	95	2.0000E+00	178	89	90	96	2.0000E+00
179	90	97	96	2.0000E+00	180	90	91	97	2.0000E+00
181	91	98	97	2.0000E+00	182	91	92	98	2.0000E+00
183	92	99	98	2.0000E+00	184	92	93	99	2.0000E+00
185	93	100	99	2.0000E+00	186	93	94	100	2.0000E+00
187	94	101	100	2.0000E+00	188	94	95	101	2.0000E+00
189	95	102	101	2.0000E+00	190	95	96	102	2.0000E+00
191	96	103	102	2.0000E+00	192	96	97	103	2.0000E+00
193	97	104	103	2.0000E+00	194	97	98	104	2.0000E+00
195	98	105	104	2.0000E+00	196	98	99	105	2.0000E+00
197	99	106	105	2.0000E+00	198	99	100	106	2.0000E+00
199	100	107	106	2.0000E+00	200	100	101	107	2.0000E+00
201	101	108	107	2.0000E+00	202	101	102	108	2.0000E+00
203	102	109	108	2.0000E+00	204	102	103	109	2.0000E+00
205	103	110	109	2.0000E+00	206	103	104	110	2.0000E+00
207	104	111	110	2.0000E+00	208	104	105	111	2.0000E+00
209	105	112	111	2.0000E+00	210	105	106	112	2.0000E+00
211	106	113	112	2.0000E+00	212	106	107	113	2.0000E+00
213	107	114	113	2.0000E+00	214	107	108	114	2.0000E+00
215	108	115	114	2.0000E+00	216	108	109	115	2.0000E+00
217	109	116	115	2.0000E+00	218	109	110	116	2.0000E+00
219	110	117	116	2.0000E+00	220	110	111	117	2.0000E+00
221	111	118	117	2.0000E+00	222	111	112	118	2.0000E+00
223	112	119	118	2.0000E+00	224	112	113	119	2.0000E+00
225	113	120	119	2.0000E+00	226	113	114	120	2.0000E+00
227	114	121	120	2.0000E+00	228	114	115	121	2.0000E+00
229	115	122	121	2.0000E+0					

THE NUMBERS OF THE 20 BOUNDARY POINTS ARE

1 2 3 4 5 6 7 12 13 18 19 24 25 30 31 32 33 34 35 36

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
5.0000E-02 5.0000E+00 1.0000E+02 0.0000E+00

PSY ERROR=6.7942E-02 THETA ERROR=1.1917E-02 OMEGA ERROR=7.0302E-02

NUMBER OF OUTER ITERATIONS= 11

RA PR NU AR
1.0390E+06 6.9991E-01 1.1619E+00 1.0000E+02

GAP CONDUCTANCE = 5.3447E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	1.0000E+02	7	6.0003E-08	8	7.1809E+01
9	7.2173E+01	10	7.0499E+01	11	9.2567E+01	12	6.0005E-08
13	6.2861E-12	14	4.6795E+01	15	4.9246E+01	16	4.7420E+01
17	7.5332E+01	18	8.5464E-12	19	3.6645E-12	20	2.6718E+01
21	2.8709E+01	22	3.0293E+01	23	5.4099E+01	24	6.0156E-12
25	1.8281E-12	26	1.2112E+01	27	1.3152E+01	28	1.5835E+01
29	2.9243E+01	30	3.1677E-12	31	2.6132E-21	32	1.8321E-08
33	1.6548E-08	34	1.9423E-08	35	3.1677E-08	36	3.8575E-21

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-5.3574E-24	2	-8.0261E-10	3	-8.4325E-09	4	-1.9123E-08
5	-2.5535E-08	6	-3.0315E-21	7	-8.0261E-14	8	-2.5801E+00
9	-1.7183E+01	10	-3.7890E+01	11	-5.3724E+01	12	-4.2298E-12
13	5.7474E-14	14	-5.8352E+00	15	-2.7195E+01	16	-4.9287E+01
17	-7.1481E+01	18	-5.9900E-12	19	-2.0612E-13	20	-2.4862E+01
21	-5.4766E+01	22	-7.0672E+01	23	-7.9425E+01	24	-6.7405E-12
25	-1.0216E-12	26	-3.5691E+01	27	-6.7553E+01	28	-7.7274E+01
29	-6.9283E+01	30	-5.8196E-12	31	-4.2709E-22	32	-1.2996E-08
33	-4.9537E-08	34	-6.0782E-08	35	-5.8196E-08	36	-5.7331E-21

VORTICITY FUNCTION DISTRIBUTION

OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
5.3000E-12	2	1.2900E+02	3	8.5916E+02	4	1.8845E+03
2.6962E+03	5	2.3845E-10	7	4.8767E-13	8	-6.6742E+01
6.9545E+02	10	6.3535E+02	11	2.5381E+03	12	2.5378E-11
-2.2901E-12	14	-3.5276E+02	15	6.0273E+02	16	-3.5086E+02
2.0575E+03	18	2.0574E-11	19	-1.2481E-12	20	-7.0832E+01
7.1743E+02	22	2.2795E+02	23	1.2734E+03	24	1.2736E-11
2.3881E-12	26	1.1561E+03	27	2.3766E+03	28	2.0564E+03
2.1186E+03	30	2.1184E-11	31	6.8926E-11	32	1.7845E+03
3.3777E+03	34	3.8637E+03	35	3.4641E+03	36	3.2563E-10

HORIZONTAL ENCLOSURE OR = 100 RA = 1.0380E+03 MESH SIZE = 7 BY 7

OUTPUT OBTAINED ON 22-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 72

NUMBER OF NODAL POINTS = 49

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	16.6667	0.0000	3	33.3333	0.0000
4	50.0000	0.0000	5	66.6667	0.0000	6	83.3333	0.0000
7	100.0000	0.0000	8	0.0000	.1667	9	16.6667	.1667
10	33.3333	.1667	11	50.0000	.1667	12	66.6667	.1667
13	83.3333	.1667	14	100.0000	.1667	15	0.0000	.3333
16	16.6667	.3333	17	33.3333	.3333	18	50.0000	.3333
19	66.6667	.3333	20	83.3333	.3333	21	100.0000	.3333
22	0.0000	.5000	23	16.6667	.5000	24	33.3333	.5000
25	50.0000	.5000	26	66.6667	.5000	27	83.3333	.5000
28	100.0000	.5000	29	0.0000	.6667	30	16.6667	.6667
31	33.3333	.6667	32	50.0000	.6667	33	66.6667	.6667
34	83.3333	.6667	35	100.0000	.6667	36	0.0000	.8333
37	16.6667	.8333	38	33.3333	.8333	39	50.0000	.8333
40	66.6667	.8333	41	83.3333	.8333	42	100.0000	.8333
43	0.0000	1.0000	44	16.6667	1.0000	45	33.3333	1.0000
46	50.0000	1.0000	47	66.6667	1.0000	48	83.3333	1.0000
49	100.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	9	8	1.3889E+00	2	1	2	7	1.3889E+00
3	2	10	9	1.3889E+00	4	2	3	10	1.3889E+00
5	3	11	10	1.3889E+00	6	3	4	11	1.3889E+00
7	4	12	11	1.3889E+00	8	4	5	12	1.3889E+00
9	5	13	12	1.3889E+00	10	5	6	13	1.3889E+00
11	6	14	13	1.3889E+00	12	6	7	14	1.3889E+00
13	8	16	15	1.3889E+00	14	8	9	16	1.3889E+00
15	9	17	16	1.3889E+00	16	9	10	17	1.3889E+00
17	10	18	17	1.3889E+00	18	10	11	18	1.3889E+00
19	11	19	18	1.3889E+00	20	11	12	19	1.3889E+00
21	12	20	19	1.3889E+00	22	12	13	20	1.3889E+00
23	13	21	20	1.3889E+00	24	13	14	21	1.3889E+00
25	15	23	22	1.3889E+00	26	15	16	23	1.3889E+00
27	16	24	23	1.3889E+00	28	16	17	24	1.3889E+00
29	17	25	24	1.3889E+00	30	17	18	25	1.3889E+00
31	18	26	25	1.3889E+00	32	18	19	26	1.3889E+00
33	19	27	26	1.3889E+00	34	19	20	27	1.3889E+00

RECTANGULAR ENCLOSURE ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 5.0000E+02 W 5.0000E+00 TS 1.0000E+02 TL 0.0000E+00
PSY ERROR=9.1148E-02 THETA ERROR=1.1234E-02 LAMBDA ERROR=3.1501E-02
NUMBER OF OUTER ITERATIONS= 12
R0 1.0580E+02 R3 5.2991E-01 R1 1.1202E+00 R2 1.0000E+02
GAP CONDUCTANCE = 5.1508E-01 KCAL/D.H.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	1.0000E+02	7	1.0000E+02	8	8.0005E-08
9	7.9330E+01	10	7.7314E+01	11	7.8231E+01	12	7.7031E+01
13	9.4141E+01	14	8.0007E-08	15	1.0005E-11	16	5.9719E+01
17	5.6636E+01	18	5.8892E+01	19	5.7631E+01	20	5.0027E+01
21	1.3226E-11	22	7.1615E-12	23	4.1504E+01	24	3.8651E+01
25	4.1668E+01	26	4.1259E+01	27	3.9123E+01	28	9.5271E-12
29	4.5344E-12	30	2.5140E+01	31	2.3375E+01	32	2.8594E+01
33	2.7220E+01	34	4.4326E+01	35	2.5722E-12	36	2.1852E-12
37	1.1508E+01	38	1.0714E+01	39	1.2978E+01	40	1.4001E+01
41	2.0355E+01	42	3.4131E-12	43	5.9580E-21	44	2.1509E-08
45	1.9818E-08	46	2.1687E-08	47	2.3015E-08	48	3.4131E-08
49	5.4388E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-7.1241E-07	2	-1.1527E-09	3	-6.6147E-09	4	-1.5077E-08
5	-3.2718E-08	6	-2.7218E-08	7	-4.3649E-21	8	-1.1687E-13
9	-1.1710E+00	10	-1.0496E+01	11	-2.0263E+01	12	-3.4430E+01
13	-1.2639E+01	14	-4.5018E-12	15	3.9349E-13	16	3.9351E+00
17	-1.3288E+01	18	-2.5515E+01	19	-4.1536E+01	20	-5.6301E+01
21	-6.1776E-12	22	5.3239E-13	23	3.3101E+00	24	-1.6327E+01
25	-2.7231E+01	26	-4.0357E+01	27	-5.3470E+01	28	-6.3273E-12
29	2.8255E-12	30	-6.4108E+00	31	-3.1950E+01	32	-4.4071E+01
33	-4.0901E+01	34	-5.5249E+01	35	-1.7666E-12	36	-3.4044E-13
37	-1.7407E+01	38	-3.9316E+01	39	-5.1071E+01	40	-5.2611E+01
41	-4.7089E+01	42	-5.4745E-12	43	2.5307E-22	44	-3.4854E-09
45	-3.4846E-08	46	-5.2519E-08	47	5.7978E-08	48	-5.4745E-08
49	-7.3362E-21						

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OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
-1.0245E-11	2	-5.4311E+01	3	7.5585E+02	4	1.4567E+03
2.4789E+03	6	3.0663E+03	7	3.5482E-10	8	-8.4311E-03
-1.5555E+05	10	5.9403E+02	11	9.7671E+02	12	1.2927E+05
2.7134E+03	14	2.7128E-11	15	-2.8333E-02	16	-4.6789E+02
4.5915E+05	18	1.7550E+01	19	3.6548E+02	20	2.1644E+03
2.1030E-11	22	-2.3852E-02	23	-4.7567E+02	24	3.7482E+02
5.1178E+05	26	3.3125E+02	27	1.6681E+03	28	1.6677E-11
-3.8542E-12	30	2.4553E+02	31	5.2286E+02	32	4.6971E+02
1.9455E+02	34	1.0150E+03	35	1.0152E-11	36	4.5037E-13
4.7227E+02	38	1.8626E+03	39	2.1968E+03	40	1.2852E+03
2.0000E+02	42	1.0327E-11	43	3.4524E-11	44	9.7972E+02
2.8500E+02	46	2.6771E+03	47	3.7880E+03	48	3.3904E+03
4.2800E-12						

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HORIZONTAL ENCLOSURE GR = 1.00 $\frac{1}{2}$ = 0.50 $\frac{1}{2}$ = 0.25 ALSO SIZE = 0.5, 3

[illegible]

OUTPUT OBTAINED ON 25-9-1957

SECRETARY DATA FOR THE NCFM

NUMBER OF ELEMENTS = 95

NUMBER OF NORMAL POINTS = 84

TOTAL POINT CO-ORDINATES

T	Y	T	Y	T	Y	T	Y	T	Y
1	0.0000	0.0000	2	14.2857	0.0000	3	28.5714	0.0000	
4	42.8571	0.0000	5	57.1429	0.0000	6	71.4286	0.0000	
7	85.7143	0.0000	8	100.0000	0.0000	9	0.0000	.1429	
10	14.2857	.1429	11	28.5714	.1429	12	42.8571	.1429	
13	57.1429	.1429	14	71.4286	.1429	15	85.7143	.1429	
16	100.0000	.1429	17	0.0000	.2857	18	14.2857	.2857	
19	28.5714	.2857	20	42.8571	.2857	21	57.1429	.2857	
22	71.4286	.2857	23	85.7143	.2857	24	100.0000	.2857	
25	0.0000	.4286	26	14.2857	.4286	27	28.5714	.4286	
28	42.8571	.4286	29	57.1429	.4286	30	71.4286	.4286	
31	85.7143	.4286	32	100.0000	.4286	33	0.0000	.5714	
34	14.2857	.5714	35	28.5714	.5714	36	42.8571	.5714	
37	57.1429	.5714	38	71.4286	.5714	39	85.7143	.5714	
40	100.0000	.5714	41	0.0000	.7143	42	14.2857	.7143	
43	28.5714	.7143	44	42.8571	.7143	45	57.1429	.7143	
46	71.4286	.7143	47	85.7143	.7143	48	100.0000	.7143	
49	0.0000	.8571	50	14.2857	.8571	51	28.5714	.8571	
52	42.8571	.8571	53	57.1429	.8571	54	71.4286	.8571	
55	85.7143	.8571	56	100.0000	.8571	57	0.0000	1.0000	
58	14.2857	1.0000	59	28.5714	1.0000	60	42.8571	1.0000	
61	57.1429	1.0000	62	71.4286	1.0000	63	85.7143	1.0000	
64	100.0000	1.0000							

ELEMENT NAME ALPHABETS AND AREAS

N	I	J	K	AREA	N	I	J	K	AREA
1	1	10	9	1.0204E+00	7	1	1	10	1.0204E+00
2	2	11	10	1.0204E+00	4	2	3	11	1.0204E+00
5	3	12	11	1.0204E+00	3	3	4	12	1.0204E+00
7	4	13	12	1.0204E+00	6	4	5	13	1.0204E+00
9	5	14	13	1.0204E+00	10	5	6	14	1.0204E+00
11	6	15	14	1.0204E+00	12	6	7	15	1.0204E+00
13	7	16	15	1.0204E+00	14	7	8	16	1.0204E+00
15	8	18	17	1.0204E+00	16	8	9	18	1.0204E+00
17	10	19	18	1.0204E+00	17	9	10	19	1.0204E+00
19	11	20	19	1.0204E+00	18	10	11	20	1.0204E+00
21	12	21	20	1.0204E+00	19	11	12	21	1.0204E+00
23	13	22	21	1.0204E+00	20	12	13	22	1.0204E+00

25	14	23	22	1.0204E+00	23	14	23	22	1.0204E+00
27	15	24	23	1.0204E+00	28	15	24	24	1.0204E+00
29	17	26	25	1.0204E+00	31	17	26	25	1.0204E+00
31	19	27	26	1.0204E+00	32	19	27	27	1.0204E+00
33	19	28	27	1.0204E+00	34	17	28	28	1.0204E+00
35	20	29	28	1.0204E+00	36	20	29	29	1.0204E+00
37	21	30	29	1.0204E+00	38	21	22	30	1.0204E+00
39	22	31	30	1.0204E+00	40	22	23	31	1.0204E+00
41	23	32	31	1.0204E+00	42	23	24	32	1.0204E+00
43	25	34	33	1.0204E+00	44	25	26	34	1.0204E+00
45	26	35	34	1.0204E+00	46	26	27	35	1.0204E+00
47	27	36	35	1.0204E+00	48	27	28	36	1.0204E+00
49	28	37	36	1.0204E+00	50	28	27	37	1.0204E+00
51	29	38	37	1.0204E+00	52	29	30	38	1.0204E+00
53	30	39	38	1.0204E+00	54	30	31	39	1.0204E+00
55	31	40	39	1.0204E+00	56	31	32	40	1.0204E+00
57	33	42	41	1.0204E+00	58	33	34	42	1.0204E+00
59	34	43	42	1.0204E+00	60	34	35	43	1.0204E+00
61	35	44	43	1.0204E+00	62	35	36	44	1.0204E+00
63	36	45	44	1.0204E+00	64	36	37	45	1.0204E+00
65	37	46	45	1.0204E+00	66	37	38	46	1.0204E+00
67	38	47	46	1.0204E+00	68	38	37	47	1.0204E+00
69	39	48	47	1.0204E+00	70	39	40	48	1.0204E+00
71	41	50	49	1.0204E+00	72	41	42	50	1.0204E+00
73	42	51	50	1.0204E+00	74	42	43	51	1.0204E+00
75	43	52	51	1.0204E+00	76	43	44	52	1.0204E+00
77	44	53	52	1.0204E+00	78	44	45	53	1.0204E+00
79	45	54	53	1.0204E+00	80	45	46	54	1.0204E+00
81	46	55	54	1.0204E+00	82	46	47	55	1.0204E+00
83	47	56	55	1.0204E+00	84	47	48	56	1.0204E+00
85	49	58	57	1.0204E+00	86	49	50	58	1.0204E+00
87	50	59	58	1.0204E+00	88	50	51	59	1.0204E+00
89	51	60	59	1.0204E+00	90	51	52	60	1.0204E+00
91	52	61	60	1.0204E+00	92	52	53	61	1.0204E+00
93	53	62	61	1.0204E+00	94	53	54	62	1.0204E+00
95	54	63	62	1.0204E+00	96	54	55	63	1.0204E+00
97	55	64	63	1.0204E+00	98	55	56	64	1.0204E+00

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THE NUMBERS OF THE 28 BOUNDARY POINTS ARE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
57	58	59	60	61	62	63	64																				

RECTANGULAR ENCLOSURE - ISO7HERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H	W	TL	TL
5.0000E-02	5.0000E+00	1.0000E+02	0.0000E+00

PSY ERROR=8.4707E-02 THETA ERROR=7.3795E-05 OMEGA ERROR=7.1988E-02

NUMBER OF OUTER ITERATIONS= 11

PA	PR	NU	AR
1.0380E+03	5.9991E-01	1.0636E+02	1.0000E+02

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TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.00000E+02	2	1.00000E+02	3	1.00000E+02	4	1.00000E+02
5	1.00000E+02	6	1.00000E+02	7	1.00000E+02	8	1.00000E+02
9	5.0004E-08	10	8.4867E+01	11	8.1077E+01	12	9.2701E+01
13	9.2770E+01	14	3.2036E+01	15	7.3354E+01	16	5.0005E-08
17	8.4397E-12	18	5.9193E+01	19	5.3800E+01	20	6.6316E+01
21	5.6618E+01	22	6.5693E+01	23	5.1017E+01	24	9.3054E-12
25	6.5499E-12	26	5.3932E+01	27	4.7904E+01	28	5.1104E+01
29	5.1757E+01	30	5.0850E+01	31	5.6015E+01	32	7.5833E-12
33	4.6974E-12	34	3.9170E+01	35	3.0711E+01	36	3.6953E+01
37	3.7858E+01	38	3.7205E+01	39	5.1384E+01	40	5.7887E-12
41	3.2025E-12	42	2.5200E+01	43	2.1016E+01	44	2.3766E+01
45	2.4883E+01	46	2.4594E+01	47	5.8342E+01	48	5.9310E-12
49	1.5781E-12	50	1.2261E+01	51	9.8141E+00	52	1.1543E+01
53	1.2306E+01	54	1.2409E+01	55	1.8207E+01	56	1.5976E-12
57	2.1060E-21	58	1.5916E-02	59	1.3011E-02	60	1.4930E-06
61	1.5479E-08	62	1.5176E-05	63	1.9976E-05	64	2.4073E-21

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	1.3659E-22	2	1.5262E-09	3	-1.5057E-09	4	-4.2739E-09
5	-6.1555E-09	6	-9.8915E-09	7	-1.1351E-03	8	-1.2820E-21
9	1.5232E-13	10	3.6915E+00	11	-4.0942E+00	12	-1.0655E+01
13	-1.5808E+01	14	-2.4298E+01	15	-1.7412E+01	16	-1.8961E-12
17	3.1102E-13	18	5.4116E+00	19	-5.1049E+00	20	-1.4201E+01
21	-1.9652E+01	22	-3.0202E+01	23	-3.3300E+01	24	-2.6800E-12
25	4.1796E-15	26	7.1210E+00	27	1.8551E+00	28	-1.4227E+01
29	-1.9554E+01	30	-2.8242E+01	31	3.6625E+01	32	-2.8172E-12
33	4.3544E-12	34	3.5282E+00	35	-5.7360E+00	36	-1.4673E+01
37	-1.7650E+01	38	-2.5000E+01	39	-3.2975E+01	40	-2.6434E-12
41	3.1927E-13	42	4.3848E+00	43	-1.1603E+01	44	-2.2196E+01
45	-2.5121E+01	46	-2.9782E+01	47	-3.2052E+01	48	-2.6234E-12
49	3.0159E-13	50	1.3295E+00	51	-1.4248E+01	52	-2.5031E+01
53	-2.8217E+01	54	-3.0822E+01	55	-2.7460E+01	56	-2.1996E-12
57	4.8972E-22	58	4.6820E-09	59	-7.5839E-09	60	-1.6312E-06
61	-1.9169E-08	62	-2.2623E-08	63	-2.1796E-08	64	-2.1469E-21

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	-2.0202E-11	2	-2.6376E+02	3	4.0125E+02	4	1.0636E+03
5	1.5472E+03	6	2.3754E+03	7	2.6863E+03	8	2.1266E-10
9	-2.6376E-02	10	-3.1496E+02	11	5.5477E+02	12	7.3212E+02
13	1.0215E+03	14	1.3718E+03	15	2.0507E+03	16	2.3561E-11
17	-5.5033E-02	18	-5.2957E+02	19	3.2200E+02	20	5.0933E+02
21	5.9013E+02	22	7.8684E+02	23	1.9120E+03	24	1.9114E-11
25	-5.9785E-02	26	-5.5910E+02	27	3.9425E+02	28	3.5969E+02
29	4.8391E+02	30	4.5024E+02	31	1.5115E+03	32	1.5109E-11
33	-6.7890E-02	34	-4.8716E+02	35	2.7937E+02	36	2.7413E+02
37	3.6520E+02	38	2.6283E+02	39	1.1225E+03	40	1.1520E-11
41	-4.2971E-02	42	-3.4788E+02	43	3.2504E+02	44	2.7564E+02
45	3.1917E+02	46	1.9651E+02	47	7.4951E+02	48	7.4914E-12
49	-1.3029E-02	50	-2.4057E+02	51	5.9932E+02	52	1.4689E+03
53	1.6747E+03	54	1.3323E+03	55	1.6696E+03	56	1.6694E-11
57	-3.3162E-11	58	-1.3029E+02	59	1.5765E+03	60	2.4530E+03
61	2.7751E+03	62	3.0206E+03	63	2.6711E+03	64	2.4247E-10

HORIZONTAL ENCLOSURE AP = 100 RA 1.000E+00 MESH SIZE = 9 BY 9

OUTPUT OBTAINED ON 22-7 1937

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 128

NUMBER OF NODAL POINTS = 81

NODAL POINT CO-ORDINATES

I	K	Y	I	K	Y	I	K	Y
1	0.0000	0.0000	2	12.5000	0.0000	3	25.0000	0.0000
4	37.5000	0.0000	5	50.0000	0.0000	6	62.5000	0.0000
7	75.0000	0.0000	8	87.5000	0.0000	9	100.0000	0.0000
10	0.0000	.1250	11	12.5000	.1250	12	25.0000	.1250
13	37.5000	.1250	14	50.0000	.1250	15	62.5000	.1250
16	75.0000	.1250	17	87.5000	.1250	18	100.0000	.1250
19	0.0000	.2500	20	12.5000	.2500	21	25.0000	.2500
22	37.5000	.2500	23	50.0000	.2500	24	62.5000	.2500
25	75.0000	.2500	26	87.5000	.2500	27	100.0000	.2500
28	0.0000	.3750	29	12.5000	.3750	30	25.0000	.3750
31	37.5000	.3750	32	50.0000	.3750	33	62.5000	.3750
34	75.0000	.3750	35	87.5000	.3750	36	100.0000	.3750
37	0.0000	.5000	38	12.5000	.5000	39	25.0000	.5000
40	37.5000	.5000	41	50.0000	.5000	42	62.5000	.5000
43	75.0000	.5000	44	87.5000	.5000	45	100.0000	.5000
46	0.0000	.6250	47	12.5000	.6250	48	25.0000	.6250
49	37.5000	.6250	50	50.0000	.6250	51	62.5000	.6250
52	75.0000	.6250	53	87.5000	.6250	54	100.0000	.6250
55	0.0000	.7500	56	12.5000	.7500	57	25.0000	.7500
58	37.5000	.7500	59	50.0000	.7500	60	62.5000	.7500
61	75.0000	.7500	62	87.5000	.7500	63	100.0000	.7500
64	0.0000	.8750	65	12.5000	.8750	66	25.0000	.8750
67	37.5000	.8750	68	50.0000	.8750	69	62.5000	.8750
70	75.0000	.8750	71	87.5000	.8750	72	100.0000	.8750
73	0.0000	1.0000	74	12.5000	1.0000	75	25.0000	1.0000
76	37.5000	1.0000	77	50.0000	1.0000	78	62.5000	1.0000
79	75.0000	1.0000	80	87.5000	1.0000	81	100.0000	1.0000

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	11	10	7.8125E-01	2	1	2	11	7.8125E-01
3	2	12	11	7.8125E-01	4	2	3	12	7.8125E-01
5	3	13	12	7.8125E-01	6	3	4	13	7.8125E-01
7	4	14	13	7.8125E-01	8	4	5	14	7.8125E-01
9	5	15	14	7.8125E-01	10	5	6	15	7.8125E-01
11	6	16	15	7.8125E-01	12	6	7	16	7.8125E-01
13	7	17	16	7.8125E-01	14	7	8	17	7.8125E-01

15	8	18	17	7.8125E-01	16	9	18	7.8125E-01
17	10	20	19	7.8125E-01	18	10	20	7.8125E-01
19	11	21	20	7.8125E-01	20	11	21	7.8125E-01
21	12	22	21	7.8125E-01	22	12	22	7.8125E-01
23	13	23	22	7.8125E-01	24	13	23	7.8125E-01
25	14	24	23	7.8125E-01	26	14	24	7.8125E-01
27	15	25	24	7.8125E-01	28	15	25	7.8125E-01
29	16	26	25	7.8125E-01	30	16	26	7.8125E-01
31	17	27	26	7.8125E-01	32	17	27	7.8125E-01
33	19	29	28	7.8125E-01	34	19	29	7.8125E-01
35	20	30	29	7.8125E-01	36	20	30	7.8125E-01
37	21	31	30	7.8125E-01	38	21	31	7.8125E-01
39	22	32	31	7.8125E-01	40	22	32	7.8125E-01
41	23	33	32	7.8125E-01	42	23	33	7.8125E-01
43	24	34	33	7.8125E-01	44	24	34	7.8125E-01
45	25	35	34	7.8125E-01	46	25	35	7.8125E-01
47	26	36	35	7.8125E-01	48	26	36	7.8125E-01
49	28	38	37	7.8125E-01	50	28	38	7.8125E-01
51	29	39	38	7.8125E-01	52	29	39	7.8125E-01
53	30	40	39	7.8125E-01	54	30	40	7.8125E-01
55	31	41	40	7.8125E-01	56	31	41	7.8125E-01
57	32	42	41	7.8125E-01	58	32	42	7.8125E-01
59	33	43	42	7.8125E-01	60	33	43	7.8125E-01
61	34	44	43	7.8125E-01	62	34	44	7.8125E-01
63	35	45	44	7.8125E-01	64	35	45	7.8125E-01
65	37	47	46	7.8125E-01	66	37	47	7.8125E-01
67	38	48	47	7.8125E-01	68	38	48	7.8125E-01
69	39	49	48	7.8125E-01	70	39	49	7.8125E-01
71	40	50	49	7.8125E-01	72	40	50	7.8125E-01
73	41	51	50	7.8125E-01	74	41	51	7.8125E-01
75	42	52	51	7.8125E-01	76	42	52	7.8125E-01
77	43	53	52	7.8125E-01	78	43	53	7.8125E-01
79	44	54	53	7.8125E-01	80	44	54	7.8125E-01
81	46	56	55	7.8125E-01	82	46	56	7.8125E-01
83	47	57	56	7.8125E-01	84	47	57	7.8125E-01
85	48	58	57	7.8125E-01	86	48	58	7.8125E-01
87	49	59	58	7.8125E-01	88	49	59	7.8125E-01
89	50	60	59	7.8125E-01	90	50	60	7.8125E-01
91	51	61	60	7.8125E-01	92	51	61	7.8125E-01
93	52	62	61	7.8125E-01	94	52	62	7.8125E-01
95	53	63	62	7.8125E-01	96	53	63	7.8125E-01
97	55	65	64	7.8125E-01	98	55	65	7.8125E-01
99	56	66	65	7.8125E-01	100	56	66	7.8125E-01
101	57	67	66	7.8125E-01	102	57	67	7.8125E-01
103	58	68	67	7.8125E-01	104	58	68	7.8125E-01
105	59	69	68	7.8125E-01	106	59	69	7.8125E-01
107	60	70	69	7.8125E-01	108	60	70	7.8125E-01
109	61	71	70	7.8125E-01	110	61	71	7.8125E-01
111	62	72	71	7.8125E-01	112	62	72	7.8125E-01
113	64	74	73	7.8125E-01	114	64	74	7.8125E-01
115	65	75	74	7.8125E-01	116	65	75	7.8125E-01
117	66	76	75	7.8125E-01	118	66	76	7.8125E-01
119	67	77	76	7.8125E-01	120	67	77	7.8125E-01
121	68	78	77	7.8125E-01	122	68	78	7.8125E-01
123	69	79	78	7.8125E-01	124	69	79	7.8125E-01
125	70	80	79	7.8125E-01	126	70	80	7.8125E-01
127	71	81	80	7.8125E-01	128	71	81	7.8125E-01

THE NUMBERS OF THE 32 BOUNDARY POINTS ARE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 5.0000E-02 W 5.0000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=9.6269E-02 THETA ERROR=4.5482E-03 OMEGA ERROR=5.6184E-02

NUMBER OF OUTER ITERATIONS= 14

RA 1.0380E+06 PR 6.9991E-01 NU 1.0715E+00 AR 1.0000E+02

GAP CONDUCTANCE = 4.9289E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	1.0000E+02	7	1.0000E+02	8	1.0000E+02
9	1.0000E+02	10	7.5006E-09	11	8.7268E+01	12	8.4367E+01
13	8.5126E+01	14	8.5807E+01	15	8.5260E+01	16	8.4934E+01
17	9.3482E+01	18	7.5006E-08	19	1.1189E-11	20	7.4158E+01
21	6.9427E+01	22	7.0879E+01	23	7.2118E+01	24	7.1203E+01
25	7.0833E+01	26	8.2403E+01	27	1.1971E-11	28	9.2401E-12
29	6.0995E+01	30	5.5481E+01	31	5.7450E+01	32	5.9067E+01
33	5.7998E+01	34	5.7639E+01	35	5.9710E+01	36	1.0080E-11
37	7.3092E-12	38	4.9015E+01	39	4.2585E+01	40	4.4784E+01
41	4.6571E+01	42	4.5580E+01	43	4.5201E+01	44	5.6479E+01
45	9.1305E-12	46	5.4156E-12	47	3.5357E+01	48	3.0634E+01
49	3.2762E+01	50	3.4492E+01	51	3.3711E+01	52	3.3400E+01
53	4.3041E+01	54	6.1596E-12	55	5.5662E-12	56	2.3116E+01
57	1.9602E+01	58	2.1319E+01	59	3.2719E+01	60	2.2352E+01
61	2.2148E+01	62	2.9288E+01	63	7.1564E-12	64	1.7671E-12
65	1.1380E+01	66	9.4361E+00	67	1.0447E+01	68	1.1259E+01
69	1.1044E+01	70	1.1123E+01	71	1.4911E+01	72	2.1008E-12
73	7.8700E-21	74	1.7709E-08	75	1.5177E-08	76	1.6599E-08
77	1.7590E-08	78	1.7170E-03	79	1.6838E-09	80	2.1008E-08
81	3.2613E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	2.1923E-22	2	1.9144E-09	3	-7.1114E-10	4	-3.3967E-09
5	-5.2825E-09	6	-6.8945E-09	7	-1.0555E-08	8	-1.1593E-08
9	-1.6750E-21	10	1.9144E-13	11	2.7333E+00	12	-1.7271E+00
13	-6.6314E+00	14	-1.0586E+01	15	-1.4059E+01	16	-2.0189E+01
17	-2.1530E+01	18	-1.9258E-12	19	3.5511E-13	20	5.0120E+00
21	-2.0623E+00	22	-8.6569E+00	23	-1.3316E+01	24	-1.7244E+01
25	-2.5062E+01	26	-2.8649E+01	27	-2.6842E-12	28	4.6294E-13
29	6.4525E+00	30	-1.7698E+00	31	-8.6052E+00	32	-1.2601E+01
33	-1.5973E+01	34	-2.3397E+01	35	-2.8577E+01	36	-2.8019E-12
37	4.9307E-13	38	6.8407E+00	39	-1.5094E+00	40	-7.8194E+00
41	-1.0961E+01	42	1.3289E+01	43	-1.9532E+01	44	-2.5370E+01

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HORIZONTAL ENCLOSURE AR = 100 RA = 1.0393E+06 MESH SIZE = 11 BY 11

OUTPUT OBTAINED ON 21-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 200

NUMBER OF NODAL POINTS = 121

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	10.0000	0.0000	3	20.0000	0.0000
4	30.0000	0.0000	5	40.0000	0.0000	6	50.0000	0.0000
7	60.0000	0.0000	8	70.0000	0.0000	9	80.0000	0.0000
10	90.0000	0.0000	11	100.0000	0.0000	12	0.0000	.1000
13	10.0000	.1000	14	20.0000	.1000	15	30.0000	.1000
16	40.0000	.1000	17	50.0000	.1000	18	60.0000	.1000
19	70.0000	.1000	20	80.0000	.1000	21	90.0000	.1000
22	100.0000	.1000	23	0.0000	.2000	24	10.0000	.2000
25	20.0000	.2000	26	30.0000	.2000	27	40.0000	.2000
28	50.0000	.2000	29	60.0000	.2000	30	70.0000	.2000
31	80.0000	.2000	32	90.0000	.2000	33	100.0000	.2000
34	0.0000	.3000	35	10.0000	.3000	36	20.0000	.3000
37	30.0000	.3000	38	40.0000	.3000	39	50.0000	.3000
40	60.0000	.3000	41	70.0000	.3000	42	80.0000	.3000
43	90.0000	.3000	44	100.0000	.3000	45	0.0000	.4000
46	10.0000	.4000	47	20.0000	.4000	48	30.0000	.4000
49	40.0000	.4000	50	50.0000	.4000	51	60.0000	.4000
52	70.0000	.4000	53	80.0000	.4000	54	90.0000	.4000
55	100.0000	.4000	56	0.0000	.5000	57	10.0000	.5000
58	20.0000	.5000	59	30.0000	.5000	60	40.0000	.5000
61	50.0000	.5000	62	60.0000	.5000	63	70.0000	.5000
64	80.0000	.5000	65	90.0000	.5000	66	100.0000	.5000
67	0.0000	.6000	68	10.0000	.6000	69	20.0000	.6000
70	30.0000	.6000	71	40.0000	.6000	72	50.0000	.6000
73	60.0000	.6000	74	70.0000	.6000	75	80.0000	.6000
76	90.0000	.6000	77	100.0000	.6000	78	0.0000	.7000
79	10.0000	.7000	80	20.0000	.7000	81	30.0000	.7000
82	40.0000	.7000	83	50.0000	.7000	84	60.0000	.7000
85	70.0000	.7000	86	80.0000	.7000	87	90.0000	.7000
88	100.0000	.7000	89	0.0000	.8000	90	10.0000	.8000
91	20.0000	.8000	92	30.0000	.8000	93	40.0000	.8000
94	50.0000	.8000	95	60.0000	.8000	96	70.0000	.8000
97	80.0000	.8000	98	90.0000	.8000	99	100.0000	.8000
100	0.0000	.9000	101	10.0000	.9000	102	20.0000	.9000
103	30.0000	.9000	104	40.0000	.9000	105	50.0000	.9000
106	60.0000	.9000	107	70.0000	.9000	108	80.0000	.9000
109	90.0000	.9000	110	100.0000	.9000	111	0.0000	1.0000
112	10.0000	1.0000	113	20.0000	1.0000	114	30.0000	1.0000
115	40.0000	1.0000	116	50.0000	1.0000	117	60.0000	1.0000

118 70.0000 1.0000 119 90.0000 1.0000 120 90.0000 1.0000
 121 100.0000 1.0000

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ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	13	12	5.0000E-01	2	1	2	13	5.0000E-01
3	2	14	13	5.0000E-01	4	2	3	14	5.0000E-01
5	3	15	14	5.0000E-01	6	3	4	15	5.0000E-01
7	4	16	15	5.0000E-01	8	4	5	16	5.0000E-01
9	5	17	16	5.0000E-01	10	5	6	17	5.0000E-01
11	6	18	17	5.0000E-01	12	6	7	18	5.0000E-01
13	7	19	18	5.0000E-01	14	7	8	19	5.0000E-01
15	8	20	19	5.0000E-01	16	8	9	20	5.0000E-01
17	9	21	20	5.0000E-01	18	9	10	21	5.0000E-01
19	10	22	21	5.0000E-01	20	10	11	22	5.0000E-01
21	12	24	23	5.0000E-01	22	12	13	24	5.0000E-01
23	13	25	24	5.0000E-01	24	13	14	25	5.0000E-01
25	14	26	25	5.0000E-01	26	14	15	26	5.0000E-01
27	15	27	26	5.0000E-01	28	15	16	27	5.0000E-01
29	16	28	27	5.0000E-01	30	16	17	28	5.0000E-01
31	17	29	28	5.0000E-01	32	17	18	29	5.0000E-01
33	18	30	29	5.0000E-01	34	18	19	30	5.0000E-01
35	19	31	30	5.0000E-01	36	19	20	31	5.0000E-01
37	20	32	31	5.0000E-01	38	20	21	32	5.0000E-01
39	21	33	32	5.0000E-01	40	21	22	33	5.0000E-01
41	23	35	34	5.0000E-01	42	23	24	35	5.0000E-01
43	24	36	35	5.0000E-01	44	24	25	36	5.0000E-01
45	25	37	36	5.0000E-01	46	25	26	37	5.0000E-01
47	26	38	37	5.0000E-01	48	26	27	38	5.0000E-01
49	27	39	38	5.0000E-01	50	27	28	39	5.0000E-01
51	28	40	39	5.0000E-01	52	28	29	40	5.0000E-01
53	29	41	40	5.0000E-01	54	29	30	41	5.0000E-01
55	30	42	41	5.0000E-01	56	30	31	42	5.0000E-01
57	31	43	42	5.0000E-01	58	31	32	43	5.0000E-01
59	32	44	43	5.0000E-01	60	32	33	44	5.0000E-01
61	34	46	45	5.0000E-01	62	34	35	46	5.0000E-01
63	35	47	46	5.0000E-01	64	35	36	47	5.0000E-01
65	36	48	47	5.0000E-01	66	36	37	48	5.0000E-01
67	37	49	48	5.0000E-01	68	37	38	49	5.0000E-01
69	38	50	49	5.0000E-01	70	38	39	50	5.0000E-01
71	39	51	50	5.0000E-01	72	39	40	51	5.0000E-01
73	40	52	51	5.0000E-01	74	40	41	52	5.0000E-01
75	41	53	52	5.0000E-01	76	41	42	53	5.0000E-01
77	42	54	53	5.0000E-01	78	42	43	54	5.0000E-01
79	43	55	54	5.0000E-01	80	43	44	55	5.0000E-01
81	45	57	56	5.0000E-01	82	45	46	57	5.0000E-01
83	46	58	57	5.0000E-01	84	46	47	58	5.0000E-01
85	47	59	58	5.0000E-01	86	47	48	59	5.0000E-01
87	48	60	59	5.0000E-01	88	48	49	60	5.0000E-01
89	49	61	60	5.0000E-01	90	49	50	61	5.0000E-01
91	50	62	61	5.0000E-01	92	50	51	62	5.0000E-01
93	51	63	62	5.0000E-01	94	51	52	63	5.0000E-01
95	52	64	63	5.0000E-01	96	52	53	64	5.0000E-01
97	53	65	64	5.0000E-01	98	53	54	65	5.0000E-01
99	54	66	65	5.0000E-01	100	54	55	66	5.0000E-01
101	56	68	67	5.0000E-01	102	56	57	68	5.0000E-01
103	57	69	68	5.0000E-01	104	57	58	69	5.0000E-01
105	58	70	69	5.0000E-01	106	58	59	70	5.0000E-01
107	59	71	70	5.0000E-01	108	59	60	71	5.0000E-01
109	60	72	71	5.0000E-01	110	60	61	72	5.0000E-01
111	61	73	72	5.0000E-01	112	61	62	73	5.0000E-01
113	62	74	73	5.0000E-01	114	62	63	74	5.0000E-01
115	63	75	74	5.0000E-01	116	63	64	75	5.0000E-01
117	64	76	75	5.0000E-01	118	64	65	76	5.0000E-01
119	65	77	76	5.0000E-01	120	65	66	77	5.0000E-01
121	67	79	78	5.0000E-01	122	67	68	79	5.0000E-01
123	68	80	79	5.0000E-01	124	68	69	80	5.0000E-01
125	69	81	80	5.0000E-01	126	69	70	81	5.0000E-01

131	72	84	83	5.0000E-01	132	73	74	85	5.0000E-01
133	73	85	84	5.0000E-01	134	74	75	86	5.0000E-01
135	74	86	85	5.0000E-01	136	75	76	87	5.0000E-01
137	75	87	86	5.0000E-01	138	76	77	88	5.0000E-01
139	76	88	87	5.0000E-01	140	77	78	89	5.0000E-01
141	78	90	89	5.0000E-01	142	78	79	90	5.0000E-01
143	79	91	90	5.0000E-01	144	79	80	91	5.0000E-01
145	80	92	91	5.0000E-01	146	80	81	92	5.0000E-01
147	81	93	92	5.0000E-01	148	81	82	93	5.0000E-01
149	82	94	93	5.0000E-01	150	82	83	94	5.0000E-01
151	83	95	94	5.0000E-01	152	83	84	95	5.0000E-01
153	84	96	95	5.0000E-01	154	84	85	96	5.0000E-01
155	85	97	96	5.0000E-01	156	85	86	97	5.0000E-01
157	86	98	97	5.0000E-01	158	86	87	98	5.0000E-01
159	87	99	98	5.0000E-01	160	87	88	99	5.0000E-01
161	89	101	100	5.0000E-01	162	89	90	101	5.0000E-01
163	90	102	101	5.0000E-01	164	90	91	102	5.0000E-01
165	91	103	102	5.0000E-01	166	91	92	103	5.0000E-01
167	92	104	103	5.0000E-01	168	92	93	104	5.0000E-01
169	93	105	104	5.0000E-01	170	93	94	105	5.0000E-01
171	94	106	105	5.0000E-01	172	94	95	106	5.0000E-01
173	95	107	106	5.0000E-01	174	95	96	107	5.0000E-01
175	96	108	107	5.0000E-01	176	96	97	108	5.0000E-01
177	97	109	108	5.0000E-01	178	97	98	109	5.0000E-01
179	98	110	109	5.0000E-01	180	98	99	110	5.0000E-01
181	100	112	111	5.0000E-01	182	100	101	112	5.0000E-01
183	101	113	112	5.0000E-01	184	101	102	113	5.0000E-01
185	102	114	113	5.0000E-01	186	102	103	114	5.0000E-01
187	103	115	114	5.0000E-01	188	103	104	115	5.0000E-01
189	104	116	115	5.0000E-01	190	104	105	116	5.0000E-01
191	105	117	116	5.0000E-01	192	105	106	117	5.0000E-01
193	106	118	117	5.0000E-01	194	106	107	118	5.0000E-01
195	107	119	118	5.0000E-01	196	107	108	119	5.0000E-01
197	108	120	119	5.0000E-01	198	108	109	120	5.0000E-01
199	109	121	120	5.0000E-01	200	109	110	121	5.0000E-01

THE NUMBERS OF THE 40 BOUNDARY POINTS ARE

1	2	3	4	5	6	7	8	9	10	11	12	22	23	33	34	44	45	55	56
66	67	77	78	88	89	99	100	110	111	112	113	114	115	116	117	118	119	120	121

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 5.0000E-02 W 5.0000E+00 TS 1.0000E+01 TL 0.0000E+00
PSY ERROR=9.4715E-02 THETA ERROR=2.3725E-03 OMEGA ERROR=8.6619E-02

NUMBER OF OUTER ITERATIONS= 11

QA 1.0529E+03 PR 5.9901E-01 NU 1.0529E+00 AR 1.0000E+02

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	1.0000E+02	7	1.0000E+02	8	1.0000E+02
9	1.0000E+02	10	1.0000E+02	11	1.0000E+02	12	6.0005E-08
13	9.0279E+01	14	8.8306E+01	15	8.8310E+01	16	8.9223E+01
17	8.9322E+01	18	8.9334E+01	19	8.5807E+01	20	8.8529E+01
21	9.2632E+01	22	6.0005E-08	23	9.5971E-12	24	8.0078E+01
25	7.6878E+01	26	7.7848E+01	27	7.8618E+01	28	7.8787E+01
29	7.8812E+01	30	7.7880E+01	31	7.7380E+01	32	8.3082E+01
33	9.8284E-12	34	8.3590E-12	35	6.9894E+01	36	6.5849E+01
37	6.7203E+01	38	6.8243E+01	39	6.6440E+01	40	6.8481E+01
41	6.7301E+01	42	6.6624E+01	43	7.2764E+01	44	8.6057E-12
45	7.1212E-12	46	5.9309E+01	47	5.5275E+01	48	5.6884E+01
49	5.8087E+01	50	5.8283E+01	51	5.8359E+01	52	5.7066E+01
53	5.6265E-01	54	6.2273E+01	55	7.3666E-12	56	5.8953E-12
57	4.9040E+01	58	4.5157E+01	59	4.6867E+01	60	4.8121E+01
61	4.8295E+01	62	4.8366E+01	63	4.7132E+01	64	4.6281E+01
65	5.1830E+01	66	6.1301E-12	67	4.6687E-12	68	3.8935E+01
69	3.5460E+01	70	3.7111E+01	71	3.5307E+01	72	3.8451E+01
73	3.8529E+01	74	3.7444E+01	75	3.6631E+01	76	4.1491E+01
77	4.9025E-12	78	3.4959E-12	79	2.9000E+01	80	2.6132E+01
81	2.7573E+01	82	2.8610E+01	83	2.3720E+01	84	2.8777E+01
85	2.7939E+01	86	2.7260E+01	87	3.1233E+01	88	3.6828E-12
89	2.3199E-12	90	1.9212E+01	91	1.7129E+01	92	1.2221E+01
93	1.9005E+01	94	1.9080E+01	95	1.7139E+01	96	1.8554E+01
97	1.8103E+01	98	2.0950E+01	99	2.4627E-12	100	1.1564E-12
101	9.5627E+00	102	8.4415E+00	103	9.0424E+00	104	9.4782E+00
105	9.5158E+00	106	9.5456E+00	107	9.1503E+00	108	9.0452E+00
109	1.0535E+01	110	1.2350E-12	111	1.5121E-21	112	1.1587E-08
113	1.0513E-08	114	1.1159E-08	115	1.1600E-08	116	1.1620E-08
117	1.1627E-08	118	1.1210E-08	119	1.0978E-08	120	1.2350E-08
121	1.5883E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	8.3524E-23	2	1.0772E-09	3	1.9753E-10	4	-7.1398E-10
5	-1.2205E-09	6	-1.4897E-09	7	-1.7103E-09	8	-2.1328E-09
9	-3.5550E-09	10	-4.0459E-09	11	-4.5762E-09	12	1.0772E-13
13	2.3492E+00	14	5.2061E-01	15	-1.6772E+00	16	-3.2028E+00
17	-4.2502E+00	18	-5.1159E+00	19	-6.3094E+00	20	-9.2738E+00
21	-9.9399E+00	22	-6.8037E-13	23	1.8752E-13	24	3.9196E+00
25	7.5304E-01	26	-2.3366E+00	27	-4.1303E+00	28	-5.3999E+00
29	-6.4549E+00	30	-7.8111E+00	31	-1.1731E+01	32	-1.3477E+01
33	-9.7540E-13	34	2.3962E-13	35	4.9339E+00	36	8.8678E-01
37	-2.4875E+00	38	-4.0423E+00	39	-5.1799E+00	40	-6.1719E+00
41	-7.3058E+00	42	-1.1197E+01	43	-1.5773E+01	44	-1.0514E-12
45	2.5962E-13	46	5.1391E+00	47	6.8424E-01	48	-2.4144E+00
49	-3.5963E+00	50	4.5486E+00	51	-5.3583E+00	52	-6.1844E+00
53	-9.6268E+00	54	-1.2634E+01	55	-1.0135E-12	56	2.5378E-13
57	4.9759E+00	58	7.6320E-01	59	-2.2855E+00	60	-3.1003E+00
61	-3.8536E+00	62	-4.5015E+00	63	-5.0831E+00	64	-7.9078E+00
65	-1.0987E+01	66	-9.2153E-13	67	2.2773E-13	68	4.4867E+00
69	5.5072E-01	70	-2.1169E+00	71	-2.6791E+00	72	-3.2676E+00
73	-3.7809E+00	74	-4.1255E+00	75	-6.3756E+00	76	-9.2566E+00
77	-9.0700E-13	78	1.9456E-13	79	3.9280E+00	80	1.4510E-01
81	-2.2227E+00	82	-2.6214E+00	83	-3.1176E+00	84	-5.5506E+00
85	-3.7966E+00	86	-5.4729E+00	87	-7.7686E+00	88	-6.9759E-13
89	1.6291E-13	90	3.3537E+00	91	-7.5047E-01	92	-3.4313E+00
93	-3.9725E+00	94	-4.5804E+00	95	-5.1230E+00	96	-5.5407E+00
97	-6.7791E+00	98	-7.5828E+00	99	-9.7527E-13	100	1.8231E-13

101	2.5080E+00	102	-1.2062E+00	103	-3.8535E+00	104	-4.8546E+00
105	-5.2096E+00	106	-5.8050E+00	107	-5.5553E+00	108	-7.1809E+00
109	-6.6236E+00	110	-5.6753E-15	111	2.2201E-22	112	2.5800E-09
113	-6.5810E-10	114	-2.9195E-07	115	-3.3440E-09	116	-3.7331E-09
117	-4.1193E-09	118	-4.5897E-09	119	-5.3328E-09	120	-5.6753E-09
121	-5.7228E-22						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	-3.0940E-11	2	-4.3984E+02	3	-1.0412E+02	4	3.3545E+02
5	3.4052E+02	6	8.5003E+02	7	1.0231E+03	8	1.2619E+03
9	1.9547E+03	10	1.9880E+03	11	1.5595E-10	12	-4.6984E-02
13	-4.4557E+02	14	-7.8639E+00	15	2.5278E+02	16	4.4222E+02
17	5.7413E+02	18	6.8474E+02	19	8.2585E+02	20	1.1532E+03
21	1.6953E+03	22	1.6948E-11	23	-7.8392E-02	24	-5.7527E+02
25	5.3308E+01	26	1.9053E+02	27	3.0605E+02	28	3.8780E+02
29	4.5915E+02	30	5.4236E+02	31	7.0419E+02	32	1.3896E+03
33	1.3890E-11	34	-9.6678E-02	35	-5.9907E+02	36	8.9360E+01
37	1.4664E+02	38	2.1822E+02	39	2.6981E+02	40	3.1761E+02
41	3.6736E+02	42	4.3183E+02	43	1.1323E+03	44	1.1317E-11
45	-1.0278E-01	46	-5.6284E+02	47	1.0512E+02	48	1.1688E+02
49	1.6368E+02	50	1.9795E+02	51	2.3172E+02	52	2.6270E+02
53	2.7191E+02	54	7.2478E+02	55	9.2418E-12	56	-9.9518E-02
57	-4.9724E+02	58	1.1597E+02	59	9.7560E+01	60	1.3077E+02
61	1.5528E+02	62	1.8031E+02	63	2.0092E+02	64	1.8039E+02
65	7.5526E+02	66	7.5472E-12	67	-5.5704E-02	68	-4.1686E+02
69	1.1732E+02	70	8.5971E+01	71	1.1148E+02	72	1.3032E+02
73	1.4935E+02	74	1.8416E+02	75	1.2905E+02	76	6.1230E+02
77	6.1185E-12	78	-7.6561E-02	79	-3.2927E+02	80	1.1599E+02
81	8.1089E+01	82	1.0116E+02	83	1.1603E+02	84	1.3069E+02
85	1.4234E+02	86	1.0232E+02	87	4.8472E+02	88	4.8435E-12
89	-6.7075E-02	90	-2.3927E+02	91	1.1558E+02	92	8.4031E+01
93	9.8318E+01	94	1.1083E+02	95	1.2110E+02	96	1.3100E+02
97	9.3596E+01	98	3.5857E+02	99	3.5819E-12	100	-5.0160E-02
101	-3.8513E+02	102	2.0713E+02	103	4.5384E+02	104	5.5134E+02
105	6.0406E+02	106	6.6955E+02	107	7.5105E+02	108	7.8841E+02
109	8.6617E+02	110	8.6606E-12	111	-4.3795E-11	112	-5.0160E+02
113	2.4123E+02	114	7.7271E+02	115	9.1281E+02	116	1.0419E+03
117	1.1610E+03	118	1.2711E+03	119	1.4362E+03	120	1.3247E+03
121	1.2675E-10						

HORIZONTAL ENCLOSURE AR = 20 H = 10 TO 25 MM RSTEP = 5 MM

OUTPUT OBTAINED ON 3-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	9	7.5000	0.0000	17	15.0000	0.0000
4	22.5000	0.0000	5	30.0000	0.0000	6	0.0000	.2500
7	7.5000	.2500	8	15.0000	.2500	9	22.5000	.2500
10	30.0000	.2500	11	0.0000	.5000	12	7.5000	.5000
13	15.0000	.5000	14	22.5000	.5000	15	30.0000	.5000
16	0.0000	.7500	17	7.5000	.7500	18	15.0000	.7500
19	22.5000	.7500	20	30.0000	.7500	21	0.0000	1.0000
22	7.5000	1.0000	23	15.0000	1.0000	24	22.5000	1.0000
25	30.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

N	I	J	K	AREA	M	I	J	K	AREA
1	1	2	3	9.3750E-01	2	1	2	3	9.3750E-01
3	2	8	7	9.3750E-01	4	2	3	8	9.3750E-01
5	2	9	8	9.3750E-01	6	3	4	9	9.3750E-01
7	4	10	9	9.3750E-01	8	4	5	10	9.3750E-01
9	6	12	11	9.3750E-01	10	6	7	12	9.3750E-01
11	7	13	12	9.3750E-01	12	7	8	13	9.3750E-01
12	8	14	13	9.3750E-01	14	8	9	14	9.3750E-01
15	9	15	14	9.3750E-01	16	9	10	15	9.3750E-01
17	11	17	16	9.3750E-01	18	11	12	17	9.3750E-01
19	12	18	17	9.3750E-01	20	12	13	18	9.3750E-01
21	13	19	18	9.3750E-01	22	13	14	19	9.3750E-01
23	14	20	19	9.3750E-01	24	14	15	20	9.3750E-01
25	16	22	21	9.3750E-01	26	16	17	22	9.3750E-01
27	17	23	22	9.3750E-01	28	17	18	23	9.3750E-01
29	18	24	23	9.3750E-01	30	18	19	24	9.3750E-01
31	19	25	24	9.3750E-01	32	19	20	25	9.3750E-01

THE NUMBERS OF THE 13 BOUNDARY POINTS ARE

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
1.0000E+02 3.0000E+01 1.0000E+02 0.0000E+00

PSY ERROR=5.5524E-02 THETA ERROR=4.7457E-03 OMEGA ERROR=9.0834E-02

NUMBER OF OUTER ITERATIONS= 13

RA PR NU AR
0.3037E+03 6.9791E-01 1.0298E+00 3.0000E+01

GAP CONDUCTANCE = 2.3662E+00 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	3	1.0000E+02	5	1.0000E+02	7	1.0000E+02
5	1.0000E+02	7	8.5092E-02	9	8.9872E+01	11	7.3338E+01
9	7.9492E+01	11	8.5052E-02	13	5.7422E-11	15	4.3739E+01
13	4.7926E+01	15	5.5279E+01	17	9.9860E-11	19	9.2991E-11
17	2.1128E+01	19	2.2695E+01	21	2.8526E+01	23	5.0608E-11
21	7.9572E-20	23	2.9719E-08	25	4.0293E-08	27	9.5547E-08
25	8.8747E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-8.0959E-22	3	-8.7974E-10	5	-2.5068E-09	7	-2.8704E-09
5	-5.3097E-21	7	-9.7749E-12	9	-2.1727E+00	11	-4.5441E+00
9	-4.6980E+00	11	-5.3777E-12	13	-1.6277E-12	15	-4.6029E+00
13	-7.9292E+00	15	-7.2610E+00	17	-8.4743E-12	19	-2.3215E-12
17	-5.4593E+00	19	-8.4470E+00	21	-6.9917E+00	23	-8.0574E-12
21	-2.4592E-21	23	-2.9334E-09	25	-7.7341E-09	27	-7.2516E-09
25	-1.0436E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	3.8996E-11	3	6.9527E+01	5	1.4541E+02	7	1.5034E+02
5	1.9877E-10	7	2.5194E-12	9	2.7121E+01	11	9.0057E+01
9	1.2316E+02	11	1.3727E-11	13	1.4535E-12	15	2.1279E+01
13	5.8220E+01	15	8.4924E+01	17	9.5442E-12	19	1.8629E-12
17	1.0621E+02	19	1.7001E+02	21	1.5154E+02	23	1.6820E-11
21	1.2598E-10	23	1.7454E+02	25	2.7094E+02	27	2.2374E+02
25	2.8267E-10						

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H = 1.5000E+02 W = 1.5000E+01 TS = 1.0000E+02 TL = 0.0000E+00

PSY ERROR=5.8351E-02 THETA ERROR=7.6286E-03 OMEGA ERROR=9.3253E-02

NUMBER OF OUTER ITERATIONS= 13

RO = 2.8025E+01 PR = 6.0001E-01 NU = 1.0950E+00 OR = 2.0000E+01

GAP CONDUCTANCE = 1.6651E+02 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	7.0029E-02	7	6.9492E+01	8	6.9628E+01
9	9.5239E+01	10	7.0049E-02	11	6.5491E-11	12	3.6539E+01
13	9.4045E+01	14	6.1794E+01	15	9.2612E-11	16	3.1224E-11
17	1.6947E+01	18	2.3009E+01	19	3.3050E+01	20	4.5855E-11
21	5.0221E-20	22	2.9154E-02	23	2.0350E-02	24	4.1269E-02
25	6.5146E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.0731E-21	2	-1.15072E-09	3	-1.8364E-09	4	-6.1457E-09
5	-9.4812E-21	6	-1.6747E-12	7	-4.9037E+00	8	-9.9767E+00
9	-1.1602E+01	10	-1.1489E-11	11	-3.0810E-12	12	-1.1036E+01
13	-1.7709E+01	14	-1.7521E+01	15	-1.7898E-11	16	-6.5915E-12
17	-1.3406E+01	18	-1.8368E+01	19	-1.6570E+01	20	-1.6774E-11
21	-5.7279E-21	22	-7.7636E-02	23	-1.5232E-02	24	-1.5092E-02
25	-1.9409E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	7.0450E-11	2	1.5372E+02	3	3.1925E+02	4	3.7128E+02
5	2.0885E-10	6	7.2759E-12	7	8.0531E+01	8	1.6941E+02
9	3.3177E+02	10	3.6931E-11	11	3.5261E-12	12	6.6637E+01
13	1.0552E+02	14	3.2183E+02	15	3.4865E-11	16	7.6739E-12
17	3.3704E+02	18	3.7796E+02	19	3.4725E+02	20	3.8541E-11
21	2.5954E-10	22	4.2899E+02	23	6.1977E+02	24	5.9023E+02
25	5.9563E-10						

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H = 2.0000E+02 L = 2.0000E+01 T₀ = 1.0000E+02 T₁ = 0.0000E+00

PSYCHROMETER SLOPE = 0.1145E+02 THERMAL ERROR = 2.4001E-01 OMEGA ERROR = 8.8032E-02

NUMBER OF CYCLE ITERATIONS = 10

RA = 2.6920E+04 PR = 2.0000E-01 NU = 1.1653E+01 MA = 2.0000E+01

GAS CONDUCTANCE = 1.5051E+00 KCAL/M.S.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.5017E-08	7	5.9197E+01	8	8.9357E+01
9	9.9830E+01	10	5.5042E-08	11	7.5725E-11	12	3.0486E+01
13	2.9191E+01	14	6.6870E+01	15	7.4022E-11	16	2.1704E-11
17	1.9379E+01	18	2.0390E+01	19	3.7020E+01	20	3.9167E-11
21	2.9131E-20	22	1.9529E-09	23	2.1141E-09	24	3.5250E-08
25	4.3510E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-8.1448E-22	2	-1.6591E-09	3	-5.8720E-09	4	-8.3561E-09
5	-1.0142E-20	6	-1.8935E-12	7	-7.6041E+00	8	-1.4762E+01
9	-1.9571E+01	10	-1.5623E-11	11	-3.7380E-12	12	-1.8541E+01
13	-2.4932E+01	14	-2.8949E+01	15	-2.4132E-11	16	-8.0844E-12
17	-2.3758E+01	18	-3.0179E+01	19	-2.6953E+01	20	-2.2287E-11
21	-5.1318E-21	22	-7.5213E-09	23	-1.9119E-09	24	-2.0059E-08
25	-1.9583E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	9.5897E-11	2	2.4339E+02	3	4.7239E+02	4	6.2627E+02
5	5.1944E-10	6	1.3926E-11	7	1.4613E+02	8	1.8713E+02
9	6.0628E+02	10	6.7433E-11	11	7.1965E-12	12	1.4990E+02
13	1.00430E+02	14	4.0321E+02	15	1.5093E-11	16	1.7537E-11
17	5.5902E+02	18	5.5560E+02	19	5.5791E+02	20	6.1922E-11
21	3.3952E-10	22	7.2226E+02	23	9.1657E+02	24	8.6249E+02
25	9.0892E-10						

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
2.5000E-02 7.5000E-01 1.0000E+02 0.0000E+00

