```
//WINGA    JOB    '9608 25    90  10','KRIZ R.D.          ',
//   MSGLEVEL=(1,1)
//STEPA EXEC FORTC,PARM='NAME=MAIN'
XXFORT     EXEC PGM=IEYFORT,REGION=100K
XXSYSPRINT DD  SYSOUT=A
XXSYSPUNCH DD  SYSOUT=B
//SYSLIN DD DSN=RONDATA,DISP=(NEW,KEEP,DELETE),VOL=SER=PCPLIB
X/SYSLIN DD DSN=&LOADSET,UNIT=SYSDA,DISP=(MOD,PASS,DELETE),            X
XX             SPACE=(80,(200,100)),DCB=BLKSIZE=80
//SYSIN DD *
 **** CAL POLY OS/19.6 **** KRIZ R.D. ****************  22222222   5555555555  ***** DATE 74.081 **** TIME 12.58.07 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. **************** 2222222222  5555555555  ***** DATE 74.081 **** TIME 12.58.07 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. **************** 22       22  55          ***** DATE 74.081 **** TIME 12.58.07 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. ****************        22  55          ***** DATE 74.081 **** TIME 12.58.07 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. ****************  222222222  555555555   ***** DATE 74.081 **** TIME 12.58.07 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. **************** 222222222   5555555555  ***** DATE 74.081 **** TIME 12.58.07 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. **************** 22              55       ***** DATE 74.081 **** TIME 12.58.07 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. **************** 22          55      55   ***** DATE 74.081 **** TIME 12.58.07 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. **************** 2222222222  5555555555  ***** DATE 74.081 **** TIME 12.58.07 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. **************** 2222222222   55555555   ***** DATE 74.081 **** TIME 12.58.07 ***
IEF236I ALLOC. FOR WINGA    FORT     STEPA
IEF237I 191   ALLOCATED TO SYSLIN
IEF237I 00C   ALLOCATED TO SYSIN
```

```
0001              REAL MX,MZ
0002              READ(5,100)S,DY
                  C
                  C  DEFLECTIONS AND TWISTS INITIALIZED TO ZERO AT THE WING ROOT
                  C
0003              Z=0.0
0004              X=0.0
0005              TWIST=0.0
0006              ZANG=0.0
0007              XANG=0.0
0008              ANGZ=0.0
0009              ANGX=0.0
                  C
                  C  STARTING AT THE WING ROOT THE WING IS DIVIDED INTO AS MANY SECTIONS AS
                  C  DESIRED FOR ACCURACY.  EACH SECTION IS TREATED AS A FREEBODY OF CONSTANT
                  C  CROSSECTION.  THE DEFLECTIONS FOR EACH SECTION DUE TO MOMENT AND SHEAR LOADS
                  C  WERE ACCUMULATED USING SUPERPOSITION AS THE PROGRAM PROGRESSED FROM THE
                  C  ROOT TO THE TIP.  TWISTING DEFLECTIONS WERE CALCULATED FOR EACH SECTION AS A
                  C  FUNCTION OF THE SHEAR FLOW DISTRIBUTION IN THE SKIN DUE TO THE TORQUE LOAD.
                  C
0010              ICOUNT=0
0011              YLOCAT=0.0
0012              CALL SECT(VX,VZ,WX,WZ,ES,XIBAR,ZIBAR,PMI,YLOCAT,ICOUNT,DY,MX,MZ,S,
                 *TPNT,TDISTR)
0013              WRITE(6,200)YLOCAT,Z,X,TWIST
0014            1 ICOUNT=ICOUNT+1
0015              YLOCAT=YLOCAT+DY
0016              CALL SECT(VX,VZ,WX,WZ,ES,XIBAR,ZIBAR,PMI,YLOCAT,ICOUNT,DY,MX,MZ,S,
                 *TPNT,TDISTR)
0017              ZDISTR=(WZ*DY**4)/(8.*ES*XIBAR)
0018              ZPNT=(VZ*DY**3)/(3.*ES*XIBAR)
0019              ZMX=(MX*DY**2)/(2.*ES*XIBAR)
0020              Z=ZDISTR+ZPNT+ZANG+ZMX+Z
0021              ANGZP=(VZ*DY**2)/(2.*ES*XIBAR)
0022              ANGZD=(WZ*DY**3)/(6.*ES*XIBAR)
0023              ANGMX=(MX*DY)/(ES*XIBAR)
0024              ANGZ=ANGZP+ANGZD+ANGMX+ANGZ
0025              ZANG=DY*SIN(ANGZ)
0026              XDISTR=(WX*DY**4)/(8.*ES*ZIBAR)
0027              XPNT=(VX*DY**3)/(3.*ES*ZIBAR)
0028              XMZ=(-MZ*DY**2)/(2.*ES*ZIBAR)
0029              X=XDISTR+XPNT+XANG+XMZ+X
0030              ANGXP=(VX*DY**2)/(2.*ES*ZIBAR)
0031              ANGXD=(WX*DY**3)/(6.*ES*ZIBAR)
0032              ANGMZ=(-MZ*DY)/(ES*ZIBAR)
0033              ANGX=ANGXP+ANGXD+ANGMZ+ANGX
0034              XANG=DY*SIN(ANGX)
0035              TWIST=TDISTR+TPNT+TWIST
0036              WRITE(6,200)YLOCAT,Z,X,TWIST
0037              IF(YLOCAT.LT.S) GO TO 1
0038              CALL EXIT
0039            100 FORMAT(/,41X,F8.4,/,30X,F7.4)
0040            200 FORMAT(1X,4(5X,E13.5))
0041              END
```

```
IEF285I   SYSOUT                                          SYSOUT
IEF285I   VOL SER NOS=      .
IEF285I   RONDATA                                         KEPT
IEF285I   VOL SER NOS= PCPLIB.
//STEPB EXEC FORTC,PARM='NAME=FCN'
XXFORT     EXEC PGM=IEYFORT,REGION=100K
XXSYSPRINT DD  SYSOUT=A
XXSYSPUNCH DD  SYSOUT=B
//SYSLIN DD DSN=RONDATA,DISP=(MOD,KEEP,DELETE),VOL=SER=PCPLIB
X/SYSLIN DD DSN=&LOADSET,UNIT=SYSDA,DISP=(MOD,PASS,DELETE),          X
XX             SPACE=(80,(200,100)),DCB=BLKSIZE=80
//SYSIN DD *
IEF236I ALLOC. FOR WINGA    FORT     STEPB
IEF237I 191   ALLOCATED TO SYSLIN
IEF237I 00C   ALLOCATED TO SYSIN
```

```
0001                FUNCTION FCN(Y,N)
0002                REAL LIFT
                    C
                    C
                    C LIFT/IN AS A FUNCTION OF Y
0003                    LIFT=1.0274
                    C DRAG/IN AS A FUNCTION Y
0004                    DRAG=0.0
                    C TORQUE/IN AS A FUNCTION OF Y
0005                    TORQUE=1.0274*(14.25-0.0639*Y)
                    C
                    C
0006                    GO TO (1,2,3),N
0007                  1 FCN=LIFT
0008                    GO TO 4
0009                  2 FCN=DRAG
0010                    GO TO 4
0011                  3 FCN=TORQUE
0012                  4 RETURN
0013                    END
```

```
*OPTIONS IN EFFECT*   ID,BCD,SOURCE,NOLIST,NODECK,LOAD,NOMAP
*OPTIONS IN EFFECT*   NAME = FCN      , LINECNT =      60
*STATISTICS*     SOURCE STATEMENTS =       13,PROGRAM SIZE =      480
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
IEF285I   SYSOUT                                          SYSOUT
IEF285I   VOL SER NOS=      .
