```
c----------Usable columns for a Fortran 77 program (1-72)---------------
c
c Declare variables
c
c-----------------------------------------------------------------------
c
      implicit real*8   (p,q,r,s,t,u,v,w,x,y,z)
c
      implicit integer  (a,b,c,d,e,f,g,h,i,j,k,l,m,n,o)
c
c-----------------------------------------------------------------------
c
c Enter model variables
c
c-----------------------------------------------------------------------
c
c Tterm = the termination time (microsec)
c
      Tterm=120.0
c
c Tprint = the time intervals for history plots (microsec)
c
      Tprint=3.0
c
c NumRRF = the number of steps between running restart files (I5)
c
      NumRRF=99999
c
c Vo = the magnitude of the initial velocity (mm/microsec)
c
      Vo=0.8
c
c SF1 = The global contact penalty factor
c
      SF1=10.0
c
c SF2 = The local slave constraint factor
c
      SF2=1.0
c
c SF3 = The local master penalty stiffness factor
c
      SF3=1.0
c
c Spall Strength of the reinforced concrete in GPa
c
      SpallStr=-0.05
c
c-----------------------------------------------------------------------
c
c Write the format statements
c
c-----------------------------------------------------------------------

100   format()
101   format(I8)
102   format(I8,I5,3(E20.12),I5)
103   format(I8,I5,8(I8))
104   format(5(I8),E10.4)
106   format(2X,I8)
110   format(A52)
```

```
111   format(I5,7(E10.4))
112   format(A8,I8)
113   format(I8,3(E10.4),I5)
114   format(I8,I8,I5,3(E10.4),3(I5),2(E7.1))
115   format(5(I8))
116   format(A80)
117   format(A22,I3,A1,I3,A20)
118   format(I8,I8)
119   format(E20.12)
120   format(I5,6(I10),E10.4,F5.3)
121   format(9(I5))
122   format(A5,5(I5),A5,I5,E10.4,I5,I5)
123   format(16(I5))
124   format(3(E10.4),2(I5),2(E10.4),2(I5),E10.4)
125   format(9(I5),A10,4(I5))
126   format(2(I5),E10.4,5(I5),3(E10.4),I5)
127   format(4(I5),E10.4,3(I5))
128   format(2(I5),E10.4,2(I5),E10.4,I5,2(E10.4),3(I5))
129   format(8(E10.4))
130   format(5(E10.4))
131   format(E10.4)
c
c-----------------------------------------------------------------------
c
c Read the node and element numbers
c
c-----------------------------------------------------------------------
c
c Read the penetrator information
c
      open(2,file='D P N Cards.txt',status='old')
c
      read(2,101)Num2DPN
      read(2,101)Num2DPE
      read(2,101)NumPN
      read(2,101)NumPE
      read(2,119)xunit
      read(2,119)yunit
      read(2,119)zunit
      read(2,100)skip
      read(2,100)skip
      read(2,100)skip
c
c Read the target information
c
      open(3,file='D T N Cards.txt',status='old')
c
      read(3,101)Num2DTN
      read(3,101)Num2DTE
      read(3,101)NumTN
      read(3,101)NumTE
      read(3,100)skip
      read(3,100)skip
      read(3,100)skip
      read(3,100)skip
      read(3,100)skip
      read(3,100)skip
c
c-----------------------------------------------------------------------
c
c Define secondary constants
```

```
c
c-----------------------------------------------------------------------
c
c Total numbers of nodes and elements
c
      NumN=NumPN+NumTN
      NumE=NumPE+NumTE
c
c Number of penetrator layers for contact
c
      NumPSI=1
c
c Number of target layers for contact
c
      NumTSI=(NumTE/Num2DTE)
c
c Total number of sliding interfaces
c
      NumSI=NumPSI*NumTSI
c
c-----------------------------------------------------------------------
c
c Begin the dyna input file and write the info lines
c
c-----------------------------------------------------------------------
c
      open(1,file='__input')
c
      write(1,110)'*--------------------Model Info----------------------'
      write(1,110)'*                                                    '
      write(1,112)'* NumN  ',NumN
      write(1,112)'* NumE  ',NumE
c
      BeginN=492
c
      write(1,112)'* BeginN',BeginN
c
      BeginE=BeginN-1+NumN+17
c
      write(1,112)'* BeginE',BeginE
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write control card 1
c
c-----------------------------------------------------------------------
c
      write(1,110)'*------------------Control Card 1-------------------'
      write(1,110)'*                                                    '
      write(1,110)'* [1] A72 - Heading                                  '
      write(1,110)'* [2] A2  - Code input format                        '
      write(1,110)'* [3] A5  - Large format option                      '
      write(1,110)'*                                                    '
      write(1,116)'*1111111111111111111111111111111111111111111111111111
     1111111111111111122_33333'
c
      write(1,116)'Penetration Problem
     1                  88 large'
c
```

```
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write control card 2
c
c-----------------------------------------------------------------------
c
      write(1,110)'*------------------Control Card 2-------------------'
      write(1,110)'*                                                    '
      write(1,110)'* [1] I5    - Number of materials                    '
      write(1,110)'* [2] I10   - Number of nodes                        '
      write(1,110)'* [3] I10   - Number of solid brick elements         '
      write(1,110)'* [4] I10   - not used                               '
      write(1,110)'* [5] I10   - not used                               '
      write(1,110)'* [6] I10   - not used                               '
      write(1,110)'* [7] I10   - not used                               '
      write(1,110)'* [8] E10.0 - not used                               '
      write(1,110)'* [9] E5.0  - not used                               '
      write(1,110)'*                                                    '
      write(1,116)'*1111222222222233333333334444444445555555556666666661
     1667777777778888888888999999'
c
      i1=3
      i2=NumN
      i3=NumE
      iu=0
      ru=0.0
c
      write(1,120)i1,i2,i3,iu,iu,iu,iu,ru,ru
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write control card 3
c
c-----------------------------------------------------------------------
c
      write(1,110)'*------------------Control Card 3-------------------'
      write(1,110)'*                                                    '
      write(1,110)'* [1] I5 - Not changed                               '
      write(1,110)'* [2] I5 - Not changed                               '
      write(1,110)'* [3] I5 - Not used                                  '
      write(1,110)'* [4] I5 - Not used                                  '
      write(1,110)'* [5] I5 - Not used                                  '
      write(1,110)'* [6] I5 - Number of steps between status reports    '
      write(1,110)'* [7] I5 - Not used                                  '
      write(1,110)'* [8] I5 - Not used                                  '
      write(1,110)'* [9] I5 - Not used                                  '
      write(1,110)'*                                                    '
      write(1,116)'*1111222233333444445555566666777778888899999--------
     1---------------------------'
c
      i1=1
      i2=1
      iu=0
      i6=1000
c
```

```
      write(1,121)i1,i2,iu,iu,iu,i6,iu,iu,iu
c
      write(1,110)'*                                                       '