PSY ERROR=5.5730E-02 THETA ERROR=2.7047E-02 OMEGA ERROR=4.9518E-02

NUMBER OF OUTER ITERATIONS= 9

RA PR NU OR
1.2874E+05 6.9991E-01 1.2547E+00 3.0000E+01

GAP CONDUCTANCE = 1.1543E+00 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.0012E-02	7	5.3409E+01	8	5.9164E+01
9	9.3332E+01	10	5.0042E-02	11	3.8046E-11	12	2.5953E+01
13	2.5215E+01	14	7.0262E+01	15	7.1100E-11	16	1.7233E-11
17	1.1669E+01	18	1.9878E+01	19	3.9912E+01	20	3.8722E-11
21	2.1909E-20	22	1.5539E-02	23	1.7193E-02	24	3.4850E-02
25	3.8945E-24						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.0322E-21	2	-2.3983E-09	3	-2.4610E-09	4	-1.1702E-08
5	-1.3199E-20	6	-2.6648E-12	7	-1.1972E+01	8	-1.9054E+01
9	-2.8494E+01	10	-2.1749E-11	11	-5.7031E-12	12	-2.8219E+01
13	-2.4663E+01	14	-4.1112E+01	15	-3.9040E-11	16	-1.2007E-11
17	-3.5706E+01	18	-3.9889E+01	19	-3.7333E+01	20	-3.0098E-11
21	-7.0132E-21	22	-1.4156E-02	23	-2.5115E-02	24	-2.7089E-02
25	-2.4944E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.2779E-10	2	3.8310E+02	3	6.0971E+02	4	9.1181E+02
5	7.8719E-10	6	2.5085E-11	7	2.9146E+02	8	1.3864E+02
9	9.4010E+02	10	1.0254E-10	11	1.5582E-11	12	2.9440E+02
13	3.0108E+01	14	2.2700E+02	15	7.1126E-11	16	2.0735E-11
17	9.1975E+02	18	4.3126E+02	19	9.0263E+02	20	8.9081E-11
21	5.1105E-10	22	1.1426E+02	23	1.2769E+02	24	1.1948E+02
25	1.0958E-02						

ENCLOSURE-INCLINATION = 0.3 DEGREES

PSY ERROR=4.0923E-02 THETA ERROR=2.7317E-02 OMEGA ERROR=9.2747E-02

NUMBER OF OUTER ITERATIONS= 10

~~SOP CONSTRUCTION~~ - 1-03575-00 XCDLTM-N. HB-DEG.C

[illegible]

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.5009E-08	7	4.9984E+01	8	5.2142E+01
9	9.7157E+01	10	5.5051E-08	11	3.6355E-11	12	2.2277E+01
13	2.9486E+01	14	7.4446E+01	15	8.2659E-11	16	1.6286E-11
17	1.0061E+01	18	1.7957E+01	19	4.3201E+01	20	4.6855E-11
21	2.2878E-20	22	1.4666E-08	23	1.7749E-08	24	4.1810E-08
25	5.1258E-20						

STRENGTH FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-2.8074E-21	2	-5.0845E-09	3	-1.1239E-08	4	-1.9097E-08
5	-2.4911E-20	7	-5.6604E-12	7	-1.7749E+01	9	-2.0129E+01
9	-3.8907E+01	10	-3.5124E-11	11	-1.1594E-11	12	-1.0013E+01
12	-4.3239E+01	14	-5.6158E+01	15	-5.3117E-11	16	-2.3380E-11
17	-4.7368E+01	18	-4.9217E+01	19	-5.3852E+01	20	-4.6820E-11
21	-1.7740E-20	22	-2.7619E-09	23	-3.8320E-09	24	-4.2138E-08
25	-1.1860E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	2.4425E-10	3	5.5841E+02	3	7.7209E+02	4	1.2418E+03
5	1.2619E-09	6	4.5387E-11	7	5.2272E+02	8	3.8476E+01
9	1.2222E+03	10	1.4713E-10	11	3.4752E-11	12	4.7361E+02
13	5.0525E+04	14	8.7510E+02	15	9.3956E-11	16	4.3299E-11
17	1.2522E+03	18	7.5098E+02	19	1.0988E+03	20	1.2190E-10
21	9.1500E-10	22	1.5158E+02	23	1.5749E+03	24	1.5273E+02
25	1.5788E-09						

[illegible]

HORIZONTAL ENCLOSURE AR = 50 H = 10 TO 50 MM STEP = 10 MM

OUTPUT OBTAINED ON 2-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	12.5000	0.0000	3	25.0000	0.0000
4	37.5000	0.0000	5	50.0000	0.0000	6	0.0000	.2500
7	12.5000	.2500	8	25.0000	.2500	9	37.5000	.2500
10	50.0000	.2500	11	0.0000	.5000	12	12.5000	.5000
13	25.0000	.5000	14	37.5000	.5000	15	50.0000	.5000
16	0.0000	.7500	17	12.5000	.7500	18	25.0000	.7500
19	37.5000	.7500	20	50.0000	.7500	21	0.0000	1.0000
22	12.5000	1.0000	23	25.0000	1.0000	24	37.5000	1.0000
25	50.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	6	1.5625E+00	2	1	2	7	1.5625E+00
3	2	8	7	1.5625E+00	4	2	3	8	1.5625E+00
5	3	9	8	1.5625E+00	6	3	4	9	1.5625E+00
7	4	10	9	1.5625E+00	8	4	5	10	1.5625E+00
9	6	12	11	1.5625E+00	10	6	7	12	1.5625E+00
11	7	13	12	1.5625E+00	12	7	8	13	1.5625E+00
13	8	14	13	1.5625E+00	14	8	9	14	1.5625E+00
15	9	15	14	1.5625E+00	16	9	10	15	1.5625E+00
17	11	17	16	1.5625E+00	18	11	12	17	1.5625E+00
19	12	18	17	1.5625E+00	20	12	13	18	1.5625E+00
21	13	19	18	1.5625E+00	22	13	14	19	1.5625E+00
23	14	20	19	1.5625E+00	24	14	15	20	1.5625E+00
25	16	22	21	1.5625E+00	26	16	17	22	1.5625E+00
27	17	23	22	1.5625E+00	28	17	18	23	1.5625E+00
29	18	24	23	1.5625E+00	30	18	19	24	1.5625E+00
31	19	25	24	1.5625E+00	32	19	20	25	1.5625E+00

THE NUMBERS OF THE 16 BOUNDARY POINTS ARE

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 1.0000E-02 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=5.710E-02 THETA ERROR=2.4543E-03 OMEGA ERROR=9.0218E-02

NUMBER OF OUTER ITERATIONS= 17

RA 9.3037E+03 PR 8.9991E-01 NU 1.0117E+00 AR 5.0000E+01

GAP CONDUCTANCE = 2.3270E+00 KCAL/(M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	9.0017E-08	7	7.2796E+01	8	7.4382E+01
9	7.6941E+01	10	9.0019E-08	11	3.4856E-11	12	4.7284E+01
13	4.9179E+01	14	5.2264E+01	15	3.6821E-11	16	1.7286E-11
17	2.3298E+01	18	2.4426E+01	19	2.6463E+01	20	-1.8510E-11
21	3.3258E-20	22	4.3295E-08	23	4.4028E-08	24	4.6276E-08
25	3.4780E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-2.3550E-22	2	-6.6924E-10	3	-1.8196E-09	4	-2.0019E-09
5	-1.3994E-21	6	-2.6769E-13	7	-1.5562E+00	8	-3.2314E+00
9	-3.1908E+00	10	-1.3529E-12	11	-4.2889E-13	12	-3.1742E+00
13	-5.6065E+00	14	-4.9910E+00	15	-2.1463E-12	16	-8.5706E-13
17	-3.7075E+00	18	-5.9277E+00	19	-4.9458E+00	20	-2.0523E-12
21	-9.9948E-22	22	-2.8129E-09	23	-5.5572E-09	24	-5.1308E-09
25	-2.7727E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.0557E-11	2	4.9798E+01	3	1.0340E+02	4	1.0211E+02
5	4.7377E-11	6	9.5580E-13	7	2.8074E+01	8	6.6953E+01
9	8.0329E+01	10	3.2174E-12	11	3.5000E-13	12	1.3277E+01
13	4.3790E+01	14	5.6799E+01	15	2.2820E-12	16	2.5681E-13
17	6.7512E+01	18	1.1978E+02	19	1.0734E+02	20	4.2919E-12
21	3.2139E-11	22	1.1864E+02	23	1.8969E+02	24	1.5507E+02
25	7.1875E-11						

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H = 2.0000E-02 W = 1.0000E+00 TS = 1.0000E+02 TL = 0.0000E+00

PSY ERROR=5.2016E-02 THETA ERROR=6.0558E-03 OMEGA ERROR=8.2952E-02

NUMBER OF OUTER ITERATIONS= 14

RA = 6.6029E+04 PR = 6.9991E-01 NU = 1.0746E+00 AR = 5.0000E+01

GAP CONDUCTANCE = 1.2357E+00 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	7.5011E-08	7	3.4475E+01	8	7.0311E+01
9	8.4622E+01	10	7.5019E-08	11	2.5569E-11	12	3.7444E+01
13	4.4790E+01	14	6.1127E+01	15	3.3987E-11	16	1.2245E-11
17	1.7472E+01	18	2.2349E+01	19	3.2565E+01	20	1.7560E-11
21	2.0907E-20	22	3.0669E-08	23	3.3078E-08	24	4.3900E-08
25	2.6722E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-7.4890E-22	2	-2.6234E-09	3	-8.0820E-09	4	-1.0060E-08
5	-6.0102E-21	6	-1.0494E-12	7	-7.5611E+00	8	-1.5520E+01
9	-1.7648E+01	10	-6.7632E-12	11	-1.9094E-12	12	-1.7181E+01
13	-2.7449E+01	14	-2.8687E+01	15	-1.0536E-11	16	-4.0663E-12
17	-2.0801E+01	18	-2.9931E+01	19	-2.5291E+01	20	-9.9025E-12
21	-3.8817E-21	22	-1.3307E-08	23	-2.5579E-08	24	-2.4756E-08
25	-1.1657E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	4.3254E-11	2	2.4196E+02	3	4.9665E+02	4	5.6475E+02
5	2.3900E-10	6	4.1817E-12	7	1.2671E+02	8	2.7086E+02
9	4.9712E+02	10	1.9901E-11	11	1.8535E-12	12	1.0178E+02
13	1.6834E+02	14	3.3204E+02	15	1.3328E-11	16	3.8556E-12
17	4.5454E+02	18	5.8428E+02	19	5.2997E+02	20	2.1190E-11
21	1.5674E-10	22	4.6564E+02	23	9.5781E+02	24	8.0930E+02
25	3.4924E-10						

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 3.0000E-02 W 1.5000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=6.4207E-02 THETA ERROR=1.9699E-02 OMEGA ERROR=6.5860E-02

NUMBER OF OUTER ITERATIONS= 10

RA 2.2420E+05 PR 6.9991E-01 NU 1.1711E+00 AR 5.0000E+01

GAP CONDUCTANCE = 9.1315E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.5006E-03	7	5.6571E+01	8	6.2936E+01
9	9.1083E+01	10	5.5016E-08	11	1.6238E-11	12	2.8979E+01
13	3.8133E+01	14	5.8187E+01	15	2.7252E-11	16	7.4833E-12
17	1.3001E+01	18	2.0307E+01	19	3.3077E+01	20	1.4564E-11
21	1.0166E-20	22	1.8742E-08	23	2.0530E-08	24	3.6411E-08
25	1.6124E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-5.8758E-22	2	-3.2814E-09	3	-1.1059E-08	4	-1.6164E-08
5	-7.1534E-21	6	-1.3126E-12	7	-1.4766E+01	8	-2.6934E+01
9	-3.6743E+01	10	-1.0849E-11	11	-2.7325E-12	12	-3.6124E+01
13	-4.8758E+01	14	-5.3908E+01	15	-1.6651E-11	16	-5.8991E-12
17	-4.4338E+01	18	-5.5230E+01	19	-4.9782E+01	20	-1.5327E-11
21	-3.8203E-21	22	-1.9292E-08	23	-3.6512E-08	24	-3.8917E-08
25	-1.3693E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	6.0895E-11	2	-4.7251E+02	3	9.5870E+02	4	-1.1758E+03
5	3.9417E-10	6	9.5216E-12	7	3.0329E+02	8	3.0205E+02
9	1.1581E+03	10	4.6340E-11	11	5.3469E-12	12	3.1557E+02
13	1.4774E+02	14	7.7148E+02	15	3.0922E-11	16	1.2432E-11
17	1.1073E+03	18	9.7434E+02	19	1.0362E+03	20	4.1430E-11
21	2.4550E-10	22	-1.4188E+03	23	1.7674E+03	24	-1.5930E+03
25	5.5415E-10						

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

190

ENCLOSURE INCLINATION = 0.0 DEGREES

H 4.0000E-02 W 2.0000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=3.0498E-02 THETA ERROR=1.8900E-02 OMEGA ERROR=8.5782E-02

NUMBER OF OUTER ITERATIONS= 10

RA 5.3143E+05 PR 6.9991E-01 NU 1.3177E+00 AR 5.0000E+01

GAP CONDUCTANCE = 7.5767E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.5004E-08	7	5.0644E+01	8	5.4306E+01
9	9.6224E+01	10	5.5018E-08	11	1.3577E-11	12	2.5455E+01
13	3.1205E+01	14	7.3358E+01	15	2.9457E-11	16	6.0934E-12
17	1.0691E+01	18	1.8458E+01	19	4.2141E+01	20	1.6433E-11
21	8.5464E-21	22	1.5261E-08	23	1.8141E-08	24	4.1083E-08
25	1.8140E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.4581E-21	2	-7.2943E-09	3	-1.7411E-08	4	-2.8920E-08
5	-1.3484E-20	6	-2.9177E-12	7	-2.6617E+01	8	-3.7638E+01
9	-5.9589E+01	10	-1.9185E-11	11	-6.0356E-12	12	-6.1203E+01
13	-6.7252E+01	14	-8.6165E+01	15	-2.8590E-11	16	-1.2492E-11
17	-7.3226E+01	18	-7.6530E+01	19	-7.7891E+01	20	-2.5785E-11
21	-9.2249E-21	22	-4.0942E-08	23	-5.9320E-08	24	-6.4463E-08
25	-2.4538E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.2742E-10	2	8.5175E+02	3	1.2044E+03	4	1.9068E+03
5	6.9015E-10	6	2.3077E-11	7	7.4155E+02	8	1.2306E+02
9	2.0059E+03	10	8.0281E-11	11	1.3395E-11	12	6.8692E+02
13	-3.4229E+01	14	1.3449E+03	15	5.3934E-11	16	2.2439E-11
17	1.9021E+03	18	1.1930E+03	19	1.7020E+03	20	6.8053E-11
21	4.9342E-10	22	2.3432E+03	23	2.4490E+03	24	2.4925E+03
25	9.2479E-10						

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

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ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
5.0000E-02 2.5000E+00 1.0000E+02 0.0000E+00

PSY ERROR=2.2453E-02 THETA ERROR=1.0005E-02 OMEGA ERROR=8.5719E-02

NUMBER OF OUTER ITERATIONS= 40

RA PR NU AR
1.0380E+06 6.9991E-01 1.4452E+00 5.0000E+01

GAP CONDUCTANCE = 6.6479E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	2.0500E-07	7	4.4845E+01	8	4.6736E+01
9	1.0001E+02	10	2.0508E-07	11	3.4366E-11	12	1.9003E+01
13	2.7092E+01	14	7.7160E+01	15	1.2356E-10	16	1.6465E-11
17	9.5366E+00	18	1.8994E+01	19	4.5712E+01	20	7.3285E-11
21	7.3471E-20	22	4.1242E-08	23	7.3616E-08	24	1.8321E-07
25	2.9876E-19						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.2284E-19	2	-8.7914E-08	3	-1.1458E-07	4	-2.0265E-07
5	-4.1112E-19	6	-3.5166E-11	7	-4.6933E+01	8	-5.0471E+01
9	-8.6537E+01	10	-1.3105E-10	11	-6.4141E-11	12	-9.8431E+01
13	-8.6908E+01	14	-1.2187E+02	15	-1.3613E-10	16	-1.2324E-10
17	-1.1289E+02	18	-9.8718E+01	19	-1.0745E+02	20	-1.6537E-10
21	-5.2399E-19	22	-4.0519E-07	23	-3.8165E-07	24	-4.1343E-07
25	-6.5488E-19						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.1854E-09	2	1.5019E+03	3	1.6157E+03	4	2.7672E+03
5	4.3043E-09	6	5.1421E-11	7	1.6348E+03	8	-2.2575E+02
9	3.0693E+03	10	1.2351E-10	11	2.7582E-11	12	1.2782E+03
13	-4.4544E+02	14	2.1133E+03	15	8.6076E-11	16	3.6463E-11
17	2.9578E+03	18	1.0572E+03	19	2.5571E+03	20	1.0232E-10
21	4.0091E-09	22	3.3125E-08	23	3.1570E+03	24	3.4383E+03
25	5.4294E-09						

ADDITIONAL ENCLOSURE AR = 100 H = 10 75 10 MM STEP = 20 MM

OUTPUT OBTAINED ON 2-7-1967

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	25.0000	0.0000	3	50.0000	0.0000
4	75.0000	0.0000	5	100.0000	0.0000	6	0.0000	.2500
7	25.0000	.2500	8	50.0000	.2500	9	75.0000	.2500
10	100.0000	.2500	11	0.0000	.5000	12	25.0000	.5000
13	50.0000	.5000	14	75.0000	.5000	15	100.0000	.5000
16	0.0000	.7500	17	25.0000	.7500	18	50.0000	.7500
19	75.0000	.7500	20	100.0000	.7500	21	0.0000	1.0000
22	25.0000	1.0000	23	50.0000	1.0000	24	75.0000	1.0000
25	100.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	6	3.1250E+00	2	1	2	7	3.1250E+00
3	2	8	7	3.1250E+00	4	2	3	8	3.1250E+00
5	3	9	8	3.1250E+00	6	3	4	9	3.1250E+00
7	4	10	9	3.1250E+00	8	4	5	10	3.1250E+00
9	5	11	10	3.1250E+00	10	5	6	11	3.1250E+00
11	6	12	11	3.1250E+00	12	6	7	12	3.1250E+00
13	7	13	12	3.1250E+00	14	7	8	13	3.1250E+00
15	8	14	13	3.1250E+00	16	8	9	14	3.1250E+00
17	9	15	14	3.1250E+00	18	9	10	15	3.1250E+00
19	10	16	15	3.1250E+00	20	10	11	16	3.1250E+00
21	11	17	16	3.1250E+00	22	11	12	17	3.1250E+00
23	12	18	17	3.1250E+00	24	12	13	18	3.1250E+00
25	13	19	18	3.1250E+00	26	13	14	19	3.1250E+00
27	14	20	19	3.1250E+00	28	14	15	20	3.1250E+00
29	15	21	20	3.1250E+00	30	15	16	21	3.1250E+00
31	16	22	21	3.1250E+00	32	16	17	22	3.1250E+00
33	17	23	22	3.1250E+00					
35	18	24	23	3.1250E+00					
37	19	25	24	3.1250E+00					

THE NUMBERS OF THE 16 BOUNDARY POINTS ARE

- 1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

193

ENCLOSURE INCLINATION = 0.0 DEGREES

PSY ERROR=6.0905E-02 THETA ERROR=7.4536E-04 OMEGA ERROR=9.5298E-02

NUMBER OF OUTER ITERATIONS= 17

SAP-CONDUCTANCE = 2.3130E+00 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.00000E+02	2	1.00000E+02	3	1.00000E+02	4	1.00000E+02
5	1.00000E+02	6	9.0004E-03	7	7.4349E+01	8	7.4781E+01
9	7.5448E+01	10	9.0005E-08	11	6.9012E-12	12	4.9208E+01
13	4.9722E+01	14	5.0533E+01	15	7.0412E-12	16	4.4411E-12
17	2.4502E+01	18	2.4807E+01	19	2.5550E+01	20	4.5267E-12
21	8.4713E-21	22	4.4494E-08	23	4.4685E-08	24	4.5267E-08
25	9.5755E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-3.0564E-23	2	-3.5186E-10	3	-7.4570E-10	4	-1.0245E-09
5	-1.7793E-72	6	-3.5186E-14	7	-8.2663E-01	8	-1.7199E+00
9	-1.6666E+00	10	-1.7343E-13	11	-5.5224E-14	12	-1.6523E+00
13	-2.9754E+00	14	-2.6252E+00	15	-2.7624E-13	16	-1.0994E-13
17	-1.9144E+00	18	-3.1281E+00	19	-2.5587E+00	20	-2.6472E-13
21	-1.2621E-22	22	-1.4309E-09	23	-2.8695E-09	24	-2.6472E-09
25	-2.5432E-22						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.3904E-12	2	2.6457E-01	3	5.5056E+01	4	5.3032E+01
5	3.0831E-12	6	1.3084E-13	7	1.5322E+01	8	3.6374E+01
9	4.1172E+01	10	4.1186E-13	11	4.5205E-14	12	6.5064E+00
13	2.3927E+01	14	2.9670E+01	15	2.9702E-13	16	1.9107E-14
17	2.3475E+01	18	5.3386E+01	19	5.7529E+01	20	5.7524E-13
21	4.0786E-12	22	6.1259E+01	23	1.0010E+02	24	8.1830E+01
25	9.2889E-12						

[illegible]

194

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 3.0000E-02 W 3.0000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=5.7319E-02 THETA ERROR=6.5514E-03 OMEGA ERROR=9.3123E-02

NUMBER OF OUTER ITERATIONS= 14

RA 2.2420E+05 PR 6.9991E-01 NU 1.0627E+00 AR 1.0000E+02

GAP CONDUCTANCE = 2.1473E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	7.5003E-08	7	6.5604E+01	8	7.0985E+01
9	9.3710E+01	10	7.5005E-08	11	6.5277E-12	12	3.8716E+01
13	4.5432E+01	14	6.0082E+01	15	8.3046E-12	16	3.1426E-12
17	1.9182E+01	18	2.2564E+01	19	3.1500E+01	20	4.3130E-12
21	5.3285E-21	22	3.1484E-08	23	3.3590E-08	24	4.3130E-08
25	6.5951E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-3.2614E-22	2	-4.6142E-09	3	-1.4202E-08	4	-1.7415E-08
5	-2.5845E-21	6	-4.6142E-13	7	-1.3391E+01	8	-2.7875E+01
9	-3.1142E+01	10	-2.9324E-12	11	-6.2291E-13	12	-3.0049E+01
13	-4.9201E+01	14	-4.7341E+01	15	-4.5840E-12	16	-1.7398E-12
17	-3.6243E+01	18	-5.3399E+01	19	-4.5021E+01	20	-4.3109E-12
21	-1.6476E-21	22	-2.2777E-03	23	-4.4654E-08	24	-4.3169E-08
25	-5.0872E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.9050E-11	2	4.2951E+02	3	8.9200E+02	4	9.9655E+02
5	1.0380E-10	6	1.8610E-12	7	2.2356E+02	8	5.0178E+02
9	8.6637E+02	10	8.6655E-12	11	7.5792E-13	12	1.6804E+02
13	3.1671E+02	14	5.9260E+02	15	5.8277E-12	16	1.5035E-12
17	7.7533E+02	18	1.0529E+03	19	9.5015E+02	20	9.5002E-12
21	6.7270E-11	22	1.1598E+03	23	1.7083E+03	24	1.4407E+03
25	1.5255E-10						

195

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 5.0000E-02 W 5.0000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=9.1073E-02 THETA ERROR=3.6760E-02 OMEGA ERROR=9.3152E-02

NUMBER OF OUTER ITERATIONS= 5

RA 1.0380E+04 PR 6.9991E-01 NU 1.2099E+00 AR 1.0000E+02

GAP CONDUCTANCE = 5.5657E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	5	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.0001E-03	7	5.5852E+01	8	6.1655E+01
9	9.1747E+01	10	5.0004E-03	11	3.6678E-12	12	2.8041E+01
13	3.7004E+01	14	6.8933E+01	15	6.2287E-12	16	1.6632E-12
17	1.2476E+01	18	1.9950E+01	19	3.6777E+01	20	3.3382E-12
21	2.1144E-21	22	1.6862E-03	23	1.8069E-03	24	3.3382E-03
25	3.3725E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-2.2091E-22	2	-5.8905E-09	3	-2.0748E-03	4	-3.1042E-03
5	-3.0873E-21	6	-5.8965E-13	7	-3.1218E+01	8	-5.6159E+01
9	-7.9088E+01	10	-5.2217E-12	11	-1.2368E-12	12	-7.7125E+01
13	-1.0326E+02	14	-1.1577E+02	15	-3.0294E-12	16	-2.6409E-12
17	-9.4463E+01	18	-1.1787E+02	19	-1.0681E+02	20	-7.3683E-12
21	-1.4773E-21	22	-3.4559E-03	23	-6.9549E-03	24	-7.3683E-03
25	-5.9475E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	2.9838E-11	2	9.9896E+02	3	1.7971E+03	4	2.5308E+03
5	1.9240E-10	6	5.2907E-12	7	6.7570E+02	8	5.6619E+02
9	2.5349E+03	10	2.5351E-11	11	2.9476E-12	12	7.1400E+02
13	2.5946E+02	14	1.6987E+03	15	1.6394E-11	16	6.9776E-12
17	2.4169E+03	18	2.0516E+03	19	2.2137E+03	20	3.2135E-11
21	1.1473E-10	22	3.0228E+03	23	3.7720E+03	24	3.4178E+03
25	2.6993E-10						

ENCLOSURE INCLINATION = 0.0 DEGREE

H	W	TS	TL
7.0000E-02	7.0000E+00	1.0000E+02	0.0000E+00

PSY ERROR=2.2047E-02 THETA ERROR=1.3077E-02 OMEGA ERROR=4.2058E-02

NUMBER OF OUTER ITERATIONS= 15

RA	PE	NU	AR
2.8432E+06	6.7971E-01	1.3760E+00	1.0000E+02

GAP CONDUCTANCE = 4.5211E-01 KCAL./M.O.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.00000E+02	2	1.00000E+02	3	1.00000E+02	4	1.00000E+02
5	1.00000E+02	6	8.0001E-08	7	4.8334E+01	8	5.0824E+01
9	9.7643E+01	10	9.0007E-08	11	4.3476E-12	12	2.1513E+01
13	2.9236E+01	14	7.5028E+01	15	1.1290E-11	16	1.9203E-12
17	9.9315E+00	18	1.8688E+01	19	4.4114E+01	20	6.4739E-12
21	3.7294E-21	22	1.9237E-08	23	2.6949E-08	24	6.4739E-08
25	1.0321E-20						

I	PSY	I	PSY	I	PSY	I	PSY
1	-3.6879E-21	2	-3.6950E-08	3	-6.5393E-06	4	-1.1250E-07
5	-2.0482E-20	6	-3.6950E-12	7	-6.9768E+01	8	-8.5088E+01
9	-1.4014E+02	10	-1.8424E-11	11	-7.3248E-12	12	-1.5296E+02
13	-1.5259E+02	14	-2.0016E+32	15	-2.6837E-11	16	-1.4682E-11
17	-1.7918E+02	18	-1.7539E+02	19	-1.9052E+02	20	-2.4046E-11
21	-1.9659E-20	22	-1.7268E-07	23	-2.2365E-07	24	-2.4046E-07
25	-3.5081E-20						

1	OMEGA	1	OMEGA	1	OMEGA	1	OMEGA
1	1.4374E-10	2	2.2006E+03	3	2.7220E+03	4	4.4846E+03
5	3.3441E-10	6	1.6734E-11	7	2.1478E+03	8	1.4373E+00
9	4.8252E+03	10	4.8270E-11	11	9.5449E-12	12	1.9003E+03
13	3.4236E+02	14	3.1975E+03	15	3.2019E-11	16	1.4377E-11
17	4.7715E+03	18	2.4417E+03	19	3.9151E+03	20	3.9147E-11
21	5.2715E-10	22	5.7336E+03	23	5.8123E+03	24	5.7701E+03
25	8.2716E-10						

FREE CONVECTION IN RECTANGULAR ENCLOSURES - CST FINITE ELEMENT SOLUTION

OUTPUT OBTAINED ON 1-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	50.0000	0.0000	3	100.0000	0.0000
4	150.0000	0.0000	5	200.0000	0.0000	6	0.0000	.2500
7	50.0000	.2500	8	100.0000	.2500	9	150.0000	.2500
10	200.0000	.2500	11	0.0000	.5000	12	50.0000	.5000
13	100.0000	.5000	14	150.0000	.5000	15	200.0000	.5000
16	0.0000	.7500	17	50.0000	.7500	18	100.0000	.7500
19	150.0000	.7500	20	200.0000	.7500	21	0.0000	1.0000
22	50.0000	1.0000	23	100.0000	1.0000	24	150.0000	1.0000
25	200.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	6	6.2500E+00	2	1	2	7	6.2500E+00
3	2	8	7	6.2500E+00	4	2	3	8	6.2500E+00
5	3	9	8	6.2500E+00	6	3	4	9	6.2500E+00
7	4	10	9	6.2500E+00	8	4	5	10	6.2500E+00
9	6	12	11	6.2500E+00	10	6	7	12	6.2500E+00
11	7	13	12	6.2500E+00	12	7	8	13	6.2500E+00
13	8	14	13	6.2500E+00	14	8	9	14	6.2500E+00
15	9	15	14	6.2500E+00	16	9	10	15	6.2500E+00
17	11	17	16	6.2500E+00	18	11	12	17	6.2500E+00
19	12	18	17	6.2500E+00	20	12	13	18	6.2500E+00
21	13	19	18	6.2500E+00	22	13	14	19	6.2500E+00
23	14	20	19	6.2500E+00	24	14	15	20	6.2500E+00
25	16	22	21	6.2500E+00	26	16	17	22	6.2500E+00
27	17	23	22	6.2500E+00	28	17	18	23	6.2500E+00
29	18	24	23	6.2500E+00	30	18	19	24	6.2500E+00
31	19	25	24	6.2500E+00	32	19	20	25	6.2500E+00

THE NUMBERS OF THE 16 BOUNDARY POINTS ARE

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

198

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H. W TS TL
2.0000E-02 4.0000E+00 1.0000E+02 0.0000E+00

PSY ERROR=5.9693E-02 THETA ERROR=1.4035E-03 OMEGA ERROR=9.3656E-02

NUMBER OF OUTER ITERATIONS= 17

RA PR NU AR
6.6429E+04 6.9991E-01 1.0071E+00 2.0000E+02

GAP CONDUCTANCE = 1.1582E+00 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	9.0001E-08	7	7.3825E+01	8	7.4653E+01
9	7.5987E+01	10	9.0001E-08	11	2.2105E-12	12	4.8555E+01
13	4.9540E+01	14	5.1157E+01	15	2.2757E-12	16	1.1007E-12
17	2.4095E+01	18	2.4674E+01	19	2.5748E+01	20	1.1410E-12
21	2.1082E-21	22	4.4108E-08	23	4.4468E-08	24	4.5640E-08
25	2.1558E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-3.0237E-23	2	-1.3867E-09	3	-3.7402E-09	4	-4.0723E-09
5	-1.7718E-22	6	-3.4667E-14	7	-3.2478E+00	8	-6.7501E+00
9	-6.5812E+00	10	-1.7223E-13	11	-5.4805E-14	12	-6.5384E+00
13	-1.1691E+01	14	-1.0342E+01	15	-2.7396E-13	16	-1.0860E-13
17	-7.5961E+00	18	-1.2315E+01	19	-1.0067E+01	20	-2.6236E-13
21	-1.2607E-22	22	-5.7040E-09	23	-1.1376E-08	24	-1.0494E-08
25	-3.5226E-22						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.3691E-12	2	1.0393E+02	3	2.1600E+02	4	2.1060E+02
5	3.0379E-12	6	1.2720E-13	7	5.9635E+01	8	1.4178E+02
9	1.6362E+02	10	4.0909E-13	11	4.3908E-14	12	2.6315E+01
13	9.3089E+01	14	1.1709E+02	15	2.9282E-13	16	2.2361E-14
17	1.3480E+02	18	2.4935E+02	19	2.2514E+02	20	5.6283E-13
21	4.0828E-12	22	2.4308E+02	23	3.9408E+02	24	3.2214E+02
25	9.2009E-12						

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

199

ENCLOSURE INCLINATION = 0.0 DEGREES

H 4.0000E-02 W 8.0000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=5.8978E-02 THETA ERROR=5.9185E-03 OMEGA ERROR=9.7315E-02

NUMBER OF OUTER ITERATIONS= 15

RA 5.3143E+05 PR 6.9991E-01 NU 1.0375E+00 AR 2.0000E+02

GAP CONDUCTANCE = 5.9659E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	8.0001E-08	7	6.8399E+01	8	7.2584E+01
9	8.1201E+01	10	8.0001E-08	11	1.8201E-12	12	4.1971E+01
13	4.7089E+01	14	5.7196E+01	15	2.1616E-12	16	8.8682E-13
17	2.0070E+01	18	2.3276E+01	19	2.9763E+01	20	1.1013E-12
21	1.5691E-21	22	3.5539E-08	23	3.7231E-08	24	4.4053E-08
25	1.8123E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.3425E-22	2	-7.0295E-09	3	-2.0737E-08	4	-2.4356E-08
5	-9.5576E-22	6	-1.7574E-13	7	-1.8021E+01	8	-3.9513E+01
9	-4.2006E+01	10	-1.0267E-12	11	-2.9448E-13	12	-4.0738E+01
13	-6.9251E+01	14	-6.4569E+01	15	-1.0143E-12	16	-6.2039E-13
17	-4.8588E+01	18	-7.4344E+01	19	-6.1900E+01	20	-1.5294E-12
21	-6.3161E-22	22	-3.2517E-08	23	-6.4372E-08	24	-6.1177E-08
25	-1.8756E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	7.1293E-12	2	6.0225E-12	3	1.2644E+03	4	1.3442E+03
5	9.8213E-11	6	6.7185E-13	7	3.1346E+02	8	7.6028E+02
9	1.1262E+03	10	2.8158E-12	11	2.4935E-13	12	2.0050E+02
13	4.9950E+02	14	7.6891E+02	15	1.9227E-12	16	3.8242E-13
17	7.8039E+02	18	1.4871E+03	19	1.3289E+03	20	3.3221E-12
21	2.3739E-11	22	1.5548E+03	23	2.3790E+03	24	1.9809E+03
25	5.3894E-11						

200

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 4.0000E-02 W 1.2000E+01 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=5.9666E-02 THETA ERROR=1.1453E-02 OMEGA ERROR=8.4886E-02

NUMBER OF OUTER ITERATIONS= 12

RA 1.7936E+06 PR 5.9991E-01 NU 1.1148E+00 AR 2.0000E+02

GAP CONDUCTANCE = 4.2735E-01 KCAL/M.H.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	6.5001E-09	7	5.1321E+01	8	6.7647E+01
9	9.7420E+01	10	6.5001E-08	11	1.3136E-12	12	3.3899E+01
13	4.2215E+01	14	6.4270E+01	15	1.9122E-12	16	6.1998E-13
17	1.5508E+01	18	2.1398E+01	19	3.4916E+01	20	1.0001E-12
21	9.4826E-22	22	2.4845E-03	23	2.6799E-08	24	4.0003E-08
25	1.3142E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.6320E-22	2	-1.1273E-08	3	-3.7213E-08	4	-4.9398E-08
5	-1.6018E-21	6	-2.8183E-13	7	-3.9946E+01	8	-8.0454E+01
9	-9.8372E+01	10	-2.0761E-12	11	-5.4270E-13	12	-9.4348E+01
13	-1.4395E+02	14	-1.4715E+02	15	-3.2188E-12	16	-1.1734E-12
17	-1.1527E+02	18	-1.5921E+02	19	-1.3315E+02	20	-3.0003E-12
21	-2.3426E-22	22	-6.1386E-08	23	-1.1957E-07	24	-1.2001E-07
25	-3.0962E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.2214E-11	2	1.2783E+03	3	2.5745E+03	4	3.1479E+03
5	7.4304E-11	6	1.4099E-12	7	6.9646E+02	8	1.2394E+03
9	2.9037E+03	10	7.2554E-12	11	6.6395E-13	12	6.5025E+02
13	7.4107E+02	14	1.9291E+03	15	4.8235E-12	16	1.5980E-12
17	2.6752E+03	18	3.0334E+03	19	2.8686E+03	20	7.1713E-12
21	4.6772E-11	22	3.6888E-03	23	5.0946E+03	24	4.4707E+03
25	1.0706E-10						

201

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

R W TS TL
8.0000E-02 1.6000E+01 1.0000E+02 0.0000E+00

PSY ERROR=8.8729E-02 THETA ERROR=3.5817E-02 OMEGA ERROR=9.0077E-02

NUMBER OF OUTER ITERATIONS= 9

RA PR NU AR
4.2515E+06 6.9971E-01 1.2129E+00 2.0000E+02

GAP CONDUCTANCE = 3.4871E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.0000E-08	7	5.5664E+01	8	8.1480E+01
9	9.1888E+01	10	5.0001E-08	11	9.1282E-13	12	2.7865E+01
13	3.6890E+01	14	6.9076E+01	15	1.5313E-12	16	4.1849E-13
17	1.2406E+01	18	1.9958E+01	19	3.8914E+01	20	8.3785E-13
21	5.2648E-22	22	1.6769E-08	23	1.8001E-08	24	3.3514E-08
25	8.4615E-22						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.1319E-22	2	-1.2051E-08	3	-4.2087E-08	4	-6.3124E-08
5	-1.5736E-21	6	-3.0127E-13	7	-6.3678E+01	8	-1.1341E+02
9	-1.6039E+02	10	-2.6561E-12	11	-6.3422E-13	12	-1.5728E+02
13	-2.0846E+02	14	-2.3448E+02	15	-4.0809E-12	16	-1.3531E-12
17	-1.9262E+02	18	-2.3818E+02	19	-2.1607E+02	20	-3.7432E-12
21	-7.5909E-22	22	-7.0827E-08	23	-1.3930E-07	24	-1.4973E-07
25	-3.0278E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.4735E-11	2	2.0377E+03	3	3.6290E+03	4	5.1524E+03
5	9.7826E-11	6	2.7190E-12	7	1.3907E+03	8	1.1207E+03
9	5.1518E+03	10	1.2880E-11	11	1.5174E-12	12	1.4685E+03
13	4.9717E+02	14	3.4348E+03	15	8.5879E-12	16	3.5577E-12
17	4.9349E+03	18	4.1153E+03	19	4.4363E+03	20	1.1215E-11
21	5.8709E-11	22	6.1639E+03	23	7.6217E+03	24	6.9148E+03
25	1.3707E-10						

202

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H = 1.0000E-01 W = 2.0000E+01 TS = 1.0000E+02 TL = 0.0000E+00

PSY ERROR=2.8912E-02 THETA ERROR=1.7763E-02 OMEGA ERROR=8.3560E-02

NUMBER OF OUTER ITERATIONS= 10

RA = 8.3037E+06 PR = 6.9991E-01 NU = 1.3127E+00 AR = 2.0000E+02

GAP CONDUCTANCE = 3.0193E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

TEMP	I	TEMP	I	TEMP	I	TEMP	I
1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02	
1.0000E+02	6	5.5000E-08	7	5.0819E+01	8	5.4588E+01	
9.6138E+01	10	5.5001E-08	11	8.5372E-13	12	2.3619E+01	
3.1439E+01	14	7.3272E+01	15	1.8402E-12	16	3.8338E-13	
1.0714E+01	18	1.8538E+01	19	4.2052E+01	20	1.0258E-12	
5.3767E-22	22	1.5363E-08	23	1.8204E-08	24	4.1031E-08	
1.1326E-21							

STREAM FUNCTION DISTRIBUTION

PSY	I	PSY	I	PSY	I	PSY	I
-3.5594E-22	2	-2.8603E-08	3	-6.8920E-08	4	-1.1411E-07	
-3.3224E-21	6	-7.1507E-13	7	-1.0506E+02	8	-1.4920E+02	
-2.3558E+02	10	-4.7325E-12	11	-1.4947E-12	12	-2.4222E+02	
-2.6651E+02	14	-3.4062E+02	15	-7.0593E-12	16	-3.0748E-12	
-2.9015E+02	18	-3.0329E+02	19	-3.0788E+02	20	-6.3690E-12	
-2.2623E-21	22	-1.6121E-07	23	-2.3481E-07	24	-2.5476E-07	
-6.0559E-21							

VORTICITY FUNCTION DISTRIBUTION

OMEGA	I	OMEGA	I	OMEGA	I	OMEGA	I
3.1287E-11	2	3.3620E+03	3	4.7743E+03	4	7.5386E+03	
1.7029E-10	6	5.6473E-12	7	2.9044E+03	8	5.2311E+02	
7.9154E+03	10	1.9789E-11	11	3.2308E-12	12	2.7012E+03	
-1.1566E+02	14	5.3130E+03	15	1.3285E-11	16	5.4441E-12	
7.5228E+03	18	4.7272E+03	19	6.7330E+03	20	1.6832E-11	
1.2160E-10	22	9.2847E+03	23	9.7052E+03	24	9.8523E+03	
2.2844E-10							

FREE CONVECTION IN RECTANGULAR ENCLOSURES - CST FINITE ELEMENT SOLUTION

OUTPUT OBTAINED ON 29-8-1987

METRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	75.0000	0.0000	3	150.0000	0.0000
4	225.0000	0.0000	5	300.0000	0.0000	6	0.0000	.2500
7	75.0000	.2500	8	150.0000	.2500	9	225.0000	.2500
10	300.0000	.2500	11	0.0000	.5000	12	75.0000	.5000
13	150.0000	.5000	14	225.0000	.5000	15	300.0000	.5000
16	0.0000	.7500	17	75.0000	.7500	18	150.0000	.7500
19	225.0000	.7500	20	300.0000	.7500	21	0.0000	1.0000
22	75.0000	1.0000	23	150.0000	1.0000	24	225.0000	1.0000
25	300.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	6	9.3750E+00	2	1	2	7	9.3750E+00
3	2	8	7	9.3750E+00	4	2	3	8	9.3750E+00
5	3	9	8	9.3750E+00	6	3	4	9	9.3750E+00
7	4	10	9	9.3750E+00	8	4	5	10	9.3750E+00
9	6	12	11	9.3750E+00	10	6	7	12	9.3750E+00
11	7	13	12	9.3750E+00	12	7	8	13	9.3750E+00
13	8	14	13	9.3750E+00	14	8	9	14	9.3750E+00
15	9	15	14	9.3750E+00	16	9	10	15	9.3750E+00
17	11	17	16	9.3750E+00	18	11	12	17	9.3750E+00
19	12	18	17	9.3750E+00	20	12	13	18	9.3750E+00
21	13	19	18	9.3750E+00	22	13	14	19	9.3750E+00
23	14	20	19	9.3750E+00	24	14	15	20	9.3750E+00
25	16	22	21	9.3750E+00	26	16	17	22	9.3750E+00
27	17	23	22	9.3750E+00	28	17	18	23	9.3750E+00
29	18	24	23	9.3750E+00	30	18	19	24	9.3750E+00
31	19	25	24	9.3750E+00	32	19	20	25	9.3750E+00

THE NUMBERS OF THE 16 BOUNDARY POINTS ARE

2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

204

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
6.0000E-02 1.8000E+01 1.0000E+02 0.0000E+00

PSY ERROR=6.0558E-02 THETA ERROR=6.7595E-03 OMEGA ERROR=9.9546E-02

NUMBER OF OUTER ITERATIONS= 14

RA PR NU AR
1.7936E+06 6.9991E-01 1.0555E+00 3.0000E+02

GAP CONDUCTANCE = 4.0461E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

TEMP	I	TEMP	I	TEMP	I	TEMP	I
1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02	
1.0000E+02	6	7.5000E-08	7	6.6354E+01	8	7.1408E+01	
8.3075E+01	10	7.5000E-08	11	7.3488E-13	12	3.9573E+01	
4.5844E+01	14	5.9349E+01	15	9.2319E-13	16	3.5495E-13	
1.8667E+01	18	2.2713E+01	19	3.1271E+01	20	4.7352E-13	
5.9902E-22	22	3.2005E-08	23	3.3921E-08	24	4.2617E-08	
7.2645E-22							

STREAM FUNCTION DISTRIBUTION

PSY	I	PSY	I	PSY	I	PSY	I
-9.8536E-23	2	-1.2625E-08	3	-3.8811E-08	4	-4.7164E-08	
-7.7427E-22	6	-1.4027E-13	7	-3.6780E+01	8	-7.7238E+01	
-8.5334E+01	10	-8.8308E-13	11	-2.4686E-13	12	-8.1809E+01	
-1.3613E+02	14	-1.3018E+02	15	-1.3835E-12	16	-5.1926E-13	
-9.8407E+01	18	-1.4728E+02	19	-1.2407E+02	20	-1.3044E-12	
-4.8940E-22	22	-6.1194E-08	23	-1.2150E-07	24	-1.1740E-07	
-1.5136E-21							

VORTICITY FUNCTION DISTRIBUTION

OMEGA	I	OMEGA	I	OMEGA	I	OMEGA	I
5.7965E-12	2	-1.1769E+03	3	2.4716E+03	4	2.7307E+03	
3.1293E-11	6	5.7092E-13	7	6.1380E+02	8	1.4172E+03	
2.3548E+03	10	2.6165E-12	11	2.2244E-13	12	4.3949E+02	
9.0258E+02	14	1.5906E+03	15	1.7675E-12	16	4.2180E-13	
2.0735E+03	18	2.9216E+03	19	2.6325E+03	20	2.9250E-12	
2.0115E-11	22	3.1490E+03	23	4.7128E+03	24	3.9703E+03	
4.6153E-11							

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
8.0000E-02 2.4000E+01 1.0000E+02 0.0000E+00

PSY ERROR=5.7327E-02 THETA ERROR=1.1429E-02 OMEGA ERROR=7.9324E-02

NUMBER OF OUTER ITERATIONS= 12

RA PR NU AR
4.2515E+06 6.9991E-01 1.1200E+00 3.0000E+02

GAP CONDUCTANCE = 3.2199E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	6.5000E-08	7	6.0926E+01	8	6.7341E+01
9	8.7735E+01	10	6.5000E-08	11	5.7903E-13	12	3.3477E+01
13	4.1953E+01	14	6.4623E+01	15	8.5433E-13	16	2.7273E-13
17	1.5291E+01	18	2.1340E+01	19	3.5190E+01	20	4.4768E-13
21	4.1830E-22	22	2.4591E-08	23	2.6814E-08	24	4.0291E-08
25	5.8752E-22						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.1361E-22	2	-1.7599E-08	3	-5.7855E-08	4	-7.7259E-08
5	-1.1166E-21	6	-1.9555E-13	7	-6.2185E+01	8	-1.2404E+02
9	-1.5275E+02	10	-1.4422E-12	11	-3.7945E-13	12	-1.4734E+02
13	-2.2206E+02	14	-2.2804E+02	15	-2.2330E-12	16	-8.2166E-13
17	-1.8016E+02	18	-2.4602E+02	19	-2.1376E+02	20	-2.0798E-12
21	-6.5664E-22	22	-9.6707E-08	23	-1.8845E-07	24	-1.8718E-07
25	-2.1541E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	9.4686E-12	2	1.9899E+03	3	3.5692E+03	4	4.8879E+03
5	5.1582E-11	6	9.8060E-13	7	1.0939E+03	8	1.8780E+03
9	4.5282E+03	10	5.0314E-12	11	4.7015E-13	12	1.0371E+03
13	1.1096E+03	14	3.0051E+03	15	3.3393E-12	16	1.1313E-12
17	4.2071E+03	18	4.6589E+03	19	4.4334E+03	20	4.9260E-12
21	3.2699E-11	22	5.7650E+03	23	7.8727E+03	24	6.8405E+03
25	7.4153E-11						

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
1.0000E-01 3.0000E+01 1.0000E+02 0.0000E+00

PSY ERROR=6.1811E-02 THETA ERROR=1.8597E-02 OMEGA ERROR=6.2576E-02

NUMBER OF OUTER ITERATIONS= 10

RA PR NU AR
8.3037E+06 6.9991E-01 1.1940E+00 3.0000E+02

GAP CONDUCTANCE = 2.7463E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	-1.0000E+02	3	1.0000E+02	4	-1.0000E+02
5	1.0000E+02	6	5.5000E-08	7	5.5452E+01	8	-6.2706E+01
9	9.1289E+01	10	-5.5000E-08	11	4.4892E-13	12	-2.8768E+01
13	3.7968E+01	14	-6.8432E+01	15	7.6033E-13	16	2.0666E-13
17	1.2912E+01	18	-2.0300E+01	19	3.8268E+01	20	-4.0709E-13
21	2.8133E-22	22	1.8633E-08	23	2.0443E-08	24	3.6638E-08
25	4.5062E-22						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.0090E-22	2	-2.0246E-08	3	-6.7569E-08	4	-9.9172E-08
5	-1.2218E-21	6	-2.2495E-13	7	-9.0731E+01	8	-1.6306E+02
9	-2.2444E+02	10	-1.8482E-12	11	-4.7000E-13	12	-2.2208E+02
13	-2.9620E+02	14	-3.2886E+02	15	-2.8341E-12	16	-1.0140E-12
17	-2.7250E+02	18	-3.3584E+02	19	-3.0332E+02	20	-2.6072E-12
21	-6.5894E-22	22	-1.1936E-07	23	-2.2360E-07	24	-2.3465E-07
25	-2.3359E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.0426E-11	2	2.9050E+03	3	5.2180E+03	4	7.1819E+03
5	6.7123E-11	6	1.6414E-12	7	1.8850E+03	8	1.7972E+03
9	7.0912E+03	10	7.8792E-12	11	9.0680E-13	12	1.9630E+03
13	8.5417E+02	14	4.7261E+03	15	5.2515E-12	16	2.0979E-12
17	6.8209E+03	18	5.8794E+03	19	6.3225E+03	20	7.0249E-12
21	4.2137E-11	22	8.7199E+03	23	1.0747E+04	24	9.7061E+03
25	9.4216E-11						

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
1.2000E-01 3.6000E+01 1.0000E+02 0.0000E+00

PSY ERROR=1.3659E-02 THETA ERROR=7.9424E-03 OMEGA ERROR=2.5762E-02

NUMBER OF OUTER ITERATIONS= 12

RA PR NU AR
1.4349E+07 6.9991E-01 1.2760E+00 3.0000E+02

GAP CONDUCTANCE = 2.4458E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	6.5000E-08	7	5.2302E+01	8	5.7388E+01
9	9.4606E+01	10	6.5001E-08	11	4.5688E-13	12	2.4879E+01
13	3.3795E+01	14	7.1903E+01	15	9.5962E-13	16	2.0634E-13
17	1.1194E+01	18	1.9397E+01	19	4.1157E+01	20	5.3130E-13
21	3.3276E-22	22	1.8604E-08	23	2.2755E-08	24	4.7817E-08
25	6.8890E-22						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-3.3860E-22	2	-4.6438E-08	3	-1.1520E-07	4	-1.8258E-07
5	-2.8393E-21	6	-5.1597E-13	7	-1.3478E+02	8	-2.0605E+02
9	-3.0878E+02	10	-3.3582E-12	11	-1.0892E-12	12	-3.1860E+02
13	-3.7095E+02	14	-4.4608E+02	15	-5.0125E-12	16	-2.3063E-12
17	-3.8499E+02	18	-4.2342E+02	19	-4.0594E+02	20	-4.5540E-12
21	-2.1331E-21	22	-2.7171E-07	23	-3.9226E-07	24	-4.0986E-07
25	-5.1488E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	2.1303E-11	2	4.3128E+03	3	6.5935E+03	4	9.8810E+03
5	1.1844E-10	6	2.8929E-12	7	3.3674E+03	8	1.2844E+03
9	1.0186E+04	10	1.1318E-11	11	1.5985E-12	12	3.3708E+03
13	2.1407E+02	14	6.7624E+03	15	7.5146E-12	16	3.2493E-12
17	1.0004E+04	18	6.7585E+03	19	8.5678E+03	20	9.5196E-12
21	8.7490E-11	22	1.2320E+04	23	1.3550E+04	24	1.2990E+04
25	1.6016E-10						

PSY1ERROR=4.03678E-08 ENGL26500751ERROR=2.18925E-02 OMEGA ERROR=9.3248E-02

NUMBER OF OUTER ITERATIONS= 10

RA PR NU AR
2.2785E+07 6.9991E-01 1.3533E+00 3.0000E+02

GAP CONDUCTANCE = 2.2233E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.5000E-08	7	4.9236E+01	8	5.1779E+01
9	9.7488E+01	10	5.5000E-08	11	3.6321E-13	12	2.2142E+01
13	2.9211E+01	14	7.4874E+01	15	8.3125E-13	16	1.6257E-13
17	1.0004E+01	18	1.7911E+01	19	4.3568E+01	20	4.6812E-13
21	2.2902E-22	22	1.4657E-08	23	1.7710E-08	24	4.2131E-08
25	5.1707E-22						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-2.9966E-22	2	-5.2322E-08	3	-1.1352E-07	4	-1.9348E-07
5	-2.5285E-21	6	-5.8135E-13	7	-1.8144E+02	8	-2.4363E+02
9	-3.9243E+02	10	-3.5589E-12	11	-1.1871E-12	12	-4.0702E+02
13	-4.3679E+02	14	-5.6811E+02	15	-5.2782E-12	16	-2.3864E-12
17	-4.8065E+02	18	-4.9712E+02	19	-5.1473E+02	20	-4.7403E-12
21	-1.8188E-21	22	-2.8182E-07	23	-3.8720E-07	24	-4.2663E-07
25	-4.5496E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	2.5054E-11	2	5.8059E+03	3	7.7961E+03	4	1.2558E+04
5	1.2784E-10	6	4.6745E-12	7	5.3914E+03	8	3.0330E+02
9	1.3379E+04	10	1.4865E-11	11	2.6329E-12	12	4.8661E+03
13	-5.7271E+02	14	8.8231E+03	15	9.8042E-12	16	4.2364E-12
17	1.2750E+04	18	7.6468E+03	19	1.1082E+04	20	1.2314E-11
21	9.3454E-11	22	1.5381E+04	23	1.5908E+04	24	1.6471E+04
25	1.6999E-10						

ENCLOSURE INCLINATION = 0.0 DEGREES

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H W TS TL
1.6000E-01 4.8000E+01 1.0000E+02 0.0000E+00

PSY ERROR=1.4113E-02 THETA ERROR=2.6202E-02 OMEGA ERROR=9.7419E-02

NUMBER OF OUTER ITERATIONS= 22

RA PR NU AR
3.4012E+07 6.9991E-01 1.4225E+00 3.0000E+02

GAP CONDUCTANCE = 2.0449E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	1.1500E-07	7	4.6551E+01	8	4.7932E+01
9	9.8829E+01	10	1.1500E-07	11	5.9222E-13	12	2.0502E+01
13	2.7884E+01	14	7.5822E+01	15	1.8779E-12	16	2.7529E-13
17	1.0059E+01	18	1.8985E+01	19	4.4749E+01	20	1.1008E-12
21	7.3004E-22	22	2.4822E-08	23	3.9697E-08	24	9.9071E-08
25	2.5188E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	4.5651E-21	2	2.4065E-07	3	-3.4495E-07	4	-6.0908E-07
5	1.8512E-20	6	2.6739E-12	7	-2.5975E+02	8	-2.8363E+02
9	4.9329E+02	10	1.0997E-11	11	-5.0102E-12	12	-5.5777E+02
13	4.9376E+02	14	6.9391E+02	15	-1.5763E-11	16	-9.7064E-12
17	6.4426E+02	18	5.6612E+02	19	-6.1307E+02	20	-1.4029E-11
21	2.1066E-20	22	1.1483E-06	23	-1.1614E-06	24	-1.2626E-06
25	3.0384E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	9.4799E-11	2	8.3119E+03	3	9.0763E+03	4	1.5785E+04
5	3.6945E-10	6	7.8328E-12	7	9.0051E+03	8	-1.0128E+03
9	1.7293E+04	10	1.9216E-11	11	4.3494E-12	12	7.2770E+03
13	2.0530E+03	14	1.1904E+04	15	1.3230E-11	16	5.3129E-12
17	1.6768E+04	18	6.5174E+03	19	1.4503E+04	20	1.6114E-11
21	3.3351E-10	22	2.0616E+04	23	1.8116E+04	24	1.7618E+04
25	4.7074E-10						

HORIZONTAL ENCLOSURE AR=100 H=50 MM TOLERANCE=0.1 PERCENT

OUTPUT OBTAINED ON 1-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	25.0000	0.0000	3	50.0000	0.0000
4	75.0000	0.0000	5	100.0000	0.0000	6	0.0000	.2500
7	25.0000	.2500	8	50.0000	.2500	9	75.0000	.2500
10	100.0000	.2500	11	0.0000	.5000	12	25.0000	.5000
13	50.0000	.5000	14	75.0000	.5000	15	100.0000	.5000
16	0.0000	.7500	17	25.0000	.7500	18	50.0000	.7500
19	75.0000	.7500	20	100.0000	.7500	21	0.0000	1.0000
22	25.0000	1.0000	23	50.0000	1.0000	24	75.0000	1.0000
25	100.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	6	3.1250E+00	2	1	2	7	3.1250E+00
3	2	8	7	3.1250E+00	4	2	3	8	3.1250E+00
5	3	9	8	3.1250E+00	6	3	4	9	3.1250E+00
7	4	10	9	3.1250E+00	8	4	5	10	3.1250E+00
9	5	11	10	3.1250E+00	10	5	6	11	3.1250E+00
11	6	12	11	3.1250E+00	12	6	7	12	3.1250E+00
13	7	13	12	3.1250E+00	14	7	8	13	3.1250E+00
15	8	14	13	3.1250E+00	16	8	9	14	3.1250E+00
17	9	15	14	3.1250E+00	18	9	10	15	3.1250E+00
19	10	16	15	3.1250E+00	20	10	11	16	3.1250E+00
21	11	17	16	3.1250E+00	22	11	12	17	3.1250E+00
23	12	18	17	3.1250E+00	24	12	13	18	3.1250E+00
25	13	19	18	3.1250E+00	26	13	14	19	3.1250E+00
27	14	20	19	3.1250E+00	28	14	15	20	3.1250E+00
29	15	21	20	3.1250E+00	30	15	16	21	3.1250E+00
31	16	22	21	3.1250E+00	32	16	17	22	3.1250E+00
	17	23	22	3.1250E+00		17	18	23	3.1250E+00
	18	24	23	3.1250E+00		18	19	24	3.1250E+00
	19	25	24	3.1250E+00		19	20	25	3.1250E+00

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-03 AFTER 12 CYCLES

CONDUCTION TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	.1000E+03	2	.1000E+03	3	.1000E+03	4	.1000E+03
5	.1000E+03	6	.5000E-08	7	.7498E+02	8	.7499E+02
9	.7498E+02	10	.5000E-08	11	.4998E-12	12	.4998E+02
13	.4999E+02	14	.4998E+02	15	.4997E-12	16	.2498E-12
17	.2499E+02	18	.2499E+02	19	.2499E+02	20	.2499E-12
21	.4995E-22	22	.2499E-08	23	.2499E-08	24	.2499E-08
25	.4997E-22						

NO CONVERGENCE AFTER 100 CYCLES TOLERANCE=1.0000 ORELAX=1.0000

TOLERANCE TOO SMALL

ITERATIONS CONVERGED TO A TOLERANCE OF .1200E+01 AFTER 1 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=0.0000E+00 OMEGA ERROR=1.0000E+00

NUMBER OF OUTER ITERATIONS= 1

ITERATION 2 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=1.1659E-01 OMEGA ERROR=4.8510E-01

NUMBER OF OUTER ITERATIONS= 2

ITERATION 3 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.5640E+00 THETA ERROR=1.1990E-01 OMEGA ERROR=5.4036E+00

NUMBER OF OUTER ITERATIONS= 3

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
PSY ERROR=1.0527E+00 THETA ERROR=8.6742E-02 OMEGA ERROR=1.3463E+00
NUMBER OF OUTER ITERATIONS= 4

ITERATION 5 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
PSY ERROR=5.7638E-01 THETA ERROR=7.7631E-02 OMEGA ERROR=1.1090E+00
NUMBER OF OUTER ITERATIONS= 5

ITERATION 6 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
PSY ERROR=3.8044E-01 THETA ERROR=1.0786E-01 OMEGA ERROR=5.2659E-01
NUMBER OF OUTER ITERATIONS= 6

ITERATION 7 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
PSY ERROR=2.5553E-01 THETA ERROR=9.7967E-02 OMEGA ERROR=3.0363E-01
NUMBER OF OUTER ITERATIONS= 7

ITERATION 8 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
PSY ERROR=1.6091E-01 THETA ERROR=6.8770E-02 OMEGA ERROR=1.6720E-01
NUMBER OF OUTER ITERATIONS= 8

ITERATION 9 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
PSY ERROR=9.1033E-02 THETA ERROR=5.1115E-02 OMEGA ERROR=1.0333E-01

ITERATION 10 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=5.1506E-02 THETA ERROR=1.2858E-02 OMEGA ERROR=4.8963E-02

NUMBER OF OUTER ITERATIONS= 10

ITERATION 11 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.8258E-02 THETA ERROR=2.7161E-03 OMEGA ERROR=2.4214E-02

NUMBER OF OUTER ITERATIONS= 11

ITERATION 12 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.7255E-02 THETA ERROR=3.3503E-03 OMEGA ERROR=1.6647E-02

NUMBER OF OUTER ITERATIONS= 12

ITERATION 13 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.3344E-02 THETA ERROR=2.8612E-03 OMEGA ERROR=1.8827E-02

NUMBER OF OUTER ITERATIONS= 13

ITERATION 14 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.1826E-02 THETA ERROR=3.6508E-03 OMEGA ERROR=1.7130E-02

NUMBER OF OUTER ITERATIONS= 14

ITERATION 15 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0151E-02 THETA ERROR=3.6076E-03 OMEGA ERROR=1.2773E-02

NUMBER OF OUTER ITERATIONS= 15

214

ITERATION 16 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=7.9359E-03 THETA ERROR=2.4918E-03 OMEGA ERROR=8.4844E-03

NUMBER OF OUTER ITERATIONS= 16

ITERATION 17 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=5.7498E-03 THETA ERROR=1.3711E-03 OMEGA ERROR=5.8440E-03

NUMBER OF OUTER ITERATIONS= 17

ITERATION 18 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=4.0797E-03 THETA ERROR=7.4154E-04 OMEGA ERROR=4.0591E-03

NUMBER OF OUTER ITERATIONS= 18

ITERATION 19 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.0061E-03 THETA ERROR=5.4550E-04 OMEGA ERROR=3.3384E-03

NUMBER OF OUTER ITERATIONS= 19

ITERATION 20 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.3454E-03 THETA ERROR=5.2762E-04 OMEGA ERROR=2.8166E-03

ITERATION 21 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 215 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.8820E-03 THETA ERROR=4.9770E-04 OMEGA ERROR=2.2646E-03

NUMBER OF OUTER ITERATIONS= 21

ITERATION 22 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.4939E-03 THETA ERROR=4.0925E-04 OMEGA ERROR=1.7172E-03

NUMBER OF OUTER ITERATIONS= 22

ITERATION 23 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.1538E-03 THETA ERROR=2.9820E-04 OMEGA ERROR=1.2630E-03

NUMBER OF OUTER ITERATIONS= 23

ITERATION 24 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=8.7345E-04 THETA ERROR=2.0558E-04 OMEGA ERROR=9.3931E-04

NUMBER OF OUTER ITERATIONS= 24

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
5.0000E-02 5.0000E+00 1.0000E+02 0.0000E+00