IEF285I   RONDATA                                         KEPT
IEF285I   VOL SER NOS= PCPLIB.
//STEPC EXEC FORTC,PARM='NAME=SECT'
XXFORT    EXEC PGM=IEYFORT,REGION=100K
XXSYSPRINT DD  SYSOUT=A
XXSYSPUNCH DD  SYSOUT=B
//SYSLIN DD DSN=RONDATA,DISP=(MOD,KEEP,DELETE),VOL=SER=PCPLIB
X/SYSLIN DD DSN=&LOADSET,UNIT=SYSDA,DISP=(MOD,PASS,DELETE),          X
XX             SPACE=(80,(200,100)),DCB=BLKSIZE=80
//SYSIN DD *
IEF236I ALLOC. FOR WINGA    FORT     STEPC
IEF237I 191   ALLOCATED TO SYSLIN
IEF237I 00C   ALLOCATED TO SYSIN
```

```
0001              SUBROUTINE SECT(VX,VZ,WX,WZ,ES,XIBAR,ZIBAR,PMI,YLOCAT,ICOUNT,DY,MX
                 *,MZ,S,TPNT,TDISTR)
0002              DIMENSION ITLEG(4),IARRY(4,5),ISENSE(4,5),IARRYW(3),LNO(13),LBEG(1
                 *3),LEND(13),IV(13),IU(13),RX(100),RZ(100),TX(100),TZ(100),TR(100),
                 *TT(100),YS(10),X(100),Z(100),T(100),AREAC(4),QXF(980),QZF(980),COF
                 *T(4,3),IDRXZF(980),IDRXXF(980),QT(4),Q(980),IDRX(980),SIGMA(980),X
                 *P(100),ZP(100),XX(980),ZZ(980),TE(980),LBEGN(13),LNON(13),E(980),G
                 *(980),EF(100),GF(100)
0003              REAL MOMENT,MX,MZ,MXA,MZA,MXP,MZP
                C
                C  READ DATA IN, WRITE DATA OUT, IF FIRST TIME THROUGH SUBROUTINE SECT
                C
0004              IF(YLOCAT.NE.0.0)GO TO 175
0005              CALL INOUT(NCELL,NPNTS,NLEG,ITLEG,IARRY,ISENSE,IARRYW,LNO,LBEG,LEN
                 *D,IV,IU,RX,RZ,TX,TZ,TR,TT,YF,YL,RXAC,RZAC,TXAC,TZAC,RHOS,RHOC,DC,A
                 *TANGD,CHAND,E,G,NN,YS,NWEB,S,DY,ES)
                C
                C  REDEFINE LEG POINTS AND SIZE FOR EXPANDED COORDINATE SYSTEM
                C
0006              DO 360 ILEG=1,NLEG
0007              IF(IV(ILEG).NE.1)IV(ILEG)=10.0*(IV(ILEG)-1)
0008              IF(IU(ILEG).NE.1)IU(ILEG)=10.0*(IU(ILEG)-1)
0009              J=10*(LBEG(ILEG)-1)
0010              JJ=10*(LBEG(ILEG)+LNO(ILEG)-2)
0011              IF(LBEG(ILEG).EQ.1)J=1
0012              LBEGN(ILEG)=J
0013              LNON(ILEG)=JJ-LBEGN(ILEG)+1
0014            360 CONTINUE
                C
                C  THIS SUBROUTINE, TO SAVE TIME, DOES NOT CALCULATE SHEAR CENTER LOCATIONS EACH
                C  TIME A SECTION OF THE WING IS EVALUATED.  INSTEAD THE WING IS FIRST
                C  EVALUATED AT MIDSPAN AND ROOT SECTIONS FOR A SHEAR CENTER LOCATION.  ALL
                C  OTHER SECTION SHEAR CENTER LOCATIONS ARE ASSUMED TO LAY ALONG A LINE DRAWN
                C  BETWEEN THE ROOT SHEAR CENTER AND MIDSPAN SHEAR CENTER LOCATION
                C
                C
                C    ISKIP IS A SWITCH WHICH CAUSES THE SUBROUTINE TO EVALUATE
                C    THE MIDSPAN FIRST AND THEN THE ROOT FOR SHEAR CENTER LOCATION
                C        INITIALIZE SKIP VARIABLE
                C
0015              ISKIP=0
                C
                C    INITIALIZE SKIN AND CORE VOLUMES
                C
0016              SVOL=0.0
0017              CVOL=0.0
                C
                C    CALCULATE MIDSPAN LOCATION
                C
0018              YM=(YL-YF)/2.
                C
                C    CHANGE ANGLES TO RADIANS
                C
0019              ATTANG=ATANGD*2.*3.14159/360.
0020              CHANG=CHAND*2.*3.14159/360.
                C
                C    DIRECTION COSINES FOR (A.C.LINE, A LINE PERPENDICULAR TO THE A.C.LINE
                C    AND LYING IN THE YZ PLANE, A LINE PERPENDICULAR TO BOTH OF THESE)
```

```
                C
0021                 UNIT=SQRT((TXAC-RXAC)**2+(TZAC-RZAC)**2+(YL-YF)**2)
0022                 A1=(TXAC-RXAC)/UNIT
0023                 B1=(YL-YF)/UNIT
0024                 C1=(TZAC-RZAC)/UNIT
0025                 A2=SQRT(1./((A1/B1)**2+1.))
0026                 B2=-A2*A1/B1
0027                 C2=0.
0028                 VAR1=-B2/A2
0029                 VAR2=-C1*VAR1/(A1*VAR1+B1)
0030                 C3=SQRT(1./(1.+VAR1**2+VAR2**2))
0031                 B3=-C3*C1/B1
0032                 A3=B3*A1/B1
                C
                C    TEST STATE OF SUBROUTINE FOR CALCULATIONG SHEAR CENTER LOCATIONS
                C
0033               175 IF(YLOCAT.EQ.0.0.AND.ISKIP.EQ.0)YLOCAT=YM
                C
                C  THE AIRFOIL SHAPE AT SPAN LOCATION YLOCAT IS CALCULATED BY THE EQUATION OF
                C  A LINE IN THREE DIMENSIONS.