      write(1,110)'*                                                       '
c
c-----------------------------------------------------------------------
c
c Write control card 4
c
c-----------------------------------------------------------------------
c
      write(1,110)'*------------------Control Card 4-------------------'
      write(1,110)'*                                                     '
      write(1,110)'* [1]  Blank                                          '
      write(1,110)'* [2]  I5    - Not used                               '
      write(1,110)'* [3]  I5    - Not used                               '
      write(1,110)'* [4]  I5    - Not used                               '
      write(1,110)'* [5]  I5    - Not used                               '
      write(1,110)'* [6]  I5    - Not used                               '
      write(1,110)'* [7]  A5    - Not changed                            '
      write(1,110)'* [8]  I5    - Not used                               '
      write(1,110)'* [9]  E10.0 - Not used                               '
      write(1,110)'* [10] I5    - Not used                               '
      write(1,110)'* [11] I5    - Not used                               '
      write(1,110)'*                                                     '
      write(1,116)'*1111222233333444445555566666777778888899999999990000
     10011111--------------------'
c
      iu=0
      ru=0.0
c
      write(1,122)'     ',iu,iu,iu,iu,iu,'e20.9',iu,ru,iu,iu
c
      write(1,110)'*                                                       '
      write(1,110)'*                                                       '
c
c-----------------------------------------------------------------------
c
c Write control card 5
c
c-----------------------------------------------------------------------
c
      write(1,110)'*------------------Control Card 5-------------------'
      write(1,110)'*                                                     '
      write(1,110)'* [1]  I5 - Not used                                  '
      write(1,110)'* [2]  I5 - Not used                                  '
      write(1,110)'* [3]  I5 - Not used                                  '
      write(1,110)'* [4]  I5 - Not used                                  '
      write(1,110)'* [5]  I5 - Not used                                  '
      write(1,110)'* [6]  I5 - Not used                                  '
      write(1,110)'* [7]  I5 - Not changed                               '
      write(1,110)'* [8]  I5 - Number of sliding interfaces              '
      write(1,110)'* [9]  I5 - Not used                                  '
      write(1,110)'* [10] I5 - Not used                                  '
      write(1,110)'* [11] I5 - Not used                                  '
      write(1,110)'* [12] I5 - Not used                                  '
      write(1,110)'* [13] I5 - Not used                                  '
      write(1,110)'* [14] I5 - Not used                                  '
      write(1,110)'* [15] I5 - Not used                                  '
      write(1,110)'* [16] I5 - Not used                                  '
      write(1,110)'*                                                     '
```

```
      write(1,116)'*1111222223333344444555556666677777888889999900000111
     1112222233333444445555566666'
c
      iu=0
      i7=1
      i8=NumSI
c
      write(1,123)iu,iu,iu,iu,iu,iu,i7,i8,iu,iu,iu,iu,iu,iu,iu,iu
c
      write(1,110)'*                                                       '
      write(1,110)'*                                                       '
c
c-----------------------------------------------------------------------
c
c Write control card 6
c
c-----------------------------------------------------------------------
c
      write(1,110)'*------------------Control Card 6-------------------'
      write(1,110)'*                                                     '
      write(1,110)'* [1]  E10.0 - Termination time                       '
      write(1,110)'* [2]  E10.0 - Time interval for time history data    '
      write(1,110)'* [3]  E10.0 - Not changed                            '
      write(1,110)'* [4]  I5    - Not changed                            '
      write(1,110)'* [5]  I5    - Steps between running restart file     '
      write(1,110)'* [6]  E10.0 - Not changed                            '
      write(1,110)'* [7]  E10.0 - Global contact panalty scale factor    '
      write(1,110)'* [8]  I5    - Not used                               '
      write(1,110)'* [9]  I5    - Not used                               '
      write(1,110)'* [10] E10.0 - Not used                               '
      write(1,110)'*                                                     '
      write(1,116)'*1111111112222222222333333333344444555556666666666777
     1777777788888999990000000000'
c
      r1=Tterm
      r2=Tprint
      r3=99999
      i4=99999
      i5=NumRRF
      r6=0.0
      r7=SF1
      i8=0
      i9=0
      r10=0.0000E+00
c
      write(1,124)r1,r2,r3,i4,i5,r6,r7,i8,i9,r10
c
      write(1,110)'*                                                       '
      write(1,110)'*                                                       '
c
c-----------------------------------------------------------------------
c
c Write control card 7
c
c-----------------------------------------------------------------------
c
      write(1,110)'*------------------Control Card 7-------------------'
      write(1,110)'*                                                     '
      write(1,110)'* [1]  I5 - Not used                                  '
      write(1,110)'* [2]  I5 - Not used                                  '
      write(1,110)'* [3]  I5 - Not used                                  '
```

```
      write(1,110)'* [4]  I5 - Not used                                  '
      write(1,110)'* [5]  I5 - Not used                                  '
      write(1,110)'* [6]  I5 - Not used                                  '
      write(1,110)'* [7]  I5 - Not used                                  '
      write(1,110)'* [8]  I5 - Not used                                  '
      write(1,110)'* [9]  I5 - Not used                                  '
      write(1,110)'* [10] Blank                                          '
      write(1,110)'* [11] I5 - Not used                                  '
      write(1,110)'* [12] I5 - Not used                                  '
      write(1,110)'* [13] I5 - Not used                                  '
      write(1,110)'* [14] I5 - Not used                                  '
      write(1,110)'*                                                     '
      write(1,116)'*1111222233333444445555566666777778888899999000000000
     1001111122222333334444-----'
c
      iu=0
c
      write(1,125)iu,iu,iu,iu,iu,iu,iu,iu,iu,'          ',iu,iu,iu,iu
c
      write(1,110)'*                                                     '
      write(1,110)'*                                                     '
c
c--------------------------------------------------------------------------
c
c Write control card 8
c
c--------------------------------------------------------------------------
c