PSY ERROR=8.7345E-04 THETA ERROR=2.0558E-04 OMEGA ERROR=9.3931E-04

NUMBER OF OUTER ITERATIONS= 24

RA PR NU AR
1.0380E+06 6.2991E-01 2.125E+00 1.0000E+02

PRESS RETURN TO CONTINUE

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TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	1.2500E-07	7	5.4668E+01	8	6.1539E+01
9	9.2527E+01	10	1.2501E-07	11	7.7771E-12	12	2.7255E+01
13	3.7341E+01	14	6.9776E+01	15	1.6669E-11	16	3.5431E-12
17	1.2376E+01	18	2.0557E+01	19	3.9286E+01	20	9.2108E-12
21	1.0153E-20	22	3.5500E-08	23	4.8705E-08	24	9.2108E-08
25	2.2763E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-5.5822E-21	2	-3.2097E-08	3	-7.3535E-08	4	-1.0748E-07
5	-3.1030E-20	6	-3.2097E-12	7	-3.8747E+01	8	-3.0217E+01
9	-8.3541E+01	10	-1.7617E-11	11	-6.7056E-12	12	-8.7627E+01
13	-1.0715E+02	14	-1.2092E+02	15	-2.8016E-11	16	-1.4626E-11
17	-1.0687E+02	18	-1.2113E+02	19	-1.1049E+02	20	-2.3827E-11
21	-3.2106E-20	22	-1.9121E-07	23	-2.4860E-07	24	-2.3827E-07
25	-5.4277E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.1447E-10	2	1.1759E+03	3	1.9269E+03	4	2.6733E+03
5	5.9046E-10	6	6.1028E-12	7	7.9176E+02	8	6.0068E+02
9	2.6385E+03	10	2.6404E-11	11	3.6843E-12	12	8.2438E+02
13	2.2568E+02	14	1.7417E+03	15	1.7462E-11	16	7.5001E-12
17	2.6823E+03	18	2.0049E+03	19	2.3010E+03	20	2.3008E-11
21	5.0223E-10	22	3.4200E+03	23	3.8762E+03	24	3.5356E+03
25	7.9781E-10						

STOP

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H	W	TS	TL
5.0000E-02	5.0000E+00	1.0000E+07	0.0000E+00

PSY ERROR=4.0797E-03 THETA ERROR=7.4154E-04 OMEGA ERROR=4.0591E-03

NUMBER OF OUTER ITERATIONS= 18

RA	PR	NU	AR
1.0380E+06	6.9991E-01	1.2161E+00	1.0000E+02

GAP CONDUCTANCE = 5.5940E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	9.5007E-08	7	5.4767E+01	8	6.1555E+01
9	9.2477E+01	10	9.5007E-08	11	6.1437E-12	12	2.7328E+01
13	3.7318E+01	14	6.9715E+01	15	1.2484E-11	16	2.8019E-12
17	1.2395E+01	18	2.0506E+01	19	3.9237E+01	20	6.8547E-12
21	6.2689E-21	22	2.8072E-08	23	3.6382E-08	24	6.8547E-08
25	1.2890E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-2.4870E-21	2	-2.1309E-08	3	-5.2120E-08	4	-7.6578E-08
5	-1.6729E-20	6	-2.1309E-12	7	-3.6353E+01	8	-5.9915E+01
9	-8.3202E+01	10	-1.2611E-11	11	-4.4683E-12	12	-8.6830E+01
13	-1.0677E+02	14	-1.2055E+02	15	-1.8768E-11	16	-9.7341E-12
17	-1.0595E+02	18	-1.2072E+02	19	-1.1021E+02	20	-1.7203E-11
21	-1.4830E-20	22	-1.2726E-07	23	-1.7600E-07	24	-1.7203E-07
25	-2.9001E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	7.9822E-11	2	-1.1633E+03	3	1.9173E+03	4	2.6625E+03
5	4.3016E-10	6	-6.0422E-12	7	7.8289E+02	8	5.9858E+02
9	2.6302E+03	10	-2.6314E-11	11	3.6122E-12	12	8.1426E+02
13	2.2890E+02	14	1.7381E+03	15	1.7411E-11	16	7.4147E-12
17	2.6591E+03	18	2.0071E+03	19	2.2972E+03	20	2.2970E-11
21	3.4539E-10	22	3.3905E+03	23	3.8630E+03	24	3.5267E+03
25	5.8575E-10						

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

R W TS TL
5.0000E-02 5.0000E+00 1.0000E+02 0.0000E+00

PSY ERROR=4.0797E-03 THETA ERROR=7.4154E-04 OMEGA ERROR=4.0591E-03

NUMBER OF OUTER ITERATIONS= 18

RA PR NU AR
1.0380E+06 6.9991E-01 1.2161E+00 1.0000E+02

GAP CONDUCTANCE = 5.5940E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	9.5002E-08	7	5.4762E+01	8	6.1555E+01
9	9.2477E+01	10	9.5007E-08	11	6.1437E-12	12	2.7328E+01
13	3.7318E+01	14	6.9715E+01	15	1.2484E-11	16	2.8019E-12
17	1.2395E+01	18	2.0506E+01	19	3.9237E+01	20	6.8547E-12
21	6.2689E-21	22	2.8072E-08	23	3.6382E-08	24	6.8547E-08
25	1.2890E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-2.4870E-21	2	-2.1309E-08	3	-5.2120E-08	4	-7.6578E-08
5	-1.6279E-20	6	-2.1309E-12	7	-3.6353E+01	8	-5.9915E+01
9	-8.3207E+01	10	-1.2611E-11	11	-4.4683E-12	12	-8.6830E+01
13	-1.0677E+02	14	-1.2055E+02	15	-1.8768E-11	16	-9.7341E-12
17	-1.0595E+02	18	-1.2072E+02	19	-1.1021E+02	20	-1.7203E-11
21	-1.4830E-20	22	-1.2726E-07	23	-1.7600E-07	24	-1.7203E-07
25	-2.9001E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	7.9822E-11	2	-1.1633E+03	3	1.9173E+03	4	-2.6625E+03
5	4.3018E-10	6	8.0422E-12	7	7.8289E+02	8	-5.9858E+02
9	-2.6302E+03	10	-2.6314E-11	11	3.6122E-12	12	8.1426E+02
13	-2.2890E+02	14	-1.7381E+03	15	1.7411E-11	16	-7.4147E-12
17	-2.6591E+03	18	-2.0071E+03	19	2.2972E+03	20	-2.2970E-11
21	3.4539E-10	22	3.3905E+03	23	3.8630E+03	24	-3.5267E+03
25	5.8575E-10						

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H
5.0000E-02

W
5.0000E+00

TS
1.0000E+02

TL
0.0000E+00

PSY ERROR=1.7255E-02

THETA ERROR=3.3503E-03

OMEGA ERROR=1.6647E-02

NUMBER OF OUTER ITERATIONS= 12

RA
1.0390E+03

PR
6.9991E-01

NU
1.2119E+00

AR
1.0000E+02

GAP CONDUCTANCE = 5.5744E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	6.5002E-02	7	5.5240E+01	8	6.1625E+01
9	9.3249E+01	10	6.5005E-02	11	4.5012E-12	12	2.7715E+01
13	2.7182E+01	14	6.9027E+01	15	9.3040E-12	16	2.0587E-12
17	1.2507E+01	18	2.0227E+01	19	3.8975E+01	20	4.5040E-12
21	2.2755E-21	22	2.0625E-02	23	2.4126E-02	24	4.5040E-02
25	5.8410E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-3.7062E-22	2	-1.0805E-02	3	-3.0267E-02	4	-4.5965E-02
5	-6.2725E-21	6	-1.0805E-12	7	-2.4465E+01	8	-5.8481E+01
9	-8.1578E+01	10	-7.6465E-12	11	-2.2786E-12	12	-8.2844E+01
13	-1.0475E+02	14	-1.1984E+02	15	-1.1564E-11	16	-4.9378E-12
17	-1.0133E+02	18	-1.1938E+02	19	-1.0991E+02	20	-1.0610E-11
21	-0.3904E-21	22	-6.4572E-02	23	-1.0389E-07	24	-1.0610E-07
25	-1.1661E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	4.5605E-11	2	1.1029E+03	3	1.8714E+03	4	2.6105E+03
5	2.7079E-10	6	5.7466E-12	7	7.3936E+02	8	5.9009E+02
9	2.5899E+03	10	2.5904E-11	11	3.3168E-12	12	7.6135E+02
13	2.4725E+02	14	1.7224E+03	15	1.7238E-11	16	7.0323E-12
17	2.5367E+03	18	2.0160E+03	19	2.2851E+03	20	2.2849E-11
21	1.9043E-10	22	3.2424E+03	23	3.7882E+03	24	3.4850E+03
25	3.7435E-10						

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
5.0000E-02 5.0000E+00 1.0000E+02 0.0000E+00

PSY ERROR=1.7255E-02 THETA ERROR=3.3503E-03 OMEGA ERROR=1.6647E-02

NUMBER OF OUTER ITERATIONS= 12

RA PR NU AR
1.0290E+03 6.9991E-01 1.2118E+00 1.0000E+02

GAP CONDUCTANCE = 5.5744E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	6.5002E-02	7	5.5240E+01	8	6.1625E+01
9	9.2249E+01	10	6.5005E-02	11	4.5013E-12	12	2.7715E+01
13	2.7182E+01	14	6.9927E+01	15	9.3040E-12	16	2.0587E-12
17	1.2507E+01	18	2.0227E+01	19	3.8976E+01	20	4.5040E-12
21	2.2755E-21	22	2.0625E-02	23	2.4126E-02	24	4.5040E-02
25	5.8410E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-6.7062E-22	2	-1.0805E-02	3	-3.0967E-02	4	-4.5965E-02
5	-6.2725E-21	6	-1.0805E-12	7	-3.4465E+01	8	-5.8481E+01
9	-8.1578E+01	10	-7.6465E-12	11	-2.2786E-12	12	-8.2844E+01
13	-1.0475E+02	14	-1.1984E+02	15	-1.1564E-11	16	-4.9378E-12
17	-1.0133E+02	18	-1.1938E+02	19	-1.0991E+02	20	-1.0610E-11
21	-4.3904E-21	22	-6.4579E-02	23	-1.0389E-07	24	-1.0610E-07
25	-1.1661E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	4.5605E-11	2	1.1029E+03	3	1.8714E+03	4	2.6105E+03
5	2.7079E-10	6	5.7466E-12	7	7.3936E+02	8	5.9009E+02
9	2.5899E+03	10	2.5904E-11	11	3.3168E-12	12	7.6135E+02
13	2.4725E+02	14	1.7224E+03	15	1.7238E-11	16	7.0323E-12
17	2.5367E+03	18	2.0160E+03	19	2.2851E+03	20	2.2849E-11
21	1.9043E-10	22	3.2424E+03	23	3.7882E+03	24	3.4850E+03
25	3.7435E-10						

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL
 5.0000E-02 5.0000E+00 1.0000E+02 0.0000E+00

PSY ERROR=2.8258E-02 THETA ERROR=2.7131E-03 OMEGA ERROR=2.4214E-02

NUMBER OF OUTER ITERATIONS= 11

RA PR NU OR
 1.0380E+06 6.9991E-01 1.2099E+00 1.0000E+02

GAP CONDUCTANCE = 5.5656E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	6.0002E-08	7	5.5398E+01	8	6.1746E+01
9	9.2112E+01	10	6.0004E-08	11	4.2246E-12	12	2.7844E+01
13	2.7267E+01	14	6.9255E+01	15	7.6118E-12	16	1.9339E-12
17	1.2532E+01	18	2.0236E+01	19	3.8845E+01	20	4.1143E-12
21	2.8635E-21	22	1.9374E-08	23	2.2113E-08	24	4.1143E-08
25	4.9403E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-4.8921E-22	2	-9.1223E-09	3	-2.7511E-08	4	-4.0944E-08
5	-5.0796E-21	6	-9.1223E-12	7	-2.3870E+01	8	-5.7796E+01
9	-8.0889E+01	10	-6.8908E-12	11	-1.9260E-12	12	-8.1877E+01
13	-1.0287E+02	14	-1.1790E+02	15	-1.0276E-11	16	-4.1625E-12
17	-1.0030E+02	18	-1.1731E+02	19	-1.0903E+02	20	-9.5206E-12
21	-3.1748E-21	22	-5.4441E-08	23	-9.2051E-08	24	-9.5206E-08
25	-9.5392E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	4.0029E-11	2	1.0838E+03	3	1.8495E+03	4	2.5884E+03
5	2.4447E-10	6	5.6695E-12	7	7.2811E+02	8	5.8520E+02
9	2.5737E+03	10	2.5740E-11	11	3.2435E-12	12	7.4868E+02
13	2.4627E+02	14	1.7185E+02	15	1.7197E-11	16	6.9519E-12
17	2.5097E+03	18	2.0029E+03	19	2.2711E+02	20	2.2759E-11
21	1.6529E-10	22	2.2095E+02	23	2.7422E+02	24	3.4579E+03
25	3.3924E-10						

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION - 0.0 DEGREES

H 5.0000E+02 W 5.0000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=2.8258E-02 THETA ERROR=2.7131E-03 OMEGA ERROR=2.4214E-02

NUMBER OF OUTER ITERATIONS- 11

RA 1.0380E+06 PR 6.9991E-01 NU 1.2099E+00 OR 1.0000E+02

GAP CONDUCTANCE = 5.5656E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	6.0002E-09	7	5.5298E+01	8	6.1746E+01
9	9.2112E+01	10	6.0004E-09	11	4.2246E-12	12	2.7844E+01
13	2.7247E+01	14	6.9255E+01	15	7.6118E-12	16	1.9339E-12
17	1.2562E+01	18	2.0236E+01	19	3.8845E+01	20	4.1143E-12
21	2.8625E-21	22	1.9374E-08	23	2.2113E-08	24	4.1143E-08
25	4.9403E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-4.8821E-22	2	-9.1223E-09	3	-2.7511E-08	4	-4.0944E-08
5	-5.0796E-21	6	-9.1223E-12	7	-2.2970E+01	8	-5.7796E+01
9	-8.0988E+01	10	-6.8308E-12	11	-1.9260E-12	12	-8.1877E+01
13	-1.0387E+02	14	-1.1790E+02	15	-1.0374E-11	16	-4.1625E-12
17	-1.0030E+02	18	-1.1731E+02	19	-1.0806E+02	20	-9.5206E-12
21	-2.1748E-21	22	-5.4441E-08	23	-9.2051E-08	24	-9.5206E-08
25	-9.5392E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	4.0025E-11	2	1.0838E+03	3	1.8495E+03	4	2.5884E+03
5	2.4447E-10	6	5.6695E-12	7	7.2811E+02	8	5.8520E+02
9	2.5737E+03	10	2.5740E-11	11	3.2435E-12	12	7.4869E+02
13	2.4627E+02	14	1.7185E+02	15	1.7197E-11	16	6.9517E-12
17	2.5097E+03	18	2.0029E+03	19	2.2711E+02	20	2.2759E-11
21	1.6529E-10	22	2.2095E+02	23	1.7627E+02	24	3.4679E+02
25	3.3924E-10						

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H = 5.0000E-02 W = 5.0000E+00 TS = 1.0000E+02 TL = 0.0000E+00

PSY ERROR=5.1506E-02 THETA ERROR=1.2858E-02 OMEGA ERROR=4.8963E-02

NUMBER OF OUTER ITERATIONS= 10

RA = 1.0350E+06 PR = 6.9991E-01 NU = 1.2090E+00 AR = 1.0000E+02

GAP CONDUCTANCE = 5.5516E-01 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.5001E-08	7	5.5552E-01	8	6.1810E+01
9	9.1920E+01	10	5.5004E-08	11	3.9467E-12	12	2.7945E+01
13	2.7289E+01	14	6.9067E+01	15	6.9196E-12	16	1.8086E-12
17	1.2564E+01	18	2.7021E+01	19	3.6767E+01	20	3.7259E-12
21	2.4764E-21	22	1.8113E-08	23	2.0070E-08	24	3.7259E-08
25	2.1176E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-3.3871E-22	2	-7.4755E-07	3	-2.4099E-08	4	-3.5967E-08
5	-4.0183E-21	6	-7.4755E-13	7	-1.2913E+01	8	-5.6978E+01
9	-8.9043E+01	10	-6.0220E-12	11	-1.5780E-12	12	-8.0384E+01
13	-1.0322E+02	14	-1.1876E+02	15	-1.1787E-12	16	-3.3950E-12
17	-9.6549E+01	18	-1.1743E+02	19	-1.0017E+02	20	-8.4401E-12
21	-2.2378E-21	22	-4.4412E-08	23	-2.0291E-08	24	-8.4401E-08
25	-7.6953E-21						

VORTICITY FUNCTION DISTRIBUTION

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H = 5.0000E-02 W = 5.0000E+00 TS = 1.0000E+01 TL = 0.0000E+00

PSY ERROR=5.1506E-02 THETA ERROR=1.2658E-02 OMEGA ERROR=4.8963E-02

NUMBER OF OUTER ITERATIONS= 10

RA = 1.0380E+06 PR = 6.2991E-01 NU = 1.2050E+00 AR = 1.0000E+02

GAP CONDUCTANCE = 5.5616E-01 KCAL/M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	5.5201E-08	7	5.5592E-01	8	6.1810E+01
9	9.1930E+01	10	5.5004E-08	11	3.9467E-12	12	2.7945E+01
13	2.7288E+01	14	4.9067E+01	15	3.7185E-12	16	1.6086E-12
17	1.2564E+01	18	2.0210E+01	19	3.8767E+01	20	3.7259E-12
21	2.4744E-21	22	1.8116E-08	23	2.0050E-08	24	3.7259E-08
25	2.1176E-21						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-3.3871E-22	2	-7.4755E-07	3	-2.4095E-08	4	-3.5467E-08
5	-4.0183E-21	6	-7.4755E-13	7	-3.2513E+01	8	-5.6178E+01
9	-8.0043E+01	10	-6.0220E-12	11	-1.5780E-12	12	-8.0364E+01
13	-1.0328E+02	14	-1.1676E+02	15	-9.4737E-12	16	-3.3950E-12
17	-9.6549E+01	18	-1.1743E+02	19	-1.0717E+02	20	-8.4401E-12
21	-2.2370E-21	22	-4.4412E-08	23	-3.0291E-08	24	-8.4401E-08
25	-7.6853E-21						

VORTICITY FUNCTION DISTRIBUTION

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

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ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-03 AFTER 12 CYCLES

CONDUCTION TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	.1000E+03	2	.1000E+03	3	.1000E+03	4	.1000E+03
5	.1000E+03	6	.5000E-08	7	.7498E+02	8	.7499E+02
9	.7498E+02	10	.5000E-08	11	.4996E-12	12	.4998E+02
13	.4999E+02	14	.4998E+02	15	.4997E-12	16	.2498E-12
17	.2499E+02	18	.2499E+02	19	.2499E+02	20	.2499E-12
21	.4995E-22	22	.2499E-08	23	.2499E-08	24	.2499E-08
25	.4997E-22						

NO CONVERGENCE AFTER 100 CYCLES TOLERANCE=1.0000 DRELAX=1.0000

TOLERANCE TOO SMALL

ITERATIONS CONVERGED TO A TOLERANCE OF .1200E+01 AFTER 1 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=0.0000E+00 OMEGA ERROR=1.0000E+00

NUMBER OF OUTER ITERATIONS= 1

ITERATION 2 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=1.0546E-03 OMEGA ERROR=5.9179E-01

NUMBER OF OUTER ITERATIONS= 2

ITERATION 3 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.4750E+00 THETA ERROR=1.1607E-03 OMEGA ERROR=4.0995E-01

NUMBER OF OUTER ITERATIONS= 3

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-03 AFTER 12 CYCLES

CONDUCTION TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	.1000E+03	2	.1000E+03	3	.1000E+03	4	.1000E+03
5	.1000E+03	6	.5000E-08	7	.7498E+02	8	.7499E+02
9	.7498E+02	10	.5000E-08	11	.4996E-12	12	.4998E+02
13	.4999E+02	14	.4998E+02	15	.4997E-12	16	.2498E-12
17	.2499E+02	18	.2499E+02	19	.2499E+02	20	.2499E-12
21	.4995E-22	22	.2499E-08	23	.2499E-08	24	.2499E-08
25	.4997E-22						

NO CONVERGENCE AFTER 100 CYCLES TOLERANCE=1.0000 ORELAX=1.0000

TOLERANCE TOO SMALL

ITERATIONS CONVERGED TO A TOLERANCE OF .1200E+01 AFTER 1 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=0.0000E+00 OMEGA ERROR=1.0000E+00

NUMBER OF OUTER ITERATIONS= 1

ITERATION 2 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=1.0546E-03 OMEGA ERROR=5.9179E-01

NUMBER OF OUTER ITERATIONS= 2

ITERATION 3 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.4760E+00 THETA ERROR=1.1607E-03 OMEGA ERROR=4.0995E-01

NUMBER OF OUTER ITERATIONS= 3

ITERATION 4 FOLLOWS NOW

- ITERATION 10 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.5607E-01 THETA ERROR=1.0215E-03 OMEGA ERROR=4.9832E-01

NUMBER OF OUTER ITERATIONS= 10

ITERATION 11 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.3105E-01 THETA ERROR=9.7561E-04 OMEGA ERROR=3.2641E-01

NUMBER OF OUTER ITERATIONS= 11

ITERATION 12 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.1209E-01 THETA ERROR=9.3222E-04 OMEGA ERROR=2.4001E-01

NUMBER OF OUTER ITERATIONS= 12

ITERATION 13 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.7279E-02 THETA ERROR=8.9139E-04 OMEGA ERROR=1.8797E-01

NUMBER OF OUTER ITERATIONS= 13

ITERATION 14 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=8.5415E-02 THETA ERROR=8.5223E-04 OMEGA ERROR=1.5320E-01

NUMBER OF OUTER ITERATIONS= 14

ITERATION 15 FOLLOWS NOW

ITERATION 10 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.5407E-01 THETA ERROR=1.0215E-03 OMEGA ERROR=4.9832E-01

NUMBER OF OUTER ITERATIONS= 10

ITERATION 11 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.3105E-01 THETA ERROR=9.7541E-04 OMEGA ERROR=3.2641E-01

NUMBER OF OUTER ITERATIONS= 11

ITERATION 12 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.1209E-01 THETA ERROR=9.3222E-04 OMEGA ERROR=2.4001E-01

NUMBER OF OUTER ITERATIONS= 12

ITERATION 13 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.7279E-02 THETA ERROR=8.9139E-04 OMEGA ERROR=1.8797E-01

NUMBER OF OUTER ITERATIONS= 13

ITERATION 14 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=8.5415E-02 THETA ERROR=8.5223E-04 OMEGA ERROR=1.5320E-01

NUMBER OF OUTER ITERATIONS= 14

ITERATION 15 FOLLOWS NOW

ITERATION 21 FOLLOWS NOW

229

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=4.2029E-02 THETA ERROR=6.2340E-04 OMEGA ERROR=5.9969E-02

NUMBER OF OUTER ITERATIONS= 21

ITERATION 22 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.8677E-02 THETA ERROR=5.9634E-04 OMEGA ERROR=5.4347E-02

NUMBER OF OUTER ITERATIONS= 22

ITERATION 23 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.5698E-02 THETA ERROR=5.6764E-04 OMEGA ERROR=4.9495E-02

NUMBER OF OUTER ITERATIONS= 23

ITERATION 24 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.3035E-02 THETA ERROR=5.4497E-04 OMEGA ERROR=4.5269E-02

NUMBER OF OUTER ITERATIONS= 24

ITERATION 25 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.0643E-02 THETA ERROR=5.2047E-04 OMEGA ERROR=4.1556E-02

NUMBER OF OUTER ITERATIONS= 25

ITERATION 26 FOLLOWS NOW

ITERATION 21 FOLLOWS NOW

230
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=4.2029E-02 THETA ERROR=6.2340E-04 OMEGA ERROR=5.9969E-02

NUMBER OF OUTER ITERATIONS= 21

ITERATION 22 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.8677E-02 THETA ERROR=5.5634E-04 OMEGA ERROR=5.4347E-02

NUMBER OF OUTER ITERATIONS= 22

ITERATION 23 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.5698E-02 THETA ERROR=5.5764E-04 OMEGA ERROR=4.9495E-02

NUMBER OF OUTER ITERATIONS= 23

ITERATION 24 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.3035E-02 THETA ERROR=5.4497E-04 OMEGA ERROR=4.5269E-02

NUMBER OF OUTER ITERATIONS= 24

ITERATION 25 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.0643E-02 THETA ERROR=5.2047E-04 OMEGA ERROR=4.1556E-02

NUMBER OF OUTER ITERATIONS= 25

ITERATION 26 FOLLOWS NOW

ITERATION 32 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 231 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.9024E-02 THETA ERROR=3.7897E-04 OMEGA ERROR=2.4573E-02

NUMBER OF OUTER ITERATIONS= 32

ITERATION 33 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.7865E-02 THETA ERROR=3.6204E-04 OMEGA ERROR=2.2970E-02

NUMBER OF OUTER ITERATIONS= 33

ITERATION 34 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.6793E-02 THETA ERROR=3.4606E-04 OMEGA ERROR=2.1501E-02

NUMBER OF OUTER ITERATIONS= 34

ITERATION 35 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.5801E-02 THETA ERROR=3.3033E-04 OMEGA ERROR=2.0151E-02

NUMBER OF OUTER ITERATIONS= 35

ITERATION 36 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.4880E-02 THETA ERROR=3.1567E-04 OMEGA ERROR=1.8908E-02

NUMBER OF OUTER ITERATIONS= 36

ITERATION 37 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATION 32 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 232 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.9024E-02 THETA ERROR=3.7897E-04 OMEGA ERROR=2.4573E-02

NUMBER OF OUTER ITERATIONS= 32

ITERATION 33 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.7345E-02 THETA ERROR=3.6204E-04 OMEGA ERROR=2.2970E-02

NUMBER OF OUTER ITERATIONS= 33

ITERATION 34 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.6793E-02 THETA ERROR=3.4606E-04 OMEGA ERROR=2.1501E-02

NUMBER OF OUTER ITERATIONS= 34

ITERATION 35 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.5801E-02 THETA ERROR=3.3033E-04 OMEGA ERROR=2.0151E-02

NUMBER OF OUTER ITERATIONS= 35

ITERATION 36 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.4860E-02 THETA ERROR=3.1567E-04 OMEGA ERROR=1.8908E-02

NUMBER OF OUTER ITERATIONS= 36

ITERATION 37 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.9621E-03 THETA ERROR=2.2894E-04 OMEGA ERROR=1.2425E-02

NUMBER OF OUTER ITERATIONS= 43

ITERATION 44 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.4283E-03 THETA ERROR=2.1839E-04 OMEGA ERROR=1.1736E-02

NUMBER OF OUTER ITERATIONS= 44

ITERATION 45 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=8.9270E-03 THETA ERROR=2.0850E-04 OMEGA ERROR=1.1091E-02

NUMBER OF OUTER ITERATIONS= 45

ITERATION 46 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.4559E-03 THETA ERROR=1.9914E-04 OMEGA ERROR=1.0488E-02

NUMBER OF OUTER ITERATIONS= 46

ITERATION 47 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=8.0127E-03 THETA ERROR=1.9038E-04 OMEGA ERROR=9.9224E-03

NUMBER OF OUTER ITERATIONS= 47

ITERATION 48 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.9621E-03 THETA ERROR=2.2894E-04 OMEGA ERROR=1.2425E-02

NUMBER OF OUTER ITERATIONS= 43

ITERATION 44 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.4263E-03 THETA ERROR=2.1839E-04 OMEGA ERROR=1.1736E-02

NUMBER OF OUTER ITERATIONS= 44

ITERATION 45 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.9270E-03 THETA ERROR=2.0850E-04 OMEGA ERROR=1.1091E-02

NUMBER OF OUTER ITERATIONS= 45

ITERATION 46 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=8.4559E-03 THETA ERROR=1.9714E-04 OMEGA ERROR=1.0488E-02

NUMBER OF OUTER ITERATIONS= 46

ITERATION 47 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=5.0129E-03 THETA ERROR=1.7036E-04 OMEGA ERROR=9.9224E-03

NUMBER OF OUTER ITERATIONS= 47

ITERATION 48 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=5.5492E-03 THETA ERROR=1.3739E-04 OMEGA ERROR=6.8152E-03

NUMBER OF OUTER ITERATIONS= 54

ITERATION 55 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=5.2714E-03 THETA ERROR=1.3131E-04 OMEGA ERROR=6.4636E-03

NUMBER OF OUTER ITERATIONS= 55

ITERATION 56 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=5.0086E-03 THETA ERROR=1.2553E-04 OMEGA ERROR=6.1355E-03

NUMBER OF OUTER ITERATIONS= 56

ITERATION 57 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=4.7599E-03 THETA ERROR=1.1957E-04 OMEGA ERROR=5.8261E-03

NUMBER OF OUTER ITERATIONS= 57

ITERATION 58 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=4.5245E-03 THETA ERROR=1.1438E-04 OMEGA ERROR=5.5332E-03

NUMBER OF OUTER ITERATIONS= 58

ITERATION 59 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

NUMBER OF OUTER ITERATIONS= 59

ITERATION 60 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=4.0904E-03 THETA ERROR=1.0387E-04 OMEGA ERROR=4.9946E-03

NUMBER OF OUTER ITERATIONS= 60

ITERATION 61 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.8902E-03 THETA ERROR=9.7480E-05 OMEGA ERROR=4.7473E-03

NUMBER OF OUTER ITERATIONS= 61

ITERATION 62 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.7007E-03 THETA ERROR=9.4950E-05 OMEGA ERROR=4.5123E-03

NUMBER OF OUTER ITERATIONS= 62

ITERATION 63 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.5205E-03 THETA ERROR=9.0539E-05 OMEGA ERROR=4.2903E-03

NUMBER OF OUTER ITERATIONS= 63

ITERATION 64 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.3500E-03 THETA ERROR=8.6367E-05 OMEGA ERROR=4.0802E-03

NUMBER OF OUTER ITERATIONS= 64

ITERATION 65 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.1860E-03 THETA ERROR=8.2473E-05 OMEGA ERROR=3.8806E-03

NUMBER OF OUTER ITERATIONS= 55

237

ITERATION 56 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.0344E-03 THETA ERROR=7.8917E-05 OMEGA ERROR=3.6916E-03

NUMBER OF OUTER ITERATIONS= 56

ITERATION 57 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.8885E-03 THETA ERROR=7.5102E-05 OMEGA ERROR=3.5124E-03

NUMBER OF OUTER ITERATIONS= 57

ITERATION 58 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.7499E-03 THETA ERROR=7.1595E-05 OMEGA ERROR=3.3420E-03

NUMBER OF OUTER ITERATIONS= 58

ITERATION 59 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.6181E-03 THETA ERROR=6.8724E-05 OMEGA ERROR=3.1809E-03

NUMBER OF OUTER ITERATIONS= 59

ITERATION 60 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.4930E-03 THETA ERROR=6.5207E-05 OMEGA ERROR=3.0273E-03

ITERATION 71 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.3742E-03 THETA ERROR=6.2466E-05 OMEGA ERROR=2.8819E-03

NUMBER OF OUTER ITERATIONS= 71

ITERATION 72 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.2614E-03 THETA ERROR=5.9545E-05 OMEGA ERROR=2.7438E-03

NUMBER OF OUTER ITERATIONS= 72

ITERATION 73 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.1539E-03 THETA ERROR=5.6524E-05 OMEGA ERROR=2.6126E-03

NUMBER OF OUTER ITERATIONS= 73

ITERATION 74 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.0517E-03 THETA ERROR=5.4300E-05 OMEGA ERROR=2.4878E-03

NUMBER OF OUTER ITERATIONS= 74

ITERATION 75 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.9547E-03 THETA ERROR=5.1796E-05 OMEGA ERROR=2.3692E-03

NUMBER OF OUTER ITERATIONS= 75

ITERATION 76 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.6624E-03 THETA ERROR=4.7353E-05 OMEGA ERROR=2.2567E-03

NUMBER OF OUTER ITERATIONS= 76

239

ITERATION 77 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.7744E-03 THETA ERROR=4.7386E-05 OMEGA ERROR=2.1495E-03

NUMBER OF OUTER ITERATIONS= 77

ITERATION 78 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.6910E-03 THETA ERROR=4.4703E-05 OMEGA ERROR=2.0477E-03

NUMBER OF OUTER ITERATIONS= 78

ITERATION 79 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.6113E-03 THETA ERROR=4.3094E-05 OMEGA ERROR=1.9510E-03

NUMBER OF OUTER ITERATIONS= 79

ITERATION 80 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.5357E-03 THETA ERROR=4.1127E-05 OMEGA ERROR=1.8587E-03

NUMBER OF OUTER ITERATIONS= 80

ITERATION 81 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.4635E-03 THETA ERROR=3.9160E-05 OMEGA ERROR=1.7712E-03

NUMBER OF OUTER ITERATIONS= 81

ITERATION 32 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 240 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.3951E-03 THETA ERROR=5.7572E-05 OMEGA ERROR=1.6875E-03

NUMBER OF OUTER ITERATIONS= 32

ITERATION 33 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.3297E-03 THETA ERROR=3.5644E-05 OMEGA ERROR=1.6084E-03

NUMBER OF OUTER ITERATIONS= 33

ITERATION 34 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.2676E-03 THETA ERROR=3.3915E-05 OMEGA ERROR=1.5327E-03

NUMBER OF OUTER ITERATIONS= 34

ITERATION 35 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.2693E-03 THETA ERROR=3.2425E-05 OMEGA ERROR=1.4609E-03

NUMBER OF OUTER ITERATIONS= 35

ITERATION 36 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.1519E-03 THETA ERROR=3.1054E-05 OMEGA ERROR=1.3925E-03

NUMBER OF OUTER ITERATIONS= 36

ITERATION 37 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0982E-03 THETA ERROR=2.9504E-05 OMEGA ERROR=1.3275E-03

NUMBER OF OUTER ITERATIONS= 87

241

ITERATION 88 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0470E-03 THETA ERROR=2.8014E-05 OMEGA ERROR=1.2652E-03

NUMBER OF OUTER ITERATIONS= 88

ITERATION 89 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.9332E-04 THETA ERROR=2.7180E-05 OMEGA ERROR=1.2062E-03

NUMBER OF OUTER ITERATIONS= 89

ITERATION 90 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.5129E-04 THETA ERROR=2.5690E-05 OMEGA ERROR=1.1498E-03

NUMBER OF OUTER ITERATIONS= 90

ITERATION 91 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.0760E-04 THETA ERROR=2.4319E-05 OMEGA ERROR=1.0964E-03

NUMBER OF OUTER ITERATIONS= 91

ITERATION 92 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=8.6564E-04 THETA ERROR=2.3484E-05 OMEGA ERROR=1.0452E-03

NUMBER OF OUTER ITERATIONS= 92

ITERATIONS CONVERGED TO A TOLERANCE OF .0000E+01 AFTER 242 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .0000E+02 AFTER 242 CYCLES
ITERATIONS CONVERGED TO A TOLERANCE OF .0000E+01 AFTER 2 CYCLES

PSY ERROR=8.2541E-04 THETA ERROR=2.2471E-05 OMEGA ERROR=9.9677E-04

NUMBER OF OUTER ITERATIONS= 93

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREE

H W TS TL
1.0000E+02 1.0000E+00 1.0000E+02 0.0000E+00

PSY ERROR=8.2541E-04 THETA ERROR=2.2471E-05 OMEGA ERROR=9.9677E-04

NUMBER OF OUTER ITERATIONS= 93

RA PR NU NR
8.3037E+03 6.9991E-01 1.0063E+00 1.0000E+02

GAP CONDUCTANCE = 2.3144E+00 KCAL/M.M.HR.DEG.C

PRESS RETURN TO CONTINUE

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	4.7002E-07	7	7.3806E+01	8	7.4805E+01
9	7.5919E+01	10	4.7002E-07	11	4.5851E-11	12	4.8554E+01
13	4.9769E+01	14	5.1114E+01	15	4.7775E-11	16	2.2800E-11
17	2.4107E+01	18	2.4847E+01	19	2.5746E+01	20	-2.4017E-11
21	2.1784E-19	22	2.2845E-07	23	2.3944E-07	24	-2.4017E-07
25	2.2712E-19						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-5.1714E-21	2	-7.1026E-09	3	-1.3879E-09	4	-1.3031E-08
5	-1.3634E-20	6	-7.1026E-13	7	-1.8762E+00	8	-3.2998E+00
9	-2.7170E+00	10	-2.1531E-12	11	-1.1587E-12	12	-3.7797E+00
13	-5.7179E+00	14	-4.5274E+00	15	-3.3570E-12	16	-2.2660E-12
17	-4.3307E+00	18	-6.1019E+00	19	-4.4351E+00	20	-3.2923E-12
21	-1.9635E-20	22	-3.0032E-08	23	-4.3615E-08	24	-3.2923E-08
25	-2.6122E-20						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	2.3527E-11	2	6.0039E+01	3	1.0599E+02	4	0.2821E+00

13	4.2236E+01	14	4.4388E+01	15	4.5116E-13	16	8.4710E-14
17	8.0943E+01	18	1.1990E+02	19	9.4155E+01	20	2439.4145E-13
21	7.4573E-11	22	1.4018E+02	23	1.9520E+02	24	1.4256E+02
25	1.0678E-10						

STOP

9)

HORIZONTAL ENCLOSURE AR = 100 H = 10 MM TOLERANCE = 0.5 PERCENT

OUTPUT OBTAINED ON 11-11-1964

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 33

NODAL POINT CO-ORDINATES

1	0.0000	0.0000	2	75.0000	0.0000	3	100.0000	0.0000
4	75.0000	0.0000	5	100.0000	0.0000	6	75.0000	0.0000
7	75.0000	0.0000	8	100.0000	0.0000	9	75.0000	0.0000
10	100.0000	0.0000	11	75.0000	0.0000	12	100.0000	0.0000
13	75.0000	0.0000	14	100.0000	0.0000	15	100.0000	0.0000
16	100.0000	0.0000	17	75.0000	0.0000	18	75.0000	0.0000
19	75.0000	0.0000	20	100.0000	0.0000	21	0.0000	1.0000
22	75.0000	1.0000	23	50.0000	1.0000	24	75.0000	1.0000
25	100.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

N	1	2	3	4	AREA	N	1	2	3	4	AREA
1	1	7	8	3	3.1250E+00	2	1	2	7	3.1250E+00	
3	2	8	7	3	3.1250E+00	4	1	3	8	3.1250E+00	
5	3	8	3	3	3.1250E+00	6	3	4	9	3.1250E+00	
7	4	11	9	3	3.1250E+00	8	4	5	10	3.1250E+00	
9	5	12	11	3	3.1250E+00	10	5	6	11	3.1250E+00	
11	6	13	12	3	3.1250E+00	11	6	7	12	3.1250E+00	
13	7	14	13	3	3.1250E+00	12	7	8	13	3.1250E+00	
15	8	15	14	3	3.1250E+00	13	8	9	14	3.1250E+00	
17	9	16	15	3	3.1250E+00	14	9	10	15	3.1250E+00	
19	10	17	16	3	3.1250E+00	15	10	11	16	3.1250E+00	
21	11	18	17	3	3.1250E+00	16	11	12	17	3.1250E+00	
23	12	19	18	3	3.1250E+00	17	12	13	18	3.1250E+00	
25	13	20	19	3	3.1250E+00	18	13	14	19	3.1250E+00	
27	14	21	20	3	3.1250E+00	19	14	15	20	3.1250E+00	
29	15	22	21	3	3.1250E+00	20	15	16	21	3.1250E+00	
31	16	23	22	3	3.1250E+00	21	16	17	22	3.1250E+00	
33	17	24	23	3	3.1250E+00	22	17	18	23	3.1250E+00	
35	18	25	24	3	3.1250E+00	23	18	19	24	3.1250E+00	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

RECTANGULAR ENCLOSURE - ISO THERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H = 4 W = 75 TL = 7L
1.0000E-02 1.0000E+00 1.0000E+02 0.0000E+00

PSY ERROR=4.0904E-03 THETA ERROR=1.0387E-04 OMEGA ERROR=4.9946E-03

NUMBER OF OUTER ITERATIONS= 80

RA = 8.2037E+03 pp = 4.9991E-01 NU = 1.0082E+00 AR = 1.0000E+02

GAP CONDUCTANCE = 2.3172E+00 K CAL/M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	3.0501E-07	7	7.3567E+01	8	7.4809E+01
9	7.5867E+01	10	3.0502E-07	11	2.9552E-11	12	4.8627E+01
13	4.7284E+01	14	5.1047E+01	15	3.0716E-11	16	1.4856E+11
17	2.4152E+01	18	2.2804E+01	19	2.5702E+01	20	1.5527E-11
21	2.2653E-20	22	1.4855E-07	23	1.5145E-07	24	1.5527E-07
25	2.5727E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-1.3261E-21	5	-3.7757E-09	9	-7.3207E-09	13	-7.2836E-09
17	-1.7170E-21	21	-3.7757E-13	25	-1.7550E+00	29	-3.1241E+00
33	-2.7774E+00	37	-1.2073E-12	41	-6.1392E-13	45	-9.5412E+00
49	-5.4133E+00	53	-4.3160E+00	57	-1.5534E-12	61	-1.2112E-12
65	-4.1030E+00	69	-5.7713E+00	73	-4.2449E+00	77	-1.8473E-12
81	-3.2360E-21	85	-1.5908E-08	89	-2.5573E-03	93	-1.8473E-08
97	-9.1150E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.2645E-11	5	5.5289E+01	9	5.5772E+01	13	8.8878E+01
17	3.9522E-11	21	2.7627E-13	25	3.3503E+01	29	6.4085E+01
33	6.3242E+01	37	6.7403E-13	41	1.1364E-13	45	1.5303E+01
49	4.0219E+01	53	4.2752E+01	57	4.3136E-13	61	7.3346E-14
65	7.5532E+01	69	1.1564E+02	73	5.0127E-01	77	9.0118E-13
81	4.0071E-11	85	1.3131E+07	89	1.8488E+01	93	1.3554E+02
97	3.5471E-11						

HORIZONTAL ENCLOSURE $AR = 100$ $H = 10$ MM. TOLERANCE = 1 PERCENT

OUTPUT OBTAINED ON 4-5-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

T	X	Y	T	X	Y	T	X	Y
1	0.0000	0.0000	2	25.0000	0.0000	3	50.0000	0.0000
4	75.0000	0.0000	5	100.0000	0.0000	6	0.0000	.2500
7	25.0000	.2500	8	50.0000	.2500	9	75.0000	.2500
10	100.0000	.2500	11	0.0000	.5000	12	25.0000	.5000
13	50.0000	.5000	14	75.0000	.5000	15	100.0000	.5000
16	0.0000	.7500	17	25.0000	.7500	18	50.0000	.7500
19	75.0000	.7500	20	100.0000	.7500	21	0.0000	1.0000
22	25.0000	1.0000	23	50.0000	1.0000	24	75.0000	1.0000
25	100.0000	1.0000						

ELEMENT-NODE NUMBERS-AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	3	3.1250E+00	2	1	2	7	3.1250E+00
3	2	8	7	3.1250E+00	4	2	3	8	3.1250E+00
5	3	9	8	3.1250E+00	6	3	4	9	3.1250E+00
7	4	10	9	3.1250E+00	8	4	5	10	3.1250E+00
9	5	11	10	3.1250E+00	10	5	6	11	3.1250E+00
11	6	12	11	3.1250E+00	12	6	7	12	3.1250E+00
13	7	13	12	3.1250E+00	14	7	8	13	3.1250E+00
15	8	14	13	3.1250E+00	16	8	9	14	3.1250E+00
17	9	15	14	3.1250E+00	18	9	10	15	3.1250E+00
19	10	16	15	3.1250E+00	20	10	11	16	3.1250E+00
21	11	17	16	3.1250E+00	22	11	12	17	3.1250E+00
23	12	18	17	3.1250E+00	24	12	13	18	3.1250E+00
25	13	19	18	3.1250E+00	26	13	14	19	3.1250E+00
27	14	20	19	3.1250E+00	28	14	15	20	3.1250E+00
29	15	21	20	3.1250E+00	30	15	16	21	3.1250E+00
31	16	22	21	3.1250E+00	32	16	17	22	3.1250E+00
33	17	23	22	3.1250E+00	34	17	18	23	3.1250E+00
35	18	24	23	3.1250E+00	36	18	19	24	3.1250E+00
37	19	25	24	3.1250E+00	38	19	20	25	3.1250E+00

THE NUMBERS OF THE 16 BOUNDARY POINTS ARE

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

247

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 1.0000E-02 W 1.0000E+00 TS 1.0000E+02 TL 0.0000E+00
 PSY ERROR=9.0129E-03 THETA ERROR=1.9038E-04 OMEGA ERROR=9.9224E-03

NUMBER OF OUTER ITERATIONS= 47

RA 9.3037E+03 PR 8.9921E-01 NU 1.0081E+00 AR 1.0000E+02

GAP CONDUCTANCE = 2.5140E+00 KCAL/M.M.WR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	2.4001E-07	7	7.3931E+01	8	7.4800E+01
9	7.5812E+01	10	2.4001E-07	11	2.5539E-11	12	4.8704E+01
13	4.9756E+01	14	5.0981E+01	15	2.4204E-11	16	1.1720E-11
17	2.4199E+01	18	2.4839E+01	19	2.5655E+01	20	1.2188E-11
21	5.7762E-20	22	1.1743E-07	23	1.1716E-07	24	1.2188E-07
25	5.9438E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-8.1731E-22	2	-2.5543E-09	3	-5.3002E-09	4	-5.1401E-09
5	-2.5605E-21	6	-2.5543E-13	7	-1.6352E+00	8	-2.9383E+00
9	-2.6300E+00	10	-8.5418E-13	11	-4.1415E-13	12	-3.2896E+00
13	-5.0910E+00	14	-4.0924E+00	15	-1.3393E-12	16	-8.1693E-13
17	-3.9117E+00	18	-5.4216E+00	19	-4.0225E+00	20	-1.3074E-12
21	-3.1604E-21	22	-1.0730E-09	23	-1.6561E-08	24	-1.3074E-08
25	-4.9683E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	-8.5971E-12	2	5.2328E+01	3	9.4028E+01	4	8.74159E+01
5	2.8175E-11	6	2.5709E-13	7	3.1171E+01	8	6.0425E+01
9	6.0916E+01	10	-3.0945E-13	11	1.1227E-13	12	1.6714E+01
13	-3.8091E+01	14	-4.1022E+01	15	4.1279E-13	16	8.4672E-14
17	6.9900E+01	18	-1.0702E+02	19	3.5856E+01	20	6.5847E-13
21	2.7361E-11	22	1.2197E+02	23	1.7349E+02	24	-1.2872E+02
25	4.3194E-11						

 HORIZONTAL ENCLOSURE AR = 100 h = 10 MM TOLERANCE = 2 PERCENT

 OUTPUT OBTAINED ON 10-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

POINT NO	X	Y	POINT NO	X	Y	POINT NO	X	Y
1	0.0000	0.0000	8	25.0000	0.0000	9	50.0000	0.0000
4	75.0000	0.0000	5	100.0000	0.0000	6	100.0000	.2500
7	25.0000	.2500	8	50.0000	.2500	9	75.0000	.2500
10	100.0000	.2500	11	0.0000	.5000	12	25.0000	.5000
13	50.0000	.5000	14	75.0000	.5000	15	100.0000	.5000
16	0.0000	.7500	17	25.0000	.7500	18	50.0000	.7500
19	75.0000	.7500	20	100.0000	.7500	21	0.0000	1.0000
22	25.0000	1.0000	23	50.0000	1.0000	24	75.0000	1.0000
25	100.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	4	3.1250E+00	2	4	2	7	3.1250E+00
3	2	3	7	3.1250E+00	4	2	3	8	3.1250E+00
5	3	9	8	3.1250E+00	6	3	4	9	3.1250E+00
7	4	10	9	3.1250E+00	5	4	5	10	3.1250E+00
9	6	12	11	3.1250E+00	7	6	7	12	3.1250E+00
11	7	13	12	3.1250E+00	13	7	8	13	3.1250E+00
13	8	14	13	3.1250E+00	14	8	9	14	3.1250E+00
15	9	15	14	3.1250E+00	15	9	10	15	3.1250E+00
17	11	17	16	3.1250E+00	16	11	11	17	3.1250E+00
19	12	18	17	3.1250E+00	20	12	13	18	3.1250E+00
21	13	19	18	3.1250E+00	22	13	14	19	3.1250E+00
23	14	20	19	3.1250E+00	23	14	15	20	3.1250E+00
25	16	22	21	3.1250E+00	24	16	17	21	3.1250E+00
27	17	23	22	3.1250E+00	25	17	18	22	3.1250E+00
29	18	24	23	3.1250E+00	30	18	19	23	3.1250E+00
31	19	25	24	3.1250E+00	32	19	20	24	3.1250E+00

THE NUMBERS OF THE 13 BOUNDARY POINTS ARE

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

1.0000E-02 1.0000E+00 1.0000E+02 0.0000E+00

PSY ERROR=1.4850E-02 THETA ERROR=3.1567E-04 OMEGA ERROR=1.8908E-02

NUMBER OF OUTER ITERATIONS= 36

RA 9.5037E+03 PR 5.9791E-01 NU 1.0060E+00 AR 1.0000E+02

GAP CONDUCTANCE = 2.2182E+00 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	5	1.0000E+02	9	1.0000E+02	13	1.0000E+02
2	1.0000E+02	6	1.8501E-07	10	1.8501E-07	14	1.8501E-07
3	7.5731E+01	7	1.8501E-07	11	1.8501E-07	15	1.8501E-07
4	4.9750E+01	8	1.8501E-07	12	1.8501E-07	16	1.8501E-07
17	2.4268E+01	19	2.4032E+01	21	2.5587E+01	23	2.5587E+01
21	3.4623E-20	22	9.0782E-08	23	9.1843E-08	24	9.3696E-08
25	3.5447E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-2.7070E-22	5	-1.6096E-09	9	-3.4807E-09	13	-3.4462E-09
2	1.2944E-21	6	-1.5096E-13	10	-1.4542E+00	14	-2.6662E+00
3	-2.4143E+00	7	-5.7467E-13	11	-2.5793E-13	15	-2.9220E+00
4	-4.6190E+00	8	-3.7649E+00	12	-9.0410E-13	16	-5.1249E-13
17	-3.3853E+00	19	-4.9096E+00	21	-3.5964E+00	23	-8.7979E-13
21	-1.4507E-21	22	-6.7311E-09	23	-1.0830E-08	24	-8.7979E-09
25	-2.5242E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	5.6160E-12	5	4.6535E+01	9	8.5319E+01	13	7.7257E+01
2	1.9163E-11	6	2.2896E-13	10	2.7651E+01	14	5.5032E+01
3	5.6401E+01	7	5.6473E-13	11	9.6845E-14	15	1.4403E+01
4	3.4940E+01	8	3.9485E+01	12	3.8648E-13	16	5.3389E-14
17	3.1660E+01	19	9.7501E+01	21	7.9578E+01	23	7.9570E-13
21	1.7435E-11	22	1.0833E+02	23	1.5711E+02	24	1.1828E+02
25	2.9331E-11						

HORIZONTAL ENCLOSURE $AA = 100$ $H = 10$ MM TOLERANCE = 3 PERCENT

OUTPUT OBTAINED ON 7-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	25.0000	0.0000	3	50.0000	0.0000
4	75.0000	0.0000	5	100.0000	0.0000	6	0.0000	.2500
7	25.0000	.2500	8	50.0000	.2500	9	75.0000	.2500
10	100.0000	.2500	11	0.0000	.5000	12	25.0000	.5000
13	50.0000	.5000	14	75.0000	.5000	15	100.0000	.5000
16	0.0000	.7500	17	25.0000	.7500	18	50.0000	.7500
19	75.0000	.7500	20	100.0000	.7500	21	0.0000	1.0000
22	25.0000	1.0000	23	50.0000	1.0000	24	75.0000	1.0000
25	100.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	6	3.1250E+00	2	1	2	7	3.1250E+00
3	2	8	7	3.1250E+00	4	2	3	8	3.1250E+00
5	3	9	8	3.1250E+00	6	3	4	9	3.1250E+00
7	4	10	9	3.1250E+00	8	4	5	10	3.1250E+00
9	5	11	10	3.1250E+00	10	5	6	11	3.1250E+00
11	6	12	11	3.1250E+00	12	6	7	12	3.1250E+00
13	7	13	12	3.1250E+00	14	7	8	13	3.1250E+00
15	8	14	13	3.1250E+00	16	8	9	14	3.1250E+00
17	9	15	14	3.1250E+00	18	9	10	15	3.1250E+00
19	10	16	15	3.1250E+00	20	10	11	16	3.1250E+00
21	11	17	16	3.1250E+00	22	11	12	17	3.1250E+00
23	12	18	17	3.1250E+00	24	12	13	18	3.1250E+00
25	13	19	18	3.1250E+00	26	13	14	19	3.1250E+00
27	14	20	19	3.1250E+00	28	14	15	20	3.1250E+00
29	15	21	20	3.1250E+00	30	15	16	21	3.1250E+00
31	16	22	21	3.1250E+00	32	16	17	22	3.1250E+00
33	17	23	22	3.1250E+00					
35	18	24	23	3.1250E+00					
37	19	25	24	3.1250E+00					

THE NUMBERS OF THE 16 BOUNDARY POINTS ARE

251

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H = 1.0000E-02 W = 1.0000E+00 TS = 1.0000E+02 TL = 0.0000E+00
PSY ERROR=2.1644E-02 THETA ERROR=4.1509E-04 OMEGA ERROR=2.8257E-02

NUMBER OF OUTER ITERATIONS= 30

RA = 8.3037E+03 PR = 6.2297E-01 NU = 1.0057E+00 AR = 1.0000E+02

GAP CONDUCTANCE = 2.3136E+00 KCAL/M.M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	1.5501E-07	7	7.4099E+01	8	7.4793E+01
9	7.5665E+01	10	1.5501E-07	11	1.5262E-11	12	4.8906E+01
13	3.9744E+01	14	5.0801E+01	15	1.5630E-11	16	7.6065E-12
17	2.4323E+01	18	2.4827E+01	19	2.5533E+01	20	7.8358E-12
21	2.4468E-20	22	7.6210E-08	23	7.6947E-08	24	7.8358E-08
25	2.4971E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-2.1033E-22	5	-1.1478E-09	9	-2.5752E-09	13	-2.5945E-09
5	-3.0572E-22	6	-1.1478E-13	7	-1.3099E+00	8	-2.4491E+00
9	-2.2424E+00	10	-4.3392E-13	11	-1.8454E-13	12	-2.6295E+00
13	-4.2420E+00	14	-3.5035E+00	15	-6.8442E-13	16	-3.6397E-13
17	-3.0461E+00	18	-4.5009E+00	19	-3.4358E+00	20	-6.6420E-13
21	-8.3162E-22	22	-4.7805E-09	23	-7.9818E-09	24	-6.6420E-09
25	-1.5779E-21						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	4.0932E-12	2	4.1917E+01	3	7.3370E+01	4	7.1757E+01
5	1.4603E-11	6	2.0649E-13	7	2.4825E+01	8	5.0778E+01
9	5.2889E+01	10	5.2942E-13	11	8.4322E-14	12	1.2572E+01
13	3.2425E+01	14	3.6466E+01	15	3.6579E-13	16	4.4996E-14
17	5.5128E+01	18	8.7536E+01	19	7.4549E+01	20	7.4541E-13
21	1.3622E-11	22	9.7475E+01	23	1.4403E+02	24	1.0995E+02
25	2.2554E-11						

HORIZONTAL ENCLOSURE CAR = 100 H = 10 MM TOLERANCE = 5 PERCENT

OUTPUT OBTAINED ON 4-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	8	25.0000	0.0000	3	50.0000	0.0000
4	75.0000	0.0000	5	100.0000	0.0000	6	0.0000	.2500
7	25.0000	.2500	8	50.0000	.2500	9	75.0000	.2500
10	100.0000	.2500	11	0.0000	.5000	12	25.0000	.5000
13	50.0000	.5000	14	75.0000	.5000	15	100.0000	.5000
16	0.0000	.7500	17	25.0000	.7500	18	50.0000	.7500
19	75.0000	.7500	20	100.0000	.7500	21	0.0000	1.0000
22	25.0000	1.0000	23	50.0000	1.0000	24	75.0000	1.0000
25	100.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	8	3.1250E+00	2	1	2	7	3.1250E+00
3	2	8	7	3.1250E+00	4	2	3	8	3.1250E+00
5	3	9	8	3.1250E+00	6	3	4	9	3.1250E+00
7	4	10	9	3.1250E+00	8	4	5	10	3.1250E+00
9	5	11	10	3.1250E+00	10	5	6	11	3.1250E+00
11	6	12	11	3.1250E+00	12	6	7	12	3.1250E+00
13	7	13	12	3.1250E+00	14	7	8	13	3.1250E+00
15	8	14	13	3.1250E+00	16	8	9	14	3.1250E+00
17	9	15	14	3.1250E+00	18	9	10	15	3.1250E+00
19	10	16	15	3.1250E+00	20	10	11	16	3.1250E+00
21	11	17	16	3.1250E+00	22	11	12	17	3.1250E+00
23	12	18	17	3.1250E+00	24	12	13	18	3.1250E+00
25	13	19	18	3.1250E+00	26	13	14	19	3.1250E+00
27	14	20	19	3.1250E+00	28	14	15	20	3.1250E+00
29	15	21	20	3.1250E+00	30	15	16	21	3.1250E+00
31	16	22	21	3.1250E+00	32	16	17	22	3.1250E+00
33	17	23	22	3.1250E+00					
35	18	24	23	3.1250E+00					
37	19	25	24	3.1250E+00					
39	20	26	25	3.1250E+00					

THE NUMBERS OF THE 16 BOUNDARY POINTS ARE

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

253

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 1.0000E-02 M 1.0000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=3.5898E-02 THETA ERROR=5.4934E-04 OMEGA ERROR=4.9495E-02

NUMBER OF OUTER ITERATIONS= 20

RA 8.3037E+03 PR 6.9991E-01 NU 1.0058E+00 AR 1.0000E+02

GAP CONDUCTANCE = 2.3133E+00 KCAL/M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	-1.2001E-07	7	7.4215E+01	8	7.4787E+01
9	7.5564E+01	10	1.2001E-07	11	1.1342E-11	12	4.9047E+01
13	4.9733E+01	14	5.0676E+01	15	1.2078E-11	16	5.9050E-12
17	2.4409E+01	18	2.4819E+01	19	2.5447E+01	20	3.0511E-12
21	1.4831E-20	22	5.9161E-08	23	5.9572E-09	24	6.0511E-08
25	1.5074E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-3.8252E-13	2	-6.7737E-10	3	-1.8298E-09	4	-1.6929E-09
5	-3.9989E-22	6	-6.7737E-14	7	-1.0942E+00	8	-2.1090E+00
9	-1.9793E+00	10	-2.9455E-13	11	-1.0800E-13	12	-2.1727E+00
13	-3.6515E+00	14	-3.0939E+00	15	-4.5075E-13	16	-2.1302E-13
17	-2.5169E+00	18	-3.9807E+00	19	-3.0272E+00	20	-4.3524E-13
21	-3.5539E-22	22	-2.7978E-09	23	-5.0120E-09	24	-4.3524E-09
25	-7.0863E-22						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	-2.5145E-12	2	3.4896E+01	3	6.7497E+01	4	6.3155E+01
5	-9.7372E-12	6	1.7124E-13	7	2.0395E+01	8	4.4064E+01
9	4.7409E+01	10	4.7439E-13	11	6.8258E-14	12	9.7270E+00
13	2.8472E+01	14	3.3297E+01	15	3.3362E-13	16	3.2567E-14
17	4.4975E+01	18	7.7354E+01	19	3.6036E+01	20	6.6630E-13
21	7.6219E-12	22	8.0539E+01	23	1.2354E+02	24	9.6870E+01
25	1.4896E-11						

HORIZONTAL ENCLOSURE AR = 100 H = 10 MM TOLERANCE = 7.5 PERCENT

OUTPUT OBTAINED ON 10-7-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	25.0000	0.0000	3	50.0000	0.0000
4	75.0000	0.0000	5	100.0000	0.0000	6	0.0000	.2500
7	25.0000	.2500	8	50.0000	.2500	9	75.0000	.2500
10	100.0000	.2500	11	0.0000	.5000	12	25.0000	.5000
13	50.0000	.5000	14	75.0000	.5000	15	100.0000	.5000
16	0.0000	.7500	17	25.0000	.7500	18	50.0000	.7500
19	75.0000	.7500	20	100.0000	.7500	21	0.0000	1.0000
22	25.0000	1.0000	23	50.0000	1.0000	24	75.0000	1.0000
25	100.0000	1.0000						

ELEMENT-NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	7	6	3.1250E+00	2	1	2	7	3.1250E+00
3	2	8	7	3.1250E+00	4	2	3	8	3.1250E+00
5	3	9	8	3.1250E+00	6	3	4	9	3.1250E+00
7	4	10	9	3.1250E+00	8	4	5	10	3.1250E+00
9	5	11	10	3.1250E+00	10	5	6	11	3.1250E+00
11	6	12	11	3.1250E+00	12	6	7	12	3.1250E+00
13	7	13	12	3.1250E+00	14	7	8	13	3.1250E+00
15	8	14	13	3.1250E+00	16	8	9	14	3.1250E+00
17	9	15	14	3.1250E+00	18	9	10	15	3.1250E+00
19	10	16	15	3.1250E+00	20	10	11	16	3.1250E+00
21	11	17	16	3.1250E+00	22	11	12	17	3.1250E+00
23	12	18	17	3.1250E+00	24	12	13	18	3.1250E+00
25	13	19	18	3.1250E+00	26	13	14	19	3.1250E+00
27	14	20	19	3.1250E+00	28	14	15	20	3.1250E+00
29	15	21	20	3.1250E+00	30	15	16	21	3.1250E+00
31	16	22	21	3.1250E+00	32	16	17	22	3.1250E+00
33	17	23	22	3.1250E+00	34	17	18	23	3.1250E+00
35	18	24	23	3.1250E+00	36	18	19	24	3.1250E+00
37	19	25	24	3.1250E+00	38	19	20	25	3.1250E+00

1 2 3 4 5 6 10 11 16 18 20 21 22 23 24 25

255

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 1.0000E-02 W 1.0000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=5.0153E-02 THETA ERROR=6.8176E-04 OMEGA ERROR=7.4364E-02

NUMBER OF OUTER ITERATIONS= 19

RA 8.3037E+03 PR 3.2991E-01 NU 1.0057E+00 AR 1.0000E+02

GAP CONDUCTANCE = 2.7313E+00 KCAL/M.HR.DEG.C

TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1.0000E+02	2	1.0000E+02	3	1.0000E+02	4	1.0000E+02
5	1.0000E+02	6	1.0000E-07	7	7.4300E+01	8	7.4783E+01
9	7.5490E+01	10	1.0001E-07	11	9.8823E-12	12	4.9150E+01
13	4.2724E+01	14	5.0585E+01	15	1.0053E-11	16	4.9297E-12
17	2.9473E+01	18	2.4812E+01	19	2.5385E+01	20	5.0342E-12
21	1.0394E-20	22	4.9390E-08	23	4.7047E-08	24	5.0342E-08
25	1.0539E-20						

STREAM FUNCTION DISTRIBUTION

I	PSY	I	PSY	I	PSY	I	PSY
1	-4.5604E-22	2	-4.5103E-10	3	-1.1568E-09	4	-1.2348E-09
5	-2.4204E-22	6	-3.5103E-14	7	-9.2012E-01	8	-1.8612E+00
9	-1.7780E+00	10	-2.0844E-13	11	-7.1276E-14	12	-1.8411E+00
13	-3.2210E+00	14	-2.7555E+00	15	-3.3131E-13	16	-1.4060E-13
17	-2.1328E+00	18	-3.9743E+00	19	-2.7290E+00	20	-3.1847E-13
21	-1.8451E-22	22	-1.8467E-09	23	-3.5353E-09	24	-3.1847E-09
25	-4.7624E-22						

VORTICITY FUNCTION DISTRIBUTION

I	OMEGA	I	OMEGA	I	OMEGA	I	OMEGA
1	1.7377E-12	2	2.9444E+01	3	5.9558E+01	4	5.8897E+01
5	7.2391E-12	6	1.4552E-13	7	1.7165E+01	8	3.9138E+01
9	4.3434E+01	10	4.3452E-12	11	5.2968E-14	12	7.6718E+00
13	2.5580E+01	14	3.0988E+01	15	3.1030E-13	16	2.3954E-14
17	2.7637E+01	18	3.8463E+01	19	3.0344E+01	20	6.0630E-13
21	5.1917E-12	22	6.8250E+01	23	1.0382E+02	24	8.7329E+01
25	1.1064E-11						

SENSITIVITY ANALYSIS OR = 20 H = 10 MM RA = 0.25027104

OUTPUT OBTAINED ON 4-9-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

I	X	Y	I	X	Y	I	X	Y
1	0.0000	0.0000	2	5.0000	0.0000	3	10.0000	0.0000
4	15.0000	0.0000	5	20.0000	0.0000	6	0.0000	.2500
7	5.0000	.2500	8	10.0000	.2500	9	15.0000	.2500
10	20.0000	.2500	11	0.0000	.5000	12	5.0000	.5000
13	10.0000	.5000	14	15.0000	.5000	15	20.0000	.5000
16	0.0000	.7500	17	5.0000	.7500	18	10.0000	.7500
19	15.0000	.7500	20	20.0000	.7500	21	0.0000	1.0000
22	5.0000	1.0000	23	10.0000	1.0000	24	15.0000	1.0000
25	20.0000	1.0000						

ELEMENT NODE NUMBERS AND AREAS

M	I	J	K	AREA	M	I	J	K	AREA
1	1	2	3	6.2500E-01	2	1	2	3	6.2500E-01
3	2	3	4	6.2500E-01	4	2	3	4	6.2500E-01
5	3	4	5	6.2500E-01	6	3	4	5	6.2500E-01
7	4	5	6	6.2500E-01	8	4	5	6	6.2500E-01
9	5	6	7	6.2500E-01	10	5	6	7	6.2500E-01
11	6	7	8	6.2500E-01	12	6	7	8	6.2500E-01
13	7	8	9	6.2500E-01	14	7	8	9	6.2500E-01
15	8	9	10	6.2500E-01	16	8	9	10	6.2500E-01
17	9	10	11	6.2500E-01	18	9	10	11	6.2500E-01
19	10	11	12	6.2500E-01	20	10	11	12	6.2500E-01
21	11	12	13	6.2500E-01	22	11	12	13	6.2500E-01
23	12	13	14	6.2500E-01	24	12	13	14	6.2500E-01
25	13	14	15	6.2500E-01	26	13	14	15	6.2500E-01
27	14	15	16	6.2500E-01	28	14	15	16	6.2500E-01
29	15	16	17	6.2500E-01	30	15	16	17	6.2500E-01
31	16	17	18	6.2500E-01	32	16	17	18	6.2500E-01

THE NUMBERS OF THE 15 BOUNDARY POINTS ARE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

ITERATIONS CONVERGED TO A TOLERANCE OF $1.1000E-03$ AFTER 12 CYCLES

CONDUCTION TEMPERATURE DISTRIBUTION

I	TEMP	I	TEMP	I	TEMP	I	TEMP
1	1000E+03	2	1000E+03	3	1000E+03	4	1000E+03
5	1000E+03	6	5003E-08	7	7477E+02	8	7499E+02
9	7177E+02	10	5006E-08	11	1140E-10	12	4974E+02
13	9994E+02	14	4974E+02	15	1240E-10	16	6193E-11
17	2484E+02	18	2499E+02	19	2484E+02	20	6194E-11
21	1225E-20	22	2478E-08	23	2493E-08	24	2478E-08
25	1226E-20						

大正十三年九月一日

NO CONVERGENCE AFTER 100 CYCLES TOLERANCE=1.0000 CRELAX=1.0000

TOLERANCE TOO SMALL

ITERATIONS CONVERGED TO A TOLERANCE OF .1200E-01 AFTER 1 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF $1.000E-07$ AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=0.0000E+00 OMEGA ERROR=1.0000E+00

NUMBER OF OUTER ITERATIONS- 1

ITERATION 3 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF $\pm 1.0000E+01$ AFTER 12 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF $1000E-02$ AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF $\pm 1.000E+01$ AFTER 2 CYCLES

PSY ERROR=1.00000000E-01 THETA ERROR=2.75252E-02 OMEGA ERROR=5.7262E-01

NUMBER OF OUTER ITERATIONS= 2

ITERATION 2 FOLLOWS NOW.