                C
0034                 DO 180 I=1,NPNTS
0035                 X(I)=((TX(I)-RX(I))*(YLOCAT-YF)/(YL-YF))+RX(I)
0036                 Z(I)=((TZ(I)-RZ(I))*(YLOCAT-YF)/(YL-YF))+RZ(I)
0037                 T(I)=((TT(I)-TR(I))*(YLOCAT-YF)/(YL-YF))+TR(I)
0038                 XAC=((TXAC-RXAC)*(YLOCAT-YF)/(YL-YF))+RXAC
0039                 ZAC=((TZAC-RZAC)*(YLOCAT-YF)/(YL-YF))+RZAC
0040                 XP(I)=X(I)
0041                 ZP(I)=Z(I)
0042                 XACP=XAC
0043                 ZACP=ZAC
0044                 EF(I)=E(I)
0045                 GF(I)=G(I)
0046               180 CONTINUE
                C
                C  THE CENTROID LOCATION, MOMENTS OF INERTIA, PRINCIPAL CENTROIDAL AXIS
                C  ORIENTATION, AND SKIN AREA AND VOLUME ARE CALCULATED AT EACH SECTION.
                C
0047                 CALL CENTRD(NLEG,LBEG,LNO,XP,ZP,T,XBAR,ZBAR,XPBAR,ZPBAR,XIBAR,ZIBA
                    *R,XIBARP,ZIBARP,XZIBAR,PMI,TANG,TAND,SVOL,CVOL,ISKIP,ICOUNT,DY,DC,
                    *ES,E)
                C
                C    CELL AREA IS CALCULATED FOR EACH CELL AT EACH SECTION
                C
0048                 DO 225 ICELL =1,NCELL
0049                 AREA1=0.0
0050                 AREA2=0.0
0051                 INO=ITLEG(ICELL)
0052                 DO 220 IORD=1,INO
0053                 ILEG=IARRY(ICELL,IORD)
0054                 L=LBEG(ILEG)
0055                 K=L+LNO(ILEG)-2
0056                 DO 220 I=L,K
0057                 J=I+1
0058                 DELTAX=(X(J)-X(I))*ISENSE(ICELL,IORD)
0059                 AVGZ=(Z(J)+Z(I))/2.
0060                 IF(DELTAX)215,215,210
0061               210 AREA1=AREA1+DELTAX*AVGZ
```

```
0062              GO TO 220
0063          215 AREA2=AREA2-DELTAX*AVGZ
0064          220 CONTINUE
0065              AREAC(ICELL)=AREA1-AREA2
0066          225 CONTINUE
                C
                C     THE MOMENTS, SHEAR FORCES, AND TORQUE ABOUT THE AERODYNAMIC CENTER
                C     ARE CALCULATED AT EACH SECTION
                C
0067              ONE=YLOCAT-DY
0068              TWO=YLOCAT
0069              WZA=(FCN(ONE,1)+FCN(TWO,1))/2.
0070              WXA=(FCN(ONE,2)+FCN(TWO,2))/2.
0071              WTA=(FCN(ONE,3)+FCN(TWO,3))/2.
0072              IF(YLOCAT.LT.YL)GO TO 230
0073              VZA=0.0
0074              MZA=0.0
0075              VXA=0.0
0076              MXA=0.0
0077              TORQUE=0.0
0078              GO TO 275
0079          230 F=YL-YLOCAT
0080              N1=500*F/YL
0081              N2=N1*4/5
0082              N=1
0083          235 CONTINUE
0084              U=YLOCAT
0085              H=F/N1
0086              SUM=FCN(U,N)+FCN(YL,N)
0087              DO 240 I=2,N1
0088              U=U+H
0089          240 SUM=SUM+FCN(U,N)*2.
0090              FORCE=H/2.*SUM
0091              IF(N.EQ.3)GO TO 250
0092              H=F/N2
0093              U=H
0094              UN=H*N2
0095              US=YLOCAT
0096              USN=YLOCAT+UN
0097              SUM=FCN(US,N)*U+FCN(USN,N)*UN
0098              US=US+H
0099              DO 245 I=2,N2
0100              U=U+H
0101              UL=U-H
0102              US=US+H
0103              USL=US-H
0104          245 SUM=SUM+2.*FCN(USL,N)*UL+FCN(USL,N)*U+FCN(US,N)*UL
0105              MOMENT=H/4.*SUM
0106          250 GO TO(255,260,265),N
0107          255 VZA=FORCE
0108              MXA=MOMENT
0109              GO TO 270
0110          260 VXA=FORCE
0111              MZA=-MOMENT
0112              GO TO 270
0113          265 TORQUE=FORCE
0114          270 N=N+1
0115              IF(N.LT.4)GO TO 235
```

```
                C
                C  DIRECTION COSINES ORIENT THE MOMENTS AND FORCES PARALLEL TO THE FREE STREAM
                C  VELOCITY FROM THE SKEWED AERODYNAMIC CENTER LINE
                C
                C   MOMENT VECTORS SUPERPOSED ON X,Z,Y AXIS
0116              275 SUB1=B1*WTA
0117                  SUB2=B1*TORQUE+B2*MXA+B3*MZA
0118                  SUB3=A1*TORQUE+A1*WTA*DY/2.+A2*MXA+A3*MZA
0119                  SUB4=C1*TORQUE+C1*WTA*DY/2.+C2*MXA+C3*MZA
0120                  WTA=SUB1
0121                  TORQUE=SUB2
0122                  MXA=SUB3
0123                  MZA=SUB4
                C   FORCE VECTORS SUPERPOSED ON X,Y,Z AXIS
0124                  SUB5=A2*WXA+A3*WZA
0125                  SUB6=C2*WXA+C3*WZA
0126                  SUB7=A2*VXA+A3*VZA
0127                  SUB8=C2*VXA+C3*VZA
0128                  WXA=SUB5
0129                  WZA=SUB6
0130                  VXA=SUB7
0131                  VZA=SUB8
                C
                C  THE MOMENTS AND FORCES ARE ORIENTED WITH RESPECT TO THE X,Y,Z, AXIS AND THE
                C  XP,Y,ZP PRINCIPAL CENTROIDAL AXIS
                C
0132                  TU=ATTANG-CHANG
0133                  VZ=VZA*COS(TU)-VXA*SIN(TU)
0134                  WZ=WZA*COS(TU)-WXA*SIN(TU)
0135                  VX=VZA*SIN(TU)+VXA*COS(TU)
0136                  WX=WZA*SIN(TU)+WXA*COS(TU)
0137                  MZ=MZA*COS(TU)-MXA*SIN(TU)
0138                  MX=MZA*SIN(TU)+MXA*COS(TU)
0139                  THETA=ATTANG-CHANG+TANG
0140                  VZP=VZA*COS(THETA)-VXA*SIN(THETA)
0141                  WZP=WZA*COS(THETA)-WXA*SIN(THETA)
0142                  VXP=VZA*SIN(THETA)+VXA*COS(THETA)
0143                  WXP=WZA*SIN(THETA)+WXA*COS(THETA)
0144                  MZP=MZA*COS(THETA)-MXA*SIN(THETA)
0145                  MXP=MZA*SIN(THETA)+MXA*COS(THETA)
                C
                C  IF THIS WAS THE NEXT TO LAST SECTION TO BE EVALUATED CALCULATE AND WRITE
                C  OUT SKIN AND CORE WEIGHT.