      write(1,110)'*------------------Control Card 8--------------------'
      write(1,110)'*                                                     '
      write(1,110)'* [1]  I5    - Not used                               '
      write(1,110)'* [2]  I5    - Not used                               '
      write(1,110)'* [3]  E10.0 - Not used
'
      write(1,110)'* [4]  I5    - Not used                               '
      write(1,110)'* [5]  I5    - Not used                               '
      write(1,110)'* [6]  I5    - Not used                               '
      write(1,110)'* [7]  I5    - Not used                               '
      write(1,110)'* [8]  I5    - Not used                               '
      write(1,110)'* [9]  E10.0 - Not used
'
      write(1,110)'* [10] E10.0 - Not used
'
      write(1,110)'* [11] E10.0 - Not used
'
      write(1,110)'* [12] I5    - Not used                               '
      write(1,110)'*                                                     '
      write(1,116)'*1111222233333333334444455555666667777788888999999999
     1990000000000111111111122222'
c
      iu=0
      ru=0.0
c
      write(1,126)iu,iu,ru,iu,iu,iu,iu,iu,ru,ru,ru,iu
c
      write(1,110)'*                                                     '
      write(1,110)'*                                                     '
c
c--------------------------------------------------------------------------
c
c Write control card 9
```

```
c
c-------------------------------------------------------------------------
c
      write(1,110)'*------------------Control Card 9--------------------'
      write(1,110)'*                                                     '
      write(1,110)'* [1]  I5    - Not used                             '
      write(1,110)'* [2]  I5    - Not used                             '
      write(1,110)'* [3]  I5    - Not used                             '
      write(1,110)'* [4]  I5    - Not used                             '
      write(1,110)'* [5]  E10.0 - Not used                             '
      write(1,110)'* [6]  I5    - Not used                             '
      write(1,110)'* [7]  I5    - Not used                             '
      write(1,110)'* [8]  I5    - Not used                             '
      write(1,110)'*                                                   '
      write(1,116)'*1111222233333444445555555556666667777788888--------
     1-------------------------'
c
      iu=0
      ru=0.0
c
      write(1,127)iu,iu,iu,iu,ru,iu,iu,iu
c
      write(1,110)'*                                                   '
      write(1,110)'*                                                   '
c
c-------------------------------------------------------------------------
c
c Write material card 1 - for material 1 - reinforced concrete
c
c-------------------------------------------------------------------------
c
      write(1,110)'*-------Material 1 - Target - Material Card 1-------'
      write(1,110)'*                                                   '
      write(1,110)'* [1]  I5    - Material Identification Number       '
      write(1,110)'* [2]  I5    - Material Type                        '
      write(1,110)'* [3]  E10.0 - Mass Density                         '
      write(1,110)'* [4]  I5    - Equation of state                    '
      write(1,110)'* [5]  I5    - Hourglass stablization method        '
      write(1,110)'* [6]  E10.0 - Hourglass stablization coefficient   '
      write(1,110)'* [7]  I5    - Bulk viscosity type for shock capture'
      write(1,110)'* [8]  E10.0 - Quadratic bulk viscosity coefficient '
      write(1,110)'* [9]  E10.0 - Linear bulk viscosity coefficient    '
      write(1,110)'* [10] I5    - Element type                         '
      write(1,110)'* [11] I5    - Material initialization              '
      write(1,110)'* [12] I5    - Element formulation                  '
      write(1,110)'*                                                   '
      write(1,116)'*1111222233333333333444445555566666666667777788888888
     188999999999900000111113333 3'
c
      i1=1
      i2=15
      r3=3.48
      i4=1
      i5=0
      r6=0.1
      i7=0
      r8=1.5
      r9=0.06
      i10=0
      i11=0
      i12=0
```

```
c
      write(1,128)i1,i2,r3,i4,i5,r6,i7,r8,r9,i10,i11,i12
c
      write(1,110)'*                                                       '
      write(1,110)'*                                                       '
c
c---------------------------------------------------------------------------
c
c Write material card 2 - for material 1 - reinforced concrete
c
c---------------------------------------------------------------------------
c
      write(1,110)'*-------Material 1 - Target - Material Card 2-------'
      write(1,110)'*                                                       '
      write(1,110)'* [1] A72 -  Material identification                    '
      write(1,110)'*                                                       '
      write(1,116)'*1111111111111111111111111111111111111111111111111111
     111111111111111111--------'
c
      write(1,116)'Material Type # 15 (Johnson/Cook Elastic-Plastic) - R
     1einforced Concrete         '
c
      write(1,110)'*                                                       '
      write(1,110)'*                                                       '
c
c---------------------------------------------------------------------------
c
c Write material card 3 - for material 1 - reinforced concrete
c
c---------------------------------------------------------------------------
c
c
      write(1,110)'*-------Material 1 - Target - Material Card 3-------'
      write(1,110)'*                                                       '
      write(1,110)'* [1] E10.0 - Shear modulus                             '
      write(1,110)'* [2] E10.0 - Yield stress constant, A                  '
      write(1,110)'* [3] E10.0 - Strain hardening coefficient, B           '
      write(1,110)'* [4] E10.0 - Strain hardening exponent, n              '
      write(1,110)'* [5] E10.0 - Strain rate dependence coeficient, C      '
      write(1,110)'* [6] E10.0 - Temperature dependence exponent, m        '
      write(1,110)'* [7] E10.0 - Melt Temperature, Tm                      '
      write(1,110)'* [8] E10.0 - Room Temperature, Tr                      '
      write(1,110)'*                                                       '
      write(1,116)'*1111111112222222222333333333344444444455555555556666
     166666667777777778888888888'
c
      r1=27.53
      r2=0.3024
      r3=0.1019
      r4=0.0520
      r5=0.0028
      r6=1.0000E-06
      r7=1793.0
      r8=298.0
c
      write(1,129)r1,r2,r3,r4,r5,r6,r7,r8
c
      write(1,110)'*                                                       '
      write(1,110)'*                                                       '
c
c---------------------------------------------------------------------------
```

```
c
c Write material card 4 - for material 1 - reinforced concrete
c
c-----------------------------------------------------------------------
c
      write(1,110)'*-------Material 1 - Target - Material Card 4-------'
      write(1,110)'*                                                   '