ITERATIONS CONVERGED TO A TOLERANCE OF $1.000E-01$ AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF $1.0000E-02$ AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF $1.0000E+01$ AFTER 2 CYCLES

PSY ERROR=5.0443E+00 THETA ERROR=2.7413E-02 OMEGA ERROR=4.71173E-01

NUMBER OF OUTER ITERATIONS- 2

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ITERATION 4 FOLLOWS NOW

大業五年春正月丙申朔壬子幸江都

ITERATIONS CONVERGED TO A TOLERANCE OF  $1.0000E+01$  AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF  $1.400E-02$  AFTER 9 CYCLES

TEMPERATURE CONSIDERED TO A TOLERANCE OF 10005.01 AFTER 2 CYCLES

PSY ERROR=1.9270E+00 THETA ERROR=3.7752E-02 OMEGA ERROR=6.7600E+01

NUMBER OF OUTER ITERATIONS= 4

253

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ITERATION 5 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=6.4937E-01 THETA ERROR=2.5986E-02 OMEGA ERROR=1.1891E+00

NUMBER OF OUTER ITERATIONS= 5

\*\*\*\*\*  
ITERATION 6 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=4.1815E-01 THETA ERROR=2.5326E-02 OMEGA ERROR=5.7382E-01

NUMBER OF OUTER ITERATIONS= 6

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ITERATION 7 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.9899E-01 THETA ERROR=2.0400E-02 OMEGA ERROR=3.3106E+00

NUMBER OF OUTER ITERATIONS= 7

\*\*\*\*\*  
ITERATION 8 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.2427E-01 THETA ERROR=1.7547E-02 OMEGA ERROR=7.6626E-01

NUMBER OF OUTER ITERATIONS= 8

\*\*\*\*\*  
ITERATION 9 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.7311E-01 THETA ERROR=1.4941E-02 OMEGA ERROR=4.2279E-01

NUMBER OF OUTER ITERATIONS= 9

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ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES 259

PSY ERROR= $1.3619E-01$  THETA ERROR= $1.2654E-02$  OMEGA ERROR= $2.8250E-01$

NUMBER OF OUTER ITERATIONS= 10

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ITERATION 11 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $1.0864E-01$  THETA ERROR= $1.0398E-02$  OMEGA ERROR= $2.0515E-01$

NUMBER OF OUTER ITERATIONS= 11

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ITERATION 12 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $8.7641E-02$  THETA ERROR= $9.0504E-03$  OMEGA ERROR= $1.5600E-01$

NUMBER OF OUTER ITERATIONS= 12

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ITERATION 13 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $7.1377E-02$  THETA ERROR= $7.6718E-03$  OMEGA ERROR= $1.2218E-01$

NUMBER OF OUTER ITERATIONS= 13

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ITERATION 14 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $5.8623E-02$  THETA ERROR= $6.5203E-03$  OMEGA ERROR= $9.7681E-02$

NUMBER OF OUTER ITERATIONS= 14

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ITERATION 15 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES

NUMBER OF OUTER ITERATIONS= 15

260

ITERATION 16 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES

PSY ERROR= $4.0420E-02$  THETA ERROR= $4.7470E-03$  OMEGA ERROR= $6.5156E-02$

NUMBER OF OUTER ITERATIONS= 16

ITERATION 17 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES

PSY ERROR= $3.3874E-02$  THETA ERROR= $4.0340E-03$  OMEGA ERROR= $5.4033E-02$

NUMBER OF OUTER ITERATIONS= 17

ITERATION 18 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES

PSY ERROR= $2.8523E-02$  THETA ERROR= $3.4847E-03$  OMEGA ERROR= $4.5145E-02$

NUMBER OF OUTER ITERATIONS= 18

ITERATION 19 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES

PSY ERROR= $2.4136E-02$  THETA ERROR= $2.9926E-03$  OMEGA ERROR= $3.7944E-02$

NUMBER OF OUTER ITERATIONS= 19

ITERATION 20 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $1.000E+01$  AFTER 2 CYCLES

PSY ERROR= $2.0470E-02$  THETA ERROR= $2.5726E-03$  OMEGA ERROR= $3.2046E-02$

NUMBER OF OUTER ITERATIONS= 20

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.7446E-02 THETA ERROR=2.2137E-03 OMEGA ERROR=2.7171E-02

NUMBER OF OUTER ITERATIONS= 21

261

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ITERATION 22 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.4891E-02 THETA ERROR=1.9067E-03 OMEGA ERROR=2.3111E-02

NUMBER OF OUTER ITERATIONS= 22

\*\*\*\*\*  
ITERATION 23 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.2736E-02 THETA ERROR=1.6429E-03 OMEGA ERROR=1.9709E-02

NUMBER OF OUTER ITERATIONS= 23

\*\*\*\*\*  
ITERATION 24 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0712E-02 THETA ERROR=1.4165E-03 OMEGA ERROR=1.6845E-02

NUMBER OF OUTER ITERATIONS= 24

\*\*\*\*\*  
ITERATION 25 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.3625E-03 THETA ERROR=1.2223E-03 OMEGA ERROR=1.4424E-02

NUMBER OF OUTER ITERATIONS= 25

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ITERATION 26 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

NUMBER OF OUTER ITERATIONS= 26

ITERATION 27 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $6.9166E-03$  THETA ERROR= $9.1100E-04$  OMEGA ERROR= $1.0623E-02$

NUMBER OF OUTER ITERATIONS= 27

ITERATION 28 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $5.9534E-03$  THETA ERROR= $7.8636E-04$  OMEGA ERROR= $9.1327E-03$

NUMBER OF OUTER ITERATIONS= 28

ITERATION 29 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $5.1285E-03$  THETA ERROR= $6.7997E-04$  OMEGA ERROR= $7.8593E-03$

NUMBER OF OUTER ITERATIONS= 29

ITERATION 30 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $4.4208E-03$  THETA ERROR= $5.8746E-04$  OMEGA ERROR= $6.7690E-03$

NUMBER OF OUTER ITERATIONS= 30

ITERATION 31 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $3.6151E-03$  THETA ERROR= $5.0771E-04$  OMEGA ERROR= $5.8340E-03$

NUMBER OF OUTER ITERATIONS= 31

ITERATION 32 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
PSY ERROR=3.2904E-03 THETA ERROR=4.3911E-04 OMEGA ERROR=5.0312E-03  
NUMBER OF OUTER ITERATIONS= 32

\*\*\*\*\*  
ITERATION 33 FOLLOWS NOW  
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ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
PSY ERROR=2.8409E-03 THETA ERROR=3.7788E-04 OMEGA ERROR=4.3416E-03  
NUMBER OF OUTER ITERATIONS= 33

\*\*\*\*\*  
ITERATION 34 FOLLOWS NOW  
\*\*\*\*\*

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
PSY ERROR=2.4538E-03 THETA ERROR=3.2818E-04 OMEGA ERROR=3.7473E-03  
NUMBER OF OUTER ITERATIONS= 34

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ITERATION 35 FOLLOWS NOW  
\*\*\*\*\*

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
PSY ERROR=2.1198E-03 THETA ERROR=2.8437E-04 OMEGA ERROR=3.2364E-03  
NUMBER OF OUTER ITERATIONS= 35

\*\*\*\*\*  
ITERATION 36 FOLLOWS NOW  
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ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
PSY ERROR=1.8922E-03 THETA ERROR=2.4551E-04 OMEGA ERROR=2.7980E-03  
NUMBER OF OUTER ITERATIONS= 36

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ITERATION 37 FOLLOWS NOW  
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ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
PSY ERROR=1.5838E-03 THETA ERROR=2.1267E-04 OMEGA ERROR=2.4140E-03

PSY ERROR=1.5838E-03 THETA ERROR=2.1267E-04 OMEGA ERROR=2.4160E-03

NUMBER OF OUTER ITERATIONS= 37

264

ITERATION 38 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 4 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.3673E-03 THETA ERROR=1.8700E-04 OMEGA ERROR=2.0682E-03

NUMBER OF OUTER ITERATIONS= 38

ITERATION 39 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 7 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.1871E-03 THETA ERROR=1.5914E-04 OMEGA ERROR=1.8055E-03

NUMBER OF OUTER ITERATIONS= 39

ITERATION 40 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0241E-03 THETA ERROR=1.3775E-04 OMEGA ERROR=1.5610E-03

NUMBER OF OUTER ITERATIONS= 40

ITERATION 41 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=8.8578E-04 THETA ERROR=1.1921E-04 OMEGA ERROR=1.3500E-03

NUMBER OF OUTER ITERATIONS= 41

ITERATION 42 FOLLOWS NOW

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $7.6628E-04$  THETA ERROR= $1.0306E-04$  OMEGA ERROR= $1.1677E-03$

NUMBER OF OUTER ITERATIONS= 42

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ITERATION 43 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $8.6904E-04$  THETA ERROR= $8.9407E-05$  OMEGA ERROR= $1.0101E-03$

NUMBER OF OUTER ITERATIONS= 43

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ITERATION 44 FOLLOWS NOW

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ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E-02$  AFTER 9 CYCLES

ITERATIONS CONVERGED TO A TOLERANCE OF  $.1000E+01$  AFTER 2 CYCLES

PSY ERROR= $5.7364E-04$  THETA ERROR= $7.7128E-05$  OMEGA ERROR= $8.7392E-04$

NUMBER OF OUTER ITERATIONS= 44

\*\*\*\*\*

RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

| H            | W            | TS           | TL           |
|--------------|--------------|--------------|--------------|
| $1.0000E-02$ | $2.0000E-01$ | $1.0000E+02$ | $0.0000E+00$ |

PSY ERROR= $5.7364E-04$  THETA ERROR= $7.7128E-05$  OMEGA ERROR= $8.7392E-04$

NUMBER OF OUTER ITERATIONS= 44

| RA           | PR           | NU           | AR           |
|--------------|--------------|--------------|--------------|
| $9.3037E+03$ | $6.9901E-01$ | $1.0729E+00$ | $2.0000E+01$ |

GAP CONDUCTANCE =  $2.4676E+00$  KCAL/M.HR.DEG.C

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PRESS RETURN TO CONTINUE

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 2.2518E-07 | 7  | 6.4170E+01 | 8  | 7.1215E+01 |
| 9  | 8.4150E+01 | 10 | 2.2536E-07 | 11 | 4.4532E-10 | 12 | 8.7302E+01 |
| 13 | 4.6057E+01 | 14 | 6.0685E+01 | 15 | 6.5802E+00 | 16 | 2.1127E-10 |
| 17 | 1.7525E+01 | 18 | 2.5297E+01 | 19 | 5.2333E+01 | 20 | 3.7578E-10 |
| 21 | 1.0182E-18 | 22 | 8.4673E-08 | 23 | 1.0310E-07 | 24 | 1.3831E-07 |
| 25 | 1.5336E-18 |    |            |    |            |    |            |

STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -4.8542E-20 | 2  | -5.7747E-09 | 3  | -1.3227E-08 | 4  | -1.5166E-08 |
| 5  | -1.9390E-19 | 6  | -1.4437E-11 | 7  | -3.3654E+00 | 8  | -6.2199E+00 |
| 9  | 6.7156E+00  | 10 | -6.2301E-11 | 11 | -2.6679E-11 | 12 | -7.5213E+00 |
| 13 | -1.0850E+01 | 14 | -1.0008E+01 | 15 | -9.4178E-11 | 16 | -5.6843E-11 |
| 17 | -9.0754E+00 | 18 | -1.1846E+01 | 19 | -9.4574E+00 | 20 | -8.9052E-11 |
| 21 | -2.2919E-19 | 22 | -2.9773E-09 | 23 | -4.2516E-08 | 24 | -3.5621E-08 |
| 25 | -3.5319E-19 |    |             |    |             |    |             |

VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA      |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 4.8983E-10 | 2  | 1.0769E+02 | 3  | 1.5704E+02 | 4  | 2.1490E+02 |
| 5  | 2.0472E-09 | 6  | 1.1531E-11 | 7  | 5.7543E+01 | 8  | 1.1031E+02 |
| 9  | 1.8242E+02 | 10 | 4.7627E-11 | 11 | 1.0581E-11 | 12 | 4.8274E+01 |
| 13 | 6.4078E+01 | 14 | 1.1797E+02 | 15 | 3.3966E-11 | 16 | 1.7603E-11 |
| 17 | 1.9813E+02 | 18 | 2.2257E+02 | 19 | 1.5269E+02 | 20 | 4.8053E-11 |
| 21 | 1.8914E-02 | 22 | 2.9091E+02 | 23 | 3.7908E+02 | 24 | 3.0264E+02 |
| 25 | 2.9251E-09 |    |            |    |            |    |            |

\*\*\*\*\*

STOP

CHECK

ENTER DATE (DD-MM-YYYY)  
29-8-1987

WHAT IS YOUR OUTPUT UNIT CODE?

1

GIVE HSTART,HSTOP,HSTEP (X.XXXX X.XXXX X.XXXX)  
0.0500

GIVE ENCLOSURE INCLINATION (XXX.X)  
000.0

100.0000 0.0000 .0500

WHAT IS TITLE OF YOUR PROGRAMME?

SENSITIVITY ANALYSIS - HORIZONTAL ENCLOSURE

5 5 1

WHAT IS ASPECT RATIO (XXX.X)?

100.0

1.0 100.0

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SENSITIVITY ANALYSIS - HORIZONTAL ENCLOSURE

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OUTPUT OBTAINED ON 29-8-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

| I  | X        | Y      | I  | X        | Y      | I  | X        | Y      |
|----|----------|--------|----|----------|--------|----|----------|--------|
| 1  | 0.0000   | 0.0000 | 2  | 25.0000  | 0.0000 | 3  | 50.0000  | 0.0000 |
| 4  | 75.0000  | 0.0000 | 5  | 100.0000 | 0.0000 | 6  | 0.0000   | .2500  |
| 7  | 25.0000  | .2500  | 8  | 50.0000  | .2500  | 9  | 75.0000  | .2500  |
| 10 | 100.0000 | .2500  | 11 | 0.0000   | .5000  | 12 | 25.0000  | .5000  |
| 13 | 50.0000  | .5000  | 14 | 75.0000  | .5000  | 15 | 100.0000 | .5000  |
| 16 | 0.0000   | .7500  | 17 | 25.0000  | .7500  | 18 | 50.0000  | .7500  |
| 19 | 75.0000  | .7500  | 20 | 100.0000 | .7500  | 21 | 0.0000   | 1.0000 |
| 22 | 25.0000  | 1.0000 | 23 | 50.0000  | 1.0000 | 24 | 75.0000  | 1.0000 |
| 25 | 100.0000 | 1.0000 |    |          |        |    |          |        |

ELEMENT NODE NUMBERS AND AREAS

| M | I | J | K | AREA       | M | I | J | K | AREA       |
|---|---|---|---|------------|---|---|---|---|------------|
| 1 | 1 | 7 | 6 | 3.1250E+00 | 2 | 1 | 2 | 7 | 3.1250E+00 |
| 3 | 2 | 8 | 7 | 3.1250E+00 | 4 | 2 | 3 | 8 | 3.1250E+00 |
| 5 | 3 | 9 | 8 | 3.1250E+00 | 6 | 3 | 4 | 9 | 3.1250E+00 |

|    |    |    |    |            |    |    |    |    |            |
|----|----|----|----|------------|----|----|----|----|------------|
| 1  | 4  | 10 | 9  | 3.1250E+00 | 9  | 4  | 5  | 10 | 3.1250E+00 |
| 9  | 6  | 12 | 11 | 3.1250E+00 | 10 | 6  | 7  | 12 | 3.1250E+00 |
| 11 | 7  | 13 | 12 | 3.1250E+00 | 12 | 7  | 8  | 13 | 3.1250E+00 |
| 13 | 8  | 14 | 13 | 3.1250E+00 | 14 | 8  | 9  | 14 | 3.1250E+00 |
| 15 | 9  | 15 | 14 | 3.1250E+00 | 16 | 9  | 10 | 15 | 3.1250E+00 |
| 17 | 11 | 17 | 16 | 3.1250E+00 | 18 | 11 | 12 | 17 | 3.1250E+00 |
| 19 | 12 | 18 | 17 | 3.1250E+00 | 20 | 12 | 13 | 18 | 3.1250E+00 |
| 21 | 13 | 19 | 18 | 3.1250E+00 | 22 | 13 | 14 | 19 | 3.1250E+00 |
| 23 | 14 | 20 | 19 | 3.1250E+00 | 24 | 14 | 15 | 20 | 3.1250E+00 |
| 25 | 16 | 22 | 21 | 3.1250E+00 | 26 | 16 | 17 | 22 | 3.1250E+00 |
| 27 | 17 | 23 | 22 | 3.1250E+00 | 28 | 17 | 18 | 23 | 3.1250E+00 |
| 29 | 18 | 24 | 23 | 3.1250E+00 | 30 | 18 | 19 | 24 | 3.1250E+00 |
| 31 | 19 | 25 | 24 | 3.1250E+00 | 32 | 19 | 20 | 25 | 3.1250E+00 |

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16

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25  
THE NUMBERS OF THE 16 BOUNDARY POINTS ARE  
1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

\*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .5000E+02 | 13 | .2500E+02 | 18 | .1250E+02 |
| 23 | .1250E-08 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .6250E+02 | 13 | .3750E+02 | 18 | .1875E+02 |
| 23 | .1875E-08 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .6875E+02 | 13 | .4375E+02 | 18 | .2187E+02 |
| 23 | .2187E-08 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .7187E+02 | 13 | .4687E+02 | 18 | .2344E+02 |
| 23 | .2343E-08 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .7344E+02 | 13 | .4844E+02 | 18 | .2422E+02 |
| 23 | .2422E-08 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .7422E+02 | 13 | .4922E+02 | 18 | .2461E+02 |
| 23 | .2461E-08 |   |           |    |           |    |           |

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .7461E+02 | 13 | .4961E+02 | 18 | .2480E+02 |
| 23 | .2480E-08 |   |           |    |           |    |           |

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\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .7480E+02 | 13 | .4980E+02 | 18 | .2490E+02 |
| 25 | .2490E-08 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .7490E+02 | 13 | .4990E+02 | 18 | .2495E+02 |
| 23 | .2495E-08 |   |           |    |           |    |           |

\*\*\*\* ITERATION 10 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .7495E+02 | 13 | .4995E+02 | 18 | .2498E+02 |
| 23 | .2497E-08 |   |           |    |           |    |           |

\*\*\*\* ITERATION 11 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .7498E+02 | 13 | .4998E+02 | 18 | .2499E+02 |
| 23 | .2499E-08 |   |           |    |           |    |           |

\*\*\*\* ITERATION 12 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+03 | 8 | .7499E+02 | 13 | .4999E+02 | 18 | .2499E+02 |
| 23 | .2499E-08 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-03 AFTER 12 CYCLES

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# CONDUCTION TEMPERATURE DISTRIBUTION

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7498E+02 | 8  | .7499E+02 |
| 9  | .7498E+02 | 10 | .5000E-08 | 11 | .4996E-12 | 12 | .4998E+02 |
| 13 | .4999E+02 | 14 | .4998E+02 | 15 | .4997E-12 | 16 | .2498E-12 |
| 17 | .2499E+02 | 18 | .2499E+02 | 19 | .2499E+02 | 20 | .2499E-12 |
| 21 | .4995E-22 | 22 | .2499E-08 | 23 | .2499E-08 | 24 | .2499E-08 |
| 25 | .4997E-22 |    |           |    |           |    |           |

\*\*\*\*\*

OWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .0000E+01 | 8 | .0000E+01 | 13 | .0000E+01 | 18 | .0000E+01 |
| 23 | .0000E+01 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1200E+01 AFTER 1 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 5 | .5000E+00 | 13 | .2500E+00 | 18 | .1250E+00 |
| 23 | .3749E-10 |   |           |    |           |    |           |

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\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6250E+00 | 13 | .3750E+00 | 18 | .1875E+00 |
| 23 | .4374E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .5875E+00 | 13 | .4375E+00 | 18 | .2187E+00 |
| 23 | .4686E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .7187E+00 | 13 | .4687E+00 | 18 | .2344E+00 |
| 23 | .4843E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .7344E+00 | 13 | .4844E+00 | 18 | .2422E+00 |
| 23 | .4921E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .7422E+00 | 13 | .4922E+00 | 18 | .2461E+00 |
| 23 | .4960E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .7461E+00 | 13 | .4961E+00 | 18 | .2480E+00 |
| 23 | .4979E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .7480E+00 | 13 | .4980E+00 | 18 | .2490E+00 |
| 23 | .4985E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .7490E+00 | 13 | .4990E+00 | 18 | .2495E+00 |
| 23 | .4994E-10 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .0000E+01 | 9 | .1626E+03 | 13 | .2433E+03 | 18 | .2835E+03 |
| 23 | .2834E-07 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|   |      |   |      |   |      |   |      |
|---|------|---|------|---|------|---|------|
| I | TEMP | I | TEMP | I | TEMP | I | TEMP |
|---|------|---|------|---|------|---|------|

.23 .3947E-07  
 ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES  
 PSY ERROR=1.0000E+00 THETA ERROR=0.0000E+00 OMEGA ERROR=1.0000E+00  
 NUMBER OF OUTER ITERATIONS= 1 271

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 ITERATION 2 FOLLOWS NOW  
 \*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | .0000E+01  | 8 | -.1164E+02 | 13 | -.1806E+02 | 18 | -.1489E+02 |
| 23 | -.1489E-08 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.1164E-08 | 8 | -.2067E+02 | 13 | -.3003E+02 | 18 | -.2088E+02 |
| 23 | -.2088E-08 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4519E-00 | 13 | .2068E+00 | 18 | .7483E-01 |
| 23 | .5742E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP       | I  | TEMP      | I  | TEMP      |
|----|-----------|---|------------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | -.5853E+00 | 13 | .2980E+00 | 18 | .1194E+00 |
| 23 | .3139E-10 |   |            |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4299E+00 | 13 | .3405E+00 | 18 | .1417E+00 |
| 23 | .6411E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6522E+00 | 13 | .3623E+00 | 18 | .1528E+00 |
| 23 | .6522E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6634E+00 | 13 | .3740E+00 | 18 | .1584E+00 |
| 23 | .6578E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6689E+00 | 13 | .3796E+00 | 18 | .1612E+00 |
| 23 | .6606E-10 |   |           |    |           |    |           |

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6717E+00 | 13 | .3823E+00 | 18 | .1626E+00 |
| 23 | .6620E-10 |   |           |    |           |    |           |

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\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6731E+00 | 13 | .3837E+00 | 18 | .1633E+00 |
| 23 | .6627E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6738E+00 | 13 | .3844E+00 | 18 | .1637E+00 |
| 23 | .6630E-10 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .6614E+03 | 8 | .4030E+03 | 13 | .2982E+03 | 18 | .2905E+03 |
| 23 | .6681E+03 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .6614E+03 | 8 | .5522E+03 | 13 | .5191E+03 | 18 | .7345E+03 |
| 23 | .6681E+03 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=1.1659E-01 OMEGA ERROR=4.8510E-01

NUMBER OF OUTER ITERATIONS= 2

\*\*\*\*\*  
ITERATION 3 FOLLOWS NOW  
\*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |            |   |            |    |            |    |            |
|----|------------|---|------------|----|------------|----|------------|
| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
| 3  | -.1164E-08 | 8 | -.1953E+02 | 13 | -.2889E+02 | 18 | -.3423E+02 |
| 23 | -.5511E-08 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |            |   |            |    |            |    |            |
|----|------------|---|------------|----|------------|----|------------|
| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
| 3  | -.3116E-08 | 8 | -.3397E+02 | 13 | -.5322E+02 | 18 | -.4640E+02 |
| 23 | -.6727E-08 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .4593E+00 | 13 | .1814E+00 | 18 | .5998E-01 |
| 23 | .7230E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|   |      |   |      |   |      |   |      |
|---|------|---|------|---|------|---|------|
| I | TEMP | I | TEMP | I | TEMP | I | TEMP |
|---|------|---|------|---|------|---|------|

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5878E+00 | 13 | .2945E+00 | 18 | .1165E+00 |
| 23 | .7795E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6066E+00 | 13 | .3133E+00 | 18 | .1259E+00 |
| 23 | .7890E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6161E+00 | 13 | .3228E+00 | 18 | .1307E+00 |
| 23 | .7937E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6208E+00 | 13 | .3275E+00 | 18 | .1330E+00 |
| 23 | .7960E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6231E+00 | 13 | .3299E+00 | 18 | .1342E+00 |
| 23 | .7972E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6243E+00 | 13 | .3310E+00 | 18 | .1348E+00 |
| 23 | .7978E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6249E+00 | 13 | .3316E+00 | 18 | .1351E+00 |
| 23 | .7981E-10 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1087E+04 | 8 | .4685E+03 | 13 | .2743E+03 | 18 | .4067E+03 |
| 23 | .1485E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1087E+04 | 8 | .6057E+03 | 13 | .5463E+03 | 18 | .1285E+04 |
| 23 | .1485E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.5640E+00 THETA ERROR=1.1990E-01 OMEGA ERROR=5.4036E+00

NUMBER OF OUTER ITERATIONS= 3

ITERATION 4 FOLLOWS NOW

\*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

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| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.2116E-08 | 8 | -.2483E+02 | 13 | -.3651E+02 | 18 | -.5277E+02 |
| 23 | -.1200E-07 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.5549E-08 | 8 | -.4259E+02 | 13 | -.7203E+02 | 18 | -.7053E+02 |
| 23 | -.1378E-07 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4425E+00 | 13 | .1687E+00 | 18 | .6058E-01 |
| 23 | .8587E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5269E+00 | 13 | .2412E+00 | 18 | .9683E-01 |
| 23 | .8949E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5631E+00 | 13 | .2775E+00 | 18 | .1150E+00 |
| 23 | .9131E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5813E+00 | 13 | .2956E+00 | 18 | .1240E+00 |
| 23 | .9221E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5904E+00 | 13 | .3047E+00 | 18 | .1286E+00 |
| 23 | .9267E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5949E+00 | 13 | .3093E+00 | 18 | .1308E+00 |
| 23 | .9289E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5972E+00 | 13 | .3115E+00 | 18 | .1320E+00 |
| 23 | .9301E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5989E+00 | 13 | .3127E+00 | 18 | .1328E+00 |
| 23 | .7306E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .5989E+00 | 13 | .3132E+00 | 18 | .1328E+00 |
| 23 | .9309E-10 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1363E+04 | 8 | .4668E+03 | 13 | .2497E+03 | 18 | .5283E+03 |
| 23 | .2257E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1363E+04 | 8 | .5917E+03 | 13 | .5763E+03 | 18 | .1820E+04 |
| 23 | .2257E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0527E+00 THETA ERROR=8.6942E-02 OMEGA ERROR=1.3463E+00

NUMBER OF OUTER ITERATIONS= 4

\*\*\*\*\*  
ITERATION 5 FOLLOWS NOW  
\*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |            |   |            |    |            |    |            |
|----|------------|---|------------|----|------------|----|------------|
| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
| 3  | -.5549E-08 | 8 | -.2728E+02 | 13 | -.4190E+02 | 18 | -.6873E+02 |
| 23 | -.2065E-07 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |            |   |            |    |            |    |            |
|----|------------|---|------------|----|------------|----|------------|
| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
| 3  | -.8277E-08 | 8 | -.4923E+02 | 13 | -.3674E+02 | 18 | -.9115E+02 |
| 23 | -.2289E-07 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .4331E+00 | 13 | .1653E+00 | 18 | .6962E-01 |
| 23 | .8975E-10 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .5157E+00 | 13 | .2409E+00 | 18 | .1065E+00 |
| 23 | .1027E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

|   |           |   |           |    |           |    |           |
|---|-----------|---|-----------|----|-----------|----|-----------|
| I | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3 | .1000E+01 | 8 | .5536E+00 | 13 | .2787E+00 | 18 | .1254E+00 |

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .5725E+00 | 13 | .2977E+00 | 18 | .1348E+00 |
| 23 | .1066E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 5  | .1000E+01 | 8 | .5820E+00 | 13 | .3071E+00 | 18 | .1396E+00 |
| 23 | .1070E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .5867E+00 | 13 | .3119E+00 | 18 | .1419E+00 |
| 23 | .1073E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .5891E+00 | 13 | .3142E+00 | 18 | .1431E+00 |
| 23 | .1074E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .5902E+00 | 13 | .3154E+00 | 18 | .1437E+00 |
| 23 | .1075E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .5908E+00 | 13 | .3160E+00 | 18 | .1440E+00 |
| 23 | .1075E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1543E+04 | 8 | .4577E+03 | 13 | .2272E+03 | 18 | .5652E+03 |
| 23 | .2917E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1543E+04 | 8 | .5714E+03 | 13 | .5667E+03 | 18 | .2193E+04 |
| 23 | .2917E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=5.7638E-01 THETA ERROR=7.7631E-02 OMEGA ERROR=1.1090E+00

NUMBER OF OUTER ITERATIONS= 5

\*\*\*\*\*  
 ITERATION 6 FOLLOWS NOW  
 \*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|   |      |   |      |   |      |   |      |
|---|------|---|------|---|------|---|------|
| I | TEMP | I | TEMP | I | TEMP | I | TEMP |
|---|------|---|------|---|------|---|------|

23 - .3094E-07

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.1121E-07 | 8 | -.5188E+02 | 13 | -.7671E+02 | 18 | -.1062E+03 |
| 23 | -.3351E-07 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4297E+00 | 13 | .1674E+00 | 18 | .7989E-01 |
| 23 | .1155E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5134E+00 | 13 | .2492E+00 | 18 | .1208E+00 |
| 23 | .1196E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5543E+00 | 13 | .2901E+00 | 18 | .1413E+00 |
| 23 | .1216E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5748E+00 | 13 | .3106E+00 | 18 | .1515E+00 |
| 23 | .1226E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5850E+00 | 13 | .3208E+00 | 18 | .1566E+00 |
| 23 | .1232E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5901E+00 | 13 | .3259E+00 | 18 | .1592E+00 |
| 23 | .1234E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5927E+00 | 13 | .3285E+00 | 18 | .1605E+00 |
| 23 | .1235E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5940E+00 | 13 | .3298E+00 | 18 | .1611E+00 |
| 23 | .1236E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I | TEMP | I | TEMP | I | TEMP | I | TEMP |
|---|------|---|------|---|------|---|------|
|---|------|---|------|---|------|---|------|

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1660E+04 | 8 | .4587E+03 | 13 | .2020E+03 | 18 | .4910E+03 |
| 23 | .3398E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1660E+04 | 8 | .5598E+03 | 13 | .4980E+03 | 18 | .2338E+04 |
| 23 | .3398E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.8044E-01 THETA ERROR=1.0786E-01 OMEGA ERROR=5.2659E-01

NUMBER OF OUTER ITERATIONS= 6

\*\*\*\*\*  
ITERATION 7 FOLLOWS NOW  
\*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.1121E-07 | 8 | -.3076E+02 | 13 | -.4662E+02 | 18 | -.8713E+02 |
| 23 | -.4222E-07 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.1428E-07 | 8 | -.5407E+02 | 13 | -.1018E+03 | 18 | -.1147E+03 |
| 23 | -.4499E-07 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4297E+00 | 13 | .1717E+00 | 18 | .9088E-01 |
| 23 | .1327E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5156E+00 | 13 | .2600E+00 | 18 | .1351E+00 |
| 23 | .1371E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5598E+00 | 13 | .3042E+00 | 18 | .1572E+00 |
| 23 | .1393E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5819E+00 | 13 | .3264E+00 | 18 | .1682E+00 |
| 23 | .1405E-09 |   |           |    |           |    |           |

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5929E+00 | 13 | .3374E+00 | 18 | .1738E+00 |
| 23 | .1410E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 5  | .1000E+01 | 8 | .5985E+00 | 13 | .3429E+00 | 18 | .1765E+00 |
| 23 | .1413E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6012E+00 | 13 | .3457E+00 | 18 | .1779E+00 |
| 23 | .1414E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6026E+00 | 13 | .3471E+00 | 18 | .1786E+00 |
| 23 | .1415E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6033E+00 | 13 | .3478E+00 | 18 | .1790E+00 |
| 23 | .1415E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1730E+04 | 8 | .4666E+03 | 13 | .1783E+03 | 18 | .3462E+03 |
| 23 | .3672E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1730E+04 | 8 | .5558E+03 | 13 | .3961E+03 | 18 | .2291E+04 |
| 23 | .3672E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.5553E-01 THETA ERROR=9.7967E-02 OMEGA ERROR=3.0363E-01

NUMBER OF OUTER ITERATIONS= 7

\*\*\*\*\*  
 ITERATION 8 FOLLOWS NOW  
 \*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |            |   |            |    |            |    |            |
|----|------------|---|------------|----|------------|----|------------|
| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
| 3  | -.1428E-07 | 8 | -.3189E+02 | 13 | -.4684E+02 | 18 | -.8954E+02 |
| 23 | -.5394E-07 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |            |   |            |    |            |    |            |
|----|------------|---|------------|----|------------|----|------------|
| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
| 3  | -.1747E-05 | 8 | -.3312E+02 | 13 | -.4684E+02 | 18 | -.8954E+02 |
| 23 | -.5394E-07 |   |            |    |            |    |            |

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4309E+00 | 13 | .1757E+00 | 18 | .9904E-01 |
| 23 | .1514E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5158E+00 | 13 | .2691E+00 | 18 | .1458E+00 |
| 23 | .1561E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5655E+00 | 13 | .3159E+00 | 18 | .1692E+00 |
| 23 | .1584E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5889E+00 | 13 | .3392E+00 | 18 | .1808E+00 |
| 23 | .1596E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6006E+00 | 13 | .3509E+00 | 18 | .1867E+00 |
| 23 | .1602E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6064E+00 | 13 | .3568E+00 | 18 | .1696E+00 |
| 23 | .1605E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6093E+00 | 13 | .3597E+00 | 18 | .1911E+00 |
| 23 | .1606E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6108E+00 | 13 | .3612E+00 | 18 | .1918E+00 |
| 23 | .1607E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6115E+00 | 13 | .3619E+00 | 18 | .1922E+00 |
| 23 | .1607E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I | TEMP | I | TEMP | I | TEMP | I | TEMP |
|---|------|---|------|---|------|---|------|
|---|------|---|------|---|------|---|------|

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP         |
|----|-----------|---|-----------|----|-----------|----|--------------|
| 3  | .1770E+04 | 8 | .5582E+03 | 13 | .3076E+03 | 18 | 281.2161E+04 |
| 23 | .3769E+04 |   |           |    |           |    |              |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.6091E-01 THETA ERROR=6.8770E-02 OMEGA ERROR=1.6720E-01

NUMBER OF OUTER ITERATIONS= 8

\*\*\*\*\*  
ITERATION 9 FOLLOWS NOW  
\*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.1747E-07 | 8 | -.3278E+02 | 13 | -.4676E+02 | 18 | -.8962E+02 |
| 23 | -.6572E-07 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.2075E-07 | 8 | -.5616E+02 | 13 | -.1033E+03 | 18 | -.1179E+03 |
| 23 | -.6855E-07 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4319E+00 | 13 | .1781E+00 | 18 | .1035E+00 |
| 23 | .1711E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5210E+00 | 13 | .2745E+00 | 18 | .1517E+00 |
| 23 | .1759E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5691E+00 | 13 | .3226E+00 | 18 | .1758E+00 |
| 23 | .1783E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5932E+00 | 13 | .3467E+00 | 18 | .1878E+00 |
| 23 | .1795E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6053E+00 | 13 | .3538E+00 | 18 | .1939E+00 |
| 23 | .1801E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

3 .1000E+01 8 .5113E+00 13 .3648E+00 18 .1969E+01  
23 .1804E-09

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

282

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6143E+00 | 13 | .3678E+00 | 18 | .1984E+00 |
| 23 | .1806E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6158E+00 | 13 | .3693E+00 | 18 | .1991E+00 |
| 23 | .1807E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6166E+00 | 13 | .3701E+00 | 18 | .1995E+00 |
| 23 | .1807E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1797E+04 | 8 | .4856E+03 | 13 | .1609E+03 | 18 | .1164E+03 |
| 23 | .3772E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1797E+04 | 8 | .5662E+03 | 13 | .2595E+03 | 18 | .2052E+04 |
| 23 | .3772E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=.9.1073E-02 THETA ERROR=.3.6760E-02 OMEGA ERROR=.9.3152E-02

NUMBER OF OUTER ITERATIONS= 9

\*\*\*\*\*  
ITERATION 10 FOLLOWS NOW  
\*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.2075E-07 | 8 | -.3352E+02 | 13 | -.4692E+02 | 18 | -.8925E+02 |
| 23 | -.7747E-07 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.2410E-07 | 8 | -.5698E+02 | 13 | -.1033E+03 | 18 | -.1174E+03 |
| 23 | -.9029E-07 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4370E+00 | 13 | .1789E+00 | 18 | .1081E+00 |
| 23 | .1807E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5215E+00 | 13 | .2763E+00 | 18 | .1538E+00 |
| 23 | .1961E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5702E+00 | 13 | .3249E+00 | 18 | .1781E+00 |
| 23 | .1985E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5945E+00 | 13 | .3493E+00 | 18 | .1903E+00 |
| 23 | .1997E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6067E+00 | 13 | .3615E+00 | 18 | .1964E+00 |
| 23 | .2003E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6128E+00 | 13 | .3675E+00 | 18 | .1994E+00 |
| 23 | .2006E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6158E+00 | 13 | .3706E+00 | 18 | .2010E+00 |
| 23 | .2008E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6173E+00 | 13 | .3721E+00 | 18 | .2017E+00 |
| 23 | .2009E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6181E+00 | 13 | .3729E+00 | 18 | .2021E+00 |
| 23 | .2009E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1823E+04 | 8 | .4951E+03 | 13 | .1628E+03 | 18 | .8402E+02 |
| 23 | .3758E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1823E+04 | 8 | .5766E+03 | 13 | .2456E+03 | 18 | .2004E+04 |
| 23 | .3758E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 2 CYCLES

NUMBER OF OUTER ITERATIONS= 10

284

\*\*\*\*\*  
ITERATION 11 FOLLOWS NOW  
\*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.2410E-07 | 8 | -.3412E+02 | 13 | -.4735E+02 | 18 | -.8935E+02 |
| 23 | -.8923E-07 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.2751E-07 | 8 | -.5780E+02 | 13 | -.1039E+03 | 18 | -.1176E+03 |
| 23 | -.9205E-07 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4315E+00 | 13 | .1787E+00 | 18 | .1053E+00 |
| 23 | .2114E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5208E+00 | 13 | .2760E+00 | 18 | .1540E+00 |
| 23 | .2163E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5695E+00 | 13 | .3247E+00 | 18 | .1784E+00 |
| 23 | .2187E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5939E+00 | 13 | .3491E+00 | 18 | .1906E+00 |
| 23 | .2200E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6060E+00 | 13 | .3613E+00 | 18 | .1966E+00 |
| 23 | .2206E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6121E+00 | 13 | .3673E+00 | 18 | .1997E+00 |
| 23 | .2209E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I | TEMP | I | TEMP | I | TEMP | I | TEMP |
|---|------|---|------|---|------|---|------|
|---|------|---|------|---|------|---|------|

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6167E+00 | 13 | .3719E+00 | 18 | .2020E+00 |
| 23 | .2211E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6175E+00 | 13 | .3727E+00 | 18 | .2024E+00 |
| 23 | .2211E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1849E+04 | 8 | .5027E+03 | 13 | .1648E+03 | 18 | .8039E+02 |
| 23 | .3764E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1849E+04 | 8 | .5852E+03 | 13 | .2463E+03 | 18 | .2003E+04 |
| 23 | .3764E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.8258E-02 THETA ERROR=2.7161E-03 OMEGA ERROR=2.4214E-02

NUMBER OF OUTER ITERATIONS= 11

\*\*\*\*\*  
ITERATION 12 FOLLOWS NOW  
\*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .2751E-07 | 8 | .3457E+02 | 13 | .4783E+02 | 18 | .8992E+02 |
| 23 | .1010E-06 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.3097E-07 | 8 | -.5848E+02 | 13 | -.1047E+03 | 18 | -.1184E+03 |
| 23 | -.1039E-06 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4307E+00 | 13 | .1781E+00 | 18 | .1054E+00 |
| 23 | .2317E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5197E+00 | 13 | .2753E+00 | 18 | .1540E+00 |
| 23 | .2365E-09 |   |           |    |           |    |           |

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5684E+00 | 13 | .3239E+00 | 18 | .1783E+00 |
| 23 | .2390E-09 |   |           |    |           |    |           |

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\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5927E+00 | 13 | .3493E+00 | 18 | .1905E+00 |
| 23 | .2402E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6048E+00 | 13 | .3604E+00 | 18 | .1966E+00 |
| 23 | .2408E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6109E+00 | 13 | .3665E+00 | 18 | .1996E+00 |
| 23 | .2411E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6140E+00 | 13 | .3695E+00 | 18 | .2011E+00 |
| 23 | .2412E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6155E+00 | 13 | .3711E+00 | 18 | .2019E+00 |
| 23 | .2413E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6163E+00 | 13 | .3718E+00 | 18 | .2023E+00 |
| 23 | .2414E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1871E+04 | 8 | .5073E+03 | 13 | .1653E+03 | 18 | .8097E+02 |
| 23 | .3788E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1871E+04 | 8 | .5901E+03 | 13 | .2472E+03 | 18 | .2016E+04 |
| 23 | .3788E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.7255E-02, THETA ERROR=3.3503E-03 OMEGA ERROR=1.6647E-02

NUMBER OF OUTER ITERATIONS= 12

\*\*\*\*\*  
ITERATION 13 FOLLOWS NOW

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.3097E-07 | 8 | -.3487E+02 | 13 | -.4818E+02 | 18 | -.9058E+02 |
| 23 | -.1129E-06 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.3445E-07 | 8 | -.5896E+02 | 13 | -.1055E+03 | 18 | -.1193E+03 |
| 23 | -.1158E-06 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4301E+00 | 13 | .1777E+00 | 18 | .1057E+00 |
| 23 | .2519E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5189E+00 | 13 | .2750E+00 | 18 | .1543E+00 |
| 23 | .2568E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5676E+00 | 13 | .3236E+00 | 18 | .1787E+00 |
| 23 | .2592E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5919E+00 | 13 | .3480E+00 | 18 | .1908E+00 |
| 23 | .2604E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6041E+00 | 13 | .3601E+00 | 18 | .1969E+00 |
| 23 | .2610E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6102E+00 | 13 | .3662E+00 | 18 | .2000E+00 |
| 23 | .2614E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6132E+00 | 13 | .3693E+00 | 18 | .2015E+00 |
| 23 | .2615E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6147E+00 | 13 | .3708E+00 | 18 | .2023E+00 |
| 23 |           |   |           |    |           |    |           |

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6155E+00 | 13 | .3716E+00 | 18 | .2026E+00 |
| 23 | .2616E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1887E+04 | 8 | .5097E+03 | 13 | .1650E+03 | 18 | .7587E+02 |
| 23 | .3816E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1887E+04 | 8 | .5923E+03 | 13 | .2444E+03 | 18 | .2024E+04 |
| 23 | .3816E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.3344E-02 THETA ERROR=2.8612E-03 OMEGA ERROR=1.8827E-02

NUMBER OF OUTER ITERATIONS= 13

\*\*\*\*\*  
 ITERATION 14 FOLLOWS NOW  
 \*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.3445E-07 | 8 | -.3508E+02 | 13 | -.4839E+02 | 18 | -.9108E+02 |
| 23 | -.1249E-06 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.3796E-07 | 8 | -.5927E+02 | 13 | -.1060E+03 | 18 | -.1199E+03 |
| 23 | -.1278E-06 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4297E+00 | 13 | .1776E+00 | 18 | .1062E+00 |
| 23 | .2722E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5185E+00 | 13 | .2751E+00 | 18 | .1550E+00 |
| 23 | .2771E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5673E+00 | 13 | .3239E+00 | 18 | .1794E+00 |
| 23 | .2796E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

|    |           |       |           |    |           |    |           |
|----|-----------|-------|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | - - 8 | .5917E+00 | 13 | .3483E+00 | 18 | .1916E+00 |
| 23 | .2808E-09 |       |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

289

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6039E+00 | 13 | .3605E+00 | 18 | .1977E+00 |
| 23 | .2814E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6100E+00 | 13 | .3666E+00 | 18 | .2007E+00 |
| 23 | .2817E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6131E+00 | 13 | .3696E+00 | 18 | .2022E+00 |
| 23 | .2818E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6146E+00 | 13 | .3712E+00 | 18 | .2030E+00 |
| 23 | .2819E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1000E+01 | 8 | .6153E+00 | 13 | .3719E+00 | 18 | .2034E+00 |
| 23 | .2820E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1897E+04 | 8 | .5111E+03 | 13 | .1648E+03 | 18 | .6629E+02 |
| 23 | .3837E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |   |           |    |           |    |           |
|----|-----------|---|-----------|----|-----------|----|-----------|
| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
| 3  | .1897E+04 | 8 | .5936E+03 | 13 | .2392E+03 | 18 | .2022E+04 |
| 23 | .3837E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.1826E-02 THETA ERROR=3.6508E-03 OMEGA ERROR=1.7150E-02

NUMBER OF OUTER ITERATIONS= 14

\*\*\*\*\*  
 ITERATION 15 FOLLOWS NOW  
 \*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |            |   |            |    |            |    |            |
|----|------------|---|------------|----|------------|----|------------|
| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
| 3  | -.3776E-07 | 8 | -.3513E+02 | 13 | -.4851E+02 | 18 | -.9137E+02 |
| 23 | -.1367E-06 |   |            |    |            |    |            |

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .4148E-07 | 8 | .5949E+02 | 13 | .1063E+03 | 18 | .1203E+03 |
| 23 | .1398E-06 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4276E+00 | 13 | .1777E+00 | 18 | .1067E+00 |
| 23 | .2926E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5184E+00 | 13 | .2754E+00 | 18 | .1556E+00 |
| 23 | .2975E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5673E+00 | 13 | .3243E+00 | 18 | .1800E+00 |
| 23 | .3000E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5918E+00 | 13 | .3488E+00 | 18 | .1923E+00 |
| 23 | .3012E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6040E+00 | 13 | .3610E+00 | 18 | .1984E+00 |
| 23 | .3018E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6101E+00 | 13 | .3672E+00 | 18 | .2014E+00 |
| 23 | .3021E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6132E+00 | 13 | .3702E+00 | 18 | .2030E+00 |
| 23 | .3023E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6147E+00 | 13 | .3717E+00 | 18 | .2037E+00 |
| 23 | .3023E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6155E+00 | 13 | .3725E+00 | 18 | .2041E+00 |
| 23 | .3024E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01

| I  | TEMP      | I | TEMP      | I  | TEMP      | I   | TEMP      |
|----|-----------|---|-----------|----|-----------|-----|-----------|
| 3  | .1904E+04 | 8 | .5124E+03 | 13 | .1648E+03 | 18  | .5673E+02 |
| 23 | .3849E+04 |   |           |    |           | 201 |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1904E+04 | 8 | .5949E+03 | 13 | .2345E+03 | 18 | .2016E+04 |
| 23 | .3849E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0151E-02 THETA ERROR=3.6076E-03 OMEGA ERROR=1.2773E-02

NUMBER OF OUTER ITERATIONS= 15

\*\*\*\*\*  
 ITERATION 16 FOLLOWS NOW  
 \*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.4148E-07 | 8 | -.3536E+02 | 13 | -.4859E+02 | 18 | -.9151E+02 |
| 23 | -.1490E-06 |   |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|---|------------|----|------------|----|------------|
| 3  | -.4502E-07 | 8 | -.5966E+02 | 13 | -.1065E+03 | 18 | -.1205E+03 |
| 23 | -.1519E-06 |   |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .4295E+00 | 13 | .1777E+00 | 18 | .1070E+00 |
| 23 | .3131E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5184E+00 | 13 | .2757E+00 | 18 | .1560E+00 |
| 23 | .3180E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5674E+00 | 13 | .3247E+00 | 18 | .1805E+00 |
| 23 | .3204E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .5919E+00 | 13 | .3492E+00 | 18 | .1928E+00 |
| 23 | .3216E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I | TEMP | I | TEMP | I | TEMP | I | TEMP |
|---|------|---|------|---|------|---|------|
|   |      |   |      |   |      |   |      |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6102E+00 | 13 | .3676E+00 | 18 | .2019E+00 |
| 23 | .3226E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6133E+00 | 13 | .3706E+00 | 18 | .2035E+00 |
| 23 | .3227E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6148E+00 | 13 | .3722E+00 | 18 | .2042E+00 |
| 23 | .3228E-09 |   |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1000E+01 | 8 | .6156E+00 | 13 | .3729E+00 | 18 | .2046E+00 |
| 23 | .3228E-09 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1909E+04 | 8 | .5137E+03 | 13 | .1650E+03 | 18 | .4998E+02 |
| 23 | .3855E+04 |   |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|---|-----------|----|-----------|----|-----------|
| 3  | .1909E+04 | 8 | .5763E+03 | 13 | .2314E+03 | 18 | .2011E+04 |
| 23 | .3855E+04 |   |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=7.9359E-03 THETA ERROR=2.4918E-03 OMEGA ERROR=8.4844E-03

NUMBER OF OUTER ITERATIONS= 16

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

| H          | W          | TS         | TL         |
|------------|------------|------------|------------|
| 5.0000E-02 | 5.0000E+00 | 1.0000E+02 | 0.0000E+00 |

PSY ERROR=7.9359E-03 THETA ERROR=2.4918E-03 OMEGA ERROR=8.4844E-03

NUMBER OF OUTER ITERATIONS= 16

| RA         | PR         | NU         | AR         |
|------------|------------|------------|------------|
| 1.0380E+06 | 6.9991E-01 | 1.2156E+00 | 1.0000E+02 |

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PRESS RETURN TO CONTINUE

293

TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 8.5002E-08 | 7  | 5.4842E+01 | 8  | 8.1561E+01 |
| 9  | 9.2429E+01 | 10 | 8.5007E-08 | 11 | 5.5980E-12 | 12 | 2.7382E+01 |
| 13 | 3.7293E+01 | 14 | 6.9663E+01 | 15 | 1.1090E-11 | 16 | 2.5544E-12 |
| 17 | 1.2403E+01 | 18 | 2.0463E+01 | 19 | 3.9205E+01 | 20 | 6.0702E-12 |
| 21 | 5.1720E-21 | 22 | 2.5593E-08 | 23 | 3.2283E-08 | 24 | 6.0702E-08 |
| 25 | 1.0226E-20 |    |            |    |            |    |            |

STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -1.7415E-21 | 2  | -1.7752E-08 | 3  | -4.5019E-08 | 4  | -6.6319E-08 |
| 5  | -1.2374E-20 | 6  | -1.7752E-12 | 7  | -3.5997E+01 | 8  | -5.9656E+01 |
| 9  | -8.3914E+01 | 10 | -1.0948E-11 | 11 | -3.7288E-12 | 12 | -8.6139E+01 |
| 13 | -1.0649E+02 | 14 | -1.2023E+02 | 15 | -1.6359E-11 | 16 | -8.1156E-12 |
| 17 | -1.0514E+02 | 18 | -1.2047E+02 | 19 | -1.0999E+02 | 20 | -1.5000E-11 |
| 21 | -1.0575E-20 | 22 | -1.0611E-07 | 23 | -1.5187E-07 | 24 | -1.5000E-07 |
| 25 | -2.2341E-20 |    |             |    |             |    |             |

VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA      |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 6.8324E-11 | 2  | 1.1519E+03 | 3  | 1.9090E+03 | 4  | 2.6533E+03 |
| 5  | 3.7686E-10 | 6  | 5.9883E-12 | 7  | 7.7516E+02 | 8  | 5.9635E+02 |
| 9  | 2.6234E+03 | 10 | 2.6243E-11 | 11 | 3.5593E-12 | 12 | 8.0649E+02 |
| 13 | 2.3140E+02 | 14 | 1.7345E+03 | 15 | 1.7370E-11 | 16 | 7.3693E-12 |
| 17 | 2.6409E+03 | 18 | 2.0106E+03 | 19 | 2.2921E+03 | 20 | 2.2919E-11 |
| 21 | 2.9334E-10 | 22 | 3.3646E+03 | 23 | 3.8550E+03 | 24 | 3.5196E+03 |
| 25 | 5.1519E-10 |    |            |    |            |    |            |

\*\*\*\*\*

STOP

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# FREE CONVECTION FROM RECTANGULAR ENCLOSURES - CST FINITE ELEMENT SOLUTION

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OUTPUT OBTAINED ON 13-1-1987

## GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 200

NUMBER OF NODAL POINTS = 121

## NODAL POINT CO-ORDINATES

| I   | X      | Y      | I   | X      | Y      | I   | X      | Y      |
|-----|--------|--------|-----|--------|--------|-----|--------|--------|
| 1   | 0.0000 | 0.0000 | 2   | .1000  | 0.0000 | 3   | .2000  | 0.0000 |
| 4   | .3000  | 0.0000 | 5   | .4000  | 0.0000 | 6   | .5000  | 0.0000 |
| 7   | .6000  | 0.0000 | 8   | .7000  | 0.0000 | 9   | .8000  | 0.0000 |
| 10  | .9000  | 0.0000 | 11  | 1.0000 | 0.0000 | 12  | 0.0000 | .1000  |
| 13  | .1000  | .1000  | 14  | .2000  | .1000  | 15  | .3000  | .1000  |
| 16  | .4000  | .1000  | 17  | .5000  | .1000  | 18  | .6000  | .1000  |
| 19  | .7000  | .1000  | 20  | .8000  | .1000  | 21  | .9000  | .1000  |
| 22  | 1.0000 | .1000  | 23  | 0.0000 | .2000  | 24  | .1000  | .2000  |
| 25  | .2000  | .2000  | 26  | .3000  | .2000  | 27  | .4000  | .2000  |
| 28  | .5000  | .2000  | 29  | .6000  | .2000  | 30  | .7000  | .2000  |
| 31  | .8000  | .2000  | 32  | .9000  | .2000  | 33  | 1.0000 | .2000  |
| 34  | 0.0000 | .3000  | 35  | .1000  | .3000  | 36  | .2000  | .3000  |
| 37  | .3000  | .3000  | 38  | .4000  | .3000  | 39  | .5000  | .3000  |
| 40  | .6000  | .3000  | 41  | .7000  | .3000  | 42  | .8000  | .3000  |
| 43  | .9000  | .3000  | 44  | 1.0000 | .3000  | 45  | 0.0000 | .4000  |
| 46  | .1000  | .4000  | 47  | .2000  | .4000  | 48  | .3000  | .4000  |
| 49  | .4000  | .4000  | 50  | .5000  | .4000  | 51  | .6000  | .4000  |
| 52  | .7000  | .4000  | 53  | .8000  | .4000  | 54  | .9000  | .4000  |
| 55  | 1.0000 | .4000  | 56  | 0.0000 | .5000  | 57  | .1000  | .5000  |
| 58  | .2000  | .5000  | 59  | .3000  | .5000  | 60  | .4000  | .5000  |
| 61  | .5000  | .5000  | 62  | .6000  | .5000  | 63  | .7000  | .5000  |
| 64  | .8000  | .5000  | 65  | .9000  | .5000  | 66  | 1.0000 | .5000  |
| 67  | 0.0000 | .6000  | 68  | .1000  | .6000  | 69  | .2000  | .6000  |
| 70  | .3000  | .6000  | 71  | .4000  | .6000  | 72  | .5000  | .6000  |
| 73  | .6000  | .6000  | 74  | .7000  | .6000  | 75  | .8000  | .6000  |
| 76  | .9000  | .6000  | 77  | 1.0000 | .6000  | 78  | 0.0000 | .7000  |
| 79  | .1000  | .7000  | 80  | .2000  | .7000  | 81  | .3000  | .7000  |
| 82  | .4000  | .7000  | 83  | .5000  | .7000  | 84  | .6000  | .7000  |
| 85  | .7000  | .7000  | 86  | .8000  | .7000  | 87  | .9000  | .7000  |
| 88  | 1.0000 | .7000  | 89  | 0.0000 | .8000  | 90  | .1000  | .8000  |
| 91  | .2000  | .8000  | 92  | .3000  | .8000  | 93  | .4000  | .8000  |
| 94  | .5000  | .8000  | 95  | .6000  | .8000  | 96  | .7000  | .8000  |
| 97  | .8000  | .8000  | 98  | .9000  | .8000  | 99  | 1.0000 | .8000  |
| 100 | 0.0000 | .9000  | 101 | .1000  | .9000  | 102 | .2000  | .9000  |
| 103 | .3000  | .9000  | 104 | .4000  | .9000  | 105 | .5000  | .9000  |
| 106 | .6000  | .9000  | 107 | .7000  | .9000  | 108 | .8000  | .9000  |
| 109 | .9000  | .9000  | 110 | 1.0000 | .9000  | 111 | 0.0000 | 1.0000 |
| 112 | .1000  | 1.0000 | 113 | .2000  | 1.0000 | 114 | .3000  | 1.0000 |
| 115 | .4000  | 1.0000 | 116 | .5000  | 1.0000 | 117 | .6000  | 1.0000 |

|     |        |        |     |       |        |     |       |        |
|-----|--------|--------|-----|-------|--------|-----|-------|--------|
| 118 | .7000  | 1.0000 | 119 | .8000 | 1.0000 | 120 | .9000 | 1.0000 |
| 121 | 1.0000 | 1.0000 |     |       |        |     |       |        |