                C
0146                  SM1=S-DY
0147                  IF(YLOCAT.EQ.SM1)WSKIN=RHOS*SVOL
0148                  IF(YLOCAT.EQ.SM1)WCORE=RHOC*CVOL
0149                  IF(YLOCAT.EQ.SM1)WRITE(6,280)WSKIN,WCORE
0150              280 FORMAT(1X,'SKIN WEIGHT= ',E12.5,/,1X,'CORE WEIGHT= ',E12.5)
                C
                C  CLEAR COORDINATE ARRAY
                C
0151                  NPNT=10.0*(NPNTS-1)
0152                  DO 281 I=1,NPNT
0153                  XX(I)=0.0
0154                  ZZ(I)=0.0
0155                  TE(I)=0.0
0156              281 CONTINUE
```

```
                C
                C        FOR COMPUTING ACCURACY EACH LINE SEGMENT IN THE X,Z CORD. SYSTEM
                C        IS BROKEN INTO TEN ADDITIONAL SEGMENTS WHICH FORMS A NEW
                C                    EXPANDED XX,ZZ CORD. SYSTEM
                C
0157                    DO 364 ILEG=1,NLEG
0158                    L=LBEG(ILEG)
0159                    K=L+LNO(ILEG)
0160                    DO 364 I=L,K
0161                    J=10.0*(I-1)
0162                    IF(I.EQ.1)J=1
0163                    XX(J)=XP(I)
0164                    ZZ(J)=ZP(I)
0165                    TE(J)=T(I)
0166                    E(J)=E(I)
0167                    G(J)=G(I)
0168                364 CONTINUE
                C
                C        SINCE THE FIRST SEGMENT OF THE FIRST LEG BEGINS WITH THE
                C        NUMBER ONE THEN THE FIRST SEGMENT IS DIVIDED INTO NINE INTERVALS.
                C
0169                    I=1
0170                    J=10
0171                    DIFTE=TE(J)-TE(I)
0172                    DELTAX=XX(J)-XX(I)
0173                    DELTAZ=ZZ(J)-ZZ(I)
0174                    DTE=DIFTE/9.0
0175                    DX=DELTAX/9.0
0176                    DZ=DELTAZ/9.0
0177                    DO 365 N=1,8
0178                    XX(I+N)=XX(I)+N*DX
0179                    ZZ(I+N)=ZZ(I)+N*DZ
0180                    TE(I+N)=TE(I)+N*DTE
0181                    E(I+N)=E(I)
0182                    G(I+N)=G(I)
0183                365 CONTINUE
0184                    DO 370 ILEG=1,NLEG
0185                    L=LBEGN(ILEG)
0186                    K=L+LNON(ILEG)-2
0187                    IF(ILEG.EQ.1)L=L+9
0188                    DO 370 I=L,K,10
0189                    J=I+10
0190                    DIFTE=TE(J)-TE(I)
0191                    DELTAX=XX(J)-XX(I)
0192                    DELTAZ=ZZ(J)-ZZ(I)
0193                    DTE=DIFTE/10.0
0194                    DX=DELTAX/10.0
0195                    DZ=DELTAZ/10.0
0196                    DO 370 N=1,9
0197                    M=I+N
0198                    XX(M)=XX(I)+N*DX
0199                    ZZ(M)=ZZ(I)+N*DZ
0200                    TE(M)=TE(I)+N*DTE
0201                    E(M)=E(I)
0202                    G(M)=G(I)
0203                370 CONTINUE
                C
                C  IF THIS IS THE FIRST SECTION TO BE EVALUATED THE PROGRAM CALCULATES THE
```

```
      C  SHEAR CENTER AT THE ROOT AND MIDSPAN.  TO SAVE COMPUTING TIME ALL OTHER
      C  SHEAR CENTER LOCATIONS ARE CALCULATED BY THE EQUATION FOR A LINE DRAWN
      C  BETWEEN THE ROOT AND MIDSPAN SHEAR CENTERS.
      C
0204      IF(((YLOCAT.EQ.0.0).OR.(YLOCAT.EQ.YM)).AND.ICOUNT.EQ.0)GO TO 355
      C
      C  INFORMATION AT A SECTION SPECIFIED IN THE DATA IS PRINTED OUT.
      C
0205    349 DO 350 I=1,NN
0206      ITEST=YS(I)/DY
0207      IF(ITEST.EQ.ICOUNT)CALL SHEAR(VXP,VZP,ZIBARP,XIBARP,NLEG,LBEGN,LNO
         *N,IV,IU,QXF,QZF,XX,ZZ,TE,XPBAR,ZPBAR,NCELL,ITLEG,IARRY,ISENSE,NWEB
         *,IARRYW,COFT,IDRXZF,IDRXXF,ZACP,XACP,TANG,ZSC,XSC,ISKIP,ICOUNT,YLO
         *CAT,TORQUE,Q,IDRX,SIGMA,MZP,MXP,ZSCM,ZSCF,XSCM,XSCF,NPNTS,WTA,WXP,
         *WZP,YM,AREAC,TORQ,G,TPNT,TDISTR,DY,QT,ES,E)
      C
      C   IF SPECIFIED WRITE OUT CALCULATED RESULTS
      C
0208      IF(ITEST.EQ.ICOUNT)CALL OUT(YLOCAT,NPNTS,X,Z,XP,ZP,TAND,XAC,ZAC,CH
         *AND,ATANGD,XIBAR,ZIBAR,XZIBAR,PMI,XBAR,ZBAR,VX,VZ,MZ,MX,TORQUE,TOR
         *Q,XSC,ZSC,IDRXXF,IDRXZF,QXF,QZF,IDRX,Q,SIGMA,YM,QT,NCELL,T,EF,GF)
0209    350 CONTINUE
0210      ZSC=((YLOCAT-YF)/(YM-YF))*(ZSCM-ZSCF)+ZSCF
0211      XSC=((YLOCAT-YF)/(YM-YF))*(XSCM-XSCF)+XSCF
0212      ZS=ZSC*COS(TANG)-XSC*SIN(TANG)
0213      XS=ZSC*SIN(TANG)+XSC*COS(TANG)
0214      ZSHEAR=ZS-ZACP
0215      XSHEAR=XS-XACP
      C
      C  WITH A SHEAR CENTER LOCATION THE TORQUE IS TRANSFERED FROM THE AERODYNAMIC
      C  CENTER TO THE SHEAR CENTER
      C
0216      TORQ=TORQUE-VZP*XSHEAR+VXP*ZSHEAR
0217      WT=WTA-WZP*XSHEAR+WXP*ZSHEAR
      C
      C  THE SHEAR FLOW DISTRIBUTION IS CALCULATED FOR TORQUE LOADS
      C
0218      CALL CELLT(NWEB,IARRYW,LBEGN,LNON,XX,ZZ,NCELL,ITLEG,IARRY,COFT,QT,
         *AREAC,TPNT,TDISTR,WT,TORQ,YLOCAT,YM,ICOUNT,G,TE,DY)
0219      RETURN
      C
      C  THE FOLLOWING CALCULATES THE SHEAR FLOW DUE TO A SHEAR LOAD USING SUCCESSIVE,
      C  APPROXIMATIONS, LOCATES SHEAR CENTER, AND ASSIGNS A SIGN BY NUMBER CONVENTION
      C                        TO EACH POINT
      C
0220    355 CALL SHEAR(VXP,VZP,ZIBARP,XIBARP,NLEG,LBEGN,LNON,IV,IU,QXF,QZF,XX,
         *ZZ,TE,XPBAR,ZPBAR,NCELL,ITLEG,IARRY,ISENSE,NWEB,IARRYW,COFT,IDRXZF
         *,IDRXXF,ZACP,XACP,TANG,ZSC,XSC,ISKIP,ICOUNT,YLOCAT,TORQUE,Q,IDRX,S
         *IGMA,MZP,MXP,ZSCM,ZSCF,XSCM,XSCF,NPNTS,WTA,WXP,WZP,YM,AREAC,TORQ,G
         *,TPNT,TDISTR,DY,QT,ES,E)
0221      IF(YLOCAT.EQ.0.0.AND.ISKIP.EQ.0)GO TO 349
0222      IF(YLOCAT.EQ.YM.AND.ISKIP.EQ.1)YLOCAT=0.0
0223      IF(YLOCAT.EQ.0.0.AND.ISKIP.EQ.1)GO TO 175
0224      RETURN
0225      END
```

```
*OPTIONS IN EFFECT*   ID,BCD,SOURCE,NOLIST,NODECK,LOAD,NOMAP
*OPTIONS IN EFFECT*   NAME = SECT     , LINECNT =       60
*STATISTICS*     SOURCE STATEMENTS =      225,PROGRAM SIZE =    61330
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
IEF285I   SYSOUT                                          SYSOUT
IEF285I   VOL SER NOS=
IEF285I   RONDATA                                         KEPT
IEF285I   VOL SER NOS= PCPLIB.