      write(1,110)'* [1] E10.0 - Reference strain rate                 '
      write(1,110)'* [2] E10.0 - Specific heat                         '
      write(1,110)'* [3] E10.0 - Pressure cutoff/ failure stress       '
      write(1,110)'* [4] E10.0 - Spall model                           '
      write(1,110)'* [5] E10.0 - Plastic strain iteration flag         '
      write(1,110)'*                                                   '
      write(1,116)'*1111111112222222222333333333344444444445555555555---
     1----------------------------'
c
      r1=1.0000E-06
      r2=4.7700E-04
      r3=SpallStr
      r4=3.0
      r5=0.0
c
      write(1,130)r1,r2,r3,r4,r5
c
      write(1,110)'*                                                   '
      write(1,110)'*                                                   '
c
c-----------------------------------------------------------------------
c
c Write material card 5 - for material 1 - reinforced concrete
c
c-----------------------------------------------------------------------
c
      write(1,110)'*-------Material 1 - Target - Material Card 5-------'
      write(1,110)'*                                                   '
      write(1,110)'* [1] E10.0 - First failure parameter, D1           '
      write(1,110)'* [2] E10.0 - Second failure parameter, D2          '
      write(1,110)'* [3] E10.0 - Third failure parameter, D3           '
      write(1,110)'* [4] E10.0 - Fourth failure parameter, D4          '
      write(1,110)'* [5] E10.0 - Fifth failure parameter, D5           '
      write(1,110)'*                                                   '
      write(1,116)'*1111111112222222222333333333344444444445555555555---
     1----------------------------'
c
      r1=0.22
      r2=0.0
      r3=0.0
      r4=0.0
      r5=0.0
c
      write(1,130)r1,r2,r3,r4,r5
c
      write(1,110)'*                                                   '
      write(1,110)'*                                                   '
c
c-----------------------------------------------------------------------
c
c Write material cards 6,7,8 - for material 1 - reinforced concrete
c
c-----------------------------------------------------------------------
c
```

```
      write(1,110)'*----Material 1 - Target - Material Cards 6,7,8-----'
      write(1,110)'*                                                   '
      write(1,110)'* All 3 are blank -> 3 empty lines                  '
      write(1,110)'*                                                   '
c
      write(1,110)'                                                    '
      write(1,110)'                                                    '
      write(1,110)'                                                    '
c
      write(1,110)'*                                                   '
      write(1,110)'*                                                   '
c
c-----------------------------------------------------------------------
c
c Write material card 9 - for material 1 - reinforced concrete
c
c-----------------------------------------------------------------------
c
      write(1,110)'*-------Material 1 - Target - Material Card 9-------'
      write(1,110)'*                                                   '
      write(1,110)'* [1] A72 - Equation of state identification        '
      write(1,110)'*                                                   '
      write(1,116)'*1111111111111111111111111111111111111111111111111111
     1111111111111111111--------'
c
      write(1,116)'Equation-of-State Form 1 (Linear Polynomial) - Reinfo
     1rced Concrete              '
c
      write(1,110)'*                                                   '
      write(1,110)'*                                                   '
c
c-----------------------------------------------------------------------
c
c Write material card 10 - for material 1 - reinforced concrete
c
c-----------------------------------------------------------------------
c
      write(1,110)'*-------Material 1 - Target - Material Card 10------'
      write(1,110)'*                                                   '
      write(1,110)'* [1] E10.0 - Pressure constant, Co                 '
      write(1,110)'* [2] E10.0 - Linear pressure coefficient, C1       '
      write(1,110)'* [3] E10.0 - Quadratic pressure coefficient, C4    '
      write(1,110)'* [4] E10.0 - Cubic pressure coefficient, C3        '
      write(1,110)'* [5] E10.0 - First energy coefficient, C4          '
      write(1,110)'* [6] E10.0 - Second energy coefficient, C5         '
      write(1,110)'* [7] E10.0 - Third energy coefficient, C6          '
      write(1,110)'* [8] E10.0 - Initial internal energy, Eo           '
      write(1,110)'*                                                   '
      write(1,116)'*1111111112222222222333333333344444444455555555556666
     1666666777777777888888888'
c
      r1=0.0
      r2=50.848
      r3=0.0
      r4=0.0
      r5=0.0
      r6=0.0
      r7=0.0
      r8=0.0
c
      write(1,129)r1,r2,r3,r4,r5,r6,r7,r8
```

```
c
      write(1,110)'*                                                      '
      write(1,110)'*                                                      '
c
c-----------------------------------------------------------------------
c
c Write material card 11 - for material 1 - reinforced concrete
c
c-----------------------------------------------------------------------
c
      write(1,110)'*-------Material 1 - Target - Material Card 11------'
      write(1,110)'*                                                      '
      write(1,110)'* [1] E10.0 - Initial relative volume                  '
      write(1,110)'*                                                      '
      write(1,116)'*111111111-----------------------------------------
     1--------------------------'
c
      r1=0.1000E+01
c
      write(1,131)r1
c
      write(1,110)'*                                                      '
      write(1,110)'*                                                      '
c
c-----------------------------------------------------------------------
c
c Write material card 1 - for material 2 - steel
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 2 - Outer Penetrator - Material Card 1--'
      write(1,110)'*                                                      '
      write(1,110)'* [1]  I5    - Material Identification Number          '
      write(1,110)'* [2]  I5    - Material Type                           '
      write(1,110)'* [3]  E10.0 - Mass Density                            '
      write(1,110)'* [4]  I5    - Equation of state                       '
      write(1,110)'* [5]  I5    - Hourglass stablization method           '
      write(1,110)'* [6]  E10.0 - Hourglass stablization coefficient      '
      write(1,110)'* [7]  I5    - Bulk viscosity type for shock capture'
      write(1,110)'* [8]  E10.0 - Quadratic bulk viscosity coefficient '
      write(1,110)'* [9]  E10.0 - Linear bulk viscosity coefficient       '
      write(1,110)'* [10] I5    - Element type                            '
      write(1,110)'* [11] I5    - Material initialization                 '
      write(1,110)'* [12] I5    - Element formulation                     '
      write(1,110)'*                                                      '