ELEMENT NODE NUMBERS AND AREAS

295

| M   | I  | J  | K  | AREA       | M   | I  | J  | K  | AREA       |
|-----|----|----|----|------------|-----|----|----|----|------------|
| 1   | 1  | 13 | 12 | 5.0000E-03 | 2   | 1  | 2  | 13 | 5.0000E-03 |
| 3   | 2  | 14 | 13 | 5.0000E-03 | 4   | 2  | 3  | 14 | 5.0000E-03 |
| 5   | 3  | 15 | 14 | 5.0000E-03 | 6   | 3  | 4  | 15 | 5.0000E-03 |
| 7   | 4  | 16 | 15 | 5.0000E-03 | 8   | 4  | 5  | 16 | 5.0000E-03 |
| 9   | 5  | 17 | 16 | 5.0000E-03 | 10  | 5  | 6  | 17 | 5.0000E-03 |
| 11  | 6  | 18 | 17 | 5.0000E-03 | 12  | 6  | 7  | 18 | 5.0000E-03 |
| 13  | 7  | 19 | 18 | 5.0000E-03 | 14  | 7  | 8  | 19 | 5.0000E-03 |
| 15  | 8  | 20 | 19 | 5.0000E-03 | 16  | 8  | 9  | 20 | 5.0000E-03 |
| 17  | 9  | 21 | 20 | 5.0000E-03 | 18  | 9  | 10 | 21 | 5.0000E-03 |
| 19  | 10 | 22 | 21 | 5.0000E-03 | 20  | 10 | 11 | 22 | 5.0000E-03 |
| 21  | 12 | 24 | 23 | 5.0000E-03 | 22  | 12 | 13 | 24 | 5.0000E-03 |
| 23  | 13 | 25 | 24 | 5.0000E-03 | 24  | 13 | 14 | 25 | 5.0000E-03 |
| 25  | 14 | 26 | 25 | 5.0000E-03 | 26  | 14 | 15 | 26 | 5.0000E-03 |
| 27  | 15 | 27 | 26 | 5.0000E-03 | 28  | 15 | 16 | 27 | 5.0000E-03 |
| 29  | 16 | 28 | 27 | 5.0000E-03 | 30  | 16 | 17 | 28 | 5.0000E-03 |
| 31  | 17 | 29 | 28 | 5.0000E-03 | 32  | 17 | 18 | 29 | 5.0000E-03 |
| 33  | 18 | 30 | 29 | 5.0000E-03 | 34  | 18 | 19 | 30 | 5.0000E-03 |
| 35  | 19 | 31 | 30 | 5.0000E-03 | 36  | 19 | 20 | 31 | 5.0000E-03 |
| 37  | 20 | 32 | 31 | 5.0000E-03 | 38  | 20 | 21 | 32 | 5.0000E-03 |
| 39  | 21 | 33 | 32 | 5.0000E-03 | 40  | 21 | 22 | 33 | 5.0000E-03 |
| 41  | 23 | 35 | 34 | 5.0000E-03 | 42  | 23 | 24 | 35 | 5.0000E-03 |
| 43  | 24 | 36 | 35 | 5.0000E-03 | 44  | 24 | 25 | 36 | 5.0000E-03 |
| 45  | 25 | 37 | 36 | 5.0000E-03 | 46  | 25 | 26 | 37 | 5.0000E-03 |
| 47  | 26 | 38 | 37 | 5.0000E-03 | 48  | 26 | 27 | 38 | 5.0000E-03 |
| 49  | 27 | 39 | 38 | 5.0000E-03 | 50  | 27 | 28 | 39 | 5.0000E-03 |
| 51  | 28 | 40 | 39 | 5.0000E-03 | 52  | 28 | 29 | 40 | 5.0000E-03 |
| 53  | 29 | 41 | 40 | 5.0000E-03 | 54  | 29 | 30 | 41 | 5.0000E-03 |
| 55  | 30 | 42 | 41 | 5.0000E-03 | 56  | 30 | 31 | 42 | 5.0000E-03 |
| 57  | 31 | 43 | 42 | 5.0000E-03 | 58  | 31 | 32 | 43 | 5.0000E-03 |
| 59  | 32 | 44 | 43 | 5.0000E-03 | 60  | 32 | 33 | 44 | 5.0000E-03 |
| 61  | 34 | 46 | 45 | 5.0000E-03 | 62  | 34 | 35 | 46 | 5.0000E-03 |
| 63  | 35 | 47 | 46 | 5.0000E-03 | 64  | 35 | 36 | 47 | 5.0000E-03 |
| 65  | 36 | 48 | 47 | 5.0000E-03 | 66  | 36 | 37 | 48 | 5.0000E-03 |
| 67  | 37 | 49 | 48 | 5.0000E-03 | 68  | 37 | 38 | 49 | 5.0000E-03 |
| 69  | 38 | 50 | 49 | 5.0000E-03 | 70  | 38 | 39 | 50 | 5.0000E-03 |
| 71  | 39 | 51 | 50 | 5.0000E-03 | 72  | 39 | 40 | 51 | 5.0000E-03 |
| 73  | 40 | 52 | 51 | 5.0000E-03 | 74  | 40 | 41 | 52 | 5.0000E-03 |
| 75  | 41 | 52 | 52 | 5.0000E-03 | 76  | 41 | 42 | 53 | 5.0000E-03 |
| 77  | 42 | 54 | 53 | 5.0000E-03 | 78  | 42 | 43 | 54 | 5.0000E-03 |
| 79  | 43 | 55 | 54 | 5.0000E-03 | 80  | 43 | 44 | 55 | 5.0000E-03 |
| 81  | 45 | 57 | 56 | 5.0000E-03 | 82  | 45 | 46 | 57 | 5.0000E-03 |
| 83  | 46 | 58 | 57 | 5.0000E-03 | 84  | 46 | 47 | 58 | 5.0000E-03 |
| 85  | 47 | 59 | 58 | 5.0000E-03 | 86  | 47 | 48 | 59 | 5.0000E-03 |
| 87  | 48 | 60 | 59 | 5.0000E-03 | 88  | 48 | 49 | 60 | 5.0000E-03 |
| 89  | 49 | 61 | 60 | 5.0000E-03 | 90  | 49 | 50 | 61 | 5.0000E-03 |
| 91  | 50 | 62 | 61 | 5.0000E-03 | 92  | 50 | 51 | 62 | 5.0000E-03 |
| 93  | 51 | 63 | 62 | 5.0000E-03 | 94  | 51 | 52 | 63 | 5.0000E-03 |
| 95  | 52 | 64 | 63 | 5.0000E-03 | 96  | 52 | 53 | 64 | 5.0000E-03 |
| 97  | 53 | 65 | 64 | 5.0000E-03 | 98  | 53 | 54 | 65 | 5.0000E-03 |
| 99  | 54 | 66 | 65 | 5.0000E-03 | 100 | 54 | 55 | 66 | 5.0000E-03 |
| 101 | 56 | 68 | 67 | 5.0000E-03 | 102 | 56 | 57 | 68 | 5.0000E-03 |
| 103 | 57 | 69 | 68 | 5.0000E-03 | 104 | 57 | 58 | 69 | 5.0000E-03 |
| 105 | 58 | 70 | 69 | 5.0000E-03 | 106 | 58 | 59 | 70 | 5.0000E-03 |
| 107 | 59 | 71 | 70 | 5.0000E-03 | 108 | 59 | 60 | 71 | 5.0000E-03 |
| 109 | 60 | 72 | 71 | 5.0000E-03 | 110 | 60 | 61 | 72 | 5.0000E-03 |
| 111 | 61 | 73 | 72 | 5.0000E-03 | 112 | 61 | 62 | 73 | 5.0000E-03 |
| 113 | 62 | 74 | 73 | 5.0000E-03 | 114 | 62 | 63 | 74 | 5.0000E-03 |
| 115 | 63 | 75 | 74 | 5.0000E-03 | 116 | 63 | 64 | 75 | 5.0000E-03 |
| 117 | 64 | 76 | 75 | 5.0000E-03 | 118 | 64 | 65 | 76 | 5.0000E-03 |
| 119 | 65 | 77 | 76 | 5.0000E-03 | 120 | 65 | 66 | 77 | 5.0000E-03 |
| 121 | 67 | 79 | 78 | 5.0000E-03 | 122 | 67 | 68 | 79 | 5.0000E-03 |
| 123 | 68 | 80 | 79 | 5.0000E-03 | 124 | 68 | 69 | 80 | 5.0000E-03 |

|     |     |     |     |            |     |     |     |     |            |
|-----|-----|-----|-----|------------|-----|-----|-----|-----|------------|
| 131 | 72  | 84  | 83  | 5.0000E-03 | 132 | 72  | 73  | 84  | 5.0000E-03 |
| 133 | 73  | 85  | 84  | 5.0000E-03 | 134 | 73  | 74  | 85  | 5.0000E-03 |
| 135 | 74  | 86  | 85  | 5.0000E-03 | 136 | 74  | 75  | 86  | 5.0000E-03 |
| 137 | 75  | 87  | 86  | 5.0000E-03 | 138 | 75  | 76  | 87  | 5.0000E-03 |
| 139 | 76  | 88  | 87  | 5.0000E-03 | 140 | 76  | 77  | 88  | 5.0000E-03 |
| 141 | 78  | 90  | 89  | 5.0000E-03 | 142 | 78  | 79  | 90  | 5.0000E-03 |
| 143 | 79  | 91  | 90  | 5.0000E-03 | 144 | 79  | 80  | 91  | 5.0000E-03 |
| 145 | 80  | 92  | 91  | 5.0000E-03 | 146 | 80  | 81  | 92  | 5.0000E-03 |
| 147 | 81  | 93  | 92  | 5.0000E-03 | 148 | 81  | 82  | 93  | 5.0000E-03 |
| 149 | 82  | 94  | 93  | 5.0000E-03 | 150 | 82  | 83  | 94  | 5.0000E-03 |
| 151 | 83  | 95  | 94  | 5.0000E-03 | 152 | 83  | 84  | 95  | 5.0000E-03 |
| 153 | 84  | 96  | 95  | 5.0000E-03 | 154 | 84  | 85  | 96  | 5.0000E-03 |
| 155 | 85  | 97  | 96  | 5.0000E-03 | 156 | 85  | 86  | 97  | 5.0000E-03 |
| 157 | 86  | 98  | 97  | 5.0000E-03 | 158 | 86  | 87  | 98  | 5.0000E-03 |
| 159 | 87  | 99  | 98  | 5.0000E-03 | 160 | 87  | 88  | 99  | 5.0000E-03 |
| 161 | 89  | 101 | 100 | 5.0000E-03 | 162 | 89  | 90  | 101 | 5.0000E-03 |
| 163 | 90  | 102 | 101 | 5.0000E-03 | 164 | 90  | 91  | 102 | 5.0000E-03 |
| 165 | 91  | 103 | 102 | 5.0000E-03 | 166 | 91  | 92  | 103 | 5.0000E-03 |
| 167 | 92  | 104 | 103 | 5.0000E-03 | 168 | 92  | 93  | 104 | 5.0000E-03 |
| 169 | 93  | 105 | 104 | 5.0000E-03 | 170 | 93  | 94  | 105 | 5.0000E-03 |
| 171 | 94  | 106 | 105 | 5.0000E-03 | 172 | 94  | 95  | 106 | 5.0000E-03 |
| 173 | 95  | 107 | 106 | 5.0000E-03 | 174 | 95  | 96  | 107 | 5.0000E-03 |
| 175 | 96  | 108 | 107 | 5.0000E-03 | 176 | 96  | 97  | 108 | 5.0000E-03 |
| 177 | 97  | 109 | 108 | 5.0000E-03 | 178 | 97  | 98  | 109 | 5.0000E-03 |
| 179 | 98  | 110 | 109 | 5.0000E-03 | 180 | 98  | 99  | 110 | 5.0000E-03 |
| 181 | 100 | 112 | 111 | 5.0000E-03 | 182 | 100 | 101 | 112 | 5.0000E-03 |
| 183 | 101 | 113 | 112 | 5.0000E-03 | 184 | 101 | 102 | 113 | 5.0000E-03 |
| 185 | 102 | 114 | 113 | 5.0000E-03 | 186 | 102 | 103 | 114 | 5.0000E-03 |
| 187 | 103 | 115 | 114 | 5.0000E-03 | 188 | 103 | 104 | 115 | 5.0000E-03 |
| 189 | 104 | 116 | 115 | 5.0000E-03 | 190 | 104 | 105 | 116 | 5.0000E-03 |
| 191 | 105 | 117 | 116 | 5.0000E-03 | 192 | 105 | 106 | 117 | 5.0000E-03 |
| 193 | 106 | 118 | 117 | 5.0000E-03 | 194 | 106 | 107 | 118 | 5.0000E-03 |
| 195 | 107 | 119 | 118 | 5.0000E-03 | 196 | 107 | 108 | 119 | 5.0000E-03 |
| 197 | 108 | 120 | 119 | 5.0000E-03 | 198 | 108 | 109 | 120 | 5.0000E-03 |
| 199 | 109 | 121 | 120 | 5.0000E-03 | 200 | 109 | 110 | 121 | 5.0000E-03 |

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THE NUMBERS OF THE 40 BOUNDARY POINTS ARE

|    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |
|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8   | 9   | 10  | 11  | 12  | 22  | 23  | 33  | 34  | 44  | 45  | 56  |
| 66 | 67 | 77 | 78 | 88 | 89 | 99 | 100 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 121 |

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

|            |            |            |            |
|------------|------------|------------|------------|
| H          | W          | TS         | TL         |
| 2.0000E-03 | 2.0000E-03 | 1.0000E+02 | 0.0000E+00 |

PSY ERROR=7.9726E-02 THETA ERROR=1.6689E-06 OMEGA ERROR=2.0153E-06

NUMBER OF OUTER ITERATIONS= 11

|            |            |            |            |
|------------|------------|------------|------------|
| RA         | PR         | NU         | AR         |
| 6.6429E+01 | 6.9791E-01 | 3.1162E+00 | 1.0000E+00 |

GAP CONDUCTANCE = 3.5836E+01 KCAL/M.M.HR.DEG.C

## TEMPERATURE DISTRIBUTION

297

| I   | TEMP       | I   | TEMP       | I   | TEMP       | I   | TEMP       |
|-----|------------|-----|------------|-----|------------|-----|------------|
| 1   | 1.0000E+02 | 2   | 1.0000E+02 | 3   | 1.0000E+02 | 4   | 1.0000E+02 |
| 5   | 1.0000E+02 | 6   | 1.0000E+02 | 7   | 1.0000E+02 | 8   | 1.0000E+02 |
| 9   | 1.0000E+02 | 10  | 1.0000E+02 | 11  | 1.0000E+02 | 12  | 5.9276E-08 |
| 13  | 4.8796E+01 | 14  | 6.7285E+01 | 15  | 7.5172E+01 | 16  | 7.8594E+01 |
| 17  | 7.9581E+01 | 18  | 7.8624E+01 | 19  | 7.5231E+01 | 20  | 6.7374E+01 |
| 21  | 4.8888E+01 | 22  | 5.9327E-08 | 23  | 1.6746E-08 | 24  | 2.7913E+01 |
| 25  | 4.5243E+01 | 26  | 5.4902E+01 | 27  | 5.9725E+01 | 28  | 6.1201E+01 |
| 29  | 5.9771E+01 | 30  | 5.4986E+01 | 31  | 4.5350E+01 | 32  | 2.8007E+01 |
| 33  | 1.6805E-08 | 34  | 1.0586E-08 | 35  | 1.7646E+01 | 36  | 3.0961E+01 |
| 37  | 3.9598E+01 | 38  | 4.4343E+01 | 39  | 4.5865E+01 | 40  | 4.4398E+01 |
| 41  | 3.9694E+01 | 42  | 3.1073E+01 | 43  | 1.7732E+01 | 44  | 1.0647E-08 |
| 45  | 7.0560E-09 | 46  | 1.1765E+01 | 47  | 2.1466E+01 | 48  | 2.8330E+01 |
| 49  | 3.2343E+01 | 50  | 3.3675E+01 | 51  | 3.2402E+01 | 52  | 2.8432E+01 |
| 53  | 2.1580E+01 | 54  | 1.1849E+01 | 55  | 7.1179E-09 | 56  | 4.8102E-09 |
| 57  | 8.0185E+00 | 58  | 1.4924E+01 | 59  | 2.0060E+01 | 60  | 2.3184E+01 |
| 61  | 2.4247E+01 | 62  | 2.3243E+01 | 63  | 2.0162E+01 | 64  | 1.5036E+01 |
| 65  | 8.0990E+00 | 66  | 4.8702E-09 | 67  | 3.2726E-09 | 68  | 5.4552E+00 |
| 69  | 1.0261E+01 | 70  | 1.3940E+01 | 71  | 1.6233E+01 | 72  | 1.7023E+01 |
| 73  | 1.4288E+01 | 74  | 1.4033E+01 | 75  | 1.0363E+01 | 76  | 5.5281E+00 |
| 77  | 3.8266E-09 | 78  | 2.1627E-09 | 79  | 3.6054E+00 | 80  | 6.8200E+00 |
| 81  | 9.3222E+00 | 82  | 1.0905E+01 | 83  | 1.1461E+01 | 84  | 1.0950E+01 |
| 85  | 9.3984E+00 | 86  | 4.9034E+00 | 87  | 3.6644E+00 | 88  | 2.2064E-09 |
| 89  | 1.3123E-09 | 90  | 2.1944E+00 | 91  | 4.1633E+00 | 92  | 5.7108E+00 |
| 93  | 4.6992E+00 | 94  | 7.0472E+00 | 95  | 6.7295E+00 | 96  | 5.7640E+00 |
| 97  | 4.2220E+00 | 98  | 2.2355E+00 | 99  | 1.3465E-09 | 100 | 6.2341E-10 |
| 101 | 1.0393E+00 | 102 | 1.9749E+00 | 103 | 2.7132E+00 | 104 | 3.1864E+00 |
| 105 | 3.3543E+00 | 106 | 3.2021E+00 | 107 | 2.7399E+00 | 108 | 2.0041E+00 |
| 109 | 1.0599E+00 | 110 | 4.3857E-10 | 111 | 4.0616E-19 | 112 | 6.2715E-10 |
| 113 | 1.1916E-07 | 114 | 1.3368E-09 | 115 | 1.9220E-09 | 116 | 2.0228E-09 |
| 117 | 1.7306E-09 | 118 | 1.6515E-09 | 119 | 1.2077E-09 | 120 | 6.3857E-10 |
| 121 | 4.1640E-19 |     |            |     |            |     |            |

## STREAM FUNCTION DISTRIBUTION

| I   | PSY         | I   | PSY         | I   | PSY         | I   | PSY         |
|-----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 1   | 1.2373E-23  | 2   | 1.2377E-13  | 3   | -1.9682E-14 | 4   | -2.6059E-13 |
| 5   | -5.1299E-13 | 6   | -7.6860E-13 | 7   | -1.0605E-12 | 8   | -1.4410E-12 |
| 9   | -1.9452E-12 | 10  | -1.6812E-12 | 11  | -1.0206E-21 | 12  | -1.2377E-13 |
| 13  | 6.1212E-04  | 14  | -1.0633E-04 | 15  | -9.4242E-04 | 16  | -2.1357E-03 |
| 17  | -3.3873E-03 | 18  | -4.8011E-03 | 19  | -6.4807E-03 | 20  | -7.8342E-03 |
| 21  | -6.3624E-03 | 22  | -2.7472E-12 | 23  | 4.4291E-13  | 24  | 1.7642E-03  |
| 25  | 1.2412E-03  | 26  | -3.8827E-04 | 27  | -2.2290E-03 | 28  | -4.0507E-03 |
| 29  | -5.9732E-03 | 30  | -8.1461E-03 | 31  | -9.9053E-03 | 32  | -8.1513E-03 |
| 33  | -3.6659E-12 | 34  | 6.6181E-13  | 35  | 2.6437E-03  | 36  | 2.4702E-03  |
| 37  | 7.3650E-04  | 38  | -1.3840E-03 | 39  | -3.4673E-03 | 40  | -5.5360E-03 |
| 41  | -7.6967E-03 | 42  | -9.3550E-03 | 43  | -7.6726E-03 | 44  | -3.5375E-12 |
| 45  | 7.0350E-13  | 46  | 2.9159E-03  | 47  | 3.0218E-03  | 48  | 1.5208E-03  |
| 49  | -5.0961E-04 | 50  | -2.5654E-03 | 51  | -4.5507E-03 | 52  | -6.4794E-03 |
| 53  | -7.8551E-03 | 54  | -6.3944E-03 | 55  | -2.9954E-12 | 56  | 6.3944E-13  |
| 57  | 2.7523E-03  | 58  | 2.9866E-03  | 59  | -1.7979E-03 | 60  | -5.6931E-05 |
| 61  | -1.7683E-03 | 62  | -3.5162E-03 | 63  | -5.1283E-03 | 64  | -6.2002E-03 |
| 65  | -5.0104E-03 | 66  | -2.3711E-12 | 67  | 5.2934E-13  | 68  | 2.3585E-03  |
| 69  | 2.6099E-03  | 70  | 1.7016E-03  | 71  | 3.0466E-04  | 72  | -1.1982E-03 |
| 73  | -2.6352E-03 | 74  | 3.9137E-03  | 75  | -4.7149E-03 | 76  | -3.7855E-03 |
| 77  | -1.8031E-12 | 78  | 4.0792E-13  | 79  | 1.8882E-03  | 80  | 2.0990E-03  |
| 81  | 1.4104E-03  | 82  | 3.3028E-04  | 83  | -8.4828E-04 | 84  | -1.9725E-03 |
| 85  | -2.9449E-03 | 86  | -3.5209E-03 | 87  | -2.8052E-03 | 88  | -1.3392E-12 |
| 89  | 3.0135E-13  | 90  | 1.4870E-03  | 91  | 1.6616E-03  | 92  | 1.1261E-03  |
| 93  | 2.6333E-04  | 94  | -6.9444E-04 | 95  | -1.6084E-03 | 96  | -2.3731E-03 |
| 97  | -2.7778E-03 | 98  | -2.1701E-03 | 99  | -1.0191E-12 | 100 | 2.3672E-13  |
| 101 | 1.1073E-03  | 102 | 1.2448E-03  | 103 | 6.3293E-04  | 104 | 1.4587E-04  |
| 105 | 4.0010E-04  |     |             |     |             |     |             |

10 3.1874E-13 13 113 3.7330E-13 113 3.8049E-13 120 -7.2314E-13  
11 0.7703E-22

VERTICAL FUNCTION DISTRIBUTION

| I   | OMEGA       | I   | OMEGA       | I   | OMEGA       | I   | OMEGA       |
|-----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 1   | 3.0798E-11  | 2   | -1.2242E-01 | 3   | -2.1266E-02 | 4   | 1.8648E-01  |
| 5   | 4.2714E-01  | 6   | 3.7746E-01  | 7   | 9.6022E-01  | 8   | 1.2961E+00  |
| 9   | 1.5663E+00  | 10  | 1.2723E+00  | 11  | 6.1307E-10  | 12  | -1.2242E-01 |
| 13  | -8.3217E-02 | 14  | 1.1216E-01  | 15  | 3.0610E-01  | 16  | 4.8680E-01  |
| 17  | 3.7113E-01  | 18  | 3.7680E-01  | 19  | 1.2032E+00  | 20  | 1.6200E+00  |
| 21  | 1.7172E+00  | 22  | -2.7223E-12 | 23  | 3.3283E-01  | 24  | -5.9843E-01 |
| 25  | 2.3705E-01  | 26  | 1.0049E-01  | 27  | 3.3061E-01  | 28  | 5.5942E-01  |
| 29  | 2.7861E-01  | 30  | 1.0386E+00  | 31  | 1.7317E+00  | 32  | 1.4701E+00  |
| 33  | 1.8834E-11  | 34  | 3.2874E-01  | 35  | 6.8027E-01  | 36  | -3.9651E-01 |
| 37  | 3.0358E-01  | 38  | 2.0383E-01  | 39  | 4.2720E-01  | 40  | 6.4279E-01  |
| 41  | 3.7343E-01  | 42  | 1.1538E+00  | 43  | 1.1234E+00  | 44  | -8.4432E-11 |
| 45  | -9.6313E-01 | 46  | 3.2713E-01  | 47  | 4.1085E-01  | 48  | -1.4253E-01 |
| 49  | 1.0424E-01  | 50  | 3.1680E-01  | 51  | 5.0760E-01  | 52  | 6.9906E-01  |
| 53  | 3.9240E-01  | 54  | 3.2917E-01  | 55  | -8.6429E-11 | 56  | -5.5046E-01 |
| 57  | 5.2738E-01  | 58  | -3.6172E-01 | 59  | -1.5212E-01 | 60  | 5.0277E-02  |
| 61  | -2.3104E-01 | 62  | 3.9199E-01  | 63  | 5.3746E-01  | 64  | 6.6406E-01  |
| 65  | 3.0106E-01  | 66  | -7.5816E-11 | 67  | -4.7171E-01 | 68  | -4.2144E-01 |
| 69  | -2.8318E-01 | 70  | -1.2946E-01 | 71  | 2.7283E-02  | 72  | -1.7030E-01 |
| 73  | 2.9621E-01  | 74  | 4.0349E-01  | 75  | 4.8697E-01  | 76  | 4.3067E-01  |
| 77  | -6.0051E-11 | 78  | -3.7764E-01 | 79  | -3.1889E-01 | 80  | -2.1277E-01 |
| 81  | -9.3964E-02 | 82  | 2.2892E-02  | 83  | 1.2991E-01  | 84  | 2.2273E-01  |
| 85  | 2.9801E-01  | 86  | 3.5108E-01  | 87  | 3.0380E-01  | 88  | -4.5075E-11 |
| 89  | -2.9741E-01 | 90  | -2.2973E-01 | 91  | -1.4310E-01 | 92  | -5.4539E-02 |
| 93  | 2.9763E-02  | 94  | 1.0547E-01  | 95  | 1.6912E-01  | 96  | -2.1767E-01 |
| 97  | 2.4777E-01  | 98  | 2.0824E-01  | 99  | -3.6933E-11 | 100 | -2.2193E-01 |
| 101 | -1.9112E-01 | 102 | -1.4793E-01 | 103 | -7.5933E-02 | 104 | -1.9397E-02 |
| 105 | 1.0605E-01  | 106 | 1.9040E-01  | 107 | 2.5616E-01  | 108 | -2.8931E-01 |
| 109 | 2.3210E-01  | 110 | -1.1605E-11 | 111 | -6.9537E-11 | 112 | -2.2193E-01 |
| 113 | -2.4891E-01 | 114 | -1.6659E-01 | 115 | -2.9198E-02 | 116 | 1.2662E-01  |
| 117 | -2.7509E-01 | 118 | 3.9222E-01  | 119 | 4.3709E-01  | 120 | 3.1539E-01  |
| 121 | 1.6040E-10  |     |             |     |             |     |             |

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

W TS IL  
1.0000E+02 1.0000E+02 0.0000E+00

OMEGA ERROR=1.3771E-02

NUMBER OF OUTER ITERATIONS= 11

KA ER NU AR  
3.3144E+02 3.7771E-01 3.1261E+00 1.0000E+00

ONE CONDUCTANCE = 1.2773E+01 KCAL/M.S.HR.DEG.C

## TEMPERATURE DISTRIBUTION

200

| I   | TEMP       | I   | TEMP       | I   | TEMP       | I   | TEMP       |
|-----|------------|-----|------------|-----|------------|-----|------------|
| 1   | 1.0000E+02 | 2   | 1.0000E+02 | 3   | 1.0000E+02 | 4   | 1.0000E+02 |
| 5   | 1.0000E+02 | 6   | 1.0000E+02 | 7   | 1.0000E+02 | 8   | 1.0000E+02 |
| 9   | 1.0000E+02 | 10  | 1.0000E+02 | 11  | 1.0000E+02 | 12  | 5.9271E-08 |
| 13  | 4.8784E+01 | 14  | 6.7138E+01 | 15  | 7.4913E+01 | 16  | 7.8270E+01 |
| 17  | 7.9255E+01 | 18  | 7.8344E+01 | 19  | 7.5097E+01 | 20  | 6.7532E+01 |
| 21  | 4.9308E+01 | 22  | 5.9514E-08 | 23  | 1.6730E-08 | 24  | 2.7874E+01 |
| 25  | 4.5023E+01 | 26  | 5.4496E+01 | 27  | 5.9208E+01 | 28  | 6.0653E+01 |
| 29  | 5.9273E+01 | 30  | 5.4651E+01 | 31  | 4.5318E+01 | 32  | 2.8231E+01 |
| 33  | 1.6912E-08 | 34  | 1.0550E-08 | 35  | 1.7567E+01 | 36  | 3.0692E+01 |
| 37  | 3.9136E+01 | 38  | 4.3748E+01 | 39  | 4.5222E+01 | 40  | 4.3792E+01 |
| 41  | 3.9224E+01 | 42  | 3.0350E+01 | 43  | 1.7741E+01 | 44  | 1.0656E-08 |
| 45  | 7.0087E-09 | 46  | 1.1654E+01 | 47  | 2.1187E+01 | 48  | 2.7874E+01 |
| 49  | 3.1759E+01 | 50  | 3.3040E+01 | 51  | 3.1793E+01 | 52  | 2.7932E+01 |
| 53  | 2.1273E+01 | 54  | 1.1745E+01 | 55  | 7.0756E-09 | 56  | 4.7575E-09 |
| 57  | 7.9017E+00 | 58  | 1.4659E+01 | 59  | 1.9648E+01 | 60  | 2.2666E+01 |
| 61  | 2.3684E+01 | 62  | 2.2700E+01 | 63  | 1.9705E+01 | 64  | 1.4729E+01 |
| 65  | 7.9632E+00 | 66  | 4.8099E-09 | 67  | 3.2248E-09 | 68  | 5.3494E+00 |
| 69  | 1.0034E+01 | 70  | 1.3599E+01 | 71  | 1.5811E+01 | 72  | 1.6570E+01 |
| 73  | 1.5846E+01 | 74  | 1.3658E+01 | 75  | 1.0102E+01 | 76  | 5.4026E+00 |
| 77  | 3.2700E-05 | 78  | 2.1247E-09 | 79  | 3.5210E+00 | 80  | 6.6448E+00 |
| 81  | 9.0635E+00 | 82  | 1.0587E+01 | 83  | 1.1116E+01 | 84  | 1.0620E+01 |
| 85  | 9.1121E+00 | 86  | 6.7049E+00 | 87  | 3.5673E+00 | 88  | 2.1621E-09 |
| 89  | 1.2903E-09 | 90  | 2.1348E+00 | 91  | 4.0453E+00 | 92  | 5.5372E+00 |
| 93  | 6.4857E+00 | 94  | 6.8168E+00 | 95  | 6.5108E+00 | 96  | 5.5798E+00 |
| 97  | 4.0927E+00 | 98  | 2.1713E+00 | 99  | 1.3171E-09 | 100 | 6.1023E-10 |
| 101 | 1.0099E+00 | 102 | 1.9148E+00 | 103 | 2.6254E+00 | 104 | 3.0791E+00 |
| 105 | 3.2390E+00 | 106 | 3.0919E+00 | 107 | 2.6473E+00 | 108 | 1.9393E+00 |
| 109 | 1.0279E+00 | 110 | 6.2383E-10 | 111 | 4.0141E-19 | 112 | 6.1389E-10 |
| 113 | 1.1647E-09 | 114 | 1.5975E-09 | 115 | 1.8737E-09 | 116 | 1.9708E-09 |
| 117 | 1.8806E-09 | 118 | 1.6093E-09 | 119 | 1.1780E-09 | 120 | 6.2383E-10 |
| 121 | 4.0872E-19 |     |            |     |            |     |            |

## STREAM FUNCTION DISTRIBUTION

| I   | PSY         | I   | PSY         | I   | PSY         | I   | PSY         |
|-----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 1   | 3.3883E-22  | 2   | 9.7035E-13  | 3   | -2.1236E-13 | 4   | 2.1823E-12  |
| 5   | -4.2441E-12 | 6   | -6.3213E-12 | 7   | -8.6731E-12 | 8   | 1.1730E-11  |
| 9   | -1.4994E-11 | 10  | -1.3681E-11 | 11  | -3.2177E-11 | 12  | 9.7035E-13  |
| 13  | 4.6154E-03  | 14  | 4.1914E-04  | 15  | 3.0133E-03  | 16  | -1.7512E-02 |
| 17  | -2.7367E-02 | 18  | -3.8429E-02 | 19  | -5.1637E-02 | 20  | -6.2451E-02 |
| 21  | -5.0878E-02 | 22  | -2.2077E-11 | 23  | 3.5201E-12  | 24  | 1.3672E-02  |
| 25  | 9.2827E-03  | 26  | -3.7905E-03 | 27  | -1.8420E-02 | 28  | -3.2767E-02 |
| 29  | -4.7816E-02 | 30  | -6.4889E-02 | 31  | -7.8904E-02 | 32  | -6.5068E-02 |
| 33  | -2.9388E-11 | 34  | 5.2875E-12  | 35  | 2.0627E-02  | 36  | 2.2024E-01  |
| 37  | 5.1287E-03  | 38  | -1.1702E-02 | 39  | -2.0107E-02 | 40  | -4.1310E-02 |
| 41  | -6.1278E-02 | 42  | -7.4452E-02 | 43  | -4.1160E-02 | 44  | -2.0272E-11 |
| 45  | 5.4463E-12  | 46  | 3.2911E-02  | 47  | 2.2105E-02  | 48  | 1.1421E-02  |
| 49  | -4.6204E-03 | 50  | -3.0317E-02 | 51  | 3.1391E-02  | 52  | -5.1518E-02 |
| 53  | -4.2402E-02 | 54  | -5.0354E-02 | 55  | -2.3892E-11 | 56  | 5.1546E-12  |
| 57  | 2.1540E-02  | 58  | 2.3236E-02  | 59  | 1.3731E-02  | 60  | -4.4670E-05 |
| 61  | -1.4389E-02 | 62  | -2.8064E-02 | 63  | -4.0680E-02 | 64  | -4.9122E-02 |
| 65  | -3.9721E-02 | 66  | -1.8852E-11 | 67  | 4.2849E-12  | 68  | -1.9470E-02 |
| 69  | 2.0342E-02  | 70  | 1.3093E-02  | 71  | 2.0599E-03  | 72  | -9.7334E-03 |
| 73  | -2.0961E-02 | 74  | 3.0945E-02  | 75  | -3.7227E-02 | 76  | -2.2897E-02 |
| 77  | -1.4286E-11 | 78  | 3.3160E-12  | 79  | 1.1002E-02  | 80  | 1.6387E-02  |
| 81  | 1.0908E-02  | 82  | 2.3909E-02  | 83  | 6.5466E-03  | 84  | -1.5617E-02 |
| 85  | -2.3195E-02 | 86  | -2.7492E-02 | 87  | -2.2067E-02 | 88  | -1.0575E-11 |
| 89  | 2.4451E-12  | 90  | 1.1684E-02  | 91  | 1.3012E-02  | 92  | 8.7582E-03  |
| 93  | 1.7635E-03  | 94  | -5.5389E-03 | 95  | -1.2668E-02 | 96  | -1.8620E-02 |
| 97  | -7.1767E-02 | 98  | -1.7004E-02 | 99  | -8.0324E-12 | 100 | 1.9573E-12  |
| 101 | 8.7474E-03  | 102 | 9.7823E-03  | 103 | 6.5164E-03  | 104 | 1.1039E-03  |
| 105 | -5.0019E-03 | 106 | -1.0798E-02 | 107 | 1.5356E-02  | 108 | 1.2401E-02  |

|    |             |     |             |     |             |     |             |
|----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 3  | 3.5520E-12  | 114 | 2.3294E-12  | 115 | 1.4452E-13  | 116 | -2.4100E-12 |
| 7  | -4.8910E-12 | 118 | -6.8939E-12 | 119 | -7.7264E-12 | 120 | -5.6907E-12 |
| 21 | -2.9603E-21 |     |             |     |             |     |             |

300

# VORTICITY FUNCTION DISTRIBUTION

| I   | OMEGA       | I   | OMEGA       | I   | OMEGA       | I   | OMEGA       |
|-----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 1   | -2.8638E-10 | 2   | -9.2308E-01 | 3   | -8.3828E-02 | 4   | 1.6037E+00  |
| 5   | 3.5023E+00  | 6   | 5.4735E+00  | 7   | 7.4859E+00  | 8   | 1.0327E+01  |
| 9   | 1.2490E+01  | 10  | 1.0166E+01  | 11  | 4.9237E-09  | 12  | -9.2308E-01 |
| 13  | -5.9785E-01 | 14  | 9.8415E-01  | 15  | 2.5559E+00  | 16  | -3.9881E+00 |
| 17  | 5.4378E+00  | 18  | 7.1769E+00  | 19  | 9.5562E+00  | 20  | 1.2872E+01  |
| 21  | 1.3767E+01  | 22  | -1.5640E-11 | 23  | -2.7344E+00 | 24  | -4.6997E+00 |
| 25  | -1.7724E+00 | 26  | 8.9751E-01  | 27  | 2.8776E+00  | 28  | 4.5141E+00  |
| 29  | -6.2134E+00 | 30  | 8.3793E+00  | 31  | 1.1384E+01  | 32  | 1.1784E+01  |
| 33  | -4.6831E-10 | 34  | -4.1258E+00 | 35  | -5.3449E+00 | 36  | -3.0652E+00 |
| 37  | -4.5068E-01 | 38  | 1.6985E+00  | 39  | 3.4643E+00  | 40  | -5.1269E+00 |
| 41  | 6.9697E+00  | 42  | 9.1818E+00  | 43  | 8.9969E+00  | 44  | -6.7941E-10 |
| 45  | -4.5601E+00 | 46  | -4.9222E+00 | 47  | -3.2044E+00 | 48  | -1.0535E+00 |
| 49  | 8.9146E-01  | 50  | 2.5545E+00  | 51  | 4.0553E+00  | 52  | -5.5629E+00 |
| 53  | 7.0400E+00  | 54  | 6.5977E+00  | 55  | -7.0104E-10 | 56  | -4.3010E+00 |
| 57  | -4.1513E+00 | 58  | -2.8120E+00 | 59  | -1.1475E+00 | 60  | -4.4117E-01 |
| 61  | 1.8566E+00  | 62  | 3.1079E+00  | 63  | 4.2401E+00  | 64  | 5.2011E+00  |
| 65  | 4.7558E+00  | 66  | -6.1918E-10 | 67  | -3.6940E+00 | 68  | -3.3012E+00 |
| 69  | -2.2422E+00 | 70  | -9.8524E-01 | 71  | 2.4533E-01  | 72  | -1.3013E+00 |
| 73  | 2.3375E+00  | 74  | 3.1702E+00  | 75  | 3.8262E+00  | 76  | 3.3013E+00  |
| 77  | -4.9376E-10 | 78  | -2.9603E+00 | 79  | -2.4986E+00 | 80  | -1.6013E+00 |
| 81  | -7.1862E-01 | 82  | 1.9674E-01  | 83  | 1.0294E+00  | 84  | -1.7013E+00 |
| 85  | 2.3315E+00  | 86  | 2.7465E+00  | 87  | 2.3791E+00  | 88  | -3.7013E-10 |
| 89  | -2.3368E+00 | 90  | -1.8014E+00 | 91  | -1.1142E+00 | 92  | -4.1013E-01 |
| 93  | 2.4022E-01  | 94  | 8.2906E-01  | 95  | 1.3221E+00  | 96  | 1.6013E+00  |
| 97  | 1.9307E+00  | 98  | 1.6230E+00  | 99  | -3.1032E-10 | 100 | -1.7013E+00 |
| 101 | -1.5030E+00 | 102 | -1.1611E+00 | 103 | -5.9420E-01 | 104 | 1.0013E-01  |
| 105 | 8.3251E-01  | 106 | 1.4905E+00  | 107 | 2.0006E+00  | 108 | -2.2013E+00 |
| 109 | 1.8067E+00  | 110 | 9.0334E-11  | 111 | -5.6641E-10 | 112 | -1.7013E+00 |
| 113 | -1.9565E+00 | 114 | -1.3033E+00 | 115 | -2.2118E-01 | 116 | 1.0013E+00  |
| 117 | 2.1596E+00  | 118 | 3.0712E+00  | 119 | 3.4133E+00  | 120 | 2.4013E+00  |
| 121 | 1.2614E-09  |     |             |     |             |     |             |

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CHECK  
 CHECK?  
 A: DIR CHECK.\*  
 A: CHECK BAK : CHECK FOR : CHECK REL

CHECK

ENTER DATE (DD-MM-YYYY)  
 22-08-1987

WHAT IS YOUR OUTPUT UNIT CODE?

1

GIVE HSTART, HSTOP, HSTEP (X.XXXX X.XXXX X.XXXX)  
 0.0500

GIVE ENCLOSURE INCLINATION (XXX.X)  
 090.0

100.0000 0.0000 0.0500  
 WHAT IS TITLE OF YOUR PROGRAMME?  
 PROGRAMME CHECKOUT FOR 90 DEGREE INCLINATION

5 5 1  
 WHAT IS ASPECT RATIO (XXX.X)?  
 100.0

1.0 100.0

\*\*\*\*\*

PROGRAMME CHECKOUT FOR 90 DEGREE INCLINATION

\*\*\*\*\*

OUTPUT OBTAINED ON 22-08-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

| I  | X       | Y       | I  | X       | Y        | I  | X       | Y       |
|----|---------|---------|----|---------|----------|----|---------|---------|
| 1  | 0.0000  | 0.0000  | 2  | -.0158  | 25.0000  | 3  | -.0316  | 50.0000 |
| 4  | -.0474  | 75.0000 | 5  | -.0632  | 100.0000 | 6  | -.2500  | -.0002  |
| 7  | -.2658  | 24.9998 | 8  | -.2816  | 49.9998  | 9  | -.2974  | 74.9998 |
| 10 | -.3132  | 99.9998 | 11 | -.5000  | -.0002   | 12 | -.5158  | 24.9997 |
| 13 | -.5316  | 49.9997 | 14 | -.5474  | 74.9997  | 15 | -.5632  | 99.9997 |
| 16 | -.7500  | -.0005  | 17 | -.7658  | 24.9995  | 18 | -.7816  | 49.9995 |
| 19 | -.7974  | 74.9995 | 20 | -.8132  | 99.9995  | 21 | -1.0000 | -.0006  |
| 22 | -1.0158 | 24.9994 | 23 | -1.0316 | 49.9994  | 24 | -1.0474 | 74.9994 |
| 25 | -1.0632 | 99.9994 |    |         |          |    |         |         |

ELEMENT NODE NUMBERS AND AREAS

| M  | I  | J  | K  | AREA       | M  | I  | J  | K  | AREA       |
|----|----|----|----|------------|----|----|----|----|------------|
| 1  | 1  | 7  | 6  | 3.1250E+00 | 2  | 1  | 2  | 7  | 3.1250E+00 |
| 3  | 2  | 8  | 7  | 3.1250E+00 | 4  | 2  | 3  | 8  | 3.1250E+00 |
| 5  | 3  | 9  | 8  | 3.1250E+00 | 6  | 3  | 4  | 9  | 3.1250E+00 |
| 7  | 4  | 10 | 9  | 3.1250E+00 | 8  | 4  | 5  | 10 | 3.1250E+00 |
| 9  | 5  | 11 | 10 | 3.1250E+00 | 10 | 5  | 6  | 11 | 3.1250E+00 |
| 11 | 6  | 12 | 11 | 3.1250E+00 | 12 | 6  | 7  | 12 | 3.1250E+00 |
| 13 | 7  | 13 | 12 | 3.1250E+00 | 14 | 7  | 8  | 13 | 3.1250E+00 |
| 15 | 8  | 14 | 13 | 3.1250E+00 | 16 | 8  | 9  | 14 | 3.1250E+00 |
| 17 | 9  | 15 | 14 | 3.1250E+00 | 18 | 9  | 10 | 15 | 3.1250E+00 |
| 19 | 10 | 16 | 15 | 3.1250E+00 | 20 | 10 | 11 | 16 | 3.1250E+00 |
| 21 | 11 | 17 | 16 | 3.1250E+00 | 22 | 11 | 12 | 17 | 3.1250E+00 |
| 23 | 12 | 18 | 17 | 3.1250E+00 | 24 | 12 | 13 | 18 | 3.1250E+00 |
| 25 | 13 | 19 | 18 | 3.1250E+00 | 26 | 13 | 14 | 19 | 3.1250E+00 |
| 27 | 14 | 20 | 19 | 3.1250E+00 | 28 | 14 | 15 | 20 | 3.1250E+00 |
| 29 | 15 | 21 | 20 | 3.1250E+00 | 30 | 15 | 16 | 21 | 3.1250E+00 |
| 31 | 16 | 22 | 21 | 3.1250E+00 | 32 | 16 | 17 | 22 | 3.1250E+00 |
| 33 | 17 | 23 | 22 | 3.1250E+00 | 34 | 17 | 18 | 23 | 3.1250E+00 |
| 35 | 18 | 24 | 23 | 3.1250E+00 | 36 | 18 | 19 | 24 | 3.1250E+00 |
| 37 | 19 | 25 | 24 | 3.1250E+00 | 38 | 19 | 20 | 25 | 3.1250E+00 |

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1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25  
 THE NUMBERS OF THE 16 BOUNDARY POINTS ARE  
 1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-09 | 7  | .5000E+02 | 8  | .5000E+02 |
| 9  | .5000E+02 | 10 | .5000E-09 | 11 | .2500E-18 | 12 | .2500E+02 |
| 13 | .2500E+02 | 14 | .2500E+02 | 15 | .2490E-12 | 16 | .1250E-28 |
| 17 | .1250E+02 | 19 | .1250E+02 | 19 | .1250E+02 | 20 | .1251E-12 |
| 21 | .0000E+01 | 22 | .1250E-09 | 23 | .1250E-08 | 24 | .1250E-08 |
| 25 | .2175E-15 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+02 | 6  | .5000E-08 | 7  | .6249E+02 | 8  | .6250E+02 |
| 9  | .6250E+02 | 10 | .5000E-08 | 11 | .2499E-12 | 12 | .3749E+02 |
| 13 | .3750E+02 | 14 | .3749E+02 | 15 | .3738E-12 | 16 | .1250E-12 |
| 17 | .1875E+02 | 19 | .1875E+02 | 19 | .1875E+02 | 20 | .1876E-12 |
| 21 | .2499E-22 | 22 | .1874E-08 | 23 | .1875E-08 | 24 | .1874E-08 |
| 25 | .3262E-15 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+02 | 6  | .5000E-08 | 7  | .6874E+02 | 8  | .6875E+02 |
| 9  | .6874E+02 | 10 | .5000E-08 | 11 | .3749E-12 | 12 | .4374E+02 |
| 13 | .4375E+02 | 14 | .4374E+02 | 15 | .4362E-12 | 16 | .1875E-12 |
| 17 | .2187E+02 | 19 | .2187E+02 | 19 | .2187E+02 | 20 | .2189E-12 |
| 21 | .3749E-22 | 22 | .2187E-08 | 23 | .2187E-08 | 24 | .2187E-08 |
| 25 | .3906E-15 |    |           |    |           |    |           |

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP        |
|----|-----------|----|-----------|----|-----------|----|-------------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | 30.3000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7187E+02 | 8  | .7187E+02   |
| 9  | .7187E+02 | 10 | .5000E-08 | 11 | .4374E-12 | 12 | .4687E+02   |
| 13 | .4687E+02 | 14 | .4687E+02 | 15 | .4674E-12 | 16 | .2187E-12   |
| 17 | .2343E+02 | 18 | .2344E+02 | 19 | .2345E+02 | 20 | .2345E-12   |
| 21 | .4274E-22 | 22 | .2343E-08 | 23 | .2343E-08 | 24 | .2343E-08   |
| 25 | .4077E-15 |    |           |    |           |    |             |

XXXX ITERATION 5 FOLLOWS NOW XXXX

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7343E+02 | 8  | .7344E+02 |
| 9  | .7343E+02 | 10 | .5000E-08 | 11 | .4686E-12 | 12 | .4843E+02 |
| 13 | .4844E+02 | 14 | .4843E+02 | 15 | .4820E-12 | 16 | .2344E-12 |
| 17 | .2421E+02 | 18 | .2422E+02 | 19 | .2421E+02 | 20 | .2423E-12 |
| 21 | .4686E-22 | 22 | .2421E-08 | 23 | .2422E-08 | 24 | .2421E-08 |
| 25 | .4213E-15 |    |           |    |           |    |           |

XXXX ITERATION 6 FOLLOWS NOW XXXX

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7421E+02 | 8  | .7422E+02 |
| 9  | .7421E+02 | 10 | .5000E-08 | 11 | .4842E-12 | 12 | .4921E+02 |
| 13 | .4922E+02 | 14 | .4921E+02 | 15 | .4907E-12 | 16 | .2422E-12 |
| 17 | .2460E+02 | 18 | .2461E+02 | 19 | .2460E+02 | 20 | .2462E-12 |
| 21 | .4942E-22 | 22 | .2460E-08 | 23 | .2461E-08 | 24 | .2460E-08 |
| 25 | .4281E-15 |    |           |    |           |    |           |

XXXX ITERATION 7 FOLLOWS NOW XXXX

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7460E+02 | 8  | .7461E+02 |
| 9  | .7460E+02 | 10 | .5000E-08 | 11 | .4920E-12 | 12 | .4960E+02 |
| 13 | .4961E+02 | 14 | .4960E+02 | 15 | .4946E-12 | 16 | .2461E-12 |
| 17 | .2480E+02 | 18 | .2480E+02 | 19 | .2480E+02 | 20 | .2482E-12 |
| 21 | .4920E-22 | 22 | .2480E-08 | 23 | .2480E-08 | 24 | .2480E-08 |
| 25 | .4315E-15 |    |           |    |           |    |           |

XXXX ITERATION 8 FOLLOWS NOW XXXX

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7480E+02 | 8  | .7480E+02 |
| 9  | .7480E+02 | 10 | .5000E-08 | 11 | .4959E-12 | 12 | .4979E+02 |
| 13 | .4980E+02 | 14 | .4979E+02 | 15 | .4966E-12 | 16 | .2480E-12 |
| 17 | .2490E+02 | 18 | .2490E+02 | 19 | .2490E+02 | 20 | .2492E-12 |
| 21 | .4960E-22 | 22 | .2489E-08 | 23 | .2490E-08 | 24 | .2489E-08 |
| 25 | .4322E-15 |    |           |    |           |    |           |

XXXX ITERATION 9 FOLLOWS NOW XXXX

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7489E+02 | 8  | .7490E+02 |
| 9  | .7489E+02 | 10 | .5000E-08 | 11 | .4979E-12 | 12 | .4989E+02 |
| 13 | .4990E+02 | 14 | .4989E+02 | 15 | .4976E-12 | 16 | .2490E-12 |
| 17 | .2494E+02 | 18 | .2495E+02 | 19 | .2494E+02 | 20 | .2496E-12 |
| 21 | .4979E-22 | 22 | .2494E-08 | 23 | .2495E-08 | 24 | .2494E-08 |
| 25 | .4241E-15 |    |           |    |           |    |           |

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP        |
|----|-----------|----|-----------|----|-----------|----|-------------|
| 1  | .1000E+03 | 3  | .1000E+03 | 3  | .1000E+03 | 4  | 30.1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7494E+02 | 8  | .7495E+02   |
| 9  | .7494E+02 | 10 | .5000E-08 | 11 | .4999E-12 | 12 | .4994E+02   |
| 13 | .4995E+02 | 14 | .4994E+02 | 15 | .4981E-12 | 16 | .2495E-12   |
| 17 | .2497E+02 | 18 | .2498E+02 | 19 | .2497E+02 | 20 | .2499E-12   |
| 21 | .4989E-22 | 22 | .2497E-08 | 23 | .2497E-08 | 24 | .2497E-08   |
| 25 | .4245E-15 |    |           |    |           |    |             |

\*\*\*\* ITERATION 11 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 3  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7497E+02 | 8  | .7498E+02 |
| 9  | .7497E+02 | 10 | .5000E-08 | 11 | .4993E-12 | 12 | .4997E+02 |
| 13 | .4998E+02 | 14 | .4997E+02 | 15 | .4983E-12 | 16 | .2498E-12 |
| 17 | .2498E+02 | 18 | .2499E+02 | 19 | .2498E+02 | 20 | .2500E-12 |
| 21 | .4994E-22 | 22 | .2498E-08 | 23 | .2499E-08 | 24 | .2498E-08 |
| 25 | .4347E-15 |    |           |    |           |    |           |

\*\*\*\* ITERATION 12 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 3  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7498E+02 | 8  | .7499E+02 |
| 9  | .7498E+02 | 10 | .5000E-08 | 11 | .4996E-12 | 12 | .4998E+02 |
| 13 | .4999E+02 | 14 | .4998E+02 | 15 | .4984E-12 | 16 | .2499E-12 |
| 17 | .2499E+02 | 18 | .2499E+02 | 19 | .2499E+02 | 20 | .2501E-12 |
| 21 | .4996E-22 | 22 | .2499E-08 | 23 | .2499E-08 | 24 | .2499E-08 |
| 25 | .4348E-15 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-03 AFTER 12 CYCLES

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#### CONDUCTION TEMPERATURE DISTRIBUTION

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 3  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7498E+02 | 8  | .7499E+02 |
| 9  | .7498E+02 | 10 | .5000E-08 | 11 | .4996E-12 | 12 | .4998E+02 |
| 13 | .4999E+02 | 14 | .4998E+02 | 15 | .4984E-12 | 16 | .2499E-12 |
| 17 | .2499E+02 | 18 | .2499E+02 | 19 | .2499E+02 | 20 | .2501E-12 |
| 21 | .4996E-22 | 22 | .2499E-08 | 23 | .2499E-08 | 24 | .2499E-08 |
| 25 | .4348E-15 |    |           |    |           |    |           |

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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

ITERATIONS CONVERGED TO A TOLERANCE OF .1200E+01 AFTER 1 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .5000E+00 | 8  | .5000E+00 |
| 9  | .5000E+00 | 10 | .1000E-09 | 11 | .4998E-14 | 12 | .2500E+00 |
| 13 | .2500E+00 | 14 | .2500E+00 | 15 | .7474E-14 | 16 | .2499E-14 |
| 17 | .1250E+00 | 18 | .1250E+00 | 19 | .1250E+00 | 20 | .3751E-14 |
| 21 | .7495E-24 | 22 | .3748E-10 | 23 | .3749E-10 | 24 | .3748E-10 |
| 25 | .6523E-17 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .6249E+00 | 8  | .6250E+00 |
| 9  | .6250E+00 | 10 | .1000E-09 | 11 | .7495E-14 | 12 | .3749E+00 |
| 13 | .3750E+00 | 14 | .3749E+00 | 15 | .8722E-14 | 16 | .3749E-14 |
| 17 | .1875E+00 | 18 | .1875E+00 | 19 | .1875E+00 | 20 | .4377E-14 |
| 21 | .1249E-23 | 22 | .4373E-10 | 23 | .4374E-10 | 24 | .4373E-10 |
| 25 | .7610E-17 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .6874E+00 | 8  | .6875E+00 |
| 9  | .6874E+00 | 10 | .1000E-09 | 11 | .8745E-14 | 12 | .4374E+00 |
| 13 | .4375E+00 | 14 | .4374E+00 | 15 | .9346E-14 | 16 | .4374E-14 |
| 17 | .2187E+00 | 18 | .2187E+00 | 19 | .2187E+00 | 20 | .4689E-14 |
| 21 | .1374E-23 | 22 | .4685E-10 | 23 | .4686E-10 | 24 | .4685E-10 |
| 25 | .8154E-17 |    |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7187E+00 | 8  | .7187E+00 |
| 9  | .7187E+00 | 10 | .1000E-09 | 11 | .9370E-14 | 12 | .4687E+00 |
| 13 | .4687E+00 | 14 | .4687E+00 | 15 | .9658E-14 | 16 | .4686E-14 |
| 17 | .2343E+00 | 18 | .2344E+00 | 19 | .2343E+00 | 20 | .4846E-14 |
| 21 | .1437E-23 | 22 | .4841E-10 | 23 | .4843E-10 | 24 | .4842E-10 |
| 25 | .8425E-17 |    |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7342E+00 | 8  | .7344E+00 |
| 9  | .7343E+00 | 10 | .1000E-09 | 11 | .9682E-14 | 12 | .4843E+00 |
| 13 | .4844E+00 | 14 | .4843E+00 | 15 | .9814E-14 | 16 | .4842E-14 |
| 17 | .2421E+00 | 18 | .2422E+00 | 19 | .2421E+00 | 20 | .4924E-14 |
| 21 | .1448E-23 | 22 | .4920E-10 | 23 | .4921E-10 | 24 | .4920E-10 |
| 25 | .8561E-17 |    |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7421E+00 | 8  | .7422E+00 |
| 9  | .7421E+00 | 10 | .1000E-09 | 11 | .9939E-14 | 12 | .4921E+00 |
| 13 | .4922E+00 | 14 | .4921E+00 | 15 | .9922E-14 | 16 | .4921E-14 |
| 17 | .2460E+00 | 18 | .2461E+00 | 19 | .2460E+00 | 20 | .4963E-14 |
| 21 | .1984E-23 | 22 | .4959E-10 | 23 | .4960E-10 | 24 | .4959E-10 |
| 25 | .8629E-17 |    |           |    |           |    |           |

XXXX ITERATION 7 FOLLOWS NOW XXXX

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7460E+00 | 8  | .7461E+00 |
| 9  | .7460E+00 | 10 | .1000E-09 | 11 | .9916E-14 | 12 | .4960E+00 |
| 13 | .4961E+00 | 14 | .4960E+00 | 15 | .9931E-14 | 16 | .4960E-14 |
| 17 | .2480E+00 | 18 | .2480E+00 | 19 | .2480E+00 | 20 | .4982E-14 |
| 21 | .1491E-23 | 22 | .4978E-10 | 23 | .4979E-10 | 24 | .4978E-10 |
| 25 | .8663E-17 |    |           |    |           |    |           |

XXXX ITERATION 8 FOLLOWS NOW XXXX

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7480E+00 | 8  | .7480E+00 |
| 9  | .7480E+00 | 10 | .1000E-09 | 11 | .9955E-14 | 12 | .4979E+00 |
| 13 | .4980E+00 | 14 | .4979E+00 | 15 | .9950E-14 | 16 | .4979E-14 |
| 17 | .2490E+00 | 18 | .2490E+00 | 19 | .2490E+00 | 20 | .4982E-14 |
| 21 | .1495E-23 | 22 | .4988E-10 | 23 | .4989E-10 | 24 | .4988E-10 |
| 25 | .8680E-17 |    |           |    |           |    |           |

XXXX ITERATION 9 FOLLOWS NOW XXXX

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7489E+00 | 8  | .7490E+00 |
| 9  | .7489E+00 | 10 | .1000E-09 | 11 | .9975E-14 | 12 | .4989E+00 |
| 13 | .4990E+00 | 14 | .4989E+00 | 15 | .9960E-14 | 16 | .4989E-14 |
| 17 | .2494E+00 | 18 | .2495E+00 | 19 | .2494E+00 | 20 | .4997E-14 |
| 21 | .1497E-23 | 22 | .4993E-10 | 23 | .4994E-10 | 24 | .4993E-10 |
| 25 | .8689E-17 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

XXXX ITERATION 1 FOLLOWS NOW XXXX

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .0000E+01  | 2  | .0000E+01  | 3  | .0000E+01  | 4  | .0000E+01  |
| 5  | .0000E+01  | 6  | .0000E+01  | 7  | .2409E+06  | 8  | -.1528E+05 |
| 9  | -.2960E+06 | 10 | -.2970E-08 | 11 | .0000E+01  | 12 | .5473E+06  |
| 13 | -.2282E-05 | 14 | -.3496E+06 | 15 | -.3491E-08 | 16 | .0000E+01  |
| 17 | .5245E+06  | 18 | -.2657E+05 | 19 | -.2804E+06 | 20 | -.2805E-08 |
| 21 | .0000E+01  | 22 | .5245E-04  | 23 | -.2657E-05 | 24 | -.2804E-04 |
| 25 | -.4880E-11 |    |            |    |            |    |            |

XXXX ITERATION 2 FOLLOWS NOW XXXX

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .2582E-12  | 2  | .2409E-04  | 3  | -.1529E-05 | 4  | -.2968E-04 |
| 5  | -.5925E-18 | 6  | .2409E-09  | 7  | .5115E+06  | 8  | -.2670E+05 |
| 9  | -.0716E+06 | 10 | -.4719E-08 | 11 | .5472E-08  | 12 | .9463E+06  |
| 13 | -.4182E+05 | 14 | -.5772E+06 | 15 | -.5765E-08 | 16 | .5246E-08  |
| 17 | .7200E+06  | 18 | -.3607E+05 | 19 | -.3942E+06 | 20 | -.3942E-08 |
| 21 | .1099E-17  | 22 | .7200E-01  | 23 | -.3607E-06 | 24 | .9463E-04  |

PSY ERROR=1.0000E+00 THETA ERROR=1.0000E+00 OMEGA ERROR=1.0000E+00

NUMBER OF OUTER ITERATIONS= 1

307

\*\*\*\*\*  
ITERATION 2 FOLLOWS NOW  
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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .0000E+01  | 2  | .0000E+01  | 3  | .0000E+01  | 4  | .0000E+01  |
| 5  | .0000E+01  | 6  | .0000E+01  | 7  | -.8406E+04 | 8  | .2278E+04  |
| 9  | .7009E+04  | 10 | .7013E-10  | 11 | .0000E+01  | 12 | -.1809E+05 |
| 13 | .9237E+02  | 14 | .1276E+05  | 15 | .1275E-09  | 16 | .0000E+01  |
| 17 | -.1974E+05 | 18 | -.3864E+04 | 19 | .1276E+05  | 20 | .1276E-09  |
| 21 | .0000E+01  | 22 | -.1974E-05 | 23 | -.3864E-06 | 24 | .1276E-05  |
| 25 | .2220E-12  |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.9014E-14 | 2  | -.8406E-06 | 3  | .2278E-06  | 4  | .7008E-06  |
| 5  | .1401E-19  | 6  | -.8406E-10 | 7  | -.1745E+05 | 8  | .2324E+04  |
| 9  | .1339E+05  | 10 | .1340E-09  | 11 | -.1809E-09 | 12 | -.3248E+05 |
| 13 | -.1817E+04 | 14 | .2233E+05  | 15 | .2231E-09  | 16 | -.1975E-09 |
| 17 | -.2694E+05 | 18 | -.4818E+04 | 19 | .1754E+05  | 20 | .1755E-09  |
| 21 | -.2949E-19 | 22 | -.2694E-05 | 23 | -.4818E-06 | 24 | .1754E-05  |
| 25 | .3053E-12  |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1000E+01  | 4  | .1000E+01  |
| 5  | .1000E+01  | 6  | .1500E-09  | 7  | -.6003E+06 | 8  | .1700E+07  |
| 9  | -.2579E+07 | 10 | -.2565E-07 | 11 | .9975E-14  | 12 | .1332E+07  |
| 13 | .3236E+07  | 14 | -.2230E+07 | 15 | -.2225E-07 | 16 | .4969E-14  |
| 17 | .1349E+07  | 18 | .3000E+07  | 19 | -.8051E+06 | 20 | -.8062E-08 |
| 21 | .1996E-23  | 22 | .1349E-03  | 23 | .2999E-03  | 24 | -.8050E-04 |
| 25 | -.1401E-10 |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .9999E+00  | 3  | .1000E+01  | 4  | .9997E+00  |
| 5  | .1000E+01  | 6  | -.5851E-08 | 7  | .6564E+05  | 8  | .3318E+07  |
| 9  | -.3694E+07 | 10 | -.3681E-07 | 11 | .1332E-07  | 12 | .2339E+07  |
| 13 | .5544E+07  | 14 | -.3189E+07 | 15 | -.3183E-07 | 16 | .1349E-07  |
| 17 | .1853E+07  | 18 | .4153E+07  | 19 | -.1285E+07 | 20 | -.1286E-07 |
| 21 | .2698E-17  | 22 | .1853E-03  | 23 | .4153E-03  | 24 | -.1285E-03 |
| 25 | -.2236E-10 |    |            |    |            |    |            |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1000E+01  | 4  | .9996E+00  |
| 5  | .1000E+01  | 6  | .8076E-09  | 7  | .5694E+06  | 8  | .4472E+07  |
| 9  | -.4173E+07 | 10 | -.4161E-07 | 11 | .2339E-07  | 12 | .2843E+07  |
| 13 | .6698E+07  | 14 | -.3669E+07 | 15 | -.3662E-07 | 16 | .1853E-07  |
| 17 | .2105E+07  | 18 | .4730E+07  | 19 | -.1525E+07 | 20 | -.1526E-07 |
| 21 | .3705E-17  | 22 | .2104E-03  | 23 | .4730E-03  | 24 | -.1524E-03 |
| 25 | .2105E-10  |    |            |    |            |    |            |