//STEPD EXEC FORTC,PARM='NAME=CENTRD'
XXFORT     EXEC PGM=IEYFORT,REGION=100K
XXSYSPRINT DD  SYSOUT=A
XXSYSPUNCH DD  SYSOUT=B
//SYSLIN DD DSN=RONDATA,DISP=(MOD,KEEP,DELETE),VOL=SER=PCPLIB
X/SYSLIN DD DSN=&LOADSET,UNIT=SYSDA,DISP=(MOD,PASS,DELETE),          X
XX              SPACE=(80,(200,100)),DCB=BLKSIZE=80
//SYSIN DD *
IEF236I ALLOC. FOR WINGA    FORT     STEPD
IEF237I 191   ALLOCATED TO SYSLIN
IEF237I 00C   ALLOCATED TO SYSIN
```

```
0001            SUBROUTINE CENTRD(NLEG,LBEG,LNO,XP,ZP,T,XBAR,ZBAR,XPBAR,ZPBAR,XIBA
               *R,ZIBAR,XIBARP,ZIBARP,XZIBAR,PMI,TANG,TAND,SVOL,CVOL,ISKIP,ICOUNT,
               *DY,DC,ES,E)
0002            DIMENSION LBEG(13),LNO(13),XP(100),ZP(100),T(100),E(100)
0003            REAL MAREAT
0004            TANG=0.0
0005            ANG=0.0
0006          185 AREAT=0.0
0007            MAREAT=0.0
0008            AXT=0
0009            AZT=0
0010            AXZT=0
0011            XIT=0
0012            ZIT=0
0013            CIRCUM=0.0
0014            DO 190 ILEG=1,NLEG
0015            L=LBEG(ILEG)
0016            K=L+LNO(ILEG)-2
0017            DO 190 I=L,K
0018            J=I+1
0019            DELTAX=XP(J)-XP(I)
0020            DELTAZ=ZP(J)-ZP(I)
0021            EAVG=(E(J)+E(I))/2.0
0022            DIST=SQRT(DELTAX**2+DELTAZ**2)
0023            IF(EAVG.EQ.ES)CIRCUM=DIST+CIRCUM
0024            TAVG=(T(J)+T(I))/2.0
0025            XIS=DIST*(TAVG**3)/12.0*EAVG/ES
0026            ZIS=TAVG*(DIST**3)/12.0*EAVG/ES
0027            SINANG=DELTAZ/DIST
0028            COSANG=DELTAX/DIST
0029            XIC=XIS*(COSANG**2)+ZIS*(SINANG**2)
0030            ZIC=XIS*(SINANG**2)+ZIS*(COSANG**2)
0031            AREA=DIST*TAVG
0032            XBARS=(XP(J)+XP(I))/2.0                                    ARNE
0033            ZBARS=(ZP(J)+ZP(I))/2.0                                    ARNE
0034            AX=AREA*XBARS*EAVG/ES
0035            AZ=AREA*ZBARS*EAVG/ES
0036            AXZ=AREA*XBARS*ZBARS*EAVG/ES
0037            AZSQD=AREA*(ZBARS**2)*EAVG/ES
0038            AXSQD=AREA*(XBARS**2)*EAVG/ES
0039            XI=XIC+AZSQD
0040            ZI=ZIC+AXSQD
0041            AREAT=AREA+AREAT
0042            MAREAT=AREA*EAVG/ES+MAREAT
0043            AXT=AX+AXT
0044            AZT=AZ+AZT
0045            AXZT=AXZ+AXZT
0046            XIT=XI+XIT
0047            ZIT=ZI+ZIT
0048          190 CONTINUE
0049            XPBAR=AXT/MAREAT
0050            ZPBAR=AZT/MAREAT
0051            XIBARP=XIT-MAREAT*(ZPBAR**2)
0052            ZIBARP=ZIT-MAREAT*(XPBAR**2)
0053            XZIBRP=AXZT-MAREAT*XPBAR*ZPBAR
0054            PMIP=XIBARP+ZIBARP
0055            IF(ANG.EQ.0.0)XBAR=XPBAR
0056            IF(ANG.EQ.0.0)ZBAR=ZPBAR
```

```
0057              IF(ANG.EQ.0.0)XIBAR=XIBARP
0058              IF(ANG.EQ.0.0)ZIBAR=ZIBARP
0059              IF(ANG.EQ.0.0)XZIBAR=XZIBRP
0060              IF(ANG.EQ.0.0)PMI=PMIP
0061              Y=2.*XZIBRP
0062              W=ZIBARP-XIBARP
0063              IF(Y.LT.0.001)GO TO 205
0064              ANG=ATAN2(Y,W)/2.
0065              TANG=TANG+ANG
0066              DO 200 I=1,NPNTS
0067              XP(I)=XP(I)*COS(ANG)+ZP(I)*SIN(ANG)
0068          200 ZP(I)=-XP(I)*SIN(ANG)+ZP(I)*COS(ANG)
0069              XACP=XACP*COS(ANG)+ZACP*SIN(ANG)
0070              ZACP=-XACP*SIN(ANG)+ZACP*COS(ANG)
0071              GO TO 185
0072          205 TAND=TANG*360./(2.*3.14159)
                  C
                  C     THIN SKIN WEIGHT CALCULATED FOR EACH SECTION
                  C
0073              IF(ISKIP.EQ.1.OR.ICOUNT.GT.0)SVOL=AREAT*DY+SVOL
0074              IF(ISKIP.EQ.1.OR.ICOUNT.GT.0)CVOL=CIRCUM*DC*DY+CVOL
0075              RETURN
0076              END
```

```
*OPTIONS IN EFFECT*   ID,BCD,SOURCE,NOLIST,NODECK,LOAD,NOMAP
*OPTIONS IN EFFECT*   NAME = CENTRD   , LINECNT =      60
*STATISTICS*     SOURCE STATEMENTS =       76,PROGRAM SIZE =     2742
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
IEF285I   SYSOUT                                          SYSOUT
IEF285I   VOL SER NOS=
IEF285I   RONDATA                                         KEPT
IEF285I   VOL SER NOS= PCPLIB.