      write(1,116)'*1111222233333333334444455555666666666677777888888888
     188999999999900000111113333 3'
c
      i1=2
      i2=15
      r3=7.84
      i4=1
      i5=0
      r6=0.1
      i7=0
      r8=1.5
      r9=0.06
      i10=0
      i11=0
      i12=0
c
```

```
      write(1,128)i1,i2,r3,i4,i5,r6,i7,r8,r9,i10,i11,i12
c
      write(1,110)'*                                                          '
      write(1,110)'*                                                          '
c
c-----------------------------------------------------------------------
c
c Write material card 2 - for material 2 - steel
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 2 - Outer Penetrator - Material Card 2--'
      write(1,110)'*                                                          '
      write(1,110)'* [1] A72 -  Material identification                       '
      write(1,110)'*                                                          '
      write(1,116)'*1111111111111111111111111111111111111111111111111111
     111111111111111111--------'
c
      write(1,116)'Material Type # 15 (Johnson/Cook Elastic-Plastic) - S
     1teel                        '
c
      write(1,110)'*                                                          '
      write(1,110)'*                                                          '
c
c-----------------------------------------------------------------------
c
c Write material card 3 - for material 2 - steel
c
c-----------------------------------------------------------------------
c
c
      write(1,110)'*--Material 2 - Outer Penetrator - Material Card 3--'
      write(1,110)'*                                                          '
      write(1,110)'* [1] E10.0 - Shear modulus                                '
      write(1,110)'* [2] E10.0 - Yield stress constant, A                     '
      write(1,110)'* [3] E10.0 - Strain hardening coefficient, B              '
      write(1,110)'* [4] E10.0 - Strain hardening exponent, n                 '
      write(1,110)'* [5] E10.0 - Strain rate dependence coeficient, C         '
      write(1,110)'* [6] E10.0 - Temperature dependence exponent, m           '
      write(1,110)'* [7] E10.0 - Melt Temperature, Tm                         '
      write(1,110)'* [8] E10.0 - Room Temperature, Tr                         '
      write(1,110)'*                                                          '
      write(1,116)'*1111111112222222222333333333344444444455555555556666
     166666677777777788888888888'
c
      r1=76.0
      r2=0.7922
      r3=0.5095
      r4=0.2600
      r5=0.0140
      r6=1.0300
      r7=1793.0
      r8=298.0
c
      write(1,129)r1,r2,r3,r4,r5,r6,r7,r8
c
      write(1,110)'*                                                          '
      write(1,110)'*                                                          '
c
c-----------------------------------------------------------------------
c
```

```
c Write material card 4 - for material 2 - steel
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 2 - Outer Penetrator - Material Card 4--'
      write(1,110)'*                                                    '
      write(1,110)'* [1] E10.0 - Reference strain rate                  '
      write(1,110)'* [2] E10.0 - Specific heat                          '
      write(1,110)'* [3] E10.0 - Pressure cutoff/ failure stress        '
      write(1,110)'* [4] E10.0 - Spall model                            '
      write(1,110)'* [5] E10.0 - Plastic strain iteration flag          '
      write(1,110)'*                                                    '
      write(1,116)'*1111111112222222222333333333344444444445555555555---
     1----------------------------'
c
      r1=1.0000E-06
      r2=4.7700E-04
      r3=0.0
      r4=0.0
      r5=0.0
c
      write(1,130)r1,r2,r3,r4,r5
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write material card 5 - for material 2 - steel
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 2 - Outer Penetrator - Material Card 5--'
      write(1,110)'*                                                    '
      write(1,110)'* [1] E10.0 - First failure parameter, D1            '
      write(1,110)'* [2] E10.0 - Second failure parameter, D2           '
      write(1,110)'* [3] E10.0 - Third failure parameter, D3            '
      write(1,110)'* [4] E10.0 - Fourth failure parameter, D4           '
      write(1,110)'* [5] E10.0 - Fifth failure parameter, D5            '
      write(1,110)'*                                                    '
      write(1,116)'*1111111112222222222333333333344444444445555555555---
     1----------------------------'
c
      r1=0.5
      r2=0.0
      r3=0.0
      r4=0.0
      r5=0.0
c
      write(1,130)r1,r2,r3,r4,r5
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write material cards 6,7,8 - for material 2 - steel
c
c-----------------------------------------------------------------------
c
      write(1,110)'*-Material 2 - Outer Penetrator - Mat. Cards 6,7,8--'
```

```
      write(1,110)'*                                                    '
      write(1,110)'* All 3 are blank -> 3 empty lines                   '
      write(1,110)'*                                                    '
c
      write(1,110)'                                                     '
      write(1,110)'                                                     '
      write(1,110)'                                                     '
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c---------------------------------------------------------------------
c
c Write material card 9 - for material 2 - steel
c
c---------------------------------------------------------------------
c
      write(1,110)'*--Material 2 - Outer Penetrator - Material Card 9--'
      write(1,110)'*                                                    '
      write(1,110)'* [1] A72 - Equation of state identification         '
      write(1,110)'*                                                    '
      write(1,116)'*1111111111111111111111111111111111111111111111111111
     1111111111111111111--------'
c
      write(1,116)'Equation-of-State Form 1 (Linear Polynomial) - Steel
     1                          '
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c---------------------------------------------------------------------
c
c Write material card 10 - for material 2 - steel
c
c---------------------------------------------------------------------
c
      write(1,110)'*--Material 2 - Outer Penetrator - Material Card 10-'
      write(1,110)'*                                                    '
      write(1,110)'* [1] E10.0 - Pressure constant, Co                  '
      write(1,110)'* [2] E10.0 - Linear pressure coefficient, C1        '
      write(1,110)'* [3] E10.0 - Quadratic pressure coefficient, C4     '
      write(1,110)'* [4] E10.0 - Cubic pressure coefficient, C3         '
      write(1,110)'* [5] E10.0 - First energy coefficient, C4           '
      write(1,110)'* [6] E10.0 - Second energy coefficient, C5          '
      write(1,110)'* [7] E10.0 - Third energy coefficient, C6           '
      write(1,110)'* [8] E10.0 - Initial internal energy, Eo            '
      write(1,110)'*                                                    '