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP         |
|----|------------|----|------------|----|------------|----|--------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1000E+01  | 4  | 308.9996E+00 |
| 5  | .1000E+01  | 6  | .5845E-08  | 7  | .8214E+06  | 8  | .5049E+07    |
| 9  | -.4413E+07 | 10 | -.4401E-07 | 11 | .2843E-07  | 12 | .3095E+07    |
| 13 | .7274E+07  | 14 | -.3909E+07 | 15 | -.3901E-07 | 16 | .2105E-07    |
| 17 | .2231E+07  | 18 | .5019E+07  | 19 | -.1644E+07 | 20 | -.1646E-07   |
| 21 | .4209E-17  | 22 | .2230E-03  | 23 | .5018E-03  | 24 | -.1644E-03   |
| 25 | -.2861E-10 |    |            |    |            |    |              |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1001E+01  | 4  | .9996E+00  |
| 5  | .1000E+01  | 6  | .8364E-08  | 7  | .9474E+06  | 8  | .5047E+07  |
| 9  | -.4533E+07 | 10 | -.4520E-07 | 11 | .3095E-07  | 12 | .3095E+07  |
| 13 | .7563E+07  | 14 | -.4029E+07 | 15 | -.4021E-07 | 16 | .2105E-07  |
| 17 | .2294E+07  | 18 | .5163E+07  | 19 | -.1704E+07 | 20 | -.1646E-07 |
| 21 | .4461E-17  | 22 | .2293E-03  | 23 | .5162E-03  | 24 | -.1704E-03 |
| 25 | -.2966E-10 |    |            |    |            |    |            |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1001E+01  | 4  | .9995E+00  |
| 5  | .1000E+01  | 6  | .9624E-08  | 7  | .1010E+07  | 8  | .5041E+07  |
| 9  | -.4593E+07 | 10 | -.4580E-07 | 11 | .3221E-07  | 12 | .3094E+07  |
| 13 | .7707E+07  | 14 | -.4088E+07 | 15 | -.4081E-07 | 16 | .2104E-07  |
| 17 | .2325E+07  | 18 | .5235E+07  | 19 | -.1734E+07 | 20 | -.1646E-07 |
| 21 | .4587E-17  | 22 | .2325E-03  | 23 | .5234E-03  | 24 | -.1734E-03 |
| 25 | -.3018E-10 |    |            |    |            |    |            |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1001E+01  | 4  | .9995E+00  |
| 5  | .1000E+01  | 6  | .1025E-07  | 7  | .1042E+07  | 8  | .5053E+07  |
| 9  | -.4623E+07 | 10 | -.4610E-07 | 11 | .3284E-07  | 12 | .3096E+07  |
| 13 | .7779E+07  | 14 | -.4118E+07 | 15 | -.4111E-07 | 16 | .2106E-07  |
| 17 | .2341E+07  | 18 | .5271E+07  | 19 | -.1749E+07 | 20 | -.1646E-07 |
| 21 | .4650E-17  | 22 | .2341E-03  | 23 | .5270E-03  | 24 | -.1749E-03 |
| 25 | -.3044E-10 |    |            |    |            |    |            |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1001E+01  | 4  | .9995E+00  |
| 5  | .1000E+01  | 6  | .1057E-07  | 7  | .1058E+07  | 8  | .5589E+07  |
| 9  | -.4638E+07 | 10 | -.4625E-07 | 11 | .3315E-07  | 12 | .3331E+07  |
| 13 | .7815E+07  | 14 | -.4133E+07 | 15 | -.4126E-07 | 16 | .2342E-07  |
| 17 | .2349E+07  | 18 | .5289E+07  | 19 | -.1757E+07 | 20 | -.1759E-07 |
| 21 | .4682E-17  | 22 | .2349E-03  | 23 | .5288E-03  | 24 | -.1756E-03 |
| 25 | -.3057E-10 |    |            |    |            |    |            |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1001E+01  | 4  | .9995E+00  |
| 5  | .1000E+01  | 6  | .1073E-07  | 7  | .1066E+07  | 8  | .5607E+07  |
| 9  | -.4645E+07 | 10 | -.4633E-07 | 11 | .3331E-07  | 12 | .3339E+07  |
| 13 | .7833E+07  | 14 | -.4141E+07 | 15 | -.4133E-07 | 16 | .2349E-07  |
| 17 | .2353E+07  | 18 | .5298E+07  | 19 | -.1760E+07 | 20 | -.1762E-07 |
| 21 | .4698E-17  | 22 | .2353E-03  | 23 | .5297E-03  | 24 | -.1740E-03 |
| 25 | -.3065E-10 |    |            |    |            |    |            |

|    | TEMP       | I  |            | TEMP | I          |    | TEMP       | I |  | TEMP | I |  | TEMP | I |
|----|------------|----|------------|------|------------|----|------------|---|--|------|---|--|------|---|
| 1  | .1000E+01  | 2  | .1000E+01  | 3    | .1001E+01  | 4  | .9995E+00  |   |  |      |   |  |      |   |
| 5  | .1000E+01  | 6  | .1081E-07  | 7    | .1069E+07  | 8  | .5616E+07  |   |  |      |   |  |      |   |
| 9  | -.4649E+07 | 10 | -.4636E-07 | 11   | .3339E-07  | 12 | .3343E+07  |   |  |      |   |  |      |   |
| 13 | .7842E+07  | 14 | -.4145E+07 | 15   | -.4137E-07 | 16 | .2353E-07  |   |  |      |   |  |      |   |
| 17 | .2355E+07  | 18 | .5302E+07  | 19   | -.1762E+07 | 20 | -.1764E-07 |   |  |      |   |  |      |   |
| 21 | .4705E-17  | 22 | .2355E-03  | 23   | .5302E-03  | 24 | -.1762E-03 |   |  |      |   |  |      |   |
| 25 | -.3066E-10 |    |            |      |            |    |            |   |  |      |   |  |      |   |

\*\*\*\* ITERATION 11 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1001E+01  | 4  | .9995E+00  |
| 5  | .1000E+01  | 6  | .1085E-07  | 7  | .1071E+07  | 8  | .5621E+07  |
| 9  | -.4651E+07 | 10 | -.4638E-07 | 11 | .3343E-07  | 12 | .3345E+07  |
| 13 | .7846E+07  | 14 | -.4146E+07 | 15 | -.4139E-07 | 16 | .2355E-07  |
| 17 | .2356E+07  | 18 | .5305E+07  | 19 | -.1763E+07 | 20 | -.1765E-07 |
| 21 | .4709E-17  | 22 | .2356E-03  | 23 | .5304E-03  | 24 | -.1763E-03 |
| 25 | -.3068E-10 |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 11 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .2690E-08  | 2  | .5584E+06  | 3  | -.7437E+05 | 4  | -.4284E+06 |
| 5  | -.8567E-08 | 6  | .1344E-18  | 7  | .2352E+13  | 8  | -.1946E+13 |
| 9  | -.1540E+13 | 10 | -.4286E+02 | 11 | -.4287E-12 | 12 | .4882E+13  |
| 13 | -.1330E+13 | 14 | -.5790E+13 | 15 | -.7151E+02 | 16 | -.7140E-12 |
| 17 | .5534E+13  | 18 | -.5030E+12 | 19 | -.8486E+13 | 20 | -.5622E+02 |
| 21 | .6320E-08  | 22 | .8626E+06  | 23 | .1541E+06  | 24 | -.5622E+06 |
| 25 | -.1477E-03 |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .2531E-05  | 2  | .5586E+06  | 3  | -.7456E+05 | 4  | -.4286E+06 |
| 5  | -.1285E-07 | 6  | .2352E-01  | 7  | .4793E+13  | 8  | -.2611E+13 |
| 9  | -.4435E+13 | 10 | -.4289E+02 | 11 | .4881E-01  | 12 | .8883E+13  |
| 13 | -.1914E+13 | 14 | -.1148E+14 | 15 | -.7157E+02 | 16 | .5565E-01  |
| 17 | .7565E+13  | 18 | -.7952E+12 | 19 | -.1133E+14 | 20 | -.5625E+02 |
| 21 | .1495E-07  | 22 | .8628E+06  | 23 | .1541E+06  | 24 | -.5625E+06 |
| 25 | -.1972E-03 |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=1.0000E+00 OMEGA ERROR=1.0000E+00

NUMBER OF OUTER ITERATIONS= 2

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 ITERATION 3 FOLLOWS NOW  
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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.9014E-14 | 2  | -.8406E-06 | 3  | .2278E-06  | 4  | .7008E-06  |
| 5  | .2102E-19  | 6  | -.8406E-10 | 7  | -.6505E+11 | 8  | .7245E+11  |
| 9  | .9512E+11  | 10 | -.9517E-03 | 11 | -.1809E-09 | 12 | -.1585E+12 |
| 13 | .9968E+11  | 14 | .2376E+12  | 15 | .2375E-02  | 16 | -.1975E-09 |
| 17 | -.1861E+12 | 18 | .4699E+11  | 19 | .2860E+12  | 20 | .2860E-02  |
| 21 | -.5923E-19 | 22 | -.1861E+02 | 23 | .4698E+01  | 24 | .2860E+02  |
| 25 | .4978E-05  |    |            |    |            |    |            |

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP         |
|----|------------|----|------------|----|------------|----|--------------|
| 1  | -.6976E-07 | 2  | -.6505E+01 | 3  | .7244E+01  | 4  | 310.9511E+01 |
| 5  | .1902E-12  | 6  | -.6505E-03 | 7  | -.1443E+12 | 8  | .1223E+12    |
| 9  | .2139E+12  | 10 | .2140E-02  | 11 | -.1585E-02 | 12 | -.2912E+12   |
| 13 | .1481E+12  | 14 | .4400E+12  | 15 | .4397E-02  | 16 | -.1862E-02   |
| 17 | -.2525E+12 | 18 | .7120E+11  | 19 | .3872E+12  | 20 | .3872E-02    |
| 21 | -.3723E-12 | 22 | -.2524E+02 | 23 | .7120E+01  | 24 | .3872E+02    |
| 25 | .6738E-05  |    |            |    |            |    |              |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .1000E+01  | 2  | .1000E+01  | 3  | .1001E+01  | 4  | .9995E+00  |
| 5  | .1000E+01  | 6  | .1090E-07  | 7  | -.3221E+21 | 8  | -.4557E+21 |
| 9  | -.7299E+20 | 10 | -.7303E+06 | 11 | .3343E-07  | 12 | -.3127E+21 |
| 13 | -.3819E+21 | 14 | .9657E+20  | 15 | .9678E+06  | 16 | .2355E-07  |
| 17 | -.1026E+21 | 18 | .3149E+20  | 19 | .3185E+21  | 20 | .3182E+07  |
| 21 | .7064E-17  | 22 | -.1026E+11 | 23 | .3149E+10  | 24 | .3184E+11  |
| 25 | .5541E+04  |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.3444E+03 | 2  | -.3220E+11 | 3  | -.4557E+11 | 4  | -.7298E+10 |
| 5  | .9999E+00  | 6  | -.3220E+07 | 7  | -.4784E+21 | 8  | -.6467E+21 |
| 9  | -.2472E+20 | 10 | -.2473E+06 | 11 | -.3127E+07 | 12 | -.4422E+21 |
| 13 | -.4616E+21 | 14 | .2799E+21  | 15 | .2801E+07  | 16 | -.1026E+07 |
| 17 | -.1673E+21 | 18 | -.8352E+19 | 19 | .4101E+21  | 20 | .4100E+07  |
| 21 | -.2052E-03 | 22 | -.1673E+11 | 23 | -.8352E+09 | 24 | .4101E+11  |
| 25 | .7136E+04  |    |            |    |            |    |            |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.5120E+03 | 2  | -.4784E+11 | 3  | -.6466E+11 | 4  | -.2471E+10 |
| 5  | .1000E+01  | 6  | -.4784E+07 | 7  | -.5432E+21 | 8  | -.6865E+21 |
| 9  | .6694E+20  | 10 | .6698E+06  | 11 | -.4421E+07 | 12 | -.5069E+21 |
| 13 | -.5015E+21 | 14 | -.3716E+21 | 15 | .3716E+07  | 16 | -.1673E+07 |
| 17 | -.1997E+21 | 18 | -.2827E+20 | 19 | .4559E+21  | 20 | .4558E+07  |
| 21 | -.3346E-03 | 22 | -.1997E+11 | 23 | -.2827E+10 | 24 | .4559E+11  |
| 25 | .7934E+04  |    |            |    |            |    |            |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.5815E+03 | 2  | -.5431E+11 | 3  | -.6865E+11 | 4  | .6694E+10  |
| 5  | .1000E+01  | 6  | -.5431E+07 | 7  | -.5755E+21 | 8  | -.7065E+21 |
| 9  | .1128E+21  | 10 | .1128E+07  | 11 | -.5069E+07 | 12 | -.5393E+21 |
| 13 | -.5214E+21 | 14 | .4174E+21  | 15 | .4174E+07  | 16 | -.1997E+07 |
| 17 | -.2159E+21 | 18 | -.3822E+20 | 19 | .4786E+21  | 20 | .4787E+07  |
| 21 | -.3993E-03 | 22 | -.2158E+11 | 23 | -.3822E+10 | 24 | .4788E+11  |
| 25 | .8332E+04  |    |            |    |            |    |            |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.6162E+03 | 2  | -.5755E+11 | 3  | -.7064E+11 | 4  | .1127E+11  |
| 5  | .1000E+01  | 6  | -.5755E+07 | 7  | -.5917E+21 | 8  | -.7164E+21 |
| 9  | .1357E+21  | 10 | .1357E+07  | 11 | -.5392E+07 | 12 | -.5555E+21 |
| 13 | -.5313E+21 | 14 | .4403E+21  | 15 | .4402E+07  | 16 | -.2159E+07 |
| 17 | -.2239E+21 | 18 | -.4320E+20 | 19 | .4903E+21  | 20 | .4902E+07  |
| 21 | -.4317E-03 | 22 | -.2239E+11 | 23 | -.4319E+10 | 24 | .4902E+11  |
| 25 | .8531E+04  |    |            |    |            |    |            |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.6335E+03 | 2  | -.5917E+11 | 3  | -.7163E+11 | 4  | .1357E+11  |
| 5  | .1000E+01  | 6  | -.5917E+07 | 7  | -.5998E+21 | 8  | -.7214E+21 |
| 9  | .1471E+21  | 10 | .1472E+07  | 11 | -.5554E+07 | 12 | -.5636E+21 |
| 13 | -.5362E+21 | 14 | -.4517E+21 | 15 | .4516E+07  | 16 | -.2240E+07 |
| 17 | -.2280E+21 | 18 | -.4568E+20 | 19 | .4960E+21  | 20 | .4959E+07  |
| 21 | -.4479E-03 | 22 | -.2280E+11 | 23 | -.4568E+10 | 24 | .4960E+11  |
| 25 | .8631E+04  |    |            |    |            |    |            |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.6422E+03 | 2  | -.5998E+11 | 3  | -.7213E+11 | 4  | .1471E+11  |
| 5  | .1000E+01  | 6  | -.5998E+07 | 7  | -.6039E+21 | 8  | -.7239E+21 |
| 9  | .1528E+21  | 10 | .1529E+07  | 11 | -.5635E+07 | 12 | -.5676E+21 |
| 13 | -.5388E+21 | 14 | -.4574E+21 | 15 | .4574E+07  | 16 | -.2280E+07 |
| 17 | -.2300E+21 | 18 | -.4692E+20 | 19 | .4989E+21  | 20 | .4988E+07  |
| 21 | -.4560E-03 | 22 | -.2300E+11 | 23 | -.4692E+10 | 24 | .4988E+11  |
| 25 | .8681E+04  |    |            |    |            |    |            |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.6465E+03 | 2  | -.6038E+11 | 3  | -.7238E+11 | 4  | .1528E+11  |
| 5  | .1000E+01  | 6  | -.6038E+07 | 7  | -.6059E+21 | 8  | -.7251E+21 |
| 9  | .1557E+21  | 10 | .1558E+07  | 11 | -.5675E+07 | 12 | -.5696E+21 |
| 13 | -.5400E+21 | 14 | .4603E+21  | 15 | .4602E+07  | 16 | -.2301E+07 |
| 17 | -.2310E+21 | 18 | -.4754E+20 | 19 | .5003E+21  | 20 | .5002E+07  |
| 21 | -.4600E-03 | 22 | -.2310E+11 | 23 | -.4754E+10 | 24 | .5003E+11  |
| 25 | .8706E+04  |    |            |    |            |    |            |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.6487E+03 | 2  | -.6058E+11 | 3  | -.7250E+11 | 4  | .1557E+11  |
| 5  | .1000E+01  | 6  | -.6058E+07 | 7  | -.6069E+21 | 8  | -.7257E+21 |
| 9  | .1571E+21  | 10 | .1572E+07  | 11 | -.5696E+07 | 12 | -.5706E+21 |
| 13 | -.5407E+21 | 14 | .4617E+21  | 15 | .4616E+07  | 16 | -.2311E+07 |
| 17 | -.2315E+21 | 18 | -.4785E+20 | 19 | .5010E+21  | 20 | .5009E+07  |
| 21 | -.4620E-03 | 22 | -.2315E+11 | 23 | -.4785E+10 | 24 | .5010E+11  |
| 25 | .8718E+04  |    |            |    |            |    |            |

\*\*\*\* ITERATION 10 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.6498E+03 | 2  | -.6068E+11 | 3  | -.7257E+11 | 4  | .1571E+11  |
| 5  | .1000E+01  | 6  | -.6068E+07 | 7  | -.6074E+21 | 8  | -.7260E+21 |
| 9  | .1578E+21  | 10 | .1579E+07  | 11 | -.5706E+07 | 12 | -.5711E+21 |
| 13 | -.5410E+21 | 14 | .4624E+21  | 15 | .4624E+07  | 16 | -.2316E+07 |
| 17 | -.2318E+21 | 18 | -.4801E+20 | 19 | .5014E+21  | 20 | .5013E+07  |
| 21 | -.4630E-03 | 22 | -.2318E+11 | 23 | -.4800E+10 | 24 | .5013E+11  |
| 25 | .8724E+04  |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 10 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP      | I  | TEMP       | I  | TEMP       |
|----|------------|----|-----------|----|------------|----|------------|
| 1  | .2082E-01  | 2  | .4618E+13 | 3  | -.3913E+13 | 4  | -.6845E+13 |
| 5  | -.1369E+00 | 6  | .1040E-11 | 7  | -.3484E+27 | 8  | .1615E+27  |
| 9  | .1587E+27  | 10 | .1587E+13 | 11 | -.6848E-05 | 12 | -.5857E+27 |
| 13 | .4061E+27  | 14 | .3128E+27 | 15 | .3125E+13  | 16 | -.1407E-04 |
| 17 | -.4758E+27 | 18 | .5849E+27 | 19 | .5845E+13  | 20 | .5845E+27  |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.3736E+09 | 2  | -.3483E+17 | 3  | .1615E+17  | 4  | .1586E+17  |
| 5  | .3171E+03  | 6  | -.3484E+13 | 7  | -.6412E+27 | 8  | .3646E+27  |
| 9  | .3151E+27  | 10 | .3152E+13  | 11 | -.5856E+13 | 12 | -.9699E+27 |
| 13 | .8060E+27  | 14 | .6435E+27  | 15 | .6431E+13  | 16 | -.4759E+13 |
| 17 | -.6678E+27 | 18 | .7967E+27  | 19 | .6704E+27  | 20 | .6702E+13  |
| 21 | -.9513E+03 | 22 | -.6677E+17 | 23 | .7966E+17  | 24 | .6702E+17  |
| 25 | .1167E+11  |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=1.0000E+00 OMEGA ERROR=1.0000E+00

NUMBER OF OUTER ITERATIONS= 3

\*\*\*\*\*

ITERATION 4 FOLLOWS NOW

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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.6976E-07 | 2  | -.6505E+01 | 3  | .7244E+01  | 4  | .9511E+01  |
| 5  | .2852E-12  | 6  | -.6505E-03 | 7  | .5982E+25  | 8  | -.7697E+25 |
| 9  | -.6783E+25 | 10 | -.6786E+11 | 11 | -.1595E-02 | 12 | .1207E+26  |
| 13 | -.1524E+26 | 14 | -.1758E+26 | 15 | -.1758E+12 | 16 | -.1862E-02 |
| 17 | .1359E+26  | 18 | -.1536E+26 | 19 | -.2357E+26 | 20 | -.2356E+12 |
| 21 | -.5584E-12 | 22 | .1359E+16  | 23 | -.1536E+16 | 24 | -.2357E+16 |
| 25 | -.4102E+09 |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .6414E+07  | 2  | .5981E+15  | 3  | -.7697E+15 | 4  | -.6782E+15 |
| 5  | -.1356E+02 | 6  | .5981E+11  | 7  | .1202E+26  | 8  | -.1532E+26 |
| 9  | -.1557E+26 | 10 | -.1558E+12 | 11 | .1207E+12  | 12 | .2189E+26  |
| 13 | -.2673E+26 | 14 | -.3376E+26 | 15 | -.3374E+12 | 16 | .1360E+12  |
| 17 | .1850E+26  | 18 | -.2110E+26 | 19 | -.3166E+26 | 20 | -.3166E+12 |
| 21 | .2718E+02  | 22 | .1850E+16  | 23 | -.2110E+16 | 24 | -.3166E+16 |
| 25 | -.5509E+09 |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*OVXX

\*OVXX

\*OVXX

\*OVXX

\*OVXX

\*OVXX

\*OVXX

\*OVXX

\*OVXX

\*OVXX

\*OVXX

\*OVXX

XXXXXX

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CHECK

ENTER DATE (DD-MM-YYYY)

22-8-1987

WHAT IS YOUR OUTPUT UNIT CODE?

ACTIVE HSTART, HSTOP, HSTEP (X, XXXX, Y, XXXX, Z, XXXX)

0 0500

ACTIVE ENCLOSURE INCLINATION (XXX, X)

000.0

100.0000 0.0000 0500

WHAT IS TITLE OF YOUR PROGRAM?

PROGRAMME CHECKOUT FOR HORIZONTAL ENCLOSURE

5 5.1

WHAT IS ASPECT RATIO (XXX, X)?

100.0

1.0 100.0

\*\*\*\*\*

PROGRAMME CHECKOUT FOR HORIZONTAL ENCLOSURE

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OUTPUT OBTAINED ON 22-8-1987

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

| I  | X        | Y      | I  | X        | Y      | I  | X        | Y      |
|----|----------|--------|----|----------|--------|----|----------|--------|
| 1  | 0.0000   | 0.0000 | 2  | 75.0000  | 0.0000 | 3  | 50.0000  | 0.0000 |
| 4  | 75.0000  | 0.0000 | 5  | 100.0000 | 0.0000 | 6  | 0.0000   | 7500   |
| 7  | 25.0000  | 2500   | 8  | 50.0000  | 2500   | 9  | 75.0000  | 2500   |
| 10 | 100.0000 | 2500   | 11 | 0.0000   | 5000   | 12 | 25.0000  | 5000   |
| 13 | 50.0000  | 5000   | 14 | 75.0000  | 5000   | 15 | 100.0000 | 5000   |
| 16 | 0.0000   | 7500   | 17 | 25.0000  | 7500   | 18 | 50.0000  | 7500   |
| 19 | 75.0000  | 7500   | 20 | 100.0000 | 7500   | 21 | 0.0000   | 1.0000 |
| 22 | 25.0000  | 1.0000 | 23 | 50.0000  | 1.0000 | 24 | 75.0000  | 1.0000 |
| 25 | 100.0000 | 1.0000 |    |          |        |    |          |        |

ELEMENT NODE NUMBERS AND AREAS

| M | I | J | K | AREA       | M | I | J | K | AREA       |
|---|---|---|---|------------|---|---|---|---|------------|
| 1 | 1 | 2 | 6 | 3.1250E+00 | 2 | 1 | 2 | 7 | 3.1250E+00 |

|    |    |    |    |            |    |    |    |    |            |
|----|----|----|----|------------|----|----|----|----|------------|
| 9  | 6  | 12 | 11 | 3.1250E+00 | 10 | 6  | 7  | 12 | 3.1250E+00 |
| 11 | 7  | 13 | 12 | 3.1250E+00 | 12 | 7  | 8  | 13 | 3.1250E+00 |
| 12 | 8  | 14 | 13 | 3.1250E+00 | 14 | 8  | 9  | 14 | 3.1250E+00 |
| 15 | 9  | 15 | 14 | 3.1250E+00 | 16 | 9  | 10 | 15 | 3.1250E+00 |
| 17 | 11 | 17 | 16 | 3.1250E+00 | 18 | 11 | 12 | 17 | 3.1250E+00 |
| 19 | 12 | 18 | 17 | 3.1250E+00 | 20 | 12 | 13 | 18 | 3.1250E+00 |
| 21 | 13 | 19 | 18 | 3.1250E+00 | 22 | 13 | 14 | 19 | 3.1250E+00 |
| 23 | 14 | 20 | 19 | 3.1250E+00 | 24 | 14 | 15 | 20 | 3.1250E+00 |
| 25 | 16 | 22 | 21 | 3.1250E+00 | 26 | 16 | 17 | 22 | 3.1250E+00 |
| 27 | 17 | 23 | 22 | 3.1250E+00 | 28 | 17 | 18 | 23 | 3.1250E+00 |
| 29 | 18 | 24 | 23 | 3.1250E+00 | 30 | 18 | 19 | 24 | 3.1250E+00 |
| 31 | 19 | 25 | 24 | 3.1250E+00 | 32 | 19 | 20 | 25 | 3.1250E+00 |

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16  
 1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25  
 THE NUMBERS OF THE 16 BOUNDARY POINTS ARE  
 1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .4999E-08 | 7  | .4999E+02 | 8  | .5000E+02 |
| 9  | .5000E+02 | 10 | .5000E-08 | 11 | .2500E-18 | 12 | .2500E+02 |
| 13 | .2500E+02 | 14 | .2500E+02 | 15 | .2500E-12 | 16 | .1250E-28 |
| 17 | .1250E+02 | 18 | .1250E+02 | 19 | .1250E+02 | 20 | .1250E-12 |
| 21 | .0000E+01 | 22 | .1249E-08 | 23 | .1250E-08 | 24 | .1250E-08 |
| 25 | .2499E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .6249E+02 | 8  | .6250E+02 |
| 9  | .3250E+02 | 10 | .5000E-08 | 11 | .2499E-12 | 12 | .3749E+02 |
| 13 | .3750E+02 | 14 | .3749E+02 | 15 | .3749E-12 | 16 | .1249E-12 |
| 17 | .1874E+02 | 18 | .1875E+02 | 19 | .1875E+02 | 20 | .1874E-12 |
| 21 | .2499E-22 | 22 | .1874E-08 | 23 | .1875E-08 | 24 | .1874E-08 |
| 25 | .3749E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .6874E+02 | 8  | .6875E+02 |
| 9  | .6874E+02 | 10 | .5000E-08 | 11 | .3749E-12 | 12 | .4374E+02 |
| 13 | .4375E+02 | 14 | .4374E+02 | 15 | .4374E-12 | 16 | .1874E-12 |
| 17 | .2187E+02 | 18 | .2187E+02 | 19 | .2187E+02 | 20 | .2187E-12 |
| 21 | .3748E-22 | 22 | .2187E-08 | 23 | .2187E-08 | 24 | .2187E-08 |
| 25 | .4373E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I | TEMP      | I | TEMP      | I | TEMP      | I | TEMP      |
|---|-----------|---|-----------|---|-----------|---|-----------|
| 1 | .1000E+03 | 2 | .1000E+03 | 3 | .1000E+03 | 4 | .1000E+03 |

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 17 | .2343E+02 | 18 | .2344E+02 | 19 | .2343E+02 | 20 | .2343E-12 |
| 21 | .4979E-22 | 22 | .2343E-08 | 23 | .2343E-08 | 24 | .2343E-09 |
| 25 | .4686E-22 |    |           |    |           |    |           |

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\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+02 | 6  | .5000E-08 | 7  | .7343E+02 | 8  | .7344E+02 |
| 9  | .7343E+02 | 10 | .5000E-08 | 11 | .4686E-12 | 12 | .4843E+02 |
| 13 | .4844E+02 | 14 | .4843E+02 | 15 | .4842E-12 | 16 | .2343E-12 |
| 17 | .2421E+02 | 18 | .2422E+02 | 19 | .2421E+02 | 20 | .2421E-12 |
| 21 | .4685E-22 | 22 | .2421E-08 | 23 | .2422E-08 | 24 | .2421E-08 |
| 25 | .4842E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7421E+02 | 8  | .7422E+02 |
| 9  | .7421E+02 | 10 | .5000E-08 | 11 | .4843E-12 | 12 | .4921E+02 |
| 13 | .4922E+02 | 14 | .4921E+02 | 15 | .4920E-12 | 16 | .2421E-12 |
| 17 | .2460E+02 | 18 | .2461E+02 | 19 | .2460E+02 | 20 | .2460E-12 |
| 21 | .4842E-22 | 22 | .2460E-08 | 23 | .2461E-08 | 24 | .2460E-08 |
| 25 | .4920E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7460E+02 | 8  | .7461E+02 |
| 9  | .7460E+02 | 10 | .5000E-08 | 11 | .4920E-12 | 12 | .4960E+02 |
| 13 | .4961E+02 | 14 | .4960E+02 | 15 | .4959E-12 | 16 | .2460E-12 |
| 17 | .2480E+02 | 18 | .2480E+02 | 19 | .2480E+02 | 20 | .2480E-12 |
| 21 | .4920E-22 | 22 | .2480E-08 | 23 | .2480E-08 | 24 | .2480E-08 |
| 25 | .4959E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7480E+02 | 8  | .7480E+02 |
| 9  | .7480E+02 | 10 | .5000E-08 | 11 | .4959E-12 | 12 | .4979E+02 |
| 13 | .4980E+02 | 14 | .4979E+02 | 15 | .4979E-12 | 16 | .2480E-12 |
| 17 | .2490E+02 | 18 | .2490E+02 | 19 | .2490E+02 | 20 | .2489E-12 |
| 21 | .4959E-22 | 22 | .2489E-08 | 23 | .2490E-08 | 24 | .2489E-08 |
| 25 | .4979E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7489E+02 | 8  | .7490E+02 |
| 9  | .7489E+02 | 10 | .5000E-08 | 11 | .4979E-12 | 12 | .4989E+02 |
| 13 | .4990E+02 | 14 | .4989E+02 | 15 | .4989E-12 | 16 | .2489E-12 |
| 17 | .2494E+02 | 18 | .2495E+02 | 19 | .2494E+02 | 20 | .2494E-12 |
| 21 | .4979E-22 | 22 | .2494E-08 | 23 | .2495E-08 | 24 | .2494E-08 |
| 25 | .4989E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 10 FOLLOWS NOW \*\*\*\*

|   |           |   |           |   |           |   |           |
|---|-----------|---|-----------|---|-----------|---|-----------|
| I | TEMP      | I | TEMP      | I | TEMP      | I | TEMP      |
| 1 | .1000E+03 | 2 | .1000E+03 | 3 | .1000E+03 | 4 | .1000E+03 |
| 5 | .1000E+03 | 6 | .5000E-08 | 7 | .7494E+02 |   |           |

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 17 | .7497E+02 | 19 | .2498E+02 | 21 | .2497E-12 | 23 | .2497E-12 |
| 21 | .4998E-22 | 22 | .2497E-08 | 23 | .2497E-08 | 24 | .2497E-08 |
| 25 | .4995E-22 |    |           |    |           |    |           |

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\*\*\*\* ITERATION 11 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+02 | 6  | .5000E-08 | 7  | .7497E+02 | 8  | .7498E+02 |
| 9  | .7497E+02 | 10 | .5000E-08 | 11 | .4994E-12 | 12 | .4997E+02 |
| 13 | .4998E+02 | 14 | .4997E+02 | 15 | .4996E-12 | 16 | .2497E-12 |
| 17 | .2498E+02 | 18 | .2499E+02 | 19 | .2498E+02 | 20 | .2498E-12 |
| 21 | .4998E-22 | 22 | .2498E-08 | 23 | .2499E-08 | 24 | .2498E-08 |
| 25 | .4995E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 12 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7498E+02 | 8  | .7499E+02 |
| 9  | .7498E+02 | 10 | .5000E-08 | 11 | .4996E-12 | 12 | .4998E+02 |
| 13 | .4998E+02 | 14 | .4999E+02 | 15 | .4997E-12 | 16 | .2498E-12 |
| 17 | .2499E+02 | 18 | .2499E+02 | 19 | .2499E+02 | 20 | .2499E-12 |
| 21 | .4995E-22 | 22 | .2499E-08 | 23 | .2499E-08 | 24 | .2499E-08 |
| 25 | .4997E-22 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-03 AFTER 12 CYCLES

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### CONDUCTION TEMPERATURE DISTRIBUTION

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+03 | 2  | .1000E+03 | 3  | .1000E+03 | 4  | .1000E+03 |
| 5  | .1000E+03 | 6  | .5000E-08 | 7  | .7498E+02 | 8  | .7499E+02 |
| 9  | .7498E+02 | 10 | .5000E-08 | 11 | .4996E-12 | 12 | .4998E+02 |
| 13 | .4998E+02 | 14 | .4998E+02 | 15 | .4997E-12 | 16 | .2498E-12 |
| 17 | .2499E+02 | 18 | .2499E+02 | 19 | .2499E+02 | 20 | .2499E-12 |
| 21 | .4995E-22 | 22 | .2499E-08 | 23 | .2499E-08 | 24 | .2499E-08 |
| 25 | .4997E-22 |    |           |    |           |    |           |

\*\*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 5  | .0000E+01 | 6  | .0000E+01 | 7  | .0000E+01 | 8  | .0000E+01 |
| 9  | .0000E+01 | 10 | .0000E+01 | 11 | .0000E+01 | 12 | .0000E+01 |
| 13 | .0000E+01 | 14 | .0000E+01 | 15 | .0000E+01 | 16 | .0000E+01 |
| 17 | .0000E+01 | 18 | .0000E+01 | 19 | .0000E+01 | 20 | .0000E+01 |
| 21 | .0000E+01 | 22 | .0000E+01 | 23 | .0000E+01 | 24 | .0000E+01 |
| 25 | .0000E+01 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1200E+01 AFTER 1 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .4999E+00 | 8  | .5000E+00 |
| 9  | .5000E+00 | 10 | .1000E-09 | 11 | .4996E-14 | 12 | .2499E+00 |
| 13 | .2500E+00 | 14 | .2500E+00 | 15 | .7497E-14 | 16 | .2498E-14 |
| 17 | .1250E+00 | 18 | .1250E+00 | 19 | .1250E+00 | 20 | .3748E-14 |
| 21 | .7493E-24 | 22 | .3748E-10 | 23 | .3749E-10 | 24 | .3748E-10 |
| 25 | .1249E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 3  | .1000E+01 | 5  | .1000E+01 | 7  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .6249E+00 | 8  | .6250E+00 |
| 9  | .6250E+00 | 10 | .1000E-09 | 11 | .7495E-14 | 12 | .3749E+00 |
| 13 | .3750E+00 | 14 | .3749E+00 | 15 | .8746E-14 | 16 | .3747E-14 |
| 17 | .1874E+00 | 18 | .1875E+00 | 19 | .1875E+00 | 20 | .4373E-14 |
| 21 | .1249E-23 | 22 | .4373E-10 | 23 | .4374E-10 | 24 | .4373E-10 |
| 25 | .1374E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .6874E+00 | 8  | .6875E+00 |
| 9  | .6874E+00 | 10 | .1000E-09 | 11 | .8745E-14 | 12 | .4374E+00 |
| 13 | .4375E+00 | 14 | .4374E+00 | 15 | .9371E-14 | 16 | .4372E-14 |
| 17 | .2187E+00 | 18 | .2187E+00 | 19 | .2187E+00 | 20 | .4685E-14 |
| 21 | .1374E-23 | 22 | .4685E-10 | 23 | .4686E-10 | 24 | .4685E-10 |
| 25 | .1437E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7187E+00 | 8  | .7187E+00 |
| 9  | .7187E+00 | 10 | .1000E-09 | 11 | .9370E-14 | 12 | .4687E+00 |
| 13 | .4687E+00 | 14 | .4687E+00 | 15 | .9684E-14 | 16 | .4685E-14 |
| 17 | .2343E+00 | 18 | .2344E+00 | 19 | .2343E+00 | 20 | .4842E-14 |
| 21 | .1436E-23 | 22 | .4841E-10 | 23 | .4843E-10 | 24 | .4842E-10 |
| 25 | .1468E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7343E+00 | 8  | .7344E+00 |
| 9  | .7343E+00 | 10 | .1000E-09 | 11 | .9682E-14 | 12 | .4843E+00 |
| 13 | .4844E+00 | 14 | .4843E+00 | 15 | .9840E-14 | 16 | .4841E-14 |
| 17 | .2421E+00 | 18 | .2422E+00 | 19 | .2421E+00 | 20 | .4920E-14 |
| 21 | .1468E-23 | 22 | .4920E-10 | 23 | .4921E-10 | 24 | .4920E-10 |
| 25 | .1483E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7421E+00 | 8  | .7422E+00 |
| 9  | .7421E+00 | 10 | .1000E-09 | 11 | .9838E-14 | 12 | .4921E+00 |
| 13 | .4922E+00 | 14 | .4921E+00 | 15 | .9918E-14 | 16 | .4919E-14 |
| 17 | .2460E+00 | 18 | .2461E+00 | 19 | .2460E+00 | 20 | .4959E-14 |
| 21 | .1483E-23 | 22 | .4959E-10 | 23 | .4960E-10 | 24 | .4959E-10 |
| 25 | .1491E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7460E+00 | 8  | .7461E+00 |
| 9  | .7460E+00 | 10 | .1000E-09 | 11 | .9916E-14 | 12 | .4960E+00 |
| 13 | .4961E+00 | 14 | .4960E+00 | 15 | .9957E-14 | 16 | .4958E-14 |
| 17 | .2480E+00 | 18 | .2480E+00 | 19 | .2480E+00 | 20 | .4978E-14 |
| 21 | .1491E-23 | 22 | .4978E-10 | 23 | .4979E-10 | 24 | .4978E-10 |
| 25 | .1495E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 3  | .1000E+01 | 5  | .1000E+01 | 7  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7480E+00 | 8  | .7480E+00 |
| 9  | .7480E+00 | 10 | .1000E-09 | 11 | .9956E-14 | 12 | .4979E+00 |
| 13 | .4980E+00 | 14 | .4979E+00 | 15 | .9976E-14 | 16 | .4978E-14 |
| 17 | .2490E+00 | 18 | .2490E+00 | 19 | .2490E+00 | 20 | .4988E-14 |
| 21 | .1495E-23 | 22 | .4988E-10 | 23 | .4989E-10 | 24 | .4988E-10 |
| 25 | .1497E-23 |    |           |    |           |    |           |

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XXXX ITERATION 9 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1000E-09 | 7  | .7490E+00 | 8  | .7490E+00 |
| 9  | .7489E+00 | 10 | .1000E-09 | 11 | .9975E-14 | 12 | .4989E+00 |
| 13 | .4990E+00 | 14 | .4989E+00 | 15 | .9986E-14 | 16 | .4987E-14 |
| 17 | .2494E+00 | 18 | .2495E+00 | 19 | .2494E+00 | 20 | .4993E-14 |
| 21 | .1497E-23 | 22 | .4993E-10 | 23 | .4994E-10 | 24 | .4993E-10 |
| 25 | .1499E-23 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

XXXX ITERATION 1 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .0000E+01 | 2  | .0000E+01 | 3  | .0000E+01 | 4  | .0000E+01 |
| 5  | .0000E+01 | 6  | .0000E+01 | 7  | .6341E+00 | 8  | .1626E+03 |
| 9  | .5944E+03 | 10 | .5943E-11 | 11 | .0000E+01 | 12 | .2694E+03 |
| 13 | .2433E+03 | 14 | .7290E+03 | 15 | .7289E-11 | 16 | .0000E+01 |
| 17 | .2426E+03 | 18 | .2835E+03 | 19 | .6342E+03 | 20 | .6342E-11 |
| 21 | .0000E+01 | 22 | .2426E-07 | 23 | .2834E-07 | 24 | .6342E-07 |
| 25 | .1268E-20 |    |           |    |           |    |           |

XXXX ITERATION 2 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .0000E+01 | 2  | .6340E-10 | 3  | .1626E-07 | 4  | .5943E-07 |
| 5  | .1189E-20 | 6  | .6340E-14 | 7  | .1341E+03 | 8  | .2843E+03 |
| 9  | .9589E+03 | 10 | .9588E-11 | 11 | .2694E-11 | 12 | .4580E+03 |
| 13 | .4459E+03 | 14 | .1228E+04 | 15 | .1228E-10 | 16 | .2426E-11 |
| 17 | .3369E+03 | 18 | .3848E+03 | 19 | .9838E+03 | 20 | .8838E-11 |
| 21 | .4851E-21 | 22 | .3369E-07 | 23 | .3847E-07 | 24 | .8838E-07 |
| 25 | .1767E-20 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0000E+00 THETA ERROR=0.0000E+00 OMEGA ERROR=1.0000E+00

NUMBER OF OUTER ITERATIONS= 1

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
 ITERATION 2 FOLLOWS NOW  
 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXX ITERATION 1 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .0000E+01 | 2  | .0000E+01 | 3  | .0000E+01 | 4  | .0000E+01 |
| 5  | .0000E+01 | 6  | .0000E+01 | 7  | .4513E+00 | 8  | .1164E+02 |
| 9  | .1524E+02 | 10 | .1524E-12 | 11 | .0000E+01 | 12 | .3747E+01 |
| 13 | .1806E+02 | 14 | .2935E+02 | 15 | .2934E-12 | 16 | .0000E+01 |
| 17 | .5637E+01 | 18 | .1489E+02 | 19 | .3103E+02 | 20 | .3102E-12 |
| 21 | .0000E+01 | 22 | .5636E-09 | 23 | .1499E-08 | 24 | .3102E-08 |
| 25 | .6204E-22 |    |           |    |           |    |           |

XXXX ITERATION 2 FOLLOWS NOW XXXX

|    |            |    |            |    |            |    |            |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .0000E+01  | 2  | .9512E-10  | 3  | -.1154E-08 | 4  | -.1524E-06 |
| 5  | -.3047E-23 | 6  | .4512E-14  | 7  | .2324E+01  | 8  | -.2067E+02 |
| 9  | -.2991E+02 | 10 | -.2991E-12 | 11 | .3747E-13  | 12 | .7501E+01  |
| 13 | -.3003E+02 | 14 | -.5219E+02 | 15 | -.5219E-12 | 16 | -.5636E-13 |
| 17 | .7513E+01  | 18 | -.2088E+02 | 19 | -.4245E+02 | 20 | -.4245E-12 |
| 21 | .1127E-22  | 22 | .7512E-09  | 23 | -.2088E-08 | 24 | -.4245E-08 |
| 25 | -.8488E-22 |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

XXXX ITERATION 1 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1500E-09 | 7  | .4882E+00 | 8  | .4819E+00 |
| 9  | .5412E+00 | 10 | .1500E-09 | 11 | .9975E-14 | 12 | .2278E+00 |
| 13 | .2068E+00 | 14 | .2964E+00 | 15 | .1285E-13 | 16 | .4987E-14 |
| 17 | .1037E+00 | 18 | .7493E-01 | 19 | .1364E+00 | 20 | .6356E-14 |
| 21 | .1996E-23 | 22 | .6029E-10 | 23 | .5742E-10 | 24 | .6356E-10 |
| 25 | .2769E-23 |    |           |    |           |    |           |

XXXX ITERATION 2 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1500E-09 | 7  | .6021E+00 | 8  | .5853E+00 |
| 9  | .6843E+00 | 10 | .1500E-09 | 11 | .1225E-13 | 12 | .3366E+00 |
| 13 | .2940E+00 | 14 | .4261E+00 | 15 | .1425E-13 | 16 | .6024E-14 |
| 17 | .1581E+00 | 18 | .1194E+00 | 19 | .2063E+00 | 20 | .7055E-14 |
| 21 | .2702E-23 | 22 | .6573E-10 | 23 | .6189E-10 | 24 | .7055E-10 |
| 25 | .2909E-23 |    |           |    |           |    |           |

XXXX ITERATION 3 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1500E-09 | 7  | .6565E+00 | 8  | .6299E+00 |
| 9  | .7542E+00 | 10 | .1500E-09 | 11 | .1234E-13 | 12 | .3910E+00 |
| 13 | .3405E+00 | 14 | .4960E+00 | 15 | .1495E-13 | 16 | .6568E-14 |
| 17 | .1853E+00 | 18 | .1417E+00 | 19 | .2412E+00 | 20 | .7405E-14 |
| 21 | .2811E-23 | 22 | .6845E-10 | 23 | .6411E-10 | 24 | .7405E-10 |
| 25 | .2979E-23 |    |           |    |           |    |           |

XXXX ITERATION 4 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1500E-09 | 7  | .6937E+00 | 8  | .6522E+00 |
| 9  | .7992E+00 | 10 | .1500E-09 | 11 | .1388E-13 | 12 | .4182E+00 |
| 13 | .3628E+00 | 14 | .5309E+00 | 15 | .1529E-13 | 16 | .6840E-14 |
| 17 | .1989E+00 | 18 | .1528E+00 | 19 | .2587E+00 | 20 | .7579E-14 |
| 21 | .2865E-23 | 22 | .6981E-10 | 23 | .6522E-10 | 24 | .7579E-10 |
| 25 | .3014E-23 |    |           |    |           |    |           |

XXXX ITERATION 5 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1500E-09 | 7  | .6973E+00 | 8  | .6634E+00 |
| 9  | .8066E+00 | 10 | .1500E-09 | 11 | .1416E-13 | 12 | .4318E+00 |
| 13 | .3740E+00 | 14 | .5484E+00 | 15 | .1547E-13 | 16 | .6976E-14 |
| 17 | .2057E+00 | 18 | .1584E+00 | 19 | .2674E+00 | 20 | .7666E-14 |
| 21 | .2892E-23 | 22 | .7049E-10 | 23 | .6578E-10 | 24 | .7666E-10 |
| 25 | .3031E-23 |    |           |    |           |    |           |

XXXX ITERATION 6 FOLLOWS NOW XXXX

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1500E-09 | 7  | .7091E+00 | 8  | .6689E+00 |
| 9  | .8159E+00 | 10 | .1500E-09 | 11 | .1439E-13 | 12 | .4386E+00 |
| 13 | .3796E+00 | 14 | .5571E+00 | 15 | .1556E-13 | 16 | .7044E-14 |
| 17 | .2091E+00 | 18 | .1412E+00 | 19 | .2719E+00 | 20 | .7710E-14 |
| 21 | .2906E-23 | 22 | .7083E-10 | 23 | .6606E-10 | 24 | .7710E-10 |
| 25 | .2040E-23 |    |           |    |           |    |           |

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\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1500E-09 | 7  | .7075E+00 | 8  | .6717E+00 |
| 9  | .8197E+00 | 10 | .1500E-09 | 11 | .1436E-13 | 12 | .4420E+00 |
| 13 | .3823E+00 | 14 | .5615E+00 | 15 | .1560E-13 | 16 | .7078E-14 |
| 17 | .2108E+00 | 18 | .1626E+00 | 19 | .2739E+00 | 20 | .7732E-14 |
| 21 | .2913E-23 | 22 | .7100E-10 | 23 | .6620E-10 | 24 | .7732E-10 |
| 25 | .2044E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1500E-09 | 7  | .7092E+00 | 8  | .6731E+00 |
| 9  | .8219E+00 | 10 | .1500E-09 | 11 | .1439E-13 | 12 | .4437E+00 |
| 13 | .3897E+00 | 14 | .5637E+00 | 15 | .1562E-13 | 16 | .7095E-14 |
| 17 | .2116E+00 | 18 | .1633E+00 | 19 | .2750E+00 | 20 | .7743E-14 |
| 21 | .2916E-23 | 22 | .7109E-10 | 23 | .6627E-10 | 24 | .7743E-10 |
| 25 | .2047E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .1500E-09 | 7  | .7100E+00 | 8  | .6738E+00 |
| 9  | .8230E+00 | 10 | .1500E-09 | 11 | .1441E-13 | 12 | .4446E+00 |
| 13 | .3944E+00 | 14 | .5648E+00 | 15 | .1563E-13 | 16 | .7103E-14 |
| 17 | .2120E+00 | 18 | .1637E+00 | 19 | .2756E+00 | 20 | .7748E-14 |
| 21 | .2918E-23 | 22 | .7113E-10 | 23 | .6630E-10 | 24 | .7748E-10 |
| 25 | .2049E-23 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.1444E-12 | 2  | -.7437E+02 | 3  | .6614E+03  | 4  | .9572E+03  |
| 5  | .1914E-10  | 6  | -.7437E-02 | 7  | .9170E+01  | 8  | .4030E+03  |
| 9  | .1044E+04  | 10 | .1044E-10  | 11 | -.2400E-01 | 12 | -.1958E+03 |
| 13 | .2982E+03  | 14 | .9001E+03  | 15 | .9000E-11  | 16 | -.2404E-01 |
| 17 | -.1607E+03 | 18 | .2905E+03  | 19 | .6652E+03  | 20 | .6651E-11  |
| 21 | -.4207E-11 | 22 | -.2404E+03 | 23 | .6681E+03  | 24 | .1358E+04  |
| 25 | .2717E-10  |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.1632E-11 | 2  | -.7437E+02 | 3  | .6614E+03  | 4  | .9572E+03  |
| 5  | .1914E-10  | 6  | -.7437E-02 | 7  | -.8969E+02 | 8  | .5522E+03  |
| 9  | .1494E+04  | 10 | .1494E-10  | 11 | -.2400E-01 | 12 | -.3250E+03 |
| 13 | .5181E+03  | 14 | .1458E+04  | 15 | .1158E-10  | 16 | -.2404E-01 |
| 17 | -.3455E+03 | 18 | .7345E+03  | 19 | .1623E+04  | 20 | .1623E-10  |
| 21 | -.6611E-11 | 22 | -.2404E+03 | 23 | .6681E+03  | 24 | .1358E+04  |
| 25 | .2717E-10  |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

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 ITERATION 3 FOLLOWS NOW  
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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .0000E+01  | 2  | .4512E-10  | 3  | -.1167E-08 | 4  | -.1524E-08 |
| 5  | -.4571E-22 | 6  | .4512E-14  | 7  | -.1406E+01 | 8  | -.1953E+02 |
| 9  | -.2816E+02 | 10 | -.5807E-12 | 11 | .3747E-13  | 12 | -.1591E+00 |
| 13 | -.2889E+02 | 14 | -.4380E+02 | 15 | -.9599E-12 | 16 | .5636E-13  |
| 17 | .6124E+00  | 18 | -.3423E+02 | 19 | -.5293E+02 | 20 | -.9537E-12 |
| 21 | .1691E-22  | 22 | .8124E-09  | 23 | -.5511E-08 | 24 | -.9537E-08 |
| 25 | -.2756E-21 |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .9024E-24  | 2  | -.9542E-10 | 3  | -.3111E-08 | 4  | -.4340E-08 |
| 5  | -.1319E-21 | 6  | -.9542E-14 | 7  | -.1486E+01 | 8  | -.3397E+02 |
| 9  | -.5006E+02 | 10 | -.7776E-12 | 11 | .3586E-13  | 12 | .1054E+00  |
| 13 | -.5322E+02 | 14 | -.8122E+02 | 15 | -.1334E-11 | 16 | .6249E-13  |
| 17 | .7429E+00  | 18 | -.4640E+02 | 19 | -.7164E+02 | 20 | -.1141E-11 |
| 21 | .2564E-22  | 22 | .8255E-09  | 23 | -.6727E-08 | 24 | -.1141E-07 |
| 25 | -.3130E-21 |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|------------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01  | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01  | 6  | .2000E-09 | 7  | .4724E+00 | 8  | .4593E+00 |
| 9  | .5579E+00  | 10 | .2000E-09 | 11 | .1441E-13 | 12 | .2059E+00 |
| 13 | .1814E+00  | 14 | .3038E+00 | 15 | .1867E-13 | 16 | .7103E-14 |
| 17 | -.8571E-01 | 18 | .5998E-01 | 19 | .1585E+00 | 20 | .9334E-14 |
| 21 | .3628E-23  | 22 | .7970E-10 | 23 | .7230E-10 | 24 | .9334E-10 |
| 25 | .4914E-23  |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2000E-09 | 7  | .5753E+00 | 8  | .5501E+00 |
| 9  | .7098E+00 | 10 | .2000E-09 | 11 | .1647E-13 | 12 | .3002E+00 |
| 13 | .2568E+00 | 14 | .4591E+00 | 15 | .2022E-13 | 16 | .7960E-14 |
| 17 | .1329E+00 | 18 | .9767E-01 | 19 | .2362E+00 | 20 | .1011E-13 |
| 21 | .4511E-23 | 22 | .8441E-10 | 23 | .7607E-10 | 24 | .1011E-09 |
| 25 | .5069E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2000E-09 | 7  | .6225E+00 | 8  | .5878E+00 |
| 9  | .7874E+00 | 10 | .2000E-09 | 11 | .1741E-13 | 12 | .3473E+00 |
| 13 | .2945E+00 | 14 | .5367E+00 | 15 | .2100E-13 | 16 | .8432E-14 |
| 17 | .1565E+00 | 18 | .1165E+00 | 19 | .2749E+00 | 20 | .1050E-13 |
| 21 | .4605E-23 | 22 | .8677E-10 | 23 | .7795E-10 | 24 | .1050E-09 |
| 25 | .5147E-23 |    |           |    |           |    |           |

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2000E-09 | 7  | .6461E+00 | 8  | .6066E+00 |
| 9  | .8262E+00 | 10 | .2000E-09 | 11 | .1788E-13 | 12 | .3709E+00 |
| 13 | .3133E+00 | 14 | .5755E+00 | 15 | .2139E-13 | 16 | .8667E-14 |
| 17 | .1682E+00 | 18 | .1259E+00 | 19 | .2943E+00 | 20 | .1069E-13 |
| 21 | .4652E-23 | 22 | .8795E-10 | 23 | .7890E-10 | 24 | .1069E-09 |
| 25 | .5186E-23 |    |           |    |           |    |           |

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\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2000E-09 | 7  | .6579E+00 | 8  | .6161E+00 |
| 9  | .8456E+00 | 10 | .2000E-09 | 11 | .1812E-13 | 12 | .3827E+00 |
| 13 | .3228E+00 | 14 | .5948E+00 | 15 | .2158E-13 | 16 | .8785E-14 |
| 17 | .1741E+00 | 18 | .1307E+00 | 19 | .3040E+00 | 20 | .1079E-13 |
| 21 | .4676E-23 | 22 | .8854E-10 | 23 | .7937E-10 | 24 | .1079E-09 |
| 25 | .5205E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2000E-09 | 7  | .6638E+00 | 8  | .6208E+00 |
| 9  | .8553E+00 | 10 | .2000E-09 | 11 | .1824E-13 | 12 | .3886E+00 |
| 13 | .3275E+00 | 14 | .6045E+00 | 15 | .2168E-13 | 16 | .8844E-14 |
| 17 | .1771E+00 | 18 | .1330E+00 | 19 | .3089E+00 | 20 | .1084E-13 |
| 21 | .4688E-23 | 22 | .8883E-10 | 23 | .7960E-10 | 24 | .1084E-09 |
| 25 | .5215E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2000E-09 | 7  | .6667E+00 | 8  | .6231E+00 |
| 9  | .8601E+00 | 10 | .2000E-09 | 11 | .1830E-13 | 12 | .3915E+00 |
| 13 | .3299E+00 | 14 | .6094E+00 | 15 | .2173E-13 | 16 | .8874E-14 |
| 17 | .1786E+00 | 18 | .1342E+00 | 19 | .3113E+00 | 20 | .1086E-13 |
| 21 | .4693E-23 | 22 | .8898E-10 | 23 | .7972E-10 | 24 | .1086E-09 |
| 25 | .5220E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2000E-09 | 7  | .6682E+00 | 8  | .6243E+00 |
| 9  | .8626E+00 | 10 | .2000E-09 | 11 | .1833E-13 | 12 | .3930E+00 |
| 13 | .3310E+00 | 14 | .6118E+00 | 15 | .2175E-13 | 16 | .8888E-14 |
| 17 | .1793E+00 | 18 | .1348E+00 | 19 | .3125E+00 | 20 | .1087E-13 |
| 21 | .4696E-23 | 22 | .8906E-10 | 23 | .7978E-10 | 24 | .1087E-09 |
| 25 | .5222E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2000E-09 | 7  | .6689E+00 | 8  | .6249E+00 |
| 9  | .8638E+00 | 10 | .2000E-09 | 11 | .1834E-13 | 12 | .3938E+00 |
| 13 | .3316E+00 | 14 | .6130E+00 | 15 | .2176E-13 | 16 | .8896E-14 |
| 17 | .1797E+00 | 18 | .1351E+00 | 19 | .3131E+00 | 20 | .1088E-13 |
| 21 | .4698E-23 | 22 | .8909E-10 | 23 | .7981E-10 | 24 | .1088E-09 |
| 25 | .5223E-23 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .3053E-12  | 2  | .4755E+02  | 3  | .1087E+04  | 4  | .1602E+04  |
| 5  | .4161E-10  | 6  | .1569E-22  | 7  | .8273E+02  | 8  | .4685E+03  |
| 9  | .1390E+04  | 10 | .1389E-10  | 11 | -.3374E-03 | 12 | -.1252E+03 |
| 13 | .2743E+03  | 14 | .1020E+04  | 15 | .1019E-10  | 16 | -.2377E-02 |
| 17 | -.6626E+02 | 18 | .4067E+03  | 19 | .6317E+03  | 20 | .6316E-11  |
| 21 | -.2237E-11 | 22 | -.2377E+02 | 23 | .1485E+04  | 24 | .2292E+04  |
| 25 | .5943E-10  |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .7808E-12  | 2  | .4755E+02  | 3  | .1087E+04  | 4  | .1602E+04  |
| 5  | .4161E-10  | 6  | .8103E-12  | 7  | .2014E+02  | 8  | .6057E+03  |
| 9  | .1899E+04  | 10 | .1899E-10  | 11 | -.3374E-03 | 12 | -.1896E+03 |
| 13 | .5463E+03  | 14 | .1590E+04  | 15 | .1590E-10  | 16 | -.2377E-02 |
| 17 | -.1103E+03 | 18 | .1285E+04  | 19 | .2063E+04  | 20 | .2063E-10  |
| 21 | -.2475E-11 | 22 | -.2377E+02 | 23 | .1485E+04  | 24 | .2292E+04  |
| 25 | .5943E-10  |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.5640E+00 THETA ERROR=1.1990E-01 OMEGA ERROR=5.4036E+00

NUMBER OF OUTER ITERATIONS= 3

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 ITERATION 4 FOLLOWS NOW  
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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | .9024E-24  | 2  | -.9542E-10 | 3  | -.3116E-08 | 4  | -.4340E-08 |
| 5  | -.1753E-21 | 6  | -.9542E-14 | 7  | -.3716E+01 | 8  | -.2433E+02 |
| 9  | -.3674E+02 | 10 | -.1167E-11 | 11 | .3588E-13  | 12 | -.5928E+01 |
| 13 | -.3651E+02 | 14 | -.5269E+02 | 15 | -.1861E-11 | 16 | .6249E-13  |
| 17 | -.1069E+02 | 18 | -.5277E+02 | 19 | -.6767E+02 | 20 | -.1817E-11 |
| 21 | .3189E-22  | 22 | -.2435E-09 | 23 | -.1200E-07 | 24 | -.1817E-07 |
| 25 | -.6765E-21 |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.1006E-23 | 2  | -.4670E-09 | 3  | -.5549E-08 | 4  | -.8014E-08 |
| 5  | -.3287E-21 | 6  | -.4670E-13 | 7  | -.6681E+01 | 8  | -.4259E+02 |
| 9  | -.6309E+02 | 10 | -.1430E-11 | 11 | -.2539E-13 | 12 | -.1276E+02 |
| 13 | -.7203E+02 | 14 | -.9970E+02 | 15 | -.2331E-11 | 16 | -.4441E-13 |
| 17 | -.1411E+02 | 18 | -.7053E+02 | 19 | -.9118E+02 | 20 | -.2052E-11 |
| 21 | .1877E-22  | 22 | -.5852E-09 | 23 | -.1378E-07 | 24 | -.2052E-07 |
| 25 | -.7235E-21 |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2500E-09 | 7  | .4588E+00 | 8  | .4425E+00 |
| 9  | .5656E+00 | 10 | .2500E-09 | 11 | .1934E-13 | 12 | .1887E+00 |
| 13 | .1687E+00 | 14 | .3127E+00 | 15 | .2489E-13 | 16 | .8896E-14 |
| 17 | .7263E-01 | 18 | .6058E-01 | 19 | .1770E+00 | 20 | .1265E-13 |
| 21 | .5587E-23 | 22 | .9635E-10 | 23 | .8587E-10 | 24 | .1265E-09 |
| 25 | .7753E-23 |    |           |    |           |    |           |

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2500E-09 | 7  | .5532E+00 | 8  | .5269E+00 |
| 9  | .7220E+00 | 10 | .2500E-09 | 11 | .2023E-13 | 12 | .2722E+00 |
| 13 | .2412E+00 | 14 | .4794E+00 | 15 | .2656E-13 | 16 | .9622E-14 |
| 17 | .1144E+00 | 18 | .9683E-01 | 19 | .2603E+00 | 20 | .1348E-13 |
| 21 | .6623E-23 | 22 | .1005E-09 | 23 | .8949E-10 | 24 | .1348E-09 |
| 25 | .7919E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2500E-09 | 7  | .5949E+00 | 8  | .5631E+00 |
| 9  | .8053E+00 | 10 | .2500E-09 | 11 | .2106E-13 | 12 | .3139E+00 |
| 13 | .2775E+00 | 14 | .5627E+00 | 15 | .2739E-13 | 16 | .1004E-13 |
| 17 | .1352E+00 | 18 | .1150E+00 | 19 | .3020E+00 | 20 | .1390E-13 |
| 21 | .6707E-23 | 22 | .1026E-09 | 23 | .9131E-10 | 24 | .1390E-09 |
| 25 | .8003E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2500E-09 | 7  | .6158E+00 | 8  | .5813E+00 |
| 9  | .8469E+00 | 10 | .2500E-09 | 11 | .2148E-13 | 12 | .3348E+00 |
| 13 | .2956E+00 | 14 | .6043E+00 | 15 | .2781E-13 | 16 | .1025E-13 |
| 17 | .1457E+00 | 18 | .1240E+00 | 19 | .3228E+00 | 20 | .1411E-13 |
| 21 | .6749E-23 | 22 | .1037E-09 | 23 | .9221E-10 | 24 | .1411E-09 |
| 25 | .8044E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2500E-09 | 7  | .6262E+00 | 8  | .5904E+00 |
| 9  | .8678E+00 | 10 | .2500E-09 | 11 | .2169E-13 | 12 | .3452E+00 |
| 13 | .3047E+00 | 14 | .6252E+00 | 15 | .2801E-13 | 16 | .1035E-13 |
| 17 | .1509E+00 | 18 | .1286E+00 | 19 | .3332E+00 | 20 | .1421E-13 |
| 21 | .6770E-23 | 22 | .1042E-09 | 23 | .9267E-10 | 24 | .1421E-09 |
| 25 | .8065E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2500E-09 | 7  | .6315E+00 | 8  | .5949E+00 |
| 9  | .8782E+00 | 10 | .2500E-09 | 11 | .2179E-13 | 12 | .3504E+00 |
| 13 | .3093E+00 | 14 | .6356E+00 | 15 | .2812E-13 | 16 | .1040E-13 |
| 17 | .1535E+00 | 18 | .1308E+00 | 19 | .3384E+00 | 20 | .1426E-13 |
| 21 | .6780E-23 | 22 | .1044E-09 | 23 | .9289E-10 | 24 | .1426E-09 |
| 25 | .8076E-23 |    |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2500E-09 | 7  | .6341E+00 | 8  | .5972E+00 |
| 9  | .8864E+00 | 10 | .2500E-09 | 11 | .2185E-13 | 12 | .3530E+00 |
| 13 | .3115E+00 | 14 | .6408E+00 | 15 | .2817E-13 | 16 | .1043E-13 |
| 17 | .1545E+00 | 18 | .1320E+00 | 19 | .3410E+00 | 20 | .1429E-13 |
| 21 | .6785E-23 | 22 | .1046E-09 | 23 | .9301E-10 | 24 | .1429E-09 |
| 25 | .8081E-23 |    |           |    |           |    |           |