//STEPE EXEC FORTC,PARM='NAME=SHEAR'
XXFORT    EXEC PGM=IEYFORT,REGION=100K
XXSYSPRINT DD  SYSOUT=A
XXSYSPUNCH DD  SYSOUT=B
//SYSLIN DD DSN=RONDATA,DISP=(MOD,KEEP,DELETE),VOL=SER=PCPLIB
X/SYSLIN DD DSN=&LOADSET,UNIT=SYSDA,DISP=(MOD,PASS,DELETE),          X
XX             SPACE=(80,(200,100)),DCB=BLKSIZE=80
//SYSIN DD *
IEF236I ALLOC. FOR WINGA    FORT     STEPE
IEF237I 191   ALLOCATED TO SYSLIN
IEF237I 00C   ALLOCATED TO SYSIN
```

```
0001                  SUBROUTINE SHEAR(VXP,VZP,ZIBARP,XIBARP,NLEG,LBEG,LNO,IV,IU,QXF,QZF
                     *,XX,ZZ,TE,XPBAR,ZPBAR,NCELL,ITLEG,IARRY,ISENSE,NWEB,IARRYW,COFT,ID
                     *RXZF,IDRXXF,ZACP,XACP,TANG,ZSC,XSC,ISKIP,ICOUNT,YLOCAT,TORQUE,Q,ID
                     *RX,SIGMA,MZP,MXP,ZSCM,ZSCF,XSCM,XSCF,NPNTS,WTA,WXP,WZP,YM,AREAC,TO
                     *RQ,G,TPNT,TDISTR,DY,QT,ES,E)
0002                  DIMENSION LBEG(13),LNO(13),QXF(980),QZF(980),XX(980),ZZ(980),TE(98
                     *0),ITLEG(4),IARRY(4,5),ISENSE(4,5),IARRYW(3),WLDIVT(3),CLDIVT(3),C
                     *OFT(4,3),QXR(4),QXL(4),QZR(4),QZL(4),QVX(4),QVZ(4),IDRXZF(980),IDR
                     *XXF(980),QT(4),Q(980),IDRX(980),SIGMA(980),IU(13),IV(13),AREAC(4),
                     *QVXA(4),QVZA(4),G(980),E(980)
0003                  REAL LDIVT,MAXQZF,MAXQXF,MXFY,MZFY,MZP,MXP
                C
                C  CLEAR ARRAYS
                C
0004                  NPNT=10.0*(NPNTS-1)
0005                  DO 374 I=1,NPNT
0006                  IDRXXF(I)=0.0
0007                  IDRXZF(I)=0.0
0008                  QXF(I)=0.0
0009                  QZF(I)=0.0
0010                  IDRX(I)=0.0
0011                  Q(I)=0.0
0012                  SIGMA(I)=0.0
0013                374 CONTINUE
                C
                C        WITH THE NEW EXPANDED COORDINATE SYSTEM THE PROGRAM PROCEEDS TO
                C        CALCULATE SHEAR FLOWS FOR THE OPEN CELLS DUE TO SHEAR LOADS.
                C
0014                  QXF(1)=0.
0015                  QZF(1)=0.
0016                  CONXF=-VXP/ZIBARP
0017                  CONZF=-VZP/XIBARP
0018                  DO 375 ILEG=1,NLEG
0019                  L=LBEG(ILEG)
0020                  K=L+LNO(ILEG)-2
0021                  QXF(L)=QXF(IV(ILEG))+QXF(IU(ILEG))
0022                  QZF(L)=QZF(IV(ILEG))+QZF(IU(ILEG))
0023                  DO 375 I=L,K
0024                  J=I+1
0025                  DELTAX=XX(J)-XX(I)
0026                  DELTAZ=ZZ(J)-ZZ(I)
0027                  DIST=SQRT(DELTAX**2+DELTAZ**2)
0028                  TAVG=(TE(J)+TE(I))/2.0
0029                  XH=(XX(J)+XX(I))/2.0
0030                  ZH=(ZZ(J)+ZZ(I))/2.0
0031                  AREA=TAVG*DIST
0032                  XCENT=XH-XPBAR
0033                  ZCENT=ZH-ZPBAR
0034                  QXF(J)=QXF(I)+CONXF*XCENT*AREA
0035                  QZF(J)=QZF(I)+CONZF*ZCENT*AREA
0036                375 CONTINUE
                C
                C        BEFORE ITERATING ON Q THE PROPER SIGN IS ASSIGNED
                C        BY MULTIPLYING THE Q'S BY THE SENSE VARIABLE.  WITH
                C        CORRECT SIGNS FOR Q, THE FIRST Q APPROXIMATIONS
                C            ARE CALCULATED FOR EACH CELL
                C
0037                  DO 385 ICELL=1,NCELL
```

```
0038                INO=ITLEG(ICELL)
0039                LDIVT=0.0
0040                DELXF=0.0
0041                DELZF=0.0
0042                DO 380 IORD=1,INO
0043                ILEG=IARRY(ICELL,IORD)
0044                L=LBEG(ILEG)
0045                K=L+LNO(ILEG)-2
0046                ISENS=ISENSE(ICELL,IORD)
0047                DO 380 I=L,K
0048                J=I+1
0049                DELTAX=XX(J)-XX(I)
0050                DELTAZ=ZZ(J)-ZZ(I)
0051                DIST=SQRT(DELTAX**2+DELTAZ**2)
0052                QXFI=ISENS*QXF(I)
0053                QZFI=ISENS*QZF(I)
0054                QXFJ=ISENS*QXF(J)
0055                QZFJ=ISENS*QZF(J)
0056                QAVXF=(QXFJ+QXFI)/2.0
0057                QAVZF=(QZFJ+QZFI)/2.0
0058                TAVG=(TE(J)+TE(I))/2.0
0059                DELXF=DELXF+QAVXF*DIST/TAVG
0060                DELZF=DELZF+QAVZF*DIST/TAVG
0061                LDIVT=LDIVT+DIST/TAVG
0062              380 CONTINUE
0063                QVX(ICELL)=-DELXF/LDIVT
0064                QVZ(ICELL)=-DELZF/LDIVT
0065                QVXA(ICELL)=QVX(ICELL)
0066                QVZA(ICELL)=QVZ(ICELL)
0067              385 CONTINUE
                  C
                  C   CALCULATE CARRY OVER FACTORS, CELL 1-2, CELL 2-1, CELL 2-3, CELL 3-2 ETC.