      write(1,116)'*1111111112222222222333333333344444444455555555556666
     1666666677777777788888888888'
c
      r1=0.0
      r2=147.0
      r3=0.0
      r4=0.0
      r5=0.0
      r6=0.0
      r7=0.0
      r8=0.0
c
      write(1,129)r1,r2,r3,r4,r5,r6,r7,r8
c
```

```
      write(1,110)'*                                                      '
      write(1,110)'*                                                      '
c
c-----------------------------------------------------------------------
c
c Write material card 11 - for material 2 - steel
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 2 - Outer Penetrator - Material Card 11-'
      write(1,110)'*                                                      '
      write(1,110)'* [1] E10.0 - Initial relative volume                  '
      write(1,110)'*                                                      '
      write(1,116)'*111111111-----------------------------------------
     1--------------------------'
c
      r1=0.1000E+01
c
      write(1,131)r1
c
      write(1,110)'*                                                      '
      write(1,110)'*                                                      '
c
c-----------------------------------------------------------------------
c
c Write material card 1 - for material 3 - ceramic
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 3 - Inner Penetrator - Material Card 1--'
      write(1,110)'*                                                      '
      write(1,110)'* [1]  I5    - Material Identification Number          '
      write(1,110)'* [2]  I5    - Material Type                           '
      write(1,110)'* [3]  E10.0 - Mass Density                            '
      write(1,110)'* [4]  I5    - Equation of state                       '
      write(1,110)'* [5]  I5    - Hourglass stablization method           '
      write(1,110)'* [6]  E10.0 - Hourglass stablization coefficient      '
      write(1,110)'* [7]  I5    - Bulk viscosity type for shock capture'
      write(1,110)'* [8]  E10.0 - Quadratic bulk viscosity coefficient    '
      write(1,110)'* [9]  E10.0 - Linear bulk viscosity coefficient       '
      write(1,110)'* [10] I5    - Element type                            '
      write(1,110)'* [11] I5    - Material initialization                 '
      write(1,110)'* [12] I5    - Element formulation                     '
      write(1,110)'*                                                      '
      write(1,116)'*1111222233333333334444455555666666666677777888888888
     188999999999900000111113333 3'
c
      i1=3
      i2=15
      r3=3.42
      i4=1
      i5=0
      r6=0.1
      i7=0
      r8=1.5
      r9=0.06
      i10=0
      i11=0
      i12=0
c
      write(1,128)i1,i2,r3,i4,i5,r6,i7,r8,r9,i10,i11,i12
```

```
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write material card 2 - for material 3 - ceramic
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 3 - Inner Penetrator - Material Card 3--'
      write(1,110)'*                                                    '
      write(1,110)'* [1] A72 -  Material identification                 '
      write(1,110)'*                                                    '
      write(1,116)'*1111111111111111111111111111111111111111111111111111
     111111111111111111--------'
c
      write(1,116)'Material Type # 15 (Johnson/Cook Elastic-Plastic) - C
     1eramic                    '
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write material card 3 - for material 3 - ceramic
c
c-----------------------------------------------------------------------
c
c
      write(1,110)'*--Material 3 - Inner Penetrator - Material Card 3--'
      write(1,110)'*                                                    '
      write(1,110)'* [1] E10.0 - Shear modulus                          '
      write(1,110)'* [2] E10.0 - Yield stress constant, A               '
      write(1,110)'* [3] E10.0 - Strain hardening coefficient, B        '
      write(1,110)'* [4] E10.0 - Strain hardening exponent, n           '
      write(1,110)'* [5] E10.0 - Strain rate dependence coeficient, C   '
      write(1,110)'* [6] E10.0 - Temperature dependence exponent, m     '
      write(1,110)'* [7] E10.0 - Melt Temperature, Tm                   '
      write(1,110)'* [8] E10.0 - Room Temperature, Tr                   '
      write(1,110)'*                                                    '
      write(1,116)'*1111111112222222222333333333344444444455555555556666
     166666667777777778888888888'
c
      r1=108.0
      r2=1.93
      r3=0.0
      r4=0.0
      r5=0.0
      r6=1.0000E-06
      r7=1793.0
      r8=298.0
c
      write(1,129)r1,r2,r3,r4,r5,r6,r7,r8
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write material card 4 - for material 3 - ceramic
```

```
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 3 - Inner Penetrator - Material Card 4--'
      write(1,110)'*                                                    '
      write(1,110)'* [1] E10.0 - Reference strain rate                  '
      write(1,110)'* [2] E10.0 - Specific heat                          '
      write(1,110)'* [3] E10.0 - Pressure cutoff/ failure stress        '
      write(1,110)'* [4] E10.0 - Spall model                            '
      write(1,110)'* [5] E10.0 - Plastic strain iteration flag          '
      write(1,110)'*                                                    '
      write(1,116)'*1111111112222222222333333333344444444445555555555---
     1-------------------------'
c
      r1=1.0000E-06
      r2=4.7700E-04
      r3=0.0
      r4=0.0
      r5=0.0
c
      write(1,130)r1,r2,r3,r4,r5
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write material card 5 - for material 3 - ceramic
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 3 - Inner Penetrator - Material Card 5--'
      write(1,110)'*                                                    '
      write(1,110)'* [1] E10.0 - First failure parameter, D1            '
      write(1,110)'* [2] E10.0 - Second failure parameter, D2           '
      write(1,110)'* [3] E10.0 - Third failure parameter, D3            '
      write(1,110)'* [4] E10.0 - Fourth failure parameter, D4           '
      write(1,110)'* [5] E10.0 - Fifth failure parameter, D5            '
      write(1,110)'*                                                    '
      write(1,116)'*1111111112222222222333333333344444444445555555555---
     1-------------------------'
c
      r1=0.05
      r2=0.0
      r3=0.0
      r4=0.0
      r5=0.0
c
      write(1,130)r1,r2,r3,r4,r5
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write material cards 6,7,8 - for material 3 - ceramic
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 3 - Inner Penetrator - Mat. Cards 6,7,8-'
      write(1,110)'*                                                    '
```

```
      write(1,110)'* All 3 are blank -> 3 empty lines                  '
      write(1,110)'*                                                  '
c
      write(1,110)'                                                   '
      write(1,110)'                                                   '
      write(1,110)'                                                   '
c