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2500E-09 | 7  | .6354E+00 | 8  | .5983E+00 |
| 9  | .8860E+00 | 10 | .2500E-09 | 11 | .2187E-13 | 12 | .3544E+00 |
| 13 | .3127E+00 | 14 | .6434E+00 | 15 | .2820E-13 | 16 | .1044E-13 |
| 17 | .1555E+00 | 18 | .1325E+00 | 19 | .3423E+00 | 20 | .1430E-13 |
| 21 | .6788E-23 | 22 | .1046E-09 | 23 | .9306E-10 | 24 | .1430E-09 |
| 25 | .8083E-23 |    |           |    |           |    |           |

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\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .2500E-09 | 7  | .6360E+00 | 8  | .5989E+00 |
| 9  | .8873E+00 | 10 | .2500E-09 | 11 | .2188E-13 | 12 | .3550E+00 |
| 13 | .3132E+00 | 14 | .6447E+00 | 15 | .2821E-13 | 16 | .1045E-13 |
| 17 | .1558E+00 | 18 | .1328E+00 | 19 | .3429E+00 | 20 | .1431E-13 |
| 21 | .6789E-23 | 22 | .1047E-09 | 23 | .9309E-10 | 24 | .1431E-09 |
| 25 | .8085E-23 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |            |
|----|-----------|----|-----------|----|-----------|----|------------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP       |
| 1  | .1494E-11 | 2  | .2138E+03 | 3  | .1363E+04 | 4  | .2019E+04  |
| 5  | .6596E-10 | 6  | .7576E-22 | 7  | .1614E+03 | 8  | .4668E+03  |
| 9  | .1618E+04 | 10 | .1618E-10 | 11 | .4578E-14 | 12 | -.4737E+02 |
| 13 | .2497E+03 | 14 | .1093E+04 | 15 | .1093E-10 | 16 | .7459E-14  |
| 17 | .7901E+02 | 18 | .5283E+03 | 19 | .5253E+03 | 20 | .5252E-11  |
| 21 | .1421E-11 | 22 | .4514E+03 | 23 | .2257E+04 | 24 | .2918E+04  |
| 25 | .9485E-10 |    |           |    |           |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |            |    |            |
|----|-----------|----|-----------|----|------------|----|------------|
| I  | TEMP      | I  | TEMP      | I  | TEMP       | I  | TEMP       |
| 1  | .3632E-11 | 2  | .2138E+03 | 3  | .1363E+04  | 4  | .2019E+04  |
| 5  | .6596E-10 | 6  | .1614E-11 | 7  | .1377E+03  | 8  | .5917E+03  |
| 9  | .2164E+04 | 10 | .2164E-10 | 11 | -.4691E-12 | 12 | -.1969E+02 |
| 13 | .5763E+03 | 14 | .1629E+04 | 15 | .1629E-10  | 16 | .7974E-12  |
| 17 | .3186E+03 | 18 | .1820E+04 | 19 | .2252E+04  | 20 | .2252E-10  |
| 21 | .5935E-11 | 22 | .4514E+03 | 23 | .2257E+04  | 24 | .2918E+04  |
| 25 | .9485E-10 |    |           |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=1.0527E+00 THETA ERROR=8.6942E-02 OMEGA ERROR=1.3463E+00

NUMBER OF OUTER ITERATIONS= 4

\*\*\*\*\*  
 ITERATION 5 FOLLOWS NOW  
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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |            |    |            |    |            |    |            |
|----|------------|----|------------|----|------------|----|------------|
| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
| 1  | -.1006E-23 | 2  | -.4670E-09 | 3  | -.5549E-08 | 4  | -.8014E-08 |
| 5  | -.4089E-21 | 6  | -.4670E-13 | 7  | -.6164E+01 | 8  | -.2728E+02 |
| 9  | -.4199E+02 | 10 | -.1850E-11 | 11 | -.2339E-13 | 12 | -.1278E+02 |
| 13 | -.4190E+02 | 14 | -.5735E+02 | 15 | -.2904E-11 | 16 | -.4441E-13 |
| 17 | -.2536E+02 | 18 | -.6873E+02 | 19 | -.7623E+02 | 20 | -.2815E-11 |
| 21 | .1433E-22  | 22 | -.3121E-08 | 23 | -.2065E-07 | 24 | -.2815E-07 |
| 25 | -.1286E-20 |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |            |    |            |    |            |    |            |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.1034E-22 | 2  | -.1083E-08 | 3  | -.3277E-08 | 4  | -.1221E-07 |
| 5  | -.6359E-21 | 6  | -.1083E-12 | 7  | -.1255E+02 | 8  | -.4823E+02 |
| 9  | -.7066E+02 | 10 | -.2137E-11 | 11 | -.1512E-12 | 12 | -.2866E+02 |
| 13 | -.8674E+02 | 14 | -.1098E+03 | 15 | -.3429E-11 | 16 | -.2980E-12 |
| 17 | -.3330E+02 | 18 | -.9115E+02 | 19 | -.1025E+03 | 20 | -.3077E-11 |
| 21 | -.4224E-22 | 22 | -.3915E-08 | 23 | -.2239E-07 | 24 | -.3077E-07 |
| 25 | -.1339E-20 |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3000E-09 | 7  | .4472E+00 | 8  | .4331E+00 |
| 9  | .5690E+00 | 10 | .3000E-09 | 11 | .2188E-13 | 12 | .1749E+00 |
| 13 | .1653E+00 | 14 | .3175E+00 | 15 | .3138E-13 | 16 | .1045E-13 |
| 17 | .6363E-01 | 18 | .6862E-01 | 19 | .1909E+00 | 20 | .1622E-13 |
| 21 | .7234E-23 | 22 | .1110E-09 | 23 | .9995E-10 | 24 | .1622E-09 |
| 25 | .1133E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3000E-09 | 7  | .5347E+00 | 8  | .5157E+00 |
| 9  | .7278E+00 | 10 | .3000E-09 | 11 | .2363E-13 | 12 | .2504E+00 |
| 13 | .2409E+00 | 14 | .4924E+00 | 15 | .3313E-13 | 16 | .1109E-13 |
| 17 | .1014E+00 | 18 | .1065E+00 | 19 | .2783E+00 | 20 | .1709E-13 |
| 21 | .9008E-23 | 22 | .1148E-09 | 23 | .1037E-09 | 24 | .1709E-09 |
| 25 | .1150E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3000E-09 | 7  | .5725E+00 | 8  | .5536E+00 |
| 9  | .8152E+00 | 10 | .3000E-09 | 11 | .2439E-13 | 12 | .2882E+00 |
| 13 | .2787E+00 | 14 | .5798E+00 | 15 | .3401E-13 | 16 | .1146E-13 |
| 17 | .1203E+00 | 18 | .1254E+00 | 19 | .3220E+00 | 20 | .1753E-13 |
| 21 | .9083E-23 | 22 | .1167E-09 | 23 | .1056E-09 | 24 | .1753E-09 |
| 25 | .1159E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3000E-09 | 7  | .5913E+00 | 8  | .5725E+00 |
| 9  | .8589E+00 | 10 | .3000E-09 | 11 | .2477E-13 | 12 | .3071E+00 |
| 13 | .2977E+00 | 14 | .6234E+00 | 15 | .3444E-13 | 16 | .1165E-13 |
| 17 | .1297E+00 | 18 | .1348E+00 | 19 | .3438E+00 | 20 | .1775E-13 |
| 21 | .9121E-23 | 22 | .1176E-09 | 23 | .1066E-09 | 24 | .1775E-09 |
| 25 | .1163E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3000E-09 | 7  | .6008E+00 | 8  | .5820E+00 |
| 9  | .8807E+00 | 10 | .3000E-09 | 11 | .2495E-13 | 12 | .3165E+00 |
| 13 | .3071E+00 | 14 | .6453E+00 | 15 | .3466E-13 | 16 | .1175E-13 |
| 17 | .1345E+00 | 18 | .1396E+00 | 19 | .3547E+00 | 20 | .1786E-13 |
| 21 | .9140E-23 | 22 | .1181E-09 | 23 | .1070E-09 | 24 | .1786E-09 |
| 25 | .1166E-22 |    |           |    |           |    |           |

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3000E-09 | 7  | .6055E+00 | 8  | .5867E+00 |
| 9  | .8917E+00 | 10 | .3000E-09 | 11 | .2505E-13 | 12 | .3212E+00 |
| 13 | .3119E+00 | 14 | .6562E+00 | 15 | .3477E-13 | 16 | .1179E-13 |
| 17 | .1368E+00 | 18 | .1419E+00 | 19 | .3602E+00 | 20 | .1791E-13 |
| 21 | .9149E-23 | 22 | .1183E-09 | 23 | .1073E-09 | 24 | .1791E-09 |
| 25 | .1167E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3000E-09 | 7  | .6079E+00 | 8  | .5891E+00 |
| 9  | .9971E+00 | 10 | .3000E-09 | 11 | .2510E-13 | 12 | .3236E+00 |
| 13 | .3142E+00 | 14 | .6617E+00 | 15 | .3482E-13 | 16 | .1182E-13 |
| 17 | .1380E+00 | 18 | .1431E+00 | 19 | .3529E+00 | 20 | .1794E-13 |
| 21 | .9154E-23 | 22 | .1185E-09 | 23 | .1074E-09 | 24 | .1794E-09 |
| 25 | .1167E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3000E-09 | 7  | .6090E+00 | 8  | .5902E+00 |
| 9  | .8998E+00 | 10 | .3000E-09 | 11 | .2512E-13 | 12 | .3248E+00 |
| 13 | .3154E+00 | 14 | .6644E+00 | 15 | .3485E-13 | 16 | .1183E-13 |
| 17 | .1386E+00 | 18 | .1437E+00 | 19 | .3643E+00 | 20 | .1795E-13 |
| 21 | .9157E-23 | 22 | .1185E-09 | 23 | .1075E-09 | 24 | .1795E-09 |
| 25 | .1167E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3000E-09 | 7  | .6096E+00 | 8  | .5908E+00 |
| 9  | .9012E+00 | 10 | .3000E-09 | 11 | .2513E-13 | 12 | .3254E+00 |
| 13 | .3160E+00 | 14 | .6658E+00 | 15 | .3487E-13 | 16 | .1184E-13 |
| 17 | .1389E+00 | 18 | .1440E+00 | 19 | .3650E+00 | 20 | .1796E-13 |
| 21 | .9158E-23 | 22 | .1186E-09 | 23 | .1075E-09 | 24 | .1796E-09 |
| 25 | .1168E-22 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .3467E-11 | 2  | .4017E+03 | 3  | .1543E+04 | 4  | .2261E+04 |
| 5  | .9099E-10 | 6  | .1753E-21 | 7  | .2475E+03 | 8  | .4577E+03 |
| 9  | .1753E+04 | 10 | .1753E-10 | 11 | .6839E-14 | 12 | .3814E+02 |
| 13 | .2272E+03 | 14 | .1140E+04 | 15 | .1140E-10 | 16 | .1097E-13 |
| 17 | .2659E+03 | 18 | .5652E+03 | 19 | .3888E+03 | 20 | .3888E-11 |
| 21 | .9536E-11 | 22 | .1066E+04 | 23 | .2917E+04 | 24 | .3279E+04 |
| 25 | .1312E-09 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .7484E-11 | 2  | .4017E+03 | 3  | .1543E+04 | 4  | .2261E+04 |
| 5  | .9099E-10 | 6  | .2475E-11 | 7  | .2666E+03 | 8  | .5714E+03 |
| 9  | .2323E+04 | 10 | .2323E-10 | 11 | .3882E-12 | 12 | .1807E+03 |
| 13 | .5667E+03 | 14 | .1620E+04 | 15 | .1620E-10 | 16 | .2670E-11 |
| 17 | .8700E+03 | 18 | .2193E+04 | 19 | .2268E+04 | 20 | .2267E-10 |
| 21 | .2019E-10 | 22 | .1066E+04 | 23 | .2917E+04 | 24 | .3279E+04 |
| 25 | .1312E-09 |    |           |    |           |    |           |

NUMBER OF OUTER ITERATIONS= 5

\*\*\*\*\*  
ITERATION 6 FOLLOWS NOW  
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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

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| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.1034E-22 | 2  | -.1083E-08 | 3  | -.8277E-08 | 4  | -.1221E-07 |
| 5  | -.7580E-21 | 6  | -.1083E-12 | 7  | -.8750E+01 | 8  | -.2929E+02 |
| 9  | -.4501E+02 | 10 | -.2587E-11 | 11 | -.1512E-12 | 12 | -.1978E+02 |
| 13 | -.4519E+02 | 14 | -.5927E+02 | 15 | -.4021E-11 | 16 | -.2980E-12 |
| 17 | -.4102E+02 | 18 | -.8044E+02 | 19 | -.7984E+02 | 20 | -.3875E-11 |
| 21 | -.7204E-22 | 22 | -.8017E-08 | 23 | -.3094E-07 | 24 | -.3875E-07 |
| 25 | -.2114E-20 |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.3201E-22 | 2  | -.1958E-08 | 3  | -.1121E-07 | 4  | -.1671E-07 |
| 5  | -.1062E-20 | 6  | -.1958E-12 | 7  | -.1864E+02 | 8  | -.5188E+02 |
| 9  | -.7465E+02 | 10 | -.2883E-11 | 11 | -.3490E-12 | 12 | -.4524E+02 |
| 13 | -.9671E+02 | 14 | -.1140E+03 | 15 | -.4569E-11 | 16 | -.7082E-12 |
| 17 | -.5375E+02 | 18 | -.1062E+03 | 19 | -.1072E+03 | 20 | -.4149E-11 |
| 21 | -.1932E-21 | 22 | -.9290E-08 | 23 | -.3351E-07 | 24 | -.4149E-07 |
| 25 | -.2168E-20 |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3500E-09 | 7  | .4371E+00 | 8  | .4297E+00 |
| 9  | .5705E+00 | 10 | .3500E-09 | 11 | .2513E-13 | 12 | .1638E+00 |
| 13 | .1674E+00 | 14 | .3202E+00 | 15 | .3807E-13 | 16 | .1184E-13 |
| 17 | .5852E-01 | 18 | .7989E-01 | 19 | .2031E+00 | 20 | .1996E-13 |
| 21 | .1034E-22 | 22 | .1244E-09 | 23 | .1155E-09 | 24 | .1996E-09 |
| 25 | .1567E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3500E-09 | 7  | .5190E+00 | 8  | .5134E+00 |
| 9  | .7307E+00 | 10 | .3500E-09 | 11 | .2677E-13 | 12 | .2340E+00 |
| 13 | .2492E+00 | 14 | .5003E+00 | 15 | .3987E-13 | 16 | .1242E-13 |
| 17 | .9362E-01 | 18 | .1208E+00 | 19 | .2901E+00 | 20 | .2086E-13 |
| 21 | .1164E-22 | 22 | .1279E-09 | 23 | .1196E-09 | 24 | .2086E-09 |
| 25 | .1585E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3500E-09 | 7  | .5541E+00 | 8  | .5543E+00 |
| 9  | .8207E+00 | 10 | .3500E-09 | 11 | .2747E-13 | 12 | .2691E+00 |
| 13 | .2901E+00 | 14 | .5903E+00 | 15 | .4077E-13 | 16 | .1277E-13 |
| 17 | .1112E+00 | 18 | .1413E+00 | 19 | .3351E+00 | 20 | .2131E-13 |
| 21 | .1171E-22 | 22 | .1297E-09 | 23 | .1216E-09 | 24 | .2131E-09 |
| 25 | .1594E-22 |    |           |    |           |    |           |

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3500E-09 | 7  | .5716E+00 | 8  | .5748E+00 |
| 9  | .8657E+00 | 10 | .3500E-09 | 11 | .2782E-13 | 12 | .2866E+00 |
| 13 | .3106E+00 | 14 | .6354E+00 | 15 | .4122E-13 | 16 | .1295E-13 |
| 17 | .1200E+00 | 18 | .1515E+00 | 19 | .3576E+00 | 20 | .3620E-13 |
| 21 | .1175E-22 | 22 | .1305E-09 | 23 | .1226E-09 | 24 | .1215E-09 |
| 25 | .1598E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3500E-09 | 7  | .5804E+00 | 8  | .5850E+00 |
| 9  | .8882E+00 | 10 | .3500E-09 | 11 | .2800E-13 | 12 | .2954E+00 |
| 13 | .3208E+00 | 14 | .6579E+00 | 15 | .4144E-13 | 16 | .1304E-13 |
| 17 | .1243E+00 | 18 | .1566E+00 | 19 | .3689E+00 | 20 | .2165E-13 |
| 21 | .1177E-22 | 22 | .1310E-09 | 23 | .1232E-09 | 24 | .2165E-09 |
| 25 | .1600E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3500E-09 | 7  | .5848E+00 | 8  | .5901E+00 |
| 9  | .8995E+00 | 10 | .3500E-09 | 11 | .2809E-13 | 12 | .2998E+00 |
| 13 | .3259E+00 | 14 | .6691E+00 | 15 | .4156E-13 | 16 | .1308E-13 |
| 17 | .1265E+00 | 18 | .1592E+00 | 19 | .3745E+00 | 20 | .2170E-13 |
| 21 | .1178E-22 | 22 | .1312E-09 | 23 | .1234E-09 | 24 | .2170E-09 |
| 25 | .1602E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3500E-09 | 7  | .5870E+00 | 8  | .5927E+00 |
| 9  | .9051E+00 | 10 | .3500E-09 | 11 | .2813E-13 | 12 | .3020E+00 |
| 13 | .3285E+00 | 14 | .6747E+00 | 15 | .4161E-13 | 16 | .1310E-13 |
| 17 | .1276E+00 | 18 | .1605E+00 | 19 | .3773E+00 | 20 | .2173E-13 |
| 21 | .1178E-22 | 22 | .1313E-09 | 23 | .1235E-09 | 24 | .2173E-09 |
| 25 | .1602E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3500E-09 | 7  | .5881E+00 | 8  | .5940E+00 |
| 9  | .9079E+00 | 10 | .3500E-09 | 11 | .2815E-13 | 12 | .3031E+00 |
| 13 | .3298E+00 | 14 | .6775E+00 | 15 | .4164E-13 | 16 | .1311E-13 |
| 17 | .1282E+00 | 18 | .1611E+00 | 19 | .3767E+00 | 20 | .2174E-13 |
| 21 | .1178E-22 | 22 | .1314E-09 | 23 | .1236E-09 | 24 | .2174E-09 |
| 25 | .1602E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .3500E-09 | 7  | .5886E+00 | 8  | .5946E+00 |
| 9  | .9093E+00 | 10 | .3500E-09 | 11 | .2816E-13 | 12 | .3037E+00 |
| 13 | .3304E+00 | 14 | .6789E+00 | 15 | .4165E-13 | 16 | .1312E-13 |
| 17 | .1285E+00 | 18 | .1614E+00 | 19 | .3794E+00 | 20 | .2175E-13 |
| 21 | .1178E-22 | 22 | .1314E-09 | 23 | .1236E-09 | 24 | .2175E-09 |
| 25 | .1603E-22 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF 1.0000E-13

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .6266E-11 | 2  | .5966E+03 | 3  | .1660E+04 | 4  | .2389E+04 |
| 5  | .1162E-09 | 6  | .3167E-21 | 7  | .3368E+03 | 8  | .4587E+03 |
| 9  | .1828E+04 | 10 | .1828E-10 | 11 | .9227E-14 | 12 | .1230E+03 |
| 13 | .2020E+03 | 14 | .1177E+04 | 15 | .1177E-10 | 16 | .1462E-13 |
| 17 | .4557E+03 | 18 | .4910E+03 | 19 | .2806E+03 | 20 | .2806E-11 |
| 21 | .2266E-10 | 22 | .1720E+04 | 23 | .3398E+04 | 24 | .3431E+04 |
| 25 | .1671E-09 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1223E-10 | 2  | .5966E+03 | 3  | .1660E+04 | 4  | .2389E+04 |
| 5  | .1162E-09 | 6  | .3368E-11 | 7  | .3783E+03 | 8  | .5598E+03 |
| 9  | .2417E+04 | 10 | .2417E-10 | 11 | .1239E-11 | 12 | .3816E+03 |
| 13 | .4980E+03 | 14 | .1612E+04 | 15 | .1612E-10 | 16 | .4572E-11 |
| 17 | .1445E+04 | 18 | .2338E+04 | 19 | .2213E+04 | 20 | .2213E-10 |
| 21 | .3986E-10 | 22 | .1720E+04 | 23 | .3398E+04 | 24 | .3431E+04 |
| 25 | .1671E-09 |    |           |    |           |    |           |

TERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=3.8044E-01 --THETA ERROR=1.0786E-01 OMEGA ERROR=5.2659E-01

NUMBER OF OUTER ITERATIONS= 6

\*\*\*\*\*  
 ITERATION 7 FOLLOWS NOW  
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\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.3201E-22 | 2  | -.1958E-08 | 3  | -.1121E-07 | 4  | -.1671E-07 |
| 5  | -.1229E-20 | 6  | -.1958E-12 | 7  | -.1122E+02 | 8  | -.3076E+02 |
| 9  | -.4677E+02 | 10 | -.3351E-11 | 11 | -.3490E-12 | 12 | -.2583E+02 |
| 13 | -.4662E+02 | 14 | -.5992E+02 | 15 | -.5168E-11 | 16 | -.7082E-12 |
| 17 | -.5518E+02 | 18 | -.8713E+02 | 19 | -.8037E+02 | 20 | -.4952E-11 |
| 21 | -.2640E-21 | 22 | -.1481E-07 | 23 | -.4222E-07 | 24 | -.4952E-07 |
| 25 | -.3159E-20 |    |            |    |            |    |            |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.7117E-22 | 2  | -.3080E-08 | 3  | -.1428E-07 | 4  | -.2139E-07 |
| 5  | -.1611E-20 | 6  | -.3080E-12 | 7  | -.2413E+02 | 8  | -.5407E+02 |
| 9  | -.7673E+02 | 10 | -.3651E-11 | 11 | -.6078E-12 | 12 | -.5987E+02 |
| 13 | -.1018E+03 | 14 | -.1151E+03 | 15 | -.5719E-11 | 16 | -.1260E-11 |
| 17 | -.7220E+02 | 18 | -.1147E+03 | 19 | -.1079E+03 | 20 | -.5228E-11 |
| 21 | -.4672E-21 | 22 | -.1651E-07 | 23 | -.4499E-07 | 24 | -.5228E-07 |
| 25 | -.3214E-20 |    |            |    |            |    |            |

TERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4000E-09 | 7  | .4296E+00 | 8  | .4297E+00 |
| 9  | .5715E+00 | 10 | .4000E-09 | 11 | .2816E-13 | 12 | .1557E+00 |
| 13 | .1717E+00 | 14 | .3218E+00 | 15 | .4437E-13 | 16 | .1312E-13 |
| 17 | .5684E-01 | 18 | .9088E-01 | 19 | .2047E+00 | 20 | .2380E-13 |
| 21 | .1309E-22 | 22 | .1371E-09 | 23 | .1327E-09 | 24 | .2380E-09 |
| 25 | .2078E-22 |    |           |    |           |    |           |

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4000E-09 | 7  | .5064E+00 | 8  | .5156E+00 |
| 9  | .7323E+00 | 10 | .4000E-09 | 11 | .2972E-13 | 12 | .2230E+00 |
| 13 | .2600E+00 | 14 | .5045E+00 | 15 | .4670E-13 | 16 | .1369E-13 |
| 17 | .9052E-01 | 18 | .1351E+00 | 19 | .2961E+00 | 20 | .2471E-13 |
| 21 | .1452E-22 | 22 | .1405E-09 | 23 | .1371E-09 | 24 | .2471E-09 |
| 25 | .2097E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4000E-09 | 7  | .5401E+00 | 8  | .5598E+00 |
| 9  | .8237E+00 | 10 | .4000E-09 | 11 | .3037E-13 | 12 | .2567E+00 |
| 13 | .3042E+00 | 14 | .5959E+00 | 15 | .4761E-13 | 16 | .1402E-13 |
| 17 | .1074E+00 | 18 | .1572E+00 | 19 | .3417E+00 | 20 | .2517E-13 |
| 21 | .1459E-22 | 22 | .1421E-09 | 23 | .1393E-09 | 24 | .2517E-09 |
| 25 | .2106E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4000E-09 | 7  | .5570E+00 | 8  | .5819E+00 |
| 9  | .8694E+00 | 10 | .4000E-09 | 11 | .3073E-13 | 12 | .2735E+00 |
| 13 | .3264E+00 | 14 | .6416E+00 | 15 | .4807E-13 | 16 | .1419E-13 |
| 17 | .1158E+00 | 18 | .1682E+00 | 19 | .3646E+00 | 20 | .2540E-13 |
| 21 | .1462E-22 | 22 | .1430E-09 | 23 | .1405E-09 | 24 | .2540E-09 |
| 25 | .2110E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4000E-09 | 7  | .5654E+00 | 8  | .5929E+00 |
| 9  | .8922E+00 | 10 | .4000E-09 | 11 | .3070E-13 | 12 | .2819E+00 |
| 13 | .3374E+00 | 14 | .6644E+00 | 15 | .4830E-13 | 16 | .1428E-13 |
| 17 | .1200E+00 | 18 | .1738E+00 | 19 | .3760E+00 | 20 | .2551E-13 |
| 21 | .1464E-22 | 22 | .1434E-09 | 23 | .1410E-09 | 24 | .2551E-09 |
| 25 | .2113E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4000E-09 | 7  | .5696E+00 | 8  | .5985E+00 |
| 9  | .9036E+00 | 10 | .4000E-09 | 11 | .3098E-13 | 12 | .2861E+00 |
| 13 | .3429E+00 | 14 | .6758E+00 | 15 | .4841E-13 | 16 | .1432E-13 |
| 17 | .1221E+00 | 18 | .1765E+00 | 19 | .3817E+00 | 20 | .2557E-13 |
| 21 | .1465E-22 | 22 | .1436E-09 | 23 | .1413E-09 | 24 | .2557E-09 |
| 25 | .2114E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4000E-09 | 7  | .5717E+00 | 8  | .6012E+00 |
| 9  | .9093E+00 | 10 | .4000E-09 | 11 | .3102E-13 | 12 | .2882E+00 |
| 13 | .3457E+00 | 14 | .6815E+00 | 15 | .4847E-13 | 16 | .1434E-13 |
| 17 | .1231E+00 | 18 | .1779E+00 | 19 | .3845E+00 | 20 | .2560E-13 |
| 21 | .1465E-22 | 22 | .1437E-09 | 23 | .1414E-09 | 24 | .2560E-09 |
| 25 | .2114E-22 |    |           |    |           |    |           |

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4000E-09 | 7  | .5727E+00 | 8  | .6026E+00 |
| 9  | .9122E+00 | 10 | .4000E-09 | 11 | .3104E-13 | 12 | .2893E+00 |
| 13 | .3471E+00 | 14 | .6844E+00 | 15 | .4850E-13 | 16 | .1435E-13 |
| 17 | .1237E+00 | 18 | .1786E+00 | 19 | .3860E+00 | 20 | .2561E-13 |
| 21 | .1465E-22 | 22 | .1438E-09 | 23 | .1415E-09 | 24 | .2561E-09 |
| 25 | .2115E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4000E-09 | 7  | .5733E+00 | 8  | .6033E+00 |
| 9  | .9136E+00 | 10 | .4000E-09 | 11 | .3106E-13 | 12 | .2898E+00 |
| 13 | .3478E+00 | 14 | .6858E+00 | 15 | .4851E-13 | 16 | .1435E-13 |
| 17 | .1239E+00 | 18 | .1790E+00 | 19 | .3867E+00 | 20 | .2562E-13 |
| 21 | .1466E-22 | 22 | .1438E-09 | 23 | .1415E-09 | 24 | .2562E-09 |
| 25 | .2115E-22 |    |           |    |           |    |           |

TERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .9855E-11 | 2  | .7722E+03 | 3  | .1730E+04 | 4  | .2455E+04 |
| 5  | .1414E-09 | 6  | .4979E-21 | 7  | .4190E+03 | 8  | .4666E+03 |
| 9  | .1870E+04 | 10 | .1870E-10 | 11 | .1168E-13 | 12 | .1982E+03 |
| 13 | .1783E+03 | 14 | .1207E+04 | 15 | .1207E-10 | 16 | .1830E-13 |
| 17 | .6004E+03 | 18 | .3462E+03 | 19 | .2357E+03 | 20 | .2357E-11 |
| 21 | .4032E-10 | 22 | .2310E+04 | 23 | .3672E+04 | 24 | .3454E+04 |
| 25 | .2018E-09 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1758E-10 | 2  | .7722E+03 | 3  | .1730E+04 | 4  | .2455E+04 |
| 5  | .1414E-09 | 6  | .4189E-11 | 7  | .5191E+03 | 8  | .5558E+03 |
| 9  | .2474E+04 | 10 | .2474E-10 | 11 | .1974E-11 | 12 | .5460E+03 |
| 13 | .3961E+03 | 14 | .1627E+04 | 15 | .1627E-10 | 16 | .6022E-11 |
| 17 | .1930E+04 | 18 | .2291E+04 | 19 | .2172E+04 | 20 | .2172E-10 |
| 21 | .6342E-10 | 22 | .2310E+04 | 23 | .3672E+04 | 24 | .3454E+04 |
| 25 | .2018E-09 |    |           |    |           |    |           |

TERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=2.5553E-01 THETA ERROR=9.7967E-02 OMEGA ERROR=3.0363E-01

NUMBER OF OUTER ITERATIONS= 7

\*\*\*\*\*  
 ITERATION 8 FOLLOWS NOW  
 \*\*\*\*\*

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.117E-22  | 2  | -.3080E-08 | 3  | -.1428E-07 | 4  | -.2139E-07 |
| 5  | -.1825E-20 | 6  | -.3080E-12 | 7  | -.1628E+02 | 8  | -.3169E+02 |
| 9  | -.4788E+02 | 10 | -.4129E-11 | 11 | -.6073E-12 | 12 | -.3018E+02 |
| 13 | -.4684E+03 | 14 | -.6032E+02 | 15 | -.6322E-11 | 16 | -.1260E-11 |
| 17 | -.6552E+02 | 18 | -.8954E+02 | 19 | -.7976E+02 | 20 | -.6026E-11 |
| 21 | -.5932E-21 | 22 | -.2309E-07 | 23 | -.5394E-07 | 24 | -.6026E-07 |
| 25 | -.4419E-20 |    |            |    |            |    |            |

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | -.1328E-21 | 2  | -.4408E-08 | 3  | -.1747E-07 | 4  | -.2618E-07 |
| 5  | -.2285E-20 | 6  | -.4408E-12 | 7  | -.2837E+02 | 8  | -.5531E+02 |
| 9  | -.7803E+02 | 10 | -.4431E-11 | 11 | -.9090E-12 | 12 | -.7063E+02 |
| 13 | -.1033E+03 | 14 | -.1153E+03 | 15 | -.6872E-11 | 16 | -.1918E-11 |
| 17 | -.8605E+02 | 18 | -.1178E+03 | 19 | -.1072E+03 | 20 | -.6300E-11 |
| 21 | -.8899E-21 | 22 | -.2511E-07 | 23 | -.5676E-07 | 24 | -.6300E-07 |
| 25 | -.4474E-20 |    |            |    |            |    |            |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES 333

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4500E-09 | 7  | .4224E+00 | 8  | .4309E+00 |
| 9  | .5724E+00 | 10 | .4500E-09 | 11 | .3106E-13 | 12 | .1507E+00 |
| 13 | .1757E+00 | 14 | .3228E+00 | 15 | .5174E-13 | 16 | .1435E-13 |
| 17 | .5741E-01 | 18 | .9904E-01 | 19 | .2057E+00 | 20 | .2768E-13 |
| 21 | .1609E-22 | 22 | .1495E-09 | 23 | .1514E-09 | 24 | .2768E-09 |
| 25 | .2668E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4500E-09 | 7  | .4978E+00 | 8  | .5188E+00 |
| 9  | .7338E+00 | 10 | .4500E-09 | 11 | .3256E-13 | 12 | .2170E+00 |
| 13 | .2691E+00 | 14 | .5063E+00 | 15 | .5357E-13 | 16 | .1493E-13 |
| 17 | .9060E-01 | 18 | .1458E+00 | 19 | .2975E+00 | 20 | .2859E-13 |
| 21 | .1764E-22 | 22 | .1529E-09 | 23 | .1561E-09 | 24 | .2859E-09 |
| 25 | .2687E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 3 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4500E-09 | 7  | .5310E+00 | 8  | .5655E+00 |
| 9  | .8255E+00 | 10 | .4500E-09 | 11 | .3523E-13 | 12 | .2502E+00 |
| 13 | .3159E+00 | 14 | .5980E+00 | 15 | .5449E-13 | 16 | .1526E-13 |
| 17 | .1072E+00 | 18 | .1692E+00 | 19 | .3434E+00 | 20 | .2905E-13 |
| 21 | .1771E-22 | 22 | .1545E-09 | 23 | .1584E-09 | 24 | .2905E-09 |
| 25 | .2696E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4500E-09 | 7  | .5476E+00 | 8  | .5889E+00 |
| 9  | .8714E+00 | 10 | .4500E-09 | 11 | .3356E-13 | 12 | .2668E+00 |
| 13 | .3392E+00 | 14 | .6439E+00 | 15 | .5495E-13 | 16 | .1543E-13 |
| 17 | .1155E+00 | 18 | .1808E+00 | 19 | .3663E+00 | 20 | .2928E-13 |
| 21 | .1774E-22 | 22 | .1553E-09 | 23 | .1596E-09 | 24 | .2928E-09 |
| 25 | .2700E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4500E-09 | 7  | .5559E+00 | 8  | .6006E+00 |
| 9  | .8943E+00 | 10 | .4500E-09 | 11 | .3372E-13 | 12 | .2751E+00 |
| 13 | .3509E+00 | 14 | .6668E+00 | 15 | .5518E-13 | 16 | .1551E-13 |
| 17 | .1197E+00 | 18 | .1867E+00 | 19 | .3778E+00 | 20 | .2940E-13 |
| 21 | .1776E-22 | 22 | .1558E-09 | 23 | .1602E-09 | 24 | .2940E-09 |
| 25 | .2703E-22 |    |           |    |           |    |           |

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4500E-09 | 7  | .5800E+00 | 8  | .6064E+00 |
| 9  | .9058E+00 | 10 | .4500E-09 | 11 | .3381E-13 | 12 | .2793E+00 |
| 13 | .3568E+00 | 14 | .6783E+00 | 15 | .5529E-13 | 16 | .1555E-13 |
| 17 | .1217E+00 | 18 | .1896E+00 | 19 | .3835E+00 | 20 | .2945E-13 |
| 21 | .1777E-22 | 22 | .1560E-09 | 23 | .1605E-09 | 24 | .2945E-09 |
| 25 | .2704E-22 |    |           |    |           |    |           |

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\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4500E-09 | 7  | .5621E+00 | 8  | .6093E+00 |
| 9  | .9115E+00 | 10 | .4500E-09 | 11 | .3385E-13 | 12 | .2814E+00 |
| 13 | .3597E+00 | 14 | .6840E+00 | 15 | .5535E-13 | 16 | .1557E-13 |
| 17 | .1228E+00 | 18 | .1911E+00 | 19 | .3864E+00 | 20 | .2948E-13 |
| 21 | .1777E-22 | 22 | .1561E-09 | 23 | .1606E-09 | 24 | .2948E-09 |
| 25 | .2704E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4500E-09 | 7  | .5631E+00 | 8  | .6108E+00 |
| 9  | .9144E+00 | 10 | .4500E-09 | 11 | .3387E-13 | 12 | .2824E+00 |
| 13 | .3612E+00 | 14 | .6869E+00 | 15 | .5538E-13 | 16 | .1558E-13 |
| 17 | .1233E+00 | 18 | .1918E+00 | 19 | .3878E+00 | 20 | .2950E-13 |
| 21 | .1777E-22 | 22 | .1561E-09 | 23 | .1607E-09 | 24 | .2950E-09 |
| 25 | .2705E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .4500E-09 | 7  | .5636E+00 | 8  | .6115E+00 |
| 9  | .9158E+00 | 10 | .4500E-09 | 11 | .3388E-13 | 12 | .2829E+00 |
| 13 | .3619E+00 | 14 | .6883E+00 | 15 | .5539E-13 | 16 | .1559E-13 |
| 17 | .1235E+00 | 18 | .1922E+00 | 19 | .3885E+00 | 20 | .2950E-13 |
| 21 | .1778E-22 | 22 | .1561E-09 | 23 | .1607E-09 | 24 | .2950E-09 |
| 25 | .2705E-22 |    |           |    |           |    |           |

ITERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1411E-10 | 2  | .9080E+03 | 3  | .1770E+04 | 4  | .2497E+04 |
| 5  | .1668E-09 | 6  | .7125E-21 | 7  | .4846E+03 | 8  | .4760E+03 |
| 9  | .1896E+04 | 10 | .1896E-10 | 11 | .1418E-13 | 12 | .2562E+03 |
| 13 | .1642E+03 | 14 | .1228E+04 | 15 | .1228E-10 | 16 | .2199E-13 |
| 17 | .6756E+03 | 18 | .2044E+03 | 19 | .2469E+03 | 20 | .2469E-11 |
| 21 | .6138E-10 | 22 | .2754E+04 | 23 | .3769E+04 | 24 | .3431E+04 |
| 25 | .2359E-09 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .2319E-10 | 2  | .9080E+03 | 3  | .1770E+04 | 4  | .2497E+04 |
| 5  | .1668E-09 | 6  | .4846E-11 | 7  | .6128E+03 | 8  | .5582E+03 |
| 9  | .2510E+04 | 10 | .2510E-10 | 11 | .2576E-11 | 12 | .6580E+03 |
| 13 | .3076E+03 | 14 | .1658E+04 | 15 | .1658E-10 | 16 | .6777E-11 |
| 17 | .2253E+04 | 18 | .2161E+04 | 19 | .2175E+04 | 20 | .2177E-10 |
| 21 | .8891E-10 | 22 | .2754E+04 | 23 | .3769E+04 | 24 | .3431E+04 |

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TEMP  
-261BE-07

- .3278E+02  
- .3279E+02

- .1918E-11  
- .7094E-11  
- .0000E+00

- .7094E-07

TEMP

```

- .3104E-07
- .5616E+02
- .7712E+02

```

- .2641E-11  
- .7368E-11  
- .7368E-07

CYCLES

|    |            |    |           |    |           |    |           |
|----|------------|----|-----------|----|-----------|----|-----------|
| 7  | .02172E+00 | 10 | .5000E-09 | 11 | .3602E-13 | 12 | .2477E+00 |
| 13 | .3226E+00  | 14 | .5990E+00 | 15 | .6138E-13 | 16 | .1651E-13 |
| 17 | .1084E+00  | 18 | .1758E+00 | 19 | .3428E+00 | 20 | .3293E-13 |
| 21 | .2108E-22  | 22 | .1670E-09 | 23 | .1783E-09 | 24 | .3293E-09 |
| 25 | .3363E-22  |    |           |    |           |    |           |

\*\*\*\* ITERATION 4 FOLLOWS NOW \*\*\*\*

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| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .5000E-09 | 7  | .5424E+00 | 8  | .5932E+00 |
| 9  | .8730E+00 | 10 | .5000E-09 | 11 | .3636E-13 | 12 | .2643E+00 |
| 13 | .3437E+00 | 14 | .6449E+00 | 15 | .6184E-13 | 16 | .1667E-13 |
| 17 | .1167E+00 | 18 | .1878E+00 | 19 | .3658E+00 | 20 | .3316E-13 |
| 21 | .2111E-22 | 22 | .1678E-09 | 23 | .1795E-09 | 24 | .3316E-09 |
| 25 | .3368E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 5 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .5000E-09 | 7  | .5507E+00 | 8  | .6053E+00 |
| 9  | .8960E+00 | 10 | .5000E-09 | 11 | .3352E-13 | 12 | .2726E+00 |
| 13 | .3588E+00 | 14 | .6678E+00 | 15 | .6207E-13 | 16 | .1675E-13 |
| 17 | .1209E+00 | 18 | .1939E+00 | 19 | .3772E+00 | 20 | .3327E-13 |
| 21 | .2113E-22 | 22 | .1682E-09 | 23 | .1801E-09 | 24 | .3327E-09 |
| 25 | .3370E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 6 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .5000E-09 | 7  | .5549E+00 | 8  | .6113E+00 |
| 9  | .9074E+00 | 10 | .5000E-09 | 11 | .3661E-13 | 12 | .2768E+00 |
| 13 | .3648E+00 | 14 | .6793E+00 | 15 | .6219E-13 | 16 | .1680E-13 |
| 17 | .1229E+00 | 18 | .1969E+00 | 19 | .3830E+00 | 20 | .3333E-13 |
| 21 | .2114E-22 | 22 | .1684E-09 | 23 | .1804E-09 | 24 | .3333E-09 |
| 25 | .3371E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 7 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .5000E-09 | 7  | .5570E+00 | 8  | .6143E+00 |
| 9  | .9132E+00 | 10 | .5000E-09 | 11 | .3665E-13 | 12 | .2789E+00 |
| 13 | .3678E+00 | 14 | .6850E+00 | 15 | .6224E-13 | 16 | .1682E-13 |
| 17 | .1240E+00 | 18 | .1984E+00 | 19 | .3858E+00 | 20 | .3336E-13 |
| 21 | .2114E-22 | 22 | .1685E-09 | 23 | .1806E-09 | 24 | .3336E-09 |
| 25 | .3372E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 8 FOLLOWS NOW \*\*\*\*

| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 1  | .1000E+01 | 2  | .1000E+01 | 3  | .1000E+01 | 4  | .1000E+01 |
| 5  | .1000E+01 | 6  | .5000E-09 | 7  | .5580E+00 | 8  | .6158E+00 |
| 9  | .9160E+00 | 10 | .5000E-09 | 11 | .3667E-13 | 12 | .2799E+00 |
| 13 | .3693E+00 | 14 | .6879E+00 | 15 | .6227E-13 | 16 | .1683E-13 |
| 17 | .1245E+00 | 18 | .1991E+00 | 19 | .3873E+00 | 20 | .3338E-13 |
| 21 | .2114E-22 | 22 | .1686E-09 | 23 | .1807E-09 | 24 | .3338E-09 |
| 25 | .3372E-22 |    |           |    |           |    |           |

\*\*\*\* ITERATION 9 FOLLOWS NOW \*\*\*\*

| I | TEMP | I | TEMP | I | TEMP | I | TEMP |
|---|------|---|------|---|------|---|------|
|---|------|---|------|---|------|---|------|

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| 9  | .7175E+00 | 10 | .5000E-09 | 11 | .3668E-13 | 12 | .2804E+00 |
| 13 | .3701E+00 | 14 | .6893E+00 | 15 | .6227E-13 | 16 | .1683E-13 |
| 17 | .1248E+00 | 18 | .1995E+00 | 19 | .3880E+00 | 20 | .3338E-13 |
| 21 | .2114E-22 | 22 | .1686E-09 | 23 | .1807E-09 | 24 | .3338E-09 |
| 25 | .3372E-22 |    |           |    |           |    |           |

TERATIONS CONVERGED TO A TOLERANCE OF .1000E-02 AFTER 9 CYCLES

\*\*\*\* ITERATION 1 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .1885E-10 | 2  | .9990E+03 | 3  | .1797E+04 | 4  | .2531E+04 |
| 5  | .1924E-09 | 6  | .9523E-21 | 7  | .5291E+03 | 8  | .4856E+03 |
| 9  | .1915E+04 | 10 | .1916E-10 | 11 | .1671E-13 | 12 | .2931E+03 |
| 13 | .1609E+03 | 14 | .1239E+04 | 15 | .1240E-10 | 16 | .2569E-13 |
| 17 | .6953E+03 | 18 | .1164E+03 | 19 | .2800E+03 | 20 | .2800E-11 |
| 21 | .8451E-10 | 22 | .3023E+04 | 23 | .3772E+04 | 24 | .3418E+04 |
| 25 | .2700E-09 |    |           |    |           |    |           |

\*\*\*\* ITERATION 2 FOLLOWS NOW \*\*\*\*

|    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| I  | TEMP      | I  | TEMP      | I  | TEMP      | I  | TEMP      |
| 1  | .2884E-10 | 2  | .9990E+03 | 3  | .1797E+04 | 4  | .2531E+04 |
| 5  | .1924E-09 | 6  | .5291E-11 | 7  | .6757E+03 | 8  | .5662E+03 |
| 9  | .2535E+04 | 10 | .2535E-10 | 11 | .2948E-11 | 12 | .7140E+03 |
| 13 | .2595E+03 | 14 | .1689E+04 | 15 | .1689E-10 | 16 | .6978E-11 |
| 17 | .2417E+04 | 18 | .2052E+04 | 19 | .2214E+04 | 20 | .2213E-10 |
| 21 | .1147E-09 | 22 | .3023E+04 | 23 | .3772E+04 | 24 | .3418E+04 |
| 25 | .2700E-09 |    |           |    |           |    |           |

TERATIONS CONVERGED TO A TOLERANCE OF .1000E+01 AFTER 2 CYCLES

PSY ERROR=9.1073E-02 THETA ERROR=3.6760E-02 OMEGA ERROR=9.3152E-02

NUMBER OF OUTER ITERATIONS= 9

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

|            |            |            |            |
|------------|------------|------------|------------|
| H          | W          | TS         | TL         |
| 5.0000E-02 | 5.0000E+00 | 1.0000E+02 | 0.0000E+00 |

PSY ERROR=9.1073E-02 THETA ERROR=3.6760E-02 OMEGA ERROR=9.3152E-02

NUMBER OF OUTER ITERATIONS= 9

|            |            |            |            |
|------------|------------|------------|------------|
| RA         | PR         | NU         | AR         |
| 1.0380E+06 | 6.9991E-01 | 1.2099E+00 | 1.0000E+02 |

GAP CONDUCTANCE = 5.5657E-01 KCAL/M.N.HR.DEG.C

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ESS RETURN TO CONTINUE

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FREE CONVECTION FROM RECTANGULAR ENCLOSURES - CSI FINITE ELEMENT SOLUTION

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OUTPUT OBTAINED ON 29-12-1986

GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

NODAL POINT CO-ORDINATES

| I  | X      | Y      | I  | X      | Y      | I  | X      | Y      |
|----|--------|--------|----|--------|--------|----|--------|--------|
| 1  | 0.0000 | 0.0000 | 2  | .2500  | 0.0000 | 3  | .5000  | 0.0000 |
| 4  | .7500  | 0.0000 | 5  | 1.0000 | 0.0000 | 6  | 0.0000 | .2500  |
| 7  | .2500  | .2500  | 8  | .5000  | .2500  | 9  | .7500  | .2500  |
| 10 | 1.0000 | .2500  | 11 | 0.0000 | .5000  | 12 | .2500  | .5000  |
| 13 | .5000  | .5000  | 14 | .7500  | .5000  | 15 | 1.0000 | .5000  |
| 16 | 0.0000 | .7500  | 17 | .2500  | .7500  | 18 | .5000  | .7500  |
| 19 | .7500  | .7500  | 20 | 1.0000 | .7500  | 21 | 0.0000 | 1.0000 |
| 22 | .2500  | 1.0000 | 23 | .5000  | 1.0000 | 24 | .7500  | 1.0000 |
| 25 | 1.0000 | 1.0000 |    |        |        |    |        |        |

ELEMENT NODE NUMBERS AND AREAS

| M  | I  | J  | K  | AREA       | M  | I  | J  | K  | AREA       |
|----|----|----|----|------------|----|----|----|----|------------|
| 1  | 1  | 7  | 6  | 3.1250E-02 | 2  | 1  | 2  | 7  | 3.1250E-02 |
| 3  | 2  | 8  | 7  | 3.1250E-02 | 4  | 2  | 3  | 8  | 3.1250E-02 |
| 5  | 3  | 9  | 8  | 3.1250E-02 | 6  | 3  | 4  | 9  | 3.1250E-02 |
| 7  | 4  | 10 | 9  | 3.1250E-02 | 8  | 4  | 5  | 10 | 3.1250E-02 |
| 9  | 6  | 12 | 11 | 3.1250E-02 | 10 | 6  | 7  | 12 | 3.1250E-02 |
| 11 | 7  | 13 | 12 | 3.1250E-02 | 12 | 7  | 8  | 13 | 3.1250E-02 |
| 13 | 8  | 14 | 13 | 3.1250E-02 | 14 | 8  | 9  | 14 | 3.1250E-02 |
| 15 | 9  | 15 | 14 | 3.1250E-02 | 16 | 9  | 10 | 15 | 3.1250E-02 |
| 17 | 11 | 17 | 16 | 3.1250E-02 | 18 | 11 | 12 | 17 | 3.1250E-02 |
| 19 | 12 | 18 | 17 | 3.1250E-02 | 20 | 12 | 13 | 18 | 3.1250E-02 |
| 21 | 13 | 19 | 18 | 3.1250E-02 | 22 | 13 | 14 | 19 | 3.1250E-02 |
| 23 | 14 | 20 | 19 | 3.1250E-02 | 24 | 14 | 15 | 20 | 3.1250E-02 |
| 25 | 16 | 22 | 21 | 3.1250E-02 | 26 | 16 | 17 | 22 | 3.1250E-02 |
| 27 | 17 | 23 | 22 | 3.1250E-02 | 28 | 17 | 18 | 23 | 3.1250E-02 |
| 29 | 18 | 24 | 23 | 3.1250E-02 | 30 | 18 | 19 | 24 | 3.1250E-02 |
| 31 | 19 | 25 | 24 | 3.1250E-02 | 32 | 19 | 20 | 25 | 3.1250E-02 |

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THE NUMBERS OF THE 16 BOUNDARY POINTS ARE

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL  
2.0000E-03 2.0000E-03 1.0000E+02 0.0000E+00

PSY ERROR=2.5744E-02 THETA ERROR=9.2328E-05 OMEGA ERROR=4.3500E-02

NUMBER OF OUTER ITERATIONS= 6

RA PR NU AR  
6.6429E+01 6.9991E-01 2.1607E+00 1.0000E+00

GAP CONDUCTANCE = 2.4848E+01 KCAL/M.M.HR.DEG.C

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TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 3.2370E-08 | 7  | 4.2386E+01 | 8  | 5.2425E+01 |
| 9  | 4.3140E+01 | 10 | 3.2562E-08 | 11 | 6.4574E-09 | 12 | 1.8389E+01 |
| 13 | 2.4693E+01 | 14 | 1.8819E+01 | 15 | 6.5750E-09 | 16 | 2.4501E-09 |
| 17 | 6.9745E+00 | 18 | 9.6458E+00 | 19 | 7.1193E+00 | 20 | 2.4922E-09 |
| 21 | 9.8568E-19 | 22 | 2.4595E-09 | 23 | 3.3942E-09 | 24 | 2.4922E-09 |
| 25 | 9.9724E-19 |    |            |    |            |    |            |

STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -5.4690E-22 | 2  | -3.0134E-12 | 3  | -7.8312E-12 | 4  | -9.0156E-12 |
| 5  | -2.9048E-21 | 6  | -3.0134E-12 | 7  | -2.4640E-02 | 8  | -5.6155E-02 |
| 9  | -5.7131E-02 | 10 | -1.2917E-11 | 11 | -2.1782E-12 | 12 | -2.3448E-02 |
| 13 | -6.1510E-02 | 14 | -6.7014E-02 | 15 | -1.5444E-11 | 16 | -1.6150E-12 |
| 17 | -1.9094E-02 | 18 | -4.7191E-02 | 19 | -4.8808E-02 | 20 | -1.0925E-11 |
| 21 | -5.9949E-22 | 22 | -3.8468E-12 | 23 | -1.0198E-11 | 24 | -1.0925E-11 |
| 25 | -3.0811E-21 |    |             |    |             |    |             |

VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA       |
|----|------------|----|------------|----|------------|----|-------------|
| 1  | 1.3585E-10 | 2  | 7.8849E-01 | 3  | 1.7970E+00 | 4  | 1.8282E+00  |
| 5  | 5.0476E-10 | 6  | 3.3796E-11 | 7  | 1.0048E+00 | 8  | 2.4721E+00  |
| 9  | 3.2632E+00 | 10 | 2.3286E-10 | 11 | 4.0126E-10 | 12 | -2.4252E-02 |
| 13 | 1.5327E+00 | 14 | 2.3317E+00 | 15 | 1.6827E-10 | 16 | 4.8481E-10  |
| 17 | 1.0570E-01 | 18 | 1.2295E+00 | 19 | 1.6872E+00 | 20 | 8.4359E-11  |
| 21 | 8.2231E-11 | 22 | 6.1100E-01 | 23 | 1.5101E+00 | 24 | 1.5619E+00  |
| 25 | 4.2769E-10 |    |            |    |            |    |             |

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H                      W                      TS                      TL  
4.0000E-03            4.0000E-03            1.0000E+02            0.0000E+00

PSY ERROR=2.1633E-02      THETA ERROR=6.8325E-04      OMEGA ERROR=3.6003E-02

NUMBER OF OUTER ITERATIONS= 6

RA                      PR                      NU                      AR  
5.3144E+02            6.9991E-01            2.1906E+00            1.0000E+00

GAP CONDUCTANCE = 1.2596E+01 KCAL/M.M.HR.DEG.C

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TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 3.1738E-08 | 7  | 3.9635E+01 | 8  | 5.0963E+01 |
| 9  | 4.5110E+01 | 10 | 3.3024E-08 | 11 | 6.0095E-09 | 12 | 1.6457E+01 |
| 13 | 2.3070E+01 | 14 | 1.9479E+01 | 15 | 6.7237E-09 | 16 | 2.2494E-09 |
| 17 | 6.1147E+00 | 18 | 8.7578E+00 | 19 | 7.1175E+00 | 20 | 2.4812E-09 |
| 21 | 9.2775E-19 | 22 | 2.2586E-09 | 23 | 3.1785E-09 | 24 | 2.4812E-09 |
| 25 | 9.9232E-19 |    |            |    |            |    |            |

STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -4.2285E-21 | 2  | -2.2808E-11 | 3  | -6.0078E-11 | 4  | -7.0377E-11 |
| 5  | -2.2798E-20 | 6  | -2.2808E-11 | 7  | -1.8260E-01 | 8  | -4.2335E-01 |
| 9  | -4.3901E-01 | 10 | -1.0058E-10 | 11 | -1.6476E-11 | 12 | -1.7471E-01 |
| 13 | -4.6245E-01 | 14 | -5.1145E-01 | 15 | -1.1965E-10 | 16 | -1.2598E-11 |
| 17 | -1.4559E-01 | 18 | -3.5748E-01 | 19 | -3.7127E-01 | 20 | -8.4429E-11 |
| 21 | -4.6879E-21 | 22 | -2.9725E-11 | 23 | -7.8507E-11 | 24 | -8.4429E-11 |
| 25 | -2.3975E-20 |    |             |    |             |    |             |

VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA       |
|----|------------|----|------------|----|------------|----|-------------|
| 1  | 1.0220E-09 | 2  | 5.8431E+00 | 3  | 1.3547E+01 | 4  | 1.4048E+01  |
| 5  | 3.9211E-09 | 6  | 2.5606E-10 | 7  | 7.4473E+00 | 8  | 1.8146E+01  |
| 9  | 2.5773E+01 | 10 | 1.8159E-09 | 11 | 3.1247E-09 | 12 | -3.4879E-01 |
| 13 | 1.1085E+01 | 14 | 1.8172E+01 | 15 | 1.3117E-09 | 16 | 3.7740E-09  |
| 17 | 1.1288E+00 | 18 | 9.4158E+00 | 19 | 1.2796E+01 | 20 | 6.3979E-10  |
| 21 | 6.3406E-10 | 22 | 4.6588E+00 | 23 | 1.1439E+01 | 24 | 1.1881E+01  |
| 25 | 3.2958E-09 |    |            |    |            |    |             |

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# RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H 6.0000E-03 W 6.0000E-03 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=5.1612E-02 THETA ERROR=1.5261E-03 OMEGA ERROR=7.8351E-02

NUMBER OF OUTER ITERATIONS= 5

RA 1.7936E+03 PR 6.9991E-01 NU 2.2832E+00 AR 1.0000E+00

GAP CONDUCTANCE = 8.7522E+00 KCAL/M.M.HR.DEG.C

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## TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 2.6031E-08 | 7  | 3.3281E+01 | 8  | 4.6560E+01 |
| 9  | 4.8921E+01 | 10 | 2.9065E-08 | 11 | 4.3893E-09 | 12 | 1.2495E+01 |
| 13 | 1.9529E+01 | 14 | 2.0971E+01 | 15 | 6.0392E-09 | 16 | 1.6116E-09 |
| 17 | 4.5251E+00 | 18 | 7.2193E+00 | 19 | 7.4215E+00 | 20 | 2.1496E-09 |
| 21 | 6.1735E-19 | 22 | 1.6191E-09 | 23 | 2.3942E-09 | 24 | 2.1496E-09 |
| 25 | 7.4482E-19 |    |            |    |            |    |            |

## STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -7.7326E-21 | 2  | -5.3710E-11 | 3  | -1.4439E-10 | 4  | -1.7482E-10 |
| 5  | -4.7103E-20 | 6  | -5.3710E-11 | 7  | -5.1823E-01 | 8  | -1.2365E+00 |
| 9  | -1.3356E+00 | 10 | -2.4912E-10 | 11 | -3.8345E-11 | 12 | -4.9814E-01 |
| 13 | -1.3397E+00 | 14 | -1.5322E+00 | 15 | -2.9451E-10 | 16 | -2.9405E-11 |
| 17 | -4.2981E-01 | 18 | -1.0471E+00 | 19 | -1.1020E+00 | 20 | -2.0516E-10 |
| 21 | -8.8819E-21 | 22 | -6.9888E-11 | 23 | -1.8714E-10 | 24 | -2.0516E-10 |
| 25 | -4.9389E-20 |    |             |    |             |    |             |

## VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA       |
|----|------------|----|------------|----|------------|----|-------------|
| 1  | 2.5479E-09 | 2  | 1.6583E+01 | 3  | 3.9568E+01 | 4  | 4.2739E+01  |
| 5  | 1.0109E-08 | 6  | 8.2052E-10 | 7  | 2.2228E+01 | 8  | 4.9383E+01  |
| 9  | 8.3118E+01 | 10 | 5.3829E-09 | 11 | 7.7021E-09 | 12 | -1.7262E+00 |
| 13 | 2.8887E+01 | 14 | 5.7115E+01 | 15 | 3.7967E-09 | 16 | 9.3716E-09  |
| 17 | 5.3895E+00 | 18 | 2.8302E+01 | 19 | 3.8123E+01 | 20 | 1.9062E-09  |
| 21 | 1.6287E-09 | 22 | 1.3754E+01 | 23 | 3.3506E+01 | 24 | 3.5263E+01  |
| 25 | 8.3284E-09 |    |            |    |            |    |             |

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## RECTANGULAR-ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H                      W                      TS                      TL  
 8.0000E-03      8.0000E-03      1.0000E+02      0.0000E+00

PSY ERROR=3.2016E-02    THETA ERROR=1.6689E-02    OMEGA ERROR=3.5136E-02

NUMBER OF OUTER ITERATIONS= 6

RA                      PR                      NU                      AR  
 4.2515E+03      6.9991E-01      2.4565E+00      1.0000E+00

GAP CONDUCTANCE = 7.0623E+00 KCAL/M.M.HR.DEG.C

## TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 2.7841E-08 | 7  | 2.4432E+01 | 8  | 3.8460E+01 |
| 9  | 5.2874E+01 | 10 | 3.5199E-08 | 11 | 3.7387E-09 | 12 | 8.0879E+00 |
| 13 | 1.5393E+01 | 14 | 2.3157E+01 | 15 | 7.6551E-09 | 16 | 1.3861E-09 |
| 17 | 3.0875E+00 | 18 | 6.1341E+00 | 19 | 8.4828E+00 | 20 | 2.7235E-09 |
| 21 | 6.4478E-19 | 22 | 1.3961E-09 | 23 | 2.3506E-09 | 24 | 2.7235E-09 |
| 25 | 1.0431E-18 |    |            |    |            |    |            |

## STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -2.7072E-20 | 2  | -1.3341E-10 | 3  | -3.6209E-10 | 4  | -4.6820E-10 |
| 5  | -1.5724E-19 | 6  | -1.3341E-10 | 7  | -9.8319E-01 | 8  | -2.3666E+00 |
| 9  | -2.6875E+00 | 10 | -6.5977E-10 | 11 | -9.4362E-11 | 12 | -9.5363E-01 |
| 13 | -2.5479E+00 | 14 | -3.0319E+00 | 15 | -7.6094E-10 | 16 | -8.3417E-11 |
| 17 | -6.6918E-01 | 18 | -2.0422E+00 | 19 | -2.1711E+00 | 20 | -5.2969E-10 |
| 21 | -3.1420E-20 | 22 | -1.8613E-10 | 23 | -4.7953E-10 | 24 | -5.2969E-10 |
| 25 | -1.5749E-19 |    |             |    |             |    |             |

## VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA       |
|----|------------|----|------------|----|------------|----|-------------|
| 1  | 5.8424E-09 | 2  | 3.1462E+01 | 3  | 7.5732E+01 | 4  | 8.5998E+01  |
| 5  | 2.5412E-08 | 6  | 2.0730E-09 | 7  | 4.9983E+01 | 8  | 8.2802E+01  |
| 9  | 1.7940E+02 | 10 | 1.2006E-08 | 11 | 2.0677E-08 | 12 | -4.3669E+00 |
| 13 | 4.2964E+01 | 14 | 1.1942E+02 | 15 | 8.6401E-09 | 16 | 2.4551E-08  |
| 17 | 1.6281E+01 | 18 | 5.6323E+01 | 19 | 7.6283E+01 | 20 | 3.8141E-09  |
| 21 | 4.0600E-09 | 22 | 2.7814E+01 | 23 | 6.5350E+01 | 24 | 6.9477E+01  |
| 25 | 2.0424E-08 |    |            |    |            |    |             |

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL  
1.0000E-02 1.0000E-02 1.0000E+02 0.0000E+00