                  C
0068                DO 286 IWEB=1,NWEB
0069                WLDIVT(IWEB)=0.
0070                ILEG=IARRYW(IWEB)
0071                L=LBEG(ILEG)
0072                K=L+LNO(ILEG)-2
0073                DO 285 I=L,K
0074                J=I+1
0075                DELTAX=XX(J)-XX(I)
0076                DELTAZ=ZZ(J)-ZZ(I)
0077                DIST=SQRT(DELTAX**2+DELTAZ**2)
0078                TAVG=(TE(J)+TE(I))/2.0
0079                WLDIVT(IWEB)=WLDIVT(IWEB)+DIST/TAVG
0080              285 CONTINUE
0081              286 CONTINUE
0082                DO 295 IWEB=1,NWEB
0083                ICELW=IWEB+1
0084                DO 295 ICELL=IWEB,ICELW
0085                CLDIVT(ICELL)=0.
0086                INO=ITLEG(ICELL)
0087                DO 290 IORD=1,INO
0088                ILEG=IARRY(ICELL,IORD)
0089                L=LBEG(ILEG)
0090                K=L+LNO(ILEG)-2
0091                DO 290 I=L,K
0092                J=I+1
```

```
0093            DELTAX=XX(J)-XX(I)
0094            DELTAZ=ZZ(J)-ZZ(I)
0095            DIST=SQRT(DELTAX**2+DELTAZ**2)
0096            TAVG=(TE(J)+TE(I))/2.0
0097            CLDIVT(ICELL)=CLDIVT(ICELL)+DIST/TAVG
0098        290 CONTINUE
0099            COFT(ICELL,IWEB)=WLDIVT(IWEB)/CLDIVT(ICELL)
0100        295 CONTINUE
C
C       WITH AN INITIAL QUESS FOR Q IN EACH CELL THE ITERATION ON Q STARTS
C
0101            QXR(1)=0.0
0102            QZR(1)=0.0
0103            QXL(NCELL)=0.0
0104            QZL(NCELL)=0.0
0105            QTOLRX=ABS(QVX(1)/100000.)
0106            QTOLRZ=ABS(QVZ(1)/100000.)
0107            DO 400 I=1,100
0108            DO 390 ICELL=2,NCELL
0109            IWEB=ICELL-1
0110            QXR(ICELL)=COFT(ICELL,IWEB)*QVXA(ICELL-1)
0111            QVX(ICELL)=QVX(ICELL)+QXR(ICELL)
0112            QZR(ICELL)=COFT(ICELL,IWEB)*QVZA(ICELL-1)
0113            QVZ(ICELL)=QVZ(ICELL)+QZR(ICELL)
0114        390 CONTINUE
0115            DO 395 ICELB=2,NCELL
0116            ICELL=NCELL-(ICELB-1)
0117            IWEB=ICELL
0118            QXL(ICELL)=COFT(ICELL,IWEB)*QVXA(ICELL+1)
0119            QVX(ICELL)=QVX(ICELL)+QXL(ICELL)
0120            QZL(ICELL)=COFT(ICELL,IWEB)*QVZA(ICELL+1)
0121            QVZ(ICELL)=QVZ(ICELL)+QZL(ICELL)
0122        395 CONTINUE
0123            DO 396 ICELL=1,NCELL
0124            QVXA(ICELL)=QXR(ICELL)+QXL(ICELL)
0125            QVZA(ICELL)=QZR(ICELL)+QZL(ICELL)
0126        396 CONTINUE
0127            IF(ABS(QXL(1)).LT.QTOLRX.AND.ABS(QZL(1)).LT.QTOLRZ)GO TO 404
0128        400 CONTINUE
0129            WRITE(6,405)QTOLRX,QTOLRZ,ICELL,QVXL,QVZL
0130        405 FORMAT(1H1,'SUCCESSIVE APPROXIMATIONS FOR CALCULATING SHEAR FLOW D
               *UE TO SHEAR LOAD DID NOT CONVERGE',/,' MIN. TOLERANCE OF',E10.3,'F
               *OR X SHEAR LOAD',E10.3,'FOR Z SHEAR LOAD IN 100 ITERATIONS',/,' LA
               *ST SHEAR FLOW INCREMENT FOR CELL',I2,'WAS',E10.3,'  FOR X SHEAR',E
               *10.3,'FOR Z SHEAR')
C
C       THE SUMMATION OF THE CARRIED OVER Q'S ARE NOW ADDED TO FORM
C       THE SHEAR FLOW DISTRIBUTION FOR THE CLOSED CELLS DUE TO SHEAR LOADS
C
0131        404 IWEB=1
0132            DO 410 ICELL=1,NCELL
0133            INO=ITLEG(ICELL)
0134            DO 410 IORD=1,INO
0135            ILEG=IARRY(ICELL,IORD)
0136            L=LBEG(ILEG)
0137            K=L+LNO(ILEG)-1
0138            ISENS=ISENSE(ICELL,IORD)
0139            IF(ICELL.GT.IWEB.AND.ILEG.EQ.IARRYW(IWEB))ISENS=-ISENS
```

```
0140                IF(ICELL.GT.IWEB.AND.ILEG.EQ.IARRYW(IWEB))IWEB=IWEB+1
0141                DO 410 I=L,K
0142                QXF(I)=ISENS*QXF(I)+QVX(ICELL)
0143                QZF(I)=ISENS*QZF(I)+QVZ(ICELL)
0144              410 CONTINUE
                  C
                  C  STARTING AT 1 CALCULATE FORCE COMPONENTS
                  C  AND ITS MOMENTS ABOUT THE AERODYNAMIC CENTER
                  C  FOR LOCATION OF THE SHEAR CENTER
0145                MXFY=0.
0146                MZFY=0.
0147                DO 542 ICELL=1,NCELL
0148                INO=ITLEG(ICELL)
0149                DO 541 IORD=1,INO
0150                ILEG=IARRY(ICELL,IORD)
0151                IF(ILEG.EQ.IARRYW(ICELL))GO TO 541
0152                L=LBEG(ILEG)
0153                K=L+LNO(ILEG)-2
0154                DO 540 I=L,K
0155                J=I+1
0156                QAVXF=(QXF(J)+QXF(I))/2.0
0157                QAVZF=(QZF(J)+QZF(I))/2.0
0158                DELTAX=XX(J)-XX(I)
0159                DELTAZ=ZZ(J)-ZZ(I)
0160                DIST=SQRT(DELTAX**2+DELTAZ**2)
0161                EFXF=QAVXF*DIST
0162                EFZF=QAVZF*DIST
0163                SINANG=DELTAZ/DIST
0164                COSANG=DELTAX/DIST
0165                XEFXF=-EFXF*COSANG*ISENSE(ICELL,IORD)
0166                ZEFXF=-EFXF*SINANG*ISENSE(ICELL,IORD)
0167                XEFZF=-EFZF*COSANG*ISENSE(ICELL,IORD)
0168                ZEFZF=-EFZF*SINANG*ISENSE(ICELL,IORD)
0169                XH=(XX(J)+XX(I))/2.
0170                ZH=(ZZ(J)+ZZ(I))/2.
0171                ZTAC=ZH-ZACP
0172                XTAC=XH-XACP
0173                MZFY=MZFY-(ZEFZF*XTAC)+(XEFZF*ZTAC)
0174                MXFY=MXFY+(ZEFXF*XTAC)-(XEFXF*ZTAC)
                  C
                  C  DIRECTION OF QZF'S
                  C
0175                IF(ZEFZF)430,431,432
0176              430 IF(XEFZF)438,439,440
0177              431 IF(XEFZF)437,441,433
0178              432 IF(XEFZF)436,435,434
0179              433 IDRXZF(I)=1
0180                  GO TO 442
0181              434 IDRXZF(I)=2
0182                  GO TO 442
0183              435 IDRXZF(I)=3
0184                  GO TO 442
0185              436 IDRXZF(I)=4
0186                  GO TO 442
0187              437 IDRXZF(I)=5
0188                  GO TO 442
0189              438 IDRXZF(I)=6
0190                  GO TO 442
```

```
0191          439 IDRXZF(I)=7
0192              GO TO 442
0193          440 IDRXZF(I)=8
0194              GO TO 442
0195          441 IDRXZF(I)=9
                C
                C  DIRECTION OF QXF'S
                C
0196          442 IF(ZEFXF)530,531,532
0197          530 IF(XEFXF)526,527,528
0198          531 IF(XEFXF)525,529,521
0199          532 IF(XEFXF)524,523,522
0200          521 IDRXXF(I)=1
0201              GO TO 540
0202          522 IDRXXF(I)=2
0203              GO TO 540
0204          523 IDRXXF(I)=3
0205              GO TO 540
0206          524 IDRXXF(I)=4
0207              GO TO 540
0208          525 IDRXXF(I)=5
0209              GO TO 540
0210          526 IDRXXF(I)=6
0211              GO TO 540
0212          527 IDRXXF(I)=7
0213              GO TO 540
0214          528 IDRXXF(I)=8
0215              GO TO 540
0216          529 IDRXXF(I)=9
0217          540 CONTINUE
0218          541 CONTINUE
0219          542 CONTINUE
                C
                C  CALCULATE SHEAR CENTER BY BALANCING PREVIOUSLY CALCULATED MOMENTS
                C
0220              ZSHEAR=MXFY/VXP
0221              XSHEAR=MZFY/VZP
0222              ZS=ZACP+ZSHEAR
0223              XS=XACP+XSHEAR
0224              ZSC=ZS*COS(-TANG)-XS*SIN(-TANG)
0225              XSC=ZS*SIN(-TANG)+XS*COS(-TANG)
0226              IF(YLOCAT.EQ.0.0)ZSCF=ZSC
0227              IF(YLOCAT.EQ.0.0)XSCF=XSC
0228              IF(YLOCAT.EQ.0.0)ISKIP=0
0229              IF(YLOCAT.EQ.YM.AND.ICOUNT.EQ.0)ZSCM=ZSC
0230              IF(YLOCAT.EQ.YM.AND.ICOUNT.EQ.0)XSCM=XSC
0231              IF(YLOCAT.EQ.YM.AND.ICOUNT.EQ.0)ISKIP=1
0232              TORQ=TORQUE-VZP*XSHEAR+VXP*ZSHEAR
0233              WT=WTA-WZP*XSHEAR+WXP*ZSHEAR
                C
                C  THE SHEAR FLOW DISTRIBUTION IS CALCULATED FOR TORQUE LOADS
                C
0234              CALL CELLT(NWEB,IARRYW,LBEG,LNO,XX,ZZ,NCELL,ITLEG,IARRY,COFT,QT,AR
                 *EAC,TPNT,TDISTR,WT,TORQ,YLOCAT,YM,ICOUNT,G,TE,DY)
                C
                C  BREAK SHEAR FLOW DUE TO TORQUE LOAD INTO FORCES IN THE X,Z DIRECTION
                C  AND THEN SUM UP ALL FORCES DUE TO SHEAR LOADS
                C
```

```
0235                DO 835 ICELL=1,NCELL
0236                INO=ITLEG(ICELL)
0237                ICELLM=ICELL-1
0238                DO 834 IORD=1,INO
0239                ILEG=IARRY(ICELL,IORD)
0240                IF(ILEG.EQ.IARRYW(ICELL))GO TO 834
0241                L=LBEG(ILEG)
0242                K=L+LNO(ILEG)-2
0243                DO 833 I=L,K
0244                J=I+1
0245                DELTAX=XX(J)-XX(I)
0246                DELTAZ=ZZ(J)-ZZ(I)
0247                DIST=SQRT(DELTAX**2+DELTAZ**2)
0248                QAVXF=QXF(I)
0249                QAVZF=QZF(I)
0250                QAVT=QT(ICELL)
0251                IF(ICELLM.EQ.0)GO TO 619
0252                IF(ILEG.EQ.IARRYW(ICELLM))QAVT=QT(ICELL)-QT(ICELLM)
0253              619 SINANG=DELTAZ/DIST
0254                COSANG=DELTAX/DIST
0255                EFXF=QAVXF*DIST
0256                EFZF=QAVZF*DIST
0257                EFT=QAVT*DIST
0258                XEFT=-EFT*COSANG*ISENSE(ICELL,IORD)
0259                ZEFT=-EFT*SINANG*ISENSE(ICELL,IORD)
0260                XEFXF=-EFXF*COSANG*ISENSE(ICELL,IORD)
0261                ZEFXF=-EFXF*SINANG*ISENSE(ICELL,IORD)
0262                XEFZF=-EFZF*COSANG*ISENSE(ICELL,IORD)
0263                ZEFZF=-EFZF*SINANG*ISENSE(ICELL,IORD)
0264                XEFF=XEFT+XEFZF+XEFXF
0265                ZEFF=ZEFT+ZEFZF+ZEFXF
0266                EFF=SQRT(ZEFF**2+XEFF**2)
0267                Q(I)=EFF/DIST
                C
                C  DIRECTION OF Q'S
                C
0268                IF(ZEFF)830,831,832
0269              830 IF(XEFF)826,827,828
0270              831 IF(XEFF)825,829,821
0271              832 IF(XEFF)824,823,822
0272              821 IDRX(I)=1
0273                  GO TO 833
0274              822 IDRX(I)=2
0275                  GO TO 833
0276              823 IDRX(I)=3
0277                  GO TO 833
0278              824 IDRX(I)=4
0279                  GO TO 833
0280              825 IDRX(I)=5
0281                  GO TO 833
0282              826 IDRX(I)=6
0283                  GO TO 833
0284              827 IDRX(I)=7
0285                  GO TO 833
0286              828 IDRX(I)=8
0287                  GO TO 833
0288              829 IDRX(I)=9
0289              833 CONTINUE
```

```
0290            834 CONTINUE
0291            835 CONTINUE
                C
                C  CALCULATES THE NORMAL STRESS DISTRIBUTION IN THE SKIN AT EACH LOCATION.
                C          MINUS(COMPRESSION)     PLUS(TENSION)
                C
0292                DO 840 ILEG=1,NLEG
0293                L=LBEG(ILEG)
0294                K=L+LNC(ILEG)-1
0295                DO 840 I=L,K
0296                D=XX(I)-XPBAR
0297                V=ZZ(I)-ZPBAR
0298                SIGMAX=-MZP*D/ZIBARP*E(I)/ES
0299                SIGMAZ=-MXP*V/XIBARP*E(I)/ES
0300            840 SIGMA(I)=SIGMAX+SIGMAZ