      write(1,110)'*                                                  '
      write(1,110)'*                                                  '
c
c-----------------------------------------------------------------------
c
c Write material card 9 - for material 3 - ceramic
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 3 - Inner Penetrator - Material Card 9--'
      write(1,110)'*                                                  '
      write(1,110)'* [1] A72 - Equation of state identification       '
      write(1,110)'*                                                  '
      write(1,116)'*1111111111111111111111111111111111111111111111111
     111111111111111111--------'
c
      write(1,116)'Equation-of-State Form 1 (Linear Polynomial) - Steel
     1                          '
c
      write(1,110)'*                                                  '
      write(1,110)'*                                                  '
c
c-----------------------------------------------------------------------
c
c Write material card 10 - for material 3 - ceramic
c
c-----------------------------------------------------------------------
c
      write(1,110)'*--Material 3 - Inner Penetrator - Material Card 10-'
      write(1,110)'*                                                  '
      write(1,110)'* [1] E10.0 - Pressure constant, Co                '
      write(1,110)'* [2] E10.0 - Linear pressure coefficient, C1      '
      write(1,110)'* [3] E10.0 - Quadratic pressure coefficient, C4   '
      write(1,110)'* [41] E10.0 - Cubic pressure coefficient, C3      '
      write(1,110)'* [5] E10.0 - First energy coefficient, C4         '
      write(1,110)'* [6] E10.0 - Second energy coefficient, C5        '
      write(1,110)'* [7] E10.0 - Third energy coefficient, C6         '
      write(1,110)'* [8] E10.0 - Initial internal energy, Eo          '
      write(1,110)'*                                                  '
      write(1,116)'*1111111112222222222333333333344444444455555555556666
     166666667777777778888888888'
c
      r1=0.0
      r2=156.86
      r3=0.0
      r4=0.0
      r5=0.0
      r6=0.0
      r7=0.0
      r8=0.0
c
      write(1,129)r1,r2,r3,r4,r5,r6,r7,r8
c
      write(1,110)'*                                                  '
```

```
      write(1,110)'*                                                    '
c
c-------------------------------------------------------------------------
c
c Write material card 11 - for material 3 - ceramic
c
c-------------------------------------------------------------------------
c
      write(1,110)'*--Material 3 - Inner Penetrator - Material Card 11-'
      write(1,110)'*                                                    '
      write(1,110)'* [1] E10.0 - Initial relative volume                '
      write(1,110)'*                                                    '
      write(1,116)'*111111111----------------------------------------
     1----------------------------'
c
      r1=0.1000E+01
c
      write(1,131)r1
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-------------------------------------------------------------------------
c
c Write the Node Cards
c
c-------------------------------------------------------------------------
c
      write(1,110)'*--------------Node Definition Cards----------------'
      write(1,110)'*                                                    '
      write(1,110)'* [1] I8    - Node Number                            '
      write(1,110)'* [2] I5    - Displacement boundary condition        '
      write(1,110)'* [3] E20.0 - x - coordinate                         '
      write(1,110)'* [4] E20.0 - y - coordinate                         '
      write(1,110)'* [5] E20.0 - z - coordinate                         '
      write(1,110)'* [6] I5    - Rotational boundary conditions         '
      write(1,110)'*                                                    '
      write(1,116)'*1111111222223333333333333333333344444444444444444444
     1555555555555555555566666--'
c
      do i=1,NumPN
         read(2,102)n,D,x,y,z,B
         write(1,102)n,D,x,y,z,B
      end do
      do i=1,NumTN
         read(3,102)n,D,x,y,z,B
         n=n+NumPN
         write(1,102)n,D,x,y,z,B
      end do
c
      close(2)
      close(3)
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-------------------------------------------------------------------------
c
c Write the Element Cards
c
c-------------------------------------------------------------------------
```

```
c
      open(4,file='D P E Cards.txt',status='old')
      open(5,file='D T E Cards.txt',status='old')
c
      write(1,110)'*----------Solid Element Definition Cards-----------'
      write(1,110)'*                                                   '
      write(1,110)'* [1]  I8 - Solid element number                    '
      write(1,110)'* [2]  I5 - Material number
'
      write(1,110)'* [3]  I8 - Node 1                                  '
      write(1,110)'* [4]  I8 - Node 2                                  '
      write(1,110)'* [5]  I8 - Node 3                                  '
      write(1,110)'* [6]  I8 - Node 4                                  '
      write(1,110)'* [7]  I8 - Node 5                                  '
      write(1,110)'* [8]  I8 - Node 6                                  '
      write(1,110)'* [9]  I8 - Node 7                                  '
      write(1,110)'* [10] I8 - Node 8                                  '
      write(1,110)'*                                                   '
      write(1,116)'*1111111222223333333344444444555555556666666677777777
     188888888999999900000000---'
c
      do i=1,NumPE
         read(4,103)e,Mat,n1,n2,n3,n4,n5,n6,n7,n8
         write(1,103)e,Mat,n1,n2,n3,n4,n5,n6,n7,n8
      end do
      do i=1,NumTE
         read(5,103)e,Mat,n1,n2,n3,n4,n5,n6,n7,n8
         e=e+NumPE
         n1=n1+NumPN
         n2=n2+NumPN
         n3=n3+NumPN
         n4=n4+NumPN
         n5=n5+NumPN
         n6=n6+NumPN
         n7=n7+NumPN
         n8=n8+NumPN
         write(1,103)e,Mat,n1,n2,n3,n4,n5,n6,n7,n8
      end do
c
      close(4)
      close(5)
c
      write(1,110)'*                                                   '
      write(1,110)'*                                                   '
c
c---------------------------------------------------------------------
c
c Write the and Element Time History Blocks
c
c---------------------------------------------------------------------
c
      write(1,110)'*-------------Node Time History Cards---------------'
      write(1,110)'*                                                   '
      write(1,110)'* [1] I8 - First node in block 1                    '
      write(1,110)'* [2] I8 - First node in block 1                    '
      write(1,110)'* [3] I8 -  First node in block 2                   '
      write(1,110)'* [4] so forth...                                   '
      write(1,110)'*                                                   '
      write(1,116)'*111111122222222-----------------------------------
     1--------------------------'
c
```

```
      write(1,112)'       1',NumN
c
      write(1,110)'*                                                      '
      write(1,110)'*                                                      '