PSY ERROR=0.0000E+00 THETA ERROR=8.5414E-03 OMEGA ERROR=5.6652E-02

NUMBER OF OUTER ITERATIONS= 9

RA PR NU AR  
8.3037E+03 6.9991E-01 2.6812E+00 1.0000E+00

GAP CONDUCTANCE = 6.1668E+00 KCAL/M.M.HR.DEG.C

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#### TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 3.5133E-08 | 7  | 1.5778E+01 | 8  | 2.7941E+01 |
| 9  | 5.5191E+01 | 10 | 5.1994E-08 | 11 | 3.4359E-09 | 12 | 5.3124E+00 |
| 13 | 1.2689E+01 | 14 | 2.5561E+01 | 15 | 1.2161E-08 | 16 | 1.4498E-09 |
| 17 | 2.5264E+00 | 18 | 6.1598E+00 | 19 | 1.0145E+01 | 20 | 4.5915E-09 |
| 21 | 9.0458E-19 | 22 | 1.4637E-09 | 23 | 3.0603E-09 | 24 | 4.5915E-09 |
| 25 | 2.3494E-18 |    |            |    |            |    |            |

#### STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -1.2236E-19 | 2  | -3.4256E-10 | 3  | -8.9312E-10 | 4  | -1.2494E-09 |
| 5  | -6.5132E-19 | 6  | -3.4256E-10 | 7  | -1.5117E+00 | 8  | -3.6024E+00 |
| 9  | -4.3165E+00 | 10 | -1.7373E-09 | 11 | -2.3909E-10 | 12 | -1.4246E+00 |
| 13 | -3.8014E+00 | 14 | -4.7639E+00 | 15 | -1.9451E-09 | 16 | -2.4515E-10 |
| 17 | -1.3799E+00 | 18 | -3.1503E+00 | 19 | -3.4186E+00 | 20 | -1.3638E-09 |
| 21 | -1.4311E-19 | 22 | -5.0488E-10 | 23 | -1.2264E-09 | 24 | -1.3638E-09 |
| 25 | -6.1675E-19 |    |             |    |             |    |             |

#### VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA       |
|----|------------|----|------------|----|------------|----|-------------|
| 1  | 1.3381E-08 | 2  | 4.8374E+01 | 3  | 1.1528E+02 | 4  | 1.3813E+02  |
| 5  | 6.2500E-08 | 6  | 4.6463E-09 | 7  | 1.0118E+02 | 8  | 1.0361E+02  |
| 9  | 3.0719E+02 | 10 | 2.3011E-08 | 11 | 5.5077E-08 | 12 | -9.6048E+00 |
| 13 | 3.9064E+01 | 14 | 1.9742E+02 | 15 | 1.7716E-08 | 16 | 6.3052E-08  |
| 17 | 3.5066E+01 | 18 | 9.3952E+01 | 19 | 1.2778E+02 | 20 | 6.3889E-09  |
| 21 | 1.0053E-08 | 22 | 4.4157E+01 | 23 | 1.0081E+02 | 24 | 1.0940E+02  |
| 25 | 4.9112E-08 |    |            |    |            |    |             |

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

H                      W                      TS                      TL  
1.2000E-02            1.2000E-02            1.0000E+02            0.0000E+00

PSY ERROR=6.6324E-02      THETA ERROR=1.6731E-02      OMEGA ERROR=7.3859E-02

NUMBER OF OUTER ITERATIONS= 13

RA                      PR                      NU                      AR  
1.4349E+04            6.9991E-01            2.8927E+00            1.0000E+00

GAP CONDUCTANCE = 5.5443E+00 KCAL/M.M.HR.DEG.C

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TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 4.3515E-08 | 7  | 8.7370E+00 | 8  | 1.7999E+01 |
| 9  | 5.6315E+01 | 10 | 7.4332E-08 | 11 | 2.9506E-09 | 12 | 4.0434E+00 |
| 13 | 1.2208E+01 | 14 | 2.8294E+01 | 15 | 1.8631E-08 | 16 | 1.5234E-09 |
| 17 | 2.4022E+00 | 18 | 6.8203E+00 | 19 | 1.2037E+01 | 20 | 7.3408E-09 |
| 21 | 1.0340E-18 | 22 | 1.5453E-09 | 23 | 4.0692E-09 | 24 | 7.3408E-09 |
| 25 | 4.9225E-18 |    |            |    |            |    |            |

STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -4.1278E-19 | 2  | -7.4575E-10 | 3  | -1.7968E-09 | 4  | -2.7017E-09 |
| 5  | -2.0665E-18 | 6  | -7.4575E-10 | 7  | -2.1904E+00 | 8  | -4.9074E+00 |
| 9  | -6.0894E+00 | 10 | -3.7166E-09 | 11 | -5.0522E-10 | 12 | -2.0330E+00 |
| 13 | -5.1924E+00 | 14 | -6.6849E+00 | 15 | -4.0696E-09 | 16 | -5.8781E-10 |
| 17 | -2.0401E+00 | 18 | -4.4960E+00 | 19 | -4.9029E+00 | 20 | -2.8962E-09 |
| 21 | -4.9593E-19 | 22 | -1.1298E-09 | 23 | -2.5882E-09 | 24 | -2.8962E-09 |
| 25 | -1.0937E-18 |    |             |    |             |    |             |

VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA       |
|----|------------|----|------------|----|------------|----|-------------|
| 1  | 2.7369E-08 | 2  | 7.0092E+01 | 3  | 1.5704E+02 | 4  | 1.9486E+02  |
| 5  | 1.2868E-07 | 6  | 9.2125E-09 | 7  | 1.8842E+02 | 8  | 1.0953E+02  |
| 9  | 4.5927E+02 | 10 | 3.9130E-08 | 11 | 1.1818E-07 | 12 | -2.4270E+01 |
| 13 | 5.7422E+00 | 14 | 2.8313E+02 | 15 | 3.2966E-08 | 16 | 1.3211E-07  |
| 17 | 6.5484E+01 | 18 | 1.4867E+02 | 19 | 1.9628E+02 | 20 | 9.8138E-09  |
| 21 | 2.2074E-08 | 22 | 6.5284E+01 | 23 | 1.4387E+02 | 24 | 1.5689E+02  |
| 25 | 1.0052E-07 |    |            |    |            |    |             |

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# FREE CONVECTION FROM RECTANGULAR ENCLOSURES - CS1 FINITE ELEMENT SOLUTION

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OUTPUT OBTAINED ON 29-12-1986

## GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

## NODAL POINT CO-ORDINATES

| I  | X      | Y      | I  | X      | Y      | I  | X      | Y      |
|----|--------|--------|----|--------|--------|----|--------|--------|
| 1  | 0.0000 | 0.0000 | 2  | .2500  | 0.0000 | 3  | .5000  | 0.0000 |
| 4  | .7500  | 0.0000 | 5  | 1.0000 | 0.0000 | 6  | 0.0000 | .2500  |
| 7  | .2500  | .2500  | 8  | .5000  | .2500  | 9  | .7500  | .2500  |
| 10 | 1.0000 | .2500  | 11 | 0.0000 | .5000  | 12 | .2500  | .5000  |
| 13 | .5000  | .5000  | 14 | .7500  | .5000  | 15 | 1.0000 | .5000  |
| 16 | 0.0000 | .7500  | 17 | .2500  | .7500  | 18 | .5000  | .7500  |
| 19 | .7500  | .7500  | 20 | 1.0000 | .7500  | 21 | 0.0000 | 1.0000 |
| 22 | .2500  | 1.0000 | 23 | .5000  | 1.0000 | 24 | .7500  | 1.0000 |
| 25 | 1.0000 | 1.0000 |    |        |        |    |        |        |

## ELEMENT NODE NUMBERS AND AREAS

| M  | I  | J  | K  | AREA       | M  | I  | J  | K  | AREA       |
|----|----|----|----|------------|----|----|----|----|------------|
| 1  | 1  | 7  | 6  | 3.1250E-02 | 2  | 1  | 2  | 7  | 3.1250E-02 |
| 3  | 2  | 8  | 7  | 3.1250E-02 | 4  | 2  | 3  | 8  | 3.1250E-02 |
| 5  | 3  | 9  | 8  | 3.1250E-02 | 6  | 3  | 4  | 9  | 3.1250E-02 |
| 7  | 4  | 10 | 9  | 3.1250E-02 | 8  | 4  | 5  | 10 | 3.1250E-02 |
| 9  | 6  | 12 | 11 | 3.1250E-02 | 10 | 6  | 7  | 12 | 3.1250E-02 |
| 11 | 7  | 13 | 12 | 3.1250E-02 | 12 | 7  | 8  | 13 | 3.1250E-02 |
| 13 | 8  | 14 | 13 | 3.1250E-02 | 14 | 8  | 9  | 14 | 3.1250E-02 |
| 15 | 9  | 15 | 14 | 3.1250E-02 | 16 | 9  | 10 | 15 | 3.1250E-02 |
| 17 | 11 | 17 | 16 | 3.1250E-02 | 18 | 11 | 12 | 17 | 3.1250E-02 |
| 19 | 12 | 18 | 17 | 3.1250E-02 | 20 | 12 | 13 | 18 | 3.1250E-02 |
| 21 | 13 | 19 | 18 | 3.1250E-02 | 22 | 13 | 14 | 19 | 3.1250E-02 |
| 23 | 14 | 20 | 19 | 3.1250E-02 | 24 | 14 | 15 | 20 | 3.1250E-02 |
| 25 | 16 | 22 | 21 | 3.1250E-02 | 26 | 16 | 17 | 22 | 3.1250E-02 |
| 27 | 17 | 23 | 22 | 3.1250E-02 | 28 | 17 | 18 | 23 | 3.1250E-02 |
| 29 | 18 | 24 | 23 | 3.1250E-02 | 30 | 18 | 19 | 24 | 3.1250E-02 |
| 31 | 19 | 25 | 24 | 3.1250E-02 | 32 | 19 | 20 | 25 | 3.1250E-02 |

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THE NUMBERS OF THE 10 BOUNDARY POINTS ARE

1 2 3 4 5 21 22 23 24 25

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RECTANGULAR ENCLOSURE - INSULATED SIDE WALLS

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ENCLOSURE INCLINATION = 0.0 DEGREES

H W TS TL  
2.0000E-03 2.0000E-03 1.0000E+02 0.0000E+00

PSY ERROR=5.9061E-02 THETA ERROR=0.0000E+00 OMEGA ERROR=3.5740E-02

NUMBER OF OUTER ITERATIONS= 6

RA PR NU AR  
6.6429E+01 6.7991E-01 1.0323E+00 1.0000E+00

GAP CONDUCTANCE = 1.1872E+01 KCAL/M.M.HR.DEG.C

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TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 7.4136E+01 | 7  | 7.4201E+01 | 8  | 7.4208E+01 |
| 9  | 7.4166E+01 | 10 | 7.4178E+01 | 11 | 4.8851E+01 | 12 | 4.8906E+01 |
| 13 | 4.8904E+01 | 14 | 4.8841E+01 | 15 | 4.8811E+01 | 16 | 2.4231E+01 |
| 17 | 2.4240E+01 | 18 | 2.4224E+01 | 19 | 2.4179E+01 | 20 | 2.4139E+01 |
| 21 | 8.5795E-09 | 22 | 8.5868E-09 | 23 | 8.5899E-09 | 24 | 8.5834E-09 |
| 25 | 8.5765E-09 |    |            |    |            |    |            |

STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -7.3968E-12 | 2  | -9.2706E-12 | 3  | -1.0173E-11 | 4  | -1.0907E-11 |
| 5  | -1.4105E-11 | 6  | -6.8704E-02 | 7  | -8.1610E-02 | 8  | -9.1288E-02 |
| 9  | -1.0420E-01 | 10 | -1.2529E-01 | 11 | -9.8348E-02 | 12 | -1.1855E-01 |
| 13 | -1.3331E-01 | 14 | -1.5331E-01 | 15 | -1.8554E-01 | 16 | -1.0864E-01 |
| 17 | -1.2530E-01 | 18 | -1.4071E-01 | 19 | -1.6387E-01 | 20 | -1.8513E-01 |
| 21 | -2.1724E-11 | 22 | -2.5214E-11 | 23 | -2.7875E-11 | 24 | -3.1948E-11 |
| 25 | -3.6242E-11 |    |             |    |             |    |             |

VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA      |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 2.1935E+00 | 2  | 2.6115E+00 | 3  | 2.9212E+00 | 4  | 3.3345E+00 |
| 5  | 4.0091E+00 | 6  | 2.2487E+00 | 7  | 2.4353E+00 | 8  | 2.6114E+00 |
| 9  | 2.2839E+00 | 10 | 3.1710E+00 | 11 | 2.0599E+00 | 12 | 2.2088E+00 |
| 13 | 2.3187E+00 | 14 | 2.4923E+00 | 15 | 2.7196E+00 | 16 | 2.5954E+00 |
| 17 | 2.9965E+00 | 18 | 3.2618E+00 | 19 | 3.6130E+00 | 20 | 4.3365E+00 |
| 21 | 3.4765E+00 | 22 | 4.0094E+00 | 23 | 4.5028E+00 | 24 | 5.2440E+00 |
| 25 | 5.9242E+00 |    |            |    |            |    |            |

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RECTANGULAR ENCLOSURE - INSULATED SIDE WALLS

347

ENCLOSURE INCLINATION = 0.0 DEGREES

H  
4.0000E-03

W  
4.0000E-03

TS  
1.0000E+02

TL  
0.0000E+00

PSY ERROR=7.7300E-02

THETA ERROR=0.0000E+00

OMEGA ERROR=6.5076E-02

NUMBER OF OUTER ITERATIONS= 6

RA  
5.3144E+02

FR  
6.9991E-01

NU  
1.2205E+00

AK  
1.0000E+00

GAP CONDUCTANCE = 7.0177E+00 KCAL/M.M.HR.DEG.C

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#### TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 5  | 1.0000E+02 | 9  | 1.0000E+02 | 13 | 1.0000E+02 |
| 3  | 1.0000E+02 | 6  | 6.9580E+01 | 7  | 6.9621E+01 | 8  | 6.9628E+01 |
| 4  | 6.9618E+01 | 10 | 6.9901E+01 | 11 | 4.2667E+01 | 12 | 4.2719E+01 |
| 13 | 4.2302E+01 | 14 | 4.1360E+01 | 15 | 4.1049E+01 | 16 | 2.0011E+01 |
| 17 | 1.7818E+01 | 18 | 1.7433E+01 | 19 | 1.8903E+01 | 20 | 1.8453E+01 |
| 21 | 7.8001E-09 | 22 | 7.7878E-09 | 23 | 7.7450E-09 | 24 | 7.6402E-09 |
| 25 | 7.6430E-09 |    |            |    |            |    |            |

#### STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | -6.0967E-11 | 5  | -7.6646E-11 | 9  | -8.4524E-11 | 13 | -9.0981E-11 |
| 3  | -1.1761E-10 | 6  | -5.7610E-01 | 7  | -6.8666E-01 | 8  | -7.7277E-01 |
| 4  | 2.8535E-01  | 10 | -1.0644E+00 | 11 | -8.2108E-01 | 12 | -9.9602E-01 |
| 13 | -1.1335E+00 | 14 | -1.3171E+00 | 15 | -1.5972E+00 | 16 | -9.0224E-01 |
| 17 | -1.0496E+00 | 18 | -1.1932E+00 | 19 | -1.4126E+00 | 20 | -1.6054E+00 |
| 21 | -1.7619E-10 | 22 | -2.0555E-10 | 23 | -2.2944E-10 | 24 | -2.6570E-10 |
| 25 | -3.0285E-10 |    |             |    |             |    |             |

#### VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA      | I  | OMEGA      | I  | OMEGA      | I  | OMEGA      |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.8435E+01 | 5  | 2.1973E+01 | 9  | 2.4729E+01 | 13 | 2.8331E+01 |
| 3  | 3.4060E+01 | 6  | 1.9040E+01 | 7  | 2.0625E+01 | 8  | 2.2218E+01 |
| 4  | 2.4347E+01 | 10 | 2.6390E+01 | 11 | 1.7102E+01 | 12 | 1.8627E+01 |
| 13 | 1.9994E+01 | 14 | 2.1817E+01 | 15 | 2.4164E+01 | 16 | 2.1810E+01 |
| 17 | 2.5588E+01 | 18 | 2.8761E+01 | 19 | 3.2981E+01 | 20 | 4.0130E+01 |
| 21 | 2.8872E+01 | 22 | 3.3555E+01 | 23 | 3.8246E+01 | 24 | 4.5205E+01 |
| 25 | 5.1372E+01 |    |            |    |            |    |            |

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# FREE CONVECTION IN RECTANGULAR ENCLOSURES DOUBLE PRECISION VERSION

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OUTPUT OBTAINED ON 12-10-1987

## GEOMETRIC DATA FOR THE MESH

NUMBER OF ELEMENTS = 32

NUMBER OF NODAL POINTS = 25

## NODAL POINT CO-ORDINATES

| I  | X        | Y      | I  | X        | Y      | I  | X        | Y      |
|----|----------|--------|----|----------|--------|----|----------|--------|
| 1  | 0.0000   | 0.0000 | 2  | 25.0000  | 0.0000 | 3  | 50.0000  | 0.0000 |
| 4  | 75.0000  | 0.0000 | 5  | 100.0000 | 0.0000 | 6  | 0.0000   | .2500  |
| 7  | 25.0000  | .2500  | 8  | 50.0000  | .2500  | 9  | 75.0000  | .2500  |
| 10 | 100.0000 | .2500  | 11 | 0.0000   | .5000  | 12 | 25.0000  | .5000  |
| 13 | 50.0000  | .5000  | 14 | 75.0000  | .5000  | 15 | 100.0000 | .5000  |
| 16 | 0.0000   | .7500  | 17 | 25.0000  | .7500  | 18 | 50.0000  | .7500  |
| 19 | 75.0000  | .7500  | 20 | 100.0000 | .7500  | 21 | 0.0000   | 1.0000 |
| 22 | 25.0000  | 1.0000 | 23 | 50.0000  | 1.0000 | 24 | 75.0000  | 1.0000 |
| 25 | 100.0000 | 1.0000 |    |          |        |    |          |        |

## ELEMENT NODE NUMBERS AND AREAS

| M  | I  | J  | K  | AREA       | M  | I  | J  | K  | AREA       |
|----|----|----|----|------------|----|----|----|----|------------|
| 1  | 1  | 7  | 6  | 3.1250E+00 | 2  | 1  | 2  | 7  | 3.1250E+00 |
| 3  | 2  | 8  | 7  | 3.1250E+00 | 4  | 2  | 3  | 8  | 3.1250E+00 |
| 5  | 3  | 9  | 8  | 3.1250E+00 | 6  | 3  | 4  | 9  | 3.1250E+00 |
| 7  | 4  | 10 | 9  | 3.1250E+00 | 8  | 4  | 5  | 10 | 3.1250E+00 |
| 9  | 5  | 11 | 10 | 3.1250E+00 | 10 | 5  | 6  | 11 | 3.1250E+00 |
| 11 | 6  | 12 | 11 | 3.1250E+00 | 12 | 6  | 7  | 12 | 3.1250E+00 |
| 13 | 7  | 13 | 12 | 3.1250E+00 | 14 | 7  | 8  | 13 | 3.1250E+00 |
| 15 | 8  | 14 | 13 | 3.1250E+00 | 16 | 8  | 9  | 14 | 3.1250E+00 |
| 17 | 9  | 15 | 14 | 3.1250E+00 | 18 | 9  | 10 | 15 | 3.1250E+00 |
| 19 | 10 | 16 | 15 | 3.1250E+00 | 20 | 10 | 11 | 16 | 3.1250E+00 |
| 21 | 11 | 17 | 16 | 3.1250E+00 | 22 | 11 | 12 | 17 | 3.1250E+00 |
| 23 | 12 | 18 | 17 | 3.1250E+00 | 24 | 12 | 13 | 18 | 3.1250E+00 |
| 25 | 13 | 19 | 18 | 3.1250E+00 | 26 | 13 | 14 | 19 | 3.1250E+00 |
| 27 | 14 | 20 | 19 | 3.1250E+00 | 28 | 14 | 15 | 20 | 3.1250E+00 |
| 29 | 15 | 21 | 20 | 3.1250E+00 | 30 | 15 | 16 | 21 | 3.1250E+00 |
| 31 | 16 | 22 | 21 | 3.1250E+00 | 32 | 16 | 17 | 22 | 3.1250E+00 |

|    |    |    |    |            |    |    |    |    |            |     |
|----|----|----|----|------------|----|----|----|----|------------|-----|
| 27 | 17 | 23 | 22 | 3.1250E+00 | 28 | 17 | 18 | 19 | 3.1250E+00 | 319 |
| 29 | 18 | 24 | 23 | 3.1250E+00 | 30 | 18 | 19 | 17 | 3.1250E+00 |     |
| 31 | 19 | 25 | 24 | 3.1250E+00 | 32 | 19 | 20 | 15 | 3.1250E+00 |     |

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THE NUMBERS OF THE 16 BOUNDARY POINTS ARE

1 2 3 4 5 6 10 11 15 16 20 21 22 23 24 25

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RECTANGULAR ENCLOSURE - ISOTHERMAL SITE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREES

|            |            |            |            |
|------------|------------|------------|------------|
| H          | W          | TS         | TL         |
| 1.0000E-02 | 1.0000E+00 | 1.0000E+02 | 0.0000E+00 |

PSY ERROR=7.1717E-02 THETA ERROR=3.125E-01 ANGLE ERROR=1.5070E-03

NUMBER OF OUTER ITERATIONS= 11

|            |            |            |            |
|------------|------------|------------|------------|
| RA         | PR         | NU         | HR         |
| 8.3037E+03 | 6.2551E-01 | 1.0043E+00 | 1.0000E+02 |

EAP CONDUCTANCE = 2.3100E+00 KCAL/M<sup>2</sup>.H.R.DEG.C

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## TEMPERATURE DISTRIBUTION

| I  | TEMP        | I  | TEMP        | I  | TEMP        | I  | TEMP        |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | 1.00000E+02 | 2  | 1.00000E+02 | 3  | 1.00000E+02 | 4  | 1.00000E+02 |
| 5  | 1.00000E+02 | 6  | 6.0002E-08  | 7  | 7.4372E+01  | 8  | 7.4376E+01  |
| 9  | 7.4928E+01  | 10 | 6.0002E-08  | 11 | 5.9709E-12  | 12 | 4.9865E+01  |
| 13 | 4.9861E+01  | 14 | 4.9928E+01  | 15 | 5.9707E-12  | 16 | 2.9561E-12  |
| 17 | 2.4924E+01  | 18 | 2.4918E+01  | 19 | 2.4710E+01  | 20 | 2.9950E-12  |
| 21 | 3.8858E-21  | 22 | 2.9916E-03  | 23 | 2.9911E-03  | 24 | 2.9755E-08  |
| 25 | 3.8935E-21  |    |             |    |             |    |             |

## STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | 0.00000E+00 | 2  | 0.00000E+00 | 3  | 0.00000E+00 | 4  | 0.00000E+00 |
| 5  | 0.00000E+00 | 6  | 0.00000E+00 | 7  | -1.7742E-12 | 8  | -1.0210E-01 |
| 9  | -1.3141E-01 | 10 | -1.2120E-14 | 11 | 0.00000E+00 | 12 | -1.3000E-03 |
| 13 | -1.3655E-01 | 14 | -2.0026E-01 | 15 | -1.7045E-14 | 16 | 0.00000E+00 |
| 17 | -4.6949E-04 | 18 | -1.5330E-01 | 19 | -2.1109E-01 | 20 | -2.1509E-14 |
| 21 | 0.00000E+00 | 22 | 5.2076E-12  | 23 | -1.4099E-10 | 24 | -2.1509E-10 |
| 25 | -2.2807E-23 |    |             |    |             |    |             |

## VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA       | I  | OMEGA       | I  | OMEGA      | I  | OMEGA       |
|----|-------------|----|-------------|----|------------|----|-------------|
| 1  | 0.00000E+00 | 2  | 5.0787E-01  | 3  | 3.1871E+00 | 4  | 4.2052E+00  |
| 5  | 4.2987E-13  | 6  | 0.00000E+00 | 7  | 3.9007E-01 | 8  | 2.9307E+00  |
| 9  | 6.8575E+00  | 10 | 6.8568E-14  | 11 | 3.9704E-17 | 12 | -2.0114E+00 |
| 13 | 2.7577E+00  | 14 | 6.0817E+00  | 15 | 6.8010E-14 | 16 | 6.0947E-17  |
| 17 | -1.8664E+00 | 18 | 2.6736E+00  | 19 | 5.5958E+00 | 20 | 5.5953E-14  |
| 21 | 6.0841E-27  | 22 | 5.1238E-02  | 23 | 4.9242E+00 | 24 | 7.2400E+00  |
| 25 | 7.6072E-13  |    |             |    |            |    |             |

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RECTANGULAR ENCLOSURE - ISOTHERMAL SIDE WALLS

ENCLOSURE INCLINATION = 0.0 DEGREE

H 2.0000E-02 W 2.0000E+00 TS 1.0000E+02 TL 0.0000E+00

PSY ERROR=6.3147E-02 THETA ERROR=7.3155E-06 CLEGA ERROR=1.9747E-05

NUMBER OF OUTER ITERATIONS= 11

RA 6.6409E+04 PR 6.9991E-01 NU 1.0057E+00 AR 1.0000E-02

GAP CONDUCTANCE = 1.1555E+00 KCAL/M.H.A.M.DEG.

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TEMPERATURE DISTRIBUTION

| TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       | I  |
|------------|----|------------|----|------------|----|------------|----|
| 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 | 5  |
| 1.0000E+02 | 6  | 6.0003E-05 | 7  | 7.4717E-11 | 8  | 7.4686E+01 | 9  |
| 7.5168E+01 | 10 | 6.0003E-05 | 11 | 5.9541E-12 | 12 | 4.7656E+01 | 13 |
| 4.9572E+01 | 14 | 5.0175E+01 | 15 | 5.0141E-12 | 16 | 2.9723E-12 | 17 |
| 2.4773E+01 | 18 | 2.4690E+01 | 19 | 2.5094E+01 | 20 | 3.0074E-12 | 21 |
| 3.8717E-21 | 22 | 2.9779E-05 | 23 | 2.9670E-05 | 24 | 3.0074E-08 | 25 |
| 3.9062E-21 |    |            |    |            |    |            |    |

STREAM FUNCTION DISTRIBUTION

| PSY         | I  | PSY         | I  | PSY         | I  | PSY         | I  |
|-------------|----|-------------|----|-------------|----|-------------|----|
| 0.0000E+00  | 2  | 0.0000E+00  | 3  | 0.0000E+00  | 4  | 0.0000E+00  | 5  |
| 0.0000E+00  | 6  | 0.0000E+00  | 7  | -1.4022E-11 | 8  | -6.1120E-01 | 9  |
| -1.0484E+00 | 10 | -9.3744E-14 | 11 | 0.0000E+00  | 12 | -7.6161E-03 | 13 |
| -1.0838E+00 | 14 | -1.5971E-00 | 15 | -1.5168E-12 | 16 | 0.0000E+00  | 17 |
| -5.7677E-03 | 18 | -1.0222E+00 | 19 | -1.5000E+00 | 20 | -1.7140E-13 | 21 |
| 0.0000E+00  | 22 | 4.0339E-11  | 23 | -1.1000E-09 | 24 | -1.7143E-09 | 25 |
| -1.8107E-27 |    |             |    |             |    |             |    |

VORTICITY FUNCTION DISTRIBUTION

| OMEGA       | I  | OMEGA      | I  | OMEGA      | I  | OMEGA       | I  |
|-------------|----|------------|----|------------|----|-------------|----|
| 0.0000E+00  | 2  | 4.4874E+00 | 3  | 2.5586E+01 | 4  | 3.3548E+01  | 5  |
| 9.4513E-12  | 6  | 0.0000E+00 | 7  | 2.3547E+00 | 8  | 2.3149E+01  | 9  |
| 5.4901E+01  | 10 | 5.4778E-13 | 11 | 1.0051E-12 | 12 | -1.5984E+01 | 13 |
| 2.1732E+01  | 14 | 5.4557E+01 | 15 | 5.1742E-13 | 16 | 4.8533E-16  | 17 |
| -1.4744E+01 | 18 | 2.1231E+01 | 19 | 7.4501E-11 | 20 | 4.4556E-13  | 21 |
| 4.3522E-26  | 22 | 1.8457E-01 | 23 | 3.8113E+01 | 24 | 5.7636E+01  | 25 |
| 6.0626E-12  |    |            |    |            |    |             |    |

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RECTANGULAR ENCLOSURE - ISOTHERMAL STEE WALLS

352

ENCLOSURE INCLINATION = 0.0 DEGREE

IN W TS L  
3.0000E-02 3.0000E+00 1.0000E+00 0.0000E+00  
PSY ERROR=2.4949E-02 THETA ERROR=1.3732E-05 Omega ERROR=1.0154E-03

NUMBER OF OUTER ITERATIONS= 10

RA FR NU GP  
2.2420E+05 6.9991E-01 1.0000E+00 1.0000E+02

GAP CONDUCTANCE = 7.7397E-01 KCAL M. M. DEG.C

\*\*\*\*\*

TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 1.0000E+02 | 2  | 1.0000E+02 | 3  | 1.0000E+02 | 4  | 1.0000E+02 |
| 5  | 1.0000E+02 | 6  | 5.5003E-02 | 7  | 7.4113E-01 | 8  | 7.4113E-01 |
| 9  | 7.5792E+01 | 10 | 5.5003E-02 | 11 | 5.4112E-01 | 12 | 4.7111E+01 |
| 13 | 4.9792E+01 | 14 | 5.0824E+01 | 15 | 5.3072E-01 | 16 | 2.6732E-12 |
| 17 | 2.4367E+01 | 18 | 2.4083E+01 | 19 | 7.5432E+01 | 20 | 2.7853E-12 |
| 21 | 3.2464E-01 | 22 | 2.6981E-03 | 23 | 2.6672E-03 | 24 | 2.7353E-08 |
| 25 | 3.3322E-01 |    |            |    |            |    |            |

STREAM FUNCTION DISTRIBUTION

| I  | PSY         | I  | PSY         | I  | PSY         | I  | PSY         |
|----|-------------|----|-------------|----|-------------|----|-------------|
| 1  | 0.0000E+00  | 2  | 0.0000E+00  | 3  | 0.0000E+00  | 4  | 0.0000E+00  |
| 5  | 0.0000E+00  | 6  | 0.0000E+00  | 7  | -4.2330E-01 | 8  | -2.6863E+00 |
| 9  | -3.5102E+00 | 10 | -2.8042E-13 | 11 | 0.0000E+00  | 12 | -2.6094E-02 |
| 13 | -3.5792E+00 | 14 | -5.3370E+00 | 15 | 4.5437E-13  | 16 | 0.0000E+00  |
| 17 | -2.3570E-02 | 18 | -4.0455E+00 | 19 | -6.0112E-01 | 20 | -5.1266E-13 |
| 21 | 0.0000E+00  | 22 | 1.3226E-10  | 23 | -3.3102E-01 | 24 | -5.1266E-09 |
| 25 | -4.9382E-22 |    |             |    |             |    |             |

VORTICITY FUNCTION DISTRIBUTION

| I  | OMEGA       | I  | OMEGA      | I  | OMEGA      | I  | OMEGA       |
|----|-------------|----|------------|----|------------|----|-------------|
| 1  | 0.0000E+00  | 2  | 1.4451E+01 | 3  | 8.5702E+01 | 4  | 1.1283E+02  |
| 5  | 1.0384E-11  | 6  | 0.0000E+00 | 7  | 8.2902E+00 | 8  | 7.5466E+01  |
| 9  | 1.8437E+02  | 10 | 1.8436E-12 | 11 | 9.1111E-11 | 12 | -5.2946E+01 |
| 13 | 7.0032E+01  | 14 | 1.5449E-01 | 15 | 1.5447E-11 | 16 | 1.4540E-13  |
| 17 | -4.7809E+01 | 18 | 7.0205E+01 | 19 | 1.1454E+02 | 20 | 1.6850E-12  |
| 21 | 1.4538E-25  | 22 | 7.5422E+01 | 23 | 1.7294E+02 | 24 | 1.9232E-02  |
| 25 | *****       |    |            |    |            |    |             |

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## ENCLOSURE INFORMATION = 0.0 RES TIED

NUMBER OF OUTER ITERATIONS = 17

GAP CONDUCTANCE = 5.5576E-01 KCAL/D.M.GR.DEG.C

TEMPERATURE DISTRIBUTION

## STREAM FUNCTION DISTRIBUTION

### VORTICITY FUNCTION DISTRIBUTION

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353

ENCLOSURE INC' IN 97100 - 100 100 100 100

NUMBER OF OUTER ITERATIONS = 5

GRIP PERFORMANCE = 4.7955-04 KIASL 11.00022000

TEMPERATURE ESTIMATION: 09

STREAM FUNCTION DISTURBANCE,

ACTIVITY FUNCTION DISTRIBUTION

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M.E. PROJECT DONE BY ANIL KUMAR.S. GUIDE-H.J.SHUKLA

## TEMPERATURE DISTRIBUTION

[illegible]

PSI CONTOUR

TEMP CONTOUR

VERTICITY CONT UR

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W. E. 887152 DONE BY ANIL KUMAR. S. GUIDE-H. J. SHUKLA

PA  
PR  
ND

|   |   |    |    |            |            |            |
|---|---|----|----|------------|------------|------------|
| H | N | TS | TL | RA         | PR         | NU         |
|   |   |    |    |            | -          |            |
|   |   |    |    | 0-3503D-04 | 0-5999D-30 | 0-6247D-31 |

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I   | TEMP       |
|----|------------|----|------------|----|------------|-----|------------|
| 1  | 0.10000 03 | 2  | 0.10000 03 | 3  | 0.10000 03 | 4   | 0.10000 03 |
| 1  | 0.10000 03 | 6  | 0.10000 03 | 7  | 0.10000 03 | 8   | 0.10000 03 |
| 5  | 0.10000 03 | 10 | 0.10000 03 | 11 | 0.25610-7  | 12  | 0.81800 02 |
| 9  | 0.10000 03 | 13 | 0.88180 02 | 14 | 0.88180 02 | 15  | 0.88420 02 |
| 13 | 0.07310 02 | 18 | 0.87390 02 | 19 | 0.82230 02 | 20  | 0.25620-07 |
| 17 | 0.88160 02 | 22 | 0.86560 02 | 23 | 0.74900 02 | 24  | 0.76480 02 |
| 21 | 0.12790-08 | 25 | 0.76940 02 | 27 | 0.76470 02 | 28  | 0.75040 02 |
| 25 | 0.76930 02 | 30 | 0.12850-08 | 31 | 0.10290-08 | 32  | 0.53540 02 |
| 29 | 0.67090 02 | 34 | 0.54950 02 | 35 | 0.65570 02 | 36  | 0.65580 02 |
| 33 | 0.62920 02 | 38 | 0.53110 02 | 39 | 0.51440 02 | 40  | 0.10360-08 |
| 37 | 0.64970 02 | 42 | 0.42260 02 | 43 | 0.53710 02 | 44  | 0.53640 02 |
| 41 | 0.81280-04 | 46 | 0.54370 02 | 47 | 0.52240-09 | 49  | 0.51670 02 |
| 45 | 0.54350 02 | 50 | 0.81940-09 | 51 | 0.42550 02 | 52  | 0.32320 02 |
| 49 | 0.42730 02 | 53 | 0.42550 02 | 55 | 0.42550 02 | 56  | 0.43300 02 |
| 53 | 0.60450 02 | 58 | 0.40700 02 | 60 | 0.23410 02 | 61  | 0.62820-09 |
| 57 | 0.42560 02 | 62 | 0.23410 02 | 63 | 0.32370 02 | 64  | 0.31690 02 |
| 61 | 0.45120-09 | 66 | 0.32370 02 | 71 | 0.45630-09 | 72  | 0.30140 02 |
| 65 | 0.32330 02 | 70 | 0.45630-09 | 75 | 0.21500 02 | 76  | 0.15220 02 |
| 69 | 0.23740 02 | 74 | 0.21510 02 | 77 | 0.19910 02 | 80  | 0.21530 02 |
| 73 | 0.19710 02 | 78 | 0.19910 02 | 83 | 0.15460 02 | 84  | 0.29700-09 |
| 77 | 0.21120 02 | 82 | 0.74980 01 | 86 | 0.10750 02 | 88  | 0.10460 02 |
| 81 | 0.14480-04 | 85 | 0.10730 02 | 91 | 0.10540 02 | 92  | 0.99970 01 |
| 85 | 0.10730 02 | 90 | 0.76230 01 | 95 | 0.14650-09 | 96  | 0.36250-08 |
| 89 | 0.76230 01 | 94 | 0.50990-03 | 99 | 0.50990-03 | 100 | 0.52020-08 |
| 93 | 0.47820-08 | 98 | 0.47820-08 | 99 | 0.50990-03 | 100 | 0.36620-08 |
| 93 | 0.47820-08 | 98 | 0.47820-08 | 99 | 0.50990-03 | 100 | 0.36620-08 |

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**POST COUNT**

TEMP CONTOL 3

WARRANTY COPY - UR



**FREE CONVECTION IN RECTANGULAR ENCLOSURES**

# 1ST FINITE ELEMENT SOLUTION

**M. E. PROJECT DONE BY ANIL KUMAR. S. GUIDE-H. J. SHUKLA**

| H          | W           | TS        | #TL | RA        | PR        | NU        |
|------------|-------------|-----------|-----|-----------|-----------|-----------|
| 0.12500-01 | 3.625-30-01 | 0.1000 03 | 0.0 | 0.1622 05 | 0.5999 00 | 0.4657 01 |

## TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I   | TEMP       |
|----|------------|----|------------|----|------------|-----|------------|
| 1  | 0.10000 03 | 2  | 0.10000 03 | 3  | 0.10000 03 | 4   | 0.10000 03 |
| 5  | 0.10000 03 | 6  | 0.10000 03 | 7  | 0.10000 03 | 8   | 0.10000 03 |
| 9  | 0.10000 03 | 10 | 0.10000 03 | 11 | 0.10000 03 | 12  | 0.10000 03 |
| 13 | 0.10000 03 | 14 | 0.10000 03 | 15 | 0.10000 03 | 16  | 0.10000 03 |
| 17 | 0.10000 03 | 18 | 0.10000 03 | 19 | 0.10000 03 | 20  | 0.10000 03 |
| 21 | 0.10000 03 | 22 | 0.10000 03 | 23 | 0.10000 03 | 24  | 0.10000 03 |
| 25 | 0.10000 03 | 26 | 0.10000 03 | 27 | 0.10000 03 | 28  | 0.10000 03 |
| 29 | 0.10000 03 | 30 | 0.10000 03 | 31 | 0.10000 03 | 32  | 0.10000 03 |
| 33 | 0.10000 03 | 34 | 0.10000 03 | 35 | 0.10000 03 | 36  | 0.10000 03 |
| 37 | 0.10000 03 | 38 | 0.10000 03 | 39 | 0.10000 03 | 40  | 0.10000 03 |
| 41 | 0.10000 03 | 42 | 0.10000 03 | 43 | 0.10000 03 | 44  | 0.10000 03 |
| 45 | 0.10000 03 | 46 | 0.10000 03 | 47 | 0.10000 03 | 48  | 0.10000 03 |
| 49 | 0.10000 03 | 50 | 0.10000 03 | 51 | 0.10000 03 | 52  | 0.10000 03 |
| 53 | 0.10000 03 | 54 | 0.10000 03 | 55 | 0.10000 03 | 56  | 0.10000 03 |
| 57 | 0.10000 03 | 58 | 0.10000 03 | 59 | 0.10000 03 | 60  | 0.10000 03 |
| 61 | 0.10000 03 | 62 | 0.10000 03 | 63 | 0.10000 03 | 64  | 0.10000 03 |
| 65 | 0.10000 03 | 66 | 0.10000 03 | 67 | 0.10000 03 | 68  | 0.10000 03 |
| 69 | 0.10000 03 | 70 | 0.10000 03 | 71 | 0.10000 03 | 72  | 0.10000 03 |
| 73 | 0.10000 03 | 74 | 0.10000 03 | 75 | 0.10000 03 | 76  | 0.10000 03 |
| 77 | 0.10000 03 | 78 | 0.10000 03 | 79 | 0.10000 03 | 80  | 0.10000 03 |
| 81 | 0.10000 03 | 82 | 0.10000 03 | 83 | 0.10000 03 | 84  | 0.10000 03 |
| 85 | 0.10000 03 | 86 | 0.10000 03 | 87 | 0.10000 03 | 88  | 0.10000 03 |
| 89 | 0.10000 03 | 90 | 0.10000 03 | 91 | 0.10000 03 | 92  | 0.10000 03 |
| 93 | 0.10000 03 | 94 | 0.10000 03 | 95 | 0.10000 03 | 96  | 0.10000 03 |
| 97 | 0.10000 03 | 98 | 0.10000 03 | 99 | 0.10000 03 | 100 | 0.10000 03 |

PSI CONTOUR

[illegible]

## TEMP CONTOUR

[illegible]

ARTICITY CONT UR

[illegible]

NO. 110705. INVENTED 31.11.13. 153

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0-1500D-01

**3.75000-01**

0.10003 03

### 3.0

0-28020 05

0.5999 30

10 07895.0

## TEMPERATURE DISTRIBUTION

| I  | TEMP    | I  | TEMP    | I  | TEMP    | I  | TEMP    | I   | TEMP    |
|----|---------|----|---------|----|---------|----|---------|-----|---------|
| 1  | 0.10000 | 2  | 0.10000 | 3  | 0.10000 | 4  | 0.10000 | 5   | 0.10000 |
| 6  | 0.10000 | 7  | 0.10000 | 8  | 0.10000 | 9  | 0.10000 | 10  | 0.10000 |
| 11 | 0.10000 | 12 | 0.10000 | 13 | 0.10000 | 14 | 0.10000 | 15  | 0.10000 |
| 16 | 0.10000 | 17 | 0.10000 | 18 | 0.10000 | 19 | 0.10000 | 20  | 0.10000 |
| 21 | 0.10000 | 22 | 0.10000 | 23 | 0.10000 | 24 | 0.10000 | 25  | 0.10000 |
| 26 | 0.10000 | 27 | 0.10000 | 28 | 0.10000 | 29 | 0.10000 | 30  | 0.10000 |
| 31 | 0.10000 | 32 | 0.10000 | 33 | 0.10000 | 34 | 0.10000 | 35  | 0.10000 |
| 36 | 0.10000 | 37 | 0.10000 | 38 | 0.10000 | 39 | 0.10000 | 40  | 0.10000 |
| 41 | 0.10000 | 42 | 0.10000 | 43 | 0.10000 | 44 | 0.10000 | 45  | 0.10000 |
| 46 | 0.10000 | 47 | 0.10000 | 48 | 0.10000 | 49 | 0.10000 | 50  | 0.10000 |
| 51 | 0.10000 | 52 | 0.10000 | 53 | 0.10000 | 54 | 0.10000 | 55  | 0.10000 |
| 56 | 0.10000 | 57 | 0.10000 | 58 | 0.10000 | 59 | 0.10000 | 60  | 0.10000 |
| 61 | 0.10000 | 62 | 0.10000 | 63 | 0.10000 | 64 | 0.10000 | 65  | 0.10000 |
| 66 | 0.10000 | 67 | 0.10000 | 68 | 0.10000 | 69 | 0.10000 | 70  | 0.10000 |
| 71 | 0.10000 | 72 | 0.10000 | 73 | 0.10000 | 74 | 0.10000 | 75  | 0.10000 |
| 76 | 0.10000 | 77 | 0.10000 | 78 | 0.10000 | 79 | 0.10000 | 80  | 0.10000 |
| 81 | 0.10000 | 82 | 0.10000 | 83 | 0.10000 | 84 | 0.10000 | 85  | 0.10000 |
| 86 | 0.10000 | 87 | 0.10000 | 88 | 0.10000 | 89 | 0.10000 | 90  | 0.10000 |
| 91 | 0.10000 | 92 | 0.10000 | 93 | 0.10000 | 94 | 0.10000 | 95  | 0.10000 |
| 96 | 0.10000 | 97 | 0.10000 | 98 | 0.10000 | 99 | 0.10000 | 100 | 0.10000 |

[illegible]

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[illegible][illegible]

**PSI CONTOUR**

**TEMP CONTOUR**

VORTICITY CONT UR

## CST FINITE ELEMENT SOLUTION

W E PROTECT JOYE BY ANIL KUMAR.S. GUIDE-H.J.SHUKLA

| NU         | PR         | RA         | TL  | YS        | W   | W   |
|------------|------------|------------|-----|-----------|-----|-----|
| 0-49810 01 | 0-59990 00 | 0-44500 05 | 0-0 | 0-0000 00 | 0-0 | 0-0 |

## TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       | I   | TEMP       |
|----|------------|----|------------|----|------------|-----|------------|
| 1  | 0.10000    | 2  | 0.10000    | 3  | 0.10000    | 4   | 0.10000    |
| 1  | 0.10000    | 6  | 0.10000    | 7  | 0.10000    | 8   | 0.10000    |
| 5  | 0.10000    |    |            |    |            |     |            |
| 9  | 0.10000    | 10 | 0.10000    | 11 | 0.25620-07 | 12  | 0.82730 02 |
| 13 | 0.84380 02 | 14 | 0.86190 02 | 15 | 0.87190 02 | 16  | 0.87360 02 |
| 17 | 0.86170 02 | 18 | 0.84670 02 | 19 | 0.87590 02 | 20  | 0.85680-07 |
| 21 | 0.12970-09 | 22 | 0.57630 02 | 23 | 0.69390 02 | 24  | 0.72710 02 |
| 25 | 0.74630 02 | 26 | 0.74910 02 | 27 | 0.72960 02 | 28  | 0.70280 02 |
| 29 | 0.73750 02 | 30 | 0.13670-08 | 31 | 0.16400-08 | 32  | 0.53990 02 |
| 33 | 0.55500 02 | 34 | 0.59840 02 | 35 | 0.62450 02 | 36  | 0.62800 02 |
| 37 | 0.65520 02 | 38 | 0.57730 02 | 39 | 0.59910 02 | 40  | 0.11100-08 |
| 41 | 0.81210-09 | 42 | 0.41860 02 | 43 | 0.43310 02 | 44  | 0.47800 02 |
| 45 | 0.50770 02 | 46 | 0.51130 02 | 47 | 0.48880 02 | 48  | 0.45520-02 |
| 49 | 0.47220 02 | 50 | 0.57640-09 | 51 | 0.61280-09 | 52  | 0.31310 02 |
| 53 | 0.32540 02 | 54 | 0.36690 02 | 55 | 0.36640 02 | 56  | 0.39990 02 |
| 57 | 0.38000 02 | 58 | 0.34990 02 | 59 | 0.35940 02 | 60  | 0.86340-09 |
| 61 | 0.43780-09 | 62 | 0.22170 02 | 63 | 0.23080 02 | 64  | 0.26480 02 |
| 65 | 0.29060 02 | 66 | 0.29360 02 | 67 | 0.27800 02 | 68  | 0.25400 02 |
| 69 | 0.25930 02 | 70 | 0.48260 09 | 71 | 0.28140-09 | 72  | 0.14160 02 |
| 73 | 0.14570 02 | 74 | 0.17050 02 | 75 | 0.18980 02 | 76  | 0.19210 02 |
| 77 | 0.18160 02 | 78 | 0.16230 02 | 79 | 0.16870 02 | 80  | 0.31340-09 |
| 81 | 0.13760-09 | 82 | 0.58820 01 | 83 | 0.70610 01 | 84  | 0.82900 01 |
| 85 | 0.93380 01 | 86 | 0.94590 01 | 87 | 0.89300 01 | 88  | 0.81270 01 |
| 89 | 0.83120 01 | 90 | 0.15390-09 | 91 | 0.81070-19 | 92  | 0.34440-08 |
| 93 | 0.39280-08 | 94 | 0.44230 08 | 95 | 0.48110-08 | 96  | 0.48570-08 |
| 97 | 0.46360-08 | 98 | 0.42470-08 | 99 | 0.38480-08 | 100 | 0.87290-19 |

PSI CONTROL

## TEMP CONTOUR

[illegible]

VERIFICITY CONT UR

W E PROJECT DONE BY ANIL KUMAR. S. GUIDE-H.J.SHUKLA

| H  | M  | TS | TL | QA | PR | NU |
|----|----|----|----|----|----|----|
| 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 1  | 1  | 1  | 1  | 1  | 1  | 1  |
| 2  | 2  | 2  | 2  | 2  | 2  | 2  |
| 3  | 3  | 3  | 3  | 3  | 3  | 3  |
| 4  | 4  | 4  | 4  | 4  | 4  | 4  |
| 5  | 5  | 5  | 5  | 5  | 5  | 5  |
| 6  | 6  | 6  | 6  | 6  | 6  | 6  |
| 7  | 7  | 7  | 7  | 7  | 7  | 7  |
| 8  | 8  | 8  | 8  | 8  | 8  | 8  |
| 9  | 9  | 9  | 9  | 9  | 9  | 9  |
| 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 21 | 21 | 21 | 21 | 21 | 21 | 21 |
| 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| 28 | 28 | 28 | 28 | 28 | 28 | 28 |
| 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| 34 | 34 | 34 | 34 | 34 | 34 | 34 |
| 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| 36 | 36 | 36 | 36 | 36 | 36 | 36 |
| 37 | 37 | 37 | 37 | 37 | 37 | 37 |
| 38 | 38 | 38 | 38 | 38 | 38 | 38 |
| 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| 41 | 41 | 41 | 41 | 41 | 41 | 41 |
| 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| 43 | 43 | 43 | 43 | 43 | 43 | 43 |
| 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| 46 | 46 | 46 | 46 | 46 | 46 | 46 |
| 47 | 47 | 47 | 47 | 47 | 47 | 47 |
| 48 | 48 | 48 | 48 | 48 | 48 | 48 |
| 49 | 49 | 49 | 49 | 49 | 49 | 49 |
| 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 51 | 51 | 51 | 51 | 51 | 51 | 51 |
| 52 | 52 | 52 | 52 | 52 | 52 | 52 |
| 53 | 53 | 53 | 53 | 53 | 53 | 53 |
| 54 | 54 | 54 | 54 | 54 | 54 | 54 |
| 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| 56 | 56 | 56 | 56 | 56 | 56 | 56 |
| 57 | 57 | 57 | 57 | 57 | 57 | 57 |
| 58 | 58 | 58 | 58 | 58 | 58 | 58 |
| 59 | 59 | 59 | 59 | 59 | 59 | 59 |
| 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 61 | 61 | 61 | 61 | 61 | 61 | 61 |
| 62 | 62 | 62 | 62 | 62 | 62 | 62 |
| 63 | 63 | 63 | 63 | 63 | 63 | 63 |
| 64 | 64 | 64 | 64 | 64 | 64 | 64 |

[illegible]

```

EEEEEEEF      CCC      88B
EEE      EEF00D      CCC      88BAAA
EEE      DDD      CCC      AAA
EEEEGG      DDD      CCC      AAAAAA
EEE      DDD      CCC      AAAAAA
EEE      EEEGGGEE      CCC      AAAAAA
EEFFF      CCC      88B
EEEEEE      DDDDDJ      CCC      88B
EEEEEE      EEEEEEE      EEEEEEEEEEEEEE

```

AAAAAAAAAAAAAAAAAAAAAAAAAAAA  
AAA  
AABBBB888888888 888888888AAA  
AAA CCCCCCCCCC CCAAAA  
AAA CCC... DDDDDDDDD DDDAAA  
AABDDDDDD EEEEE EEEAAA  
AAEEEEEEE FFFFF FFAAAA  
AAA GGGGG GGGAAA  
AAA HHHHHHHHHH AAA  
KKKKKKKKKKKKKKKKKKKKKKKK

```

CCC      FFF      GGG      HHHEE
DDD      FFF      FFF      EEE
CCC      FFF      HHHEE      EEE
      FFFFF      KKKEE
BBB      FFF      KKKEE
      FFF      KKKEE
AAA      FFF      KKKEE
      FFFFF      KKKEE
DDD      FFFFF      KKKEE
      FFFFFGGGHHHEE
      EEE

```

PSI CONTOUR

TEMP CONTOUR

**VERTICITY CONT UR**



# 251 FINITE ELEMENT SOLUTION

| H        | W           | TS         | TL  | RA         | PR         | VU         |
|----------|-------------|------------|-----|------------|------------|------------|
| 25000 01 | 2 125 00 00 | 0 10000 03 | 0 0 | 0 1297D 06 | 0 55990 00 | 0 7876D 01 |

| I  | TEMP       | I  | TEMP        | I  | TEMP       | I   | TEMP       | I | TEMP |
|----|------------|----|-------------|----|------------|-----|------------|---|------|
| 1  | 0.10000 03 | 2  | 0.10000 03  | 3  | 0.10000 03 | 4   | 0.10000 03 |   |      |
| 5  | 0.10000 03 | 6  | 0.10000 03  | 7  | 0.10000 03 | 8   | 0.10000 03 |   |      |
| 9  | 0.10000 03 | 10 | 0.10000 03  | 11 | 0.25630-07 | 12  | 0.53940 07 |   |      |
| 13 | 0.79170 02 | 14 | 0.33230 02  | 15 | 0.85790 02 | 16  | 0.84200 02 |   |      |
| 17 | 0.83200 02 | 18 | 0.80320 02  | 19 | 0.97090 02 | 20  | 0.25780-01 |   |      |
| 21 | 0.13020-03 | 22 | 0.69550 02  | 23 | 0.59970 02 | 24  | 0.66990 02 |   |      |
| 25 | 0.72300 02 | 26 | 0.69130 02  | 27 | 0.66620 02 | 28  | 0.53470 07 |   |      |
| 29 | 0.85870 02 | 30 | 0.14940-08  | 31 | 0.10320-08 | 32  | 0.55700 02 |   |      |
| 33 | 0.43720 02 | 34 | 0.51870 02  | 35 | 0.59640 02 | 36  | 0.55310 07 |   |      |
| 37 | 0.50700 02 | 38 | 0.49420 02  | 39 | 0.72230 02 | 40  | 0.12250-08 |   |      |
| 41 | 0.78950-09 | 42 | 0.42890 02  | 43 | 0.30740 02 | 44  | 0.38320 02 |   |      |
| 45 | 0.47770 02 | 46 | 0.43140 02  | 47 | 0.36280 02 | 48  | 0.37120 02 |   |      |
| 49 | 0.58460 02 | 50 | 0.96840-09  | 51 | 0.58150-09 | 52  | 0.31610 02 |   |      |
| 53 | 0.20580 02 | 54 | 0.26630 02  | 55 | 0.36720 02 | 56  | 0.32560 03 |   |      |
| 57 | 0.24160 02 | 58 | 0.26230 02  | 59 | 0.45320 02 | 60  | 0.73700-09 |   |      |
| 61 | 0.40550-09 | 62 | 0.21960 02  | 63 | 0.12750 02 | 64  | 0.16880 02 |   |      |
| 65 | 0.26450 02 | 66 | 0.23340 02  | 67 | 0.14760 02 | 68  | 0.16990 02 |   |      |
| 69 | 0.33360 02 | 70 | 0.53080-09  | 71 | 0.25530-09 | 72  | 0.13730 02 |   |      |
| 73 | 0.69720 01 | 74 | 0.96330 01  | 75 | 0.16890 02 | 76  | 0.15090 02 |   |      |
| 77 | 0.79900 01 | 78 | 0.92560 01  | 79 | 0.21630 02 | 80  | 0.34410-09 |   |      |
| 81 | 0.12290-09 | 82 | 0.65730 01  | 83 | 0.29530 01 | 84  | 0.37440 01 |   |      |
| 85 | 0.79210 01 | 86 | 0.75210 01  | 87 | 0.33940 01 | 88  | 0.40630 01 |   |      |
| 89 | 0.10320 02 | 90 | 0.16840-09  | 91 | 0.74770-19 | 92  | 0.30760-08 |   |      |
| 93 | 0.27220 02 | 94 | 0.34970 -08 | 95 | 0.41730-08 | 96  | 0.41770-08 |   |      |
| 97 | 0.18470-08 | 98 | 0.34940-08  | 99 | 0.42100-08 | 100 | 0.92100-19 |   |      |

[illegible]

|          |           |              |          |
|----------|-----------|--------------|----------|
| B39      | FFHHH     | GGG          | KKKKKKEE |
| CCGGGGDD | H4HGSGDDK | KKKEE        | EE       |
| B3GGGGDD | KKKEE     |              |          |
| AAA      | DDOFF     | KKKEE        |          |
| AAA      |           | 4HDDDKKKEE   |          |
| AAA      |           | HHHHHDDDKKEE |          |
| AAA      | GGFFFGG   | HHH          | KKKEE    |
| DDD      | GGGGGG    | FFFKKEE      |          |
| DDG      |           | GGGGG        | KKKEE    |

TEMP CONTOUR

VIRILITY CONT UR

305

333

365

N.E. PROJECT-DONE BY: ANIL KUMAR, S.- GUIDE-H. J. SHUKLA

| NU         | PR         | RA         | FL  | TS         | W          | H          |
|------------|------------|------------|-----|------------|------------|------------|
| 0.31930 21 | 0.59990 00 | 0.35330 06 | 0.0 | 0.10000 03 | 0.37500 00 | 0.75000-02 |

| I  | Temp       | I  | Temp       | I  | Temp       | I  | Temp       |
|----|------------|----|------------|----|------------|----|------------|
| 1  | 0.10000 33 | 2  | 0.10000 33 | 3  | 0.10000 33 | 4  | 0.10000 33 |
| 5  | 0.10000 33 | 5  | 0.10000 33 | 7  | 0.10000 33 | 8  | 0.10000 33 |
| 9  | 0.10000 33 | 12 | 0.10000 33 | 11 | 0.25010-07 | 12 | 0.88510 02 |
| 13 | 0.88500 02 | 14 | 0.88620 02 | 15 | 0.88600 02 | 15 | 0.88600 02 |
| 17 | 0.88500 02 | 18 | 0.88620 02 | 19 | 0.88520 02 | 20 | 0.25010-37 |
| 21 | 0.15420 10 | 22 | 0.77120 02 | 23 | 0.77260 02 | 24 | 0.77270 02 |
| 25 | 0.77270 02 | 26 | 0.77270 02 | 27 | 0.77270 02 | 28 | 0.77260 02 |
| 29 | 0.77130 02 | 30 | 0.15440-10 | 31 | 0.13170-10 | 32 | 0.65840 02 |
| 33 | 0.66310 02 | 34 | 0.56320 02 | 35 | 0.66030 02 | 36 | 0.66030 02 |
| 37 | 0.66020 02 | 38 | 0.66020 02 | 39 | 0.56850 02 | 40 | 0.13190-10 |
| 41 | 0.10940-10 | 42 | 0.54630 02 | 43 | 0.54860 02 | 44 | 0.54870 02 |
| 45 | 0.54370 02 | 46 | 0.54870 02 | 47 | 0.54870 02 | 48 | 0.54860 02 |
| 49 | 0.54590 02 | 50 | 0.10950-10 | 51 | 0.87300-11 | 52 | 0.43620 02 |
| 53 | 0.43790 02 | 54 | 0.43800 02 | 55 | 0.43800 02 | 56 | 0.43800 02 |
| 57 | 0.43930 02 | 58 | 0.43790 02 | 59 | 0.43630 02 | 60 | 0.87450-11 |
| 61 | 0.65360-11 | 62 | 0.32650 02 | 63 | 0.32800 02 | 64 | 0.32800 02 |
| 65 | 0.32800 02 | 66 | 0.32800 02 | 67 | 0.32790 02 | 68 | 0.32790 02 |
| 69 | 0.52560 02 | 70 | 0.65430-11 | 71 | 0.43530-11 | 72 | 0.21740 02 |
| 73 | 0.21940 02 | 74 | 0.21950 02 | 75 | 0.21850 02 | 76 | 0.21850 02 |
| 77 | 0.21950 02 | 78 | 0.21340 02 | 79 | 0.21750 02 | 80 | 0.43610-11 |
| 81 | 0.21750-11 | 82 | 0.10870 02 | 83 | 0.10920 02 | 84 | 0.10920 02 |
| 85 | 0.10920 02 | 86 | 0.10930 02 | 87 | 0.10920 02 | 88 | 0.10920 02 |
| 89 | 0.10920 02 | 90 | 0.21950-11 | 91 | 0.13090-20 | 92 | 0.54490-38 |
| 93 | 0.54760-08 | 94 | 0.54770-08 | 95 | 0.54780-08 | 96 | 0.54780-08 |
|    |            | 97 | 0.54760-08 | 98 | 0.54760-08 | 99 | 0.13100-20 |

[illegible]

NO 110765--JAN 31 1955  
FIVE-ELEMENT

N.E. PROJECT DONE BY ANIL KUMAR. See GUIDE-H.J. SHUKLA

| H          | M          | IS         | FL | RA | PR | NU |
|------------|------------|------------|----|----|----|----|
| 0-31940 JI | 0-87040 04 | 0-5999D 00 |    |    |    |    |

## TEMPERATURE DISTRIBUTION

| I  | TEMP       | I  | TEMP       | I  | TEMP       |
|----|------------|----|------------|----|------------|
| 1  | 0.10000-03 | 2  | 0.10000-03 | 3  | 0.10000-03 |
| 1  | 0.10000-03 | 6  | 0.10000-03 | 7  | 0.10000-03 |
| 5  | 0.10000-03 | 10 | 0.10000-03 | 11 | 0.10000-03 |
| 9  | 0.10000-03 | 13 | 0.10000-03 | 15 | 0.10000-03 |
| 13 | 0.10000-03 | 18 | 0.10000-03 | 19 | 0.10000-03 |
| 17 | 0.10000-03 | 21 | 0.10000-03 | 23 | 0.10000-03 |
| 21 | 0.10000-03 | 26 | 0.10000-03 | 27 | 0.10000-03 |
| 25 | 0.10000-03 | 30 | 0.10000-03 | 31 | 0.10000-03 |
| 33 | 0.10000-03 | 34 | 0.10000-03 | 35 | 0.10000-03 |
| 37 | 0.10000-03 | 42 | 0.10000-03 | 43 | 0.10000-03 |
| 41 | 0.10000-03 | 45 | 0.10000-03 | 47 | 0.10000-03 |
| 45 | 0.10000-03 | 50 | 0.10000-03 | 51 | 0.10000-03 |
| 49 | 0.10000-03 | 54 | 0.10000-03 | 55 | 0.10000-03 |
| 53 | 0.10000-03 | 58 | 0.10000-03 | 61 | 0.10000-03 |
| 57 | 0.10000-03 | 62 | 0.10000-03 | 66 | 0.10000-03 |
| 61 | 0.10000-03 | 69 | 0.10000-03 | 73 | 0.10000-03 |
| 65 | 0.10000-03 | 77 | 0.10000-03 | 81 | 0.10000-03 |
| 69 | 0.10000-03 | 85 | 0.10000-03 | 91 | 0.10000-03 |
| 73 | 0.10000-03 | 93 | 0.10000-03 | 95 | 0.10000-03 |
| 77 | 0.10000-03 | 97 | 0.10000-03 | 99 | 0.10000-03 |
| 81 | 0.10000-03 |    |            |    |            |
| 85 | 0.10000-03 |    |            |    |            |
| 89 | 0.10000-03 |    |            |    |            |
| 93 | 0.10000-03 |    |            |    |            |
| 97 | 0.10000-03 |    |            |    |            |
| 99 | 0.10000-03 |    |            |    |            |

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

**INDIAN INC.**

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## NOTES

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