c
      write(1,110)'*------------Element Time History Cards-------------'
      write(1,110)'*                                                      '
      write(1,110)'* [1] I8 - First element in block 1                    '
      write(1,110)'* [2] I8 - First element in block 1                    '
      write(1,110)'* [3] I8 - First element in block 2                    '
      write(1,110)'* [4] so forth...                                      '
      write(1,110)'*                                                      '
      write(1,116)'*111111122222222-------------------------------------
     1-------------------------'
c
      write(1,112)'       1',NumE
c
      write(1,110)'*                                                      '
      write(1,110)'*                                                      '
c
c---------------------------------------------------------------------
c
c Write the Initial Condition Cards
c
c---------------------------------------------------------------------
c
      write(1,110)'*--------------Initial Velocity Cards---------------'
      write(1,110)'*                                                      '
      write(1,110)'* [1] I8    - Node number                              '
      write(1,110)'* [2] E10.0 - Initial velocity in the x - direction    '
      write(1,110)'* [3] E10.0 - Initial velocity in the y - direction    '
      write(1,110)'* [4] E10.0 - Initial velocity in the z - direction    '
      write(1,110)'* [5] I5    - Generation increment                     '
      write(1,110)'*                                                      '
      write(1,116)'*1111111222222222233333333334444444444555555----------
     1-------------------------'
c
c Nodes with velocity
c
      i1=1
      r2=Vo*xunit
      r3=Vo*yunit
      r4=Vo*zunit
      i5=1
c
      write(1,113)i1,r2,r3,r4,i5
      write(1,113)NumPN,r2,r3,r4,i5
c
c Node with no velocity
c
      i1=NumPN+1
      r2=0.0
      r3=0.0
      r4=0.0
      i5=1
c
      write(1,113)i1,r2,r3,r4,i5
      write(1,113)NumN,r2,r3,r4,i5
c
      write(1,110)'*                                                      '
      write(1,110)'*                                                      '
```

```
c
c-----------------------------------------------------------------------
c
c Write the Sliding 1 Interface Definition Cards
c
c-----------------------------------------------------------------------
c
      write(1,110)'*                                                    '
      write(1,110)'*----------Sliding Interface Definitions-1..i-------'
      write(1,110)'*                                                    '
      write(1,110)'* [1]  I8    - Number of slave segments              '
      write(1,110)'* [2]  I8    - Number of master segments             '
      write(1,110)'* [3]  I5    - Slide surface type                    '
      write(1,110)'* [4]  E10.0 - Static coefficient of friction        '
      write(1,110)'* [5]  E10.0 - Dynamic coefficient of friction       '
      write(1,110)'* [6]  E10.0 - Exponential friction decay coef.      '
      write(1,110)'* [7]  I5    - Small penetration search flag         '
      write(1,110)'* [8]  I5    - Print output slave side data          '
      write(1,110)'* [9]  I5    - Print output master side data         '
      write(1,110)'* [10] E7.0  - Slave constraint factor               '
      write(1,110)'* [11] E7.0  - Master penalty stiffness factor       '
      write(1,110)'*                                                    '
      write(1,116)'*1111111222222223333344444444455555555556666666667
     1777888889999900000001111111'
c
      in1=Num2DPE
      in2=Num2DTE
      in3=3
      rn4=0.0
      rn5=0.0
      rn6=0.0
      in7=1
      in8=0
      in9=0
      rn10=SF2
      rn11=SF3
c
      do i=1,NumSI
         write(1,114)in1,in2,in3,rn4,rn5,rn6,in7,in8,in9,rn10,rn11
      end do
c
      write(1,110)'*                                                    '
      write(1,110)'*                                                    '
c
c-----------------------------------------------------------------------
c
c Write the slave segment / master segment pairs
c
c-----------------------------------------------------------------------
c
      open(9,file='D T MS Cards.txt',status='old')
      open(10,file='D P SS Cards.txt',status='old')
c
      write(1,110)'*---------Slave Segment Cards for Surface i---------'
      write(1,110)'*                                                    '
      write(1,110)'* [1] I8 - Slave segment number                      '
      write(1,110)'* [2] I8 - Node 1                                    '
      write(1,110)'* [3] I8 - Node 2                                    '
      write(1,110)'* [4] I8 - Node 3                                    '
      write(1,110)'* [5] I8 - Node 4                                    '
      write(1,110)'*                                                    '
```

```
      write(1,116)'*1111111222222223333333344444444555555555-------------
     1-------------------------'
      write(1,110)'*                                                      '
      write(1,110)'*--------Master Segment Cards for Surface i---------'
      write(1,110)'*                                                      '
      write(1,110)'* [1] I8 - Master segment number                       '
      write(1,110)'* [3] I8 - Node 1                                      '
      write(1,110)'* [4] I8 - Node 2                                      '
      write(1,110)'* [5] I8 - Node 3                                      '
      write(1,110)'* [6] I8 - Node 4                                      '
      write(1,110)'*                                                      '
      write(1,116)'*1111111222222223333333344444444555555555-------------
     1-------------------------'
      write(1,110)'*                                                      '
c
      do m=1,NumPSI
         do j=1,NumTSI
c
            write(1,110)'*
     1      '
            write(1,117)'*----------------Slave',m,',',j,'--------------
     1------'
            write(1,110)'*
     1      '
            do i=1,Num2DPE
               read(10,115)e,n1,n2,n3,n4
               n1=n1-((m-1)*Num2DPN)
               n2=n2-((m-1)*Num2DPN)
               n3=n3-((m-1)*Num2DPN)
               n4=n4-((m-1)*Num2DPN)
               write(1,115)i,n1,n2,n3,n4
            end do
            rewind(10)
c
            write(1,110)'*
     1      '
            write(1,117)'*---------------Master',m,',',j,'--------------
     1------'
            write(1,110)'*
     1      '
            do i=1,Num2DTE
               read(9,115)e,n1,n2,n3,n4
               n1=n1+((j-1)*Num2DTN)
               n2=n2+((j-1)*Num2DTN)
               n3=n3+((j-1)*Num2DTN)
               n4=n4+((j-1)*Num2DTN)
               n1=n1+NumPN
               n2=n2+NumPN
               n3=n3+NumPN
               n4=n4+NumPN
               write(1,115)i,n1,n2,n3,n4
            end do
            rewind(9)
         end do
      end do
c
      close(1)
      close(9)
      close(10)
c
      write(*,*)' '
```

```
      write(*,*)'"__input" has been written.'

      write(*,*)' '
c
c End of Program
c
      end
c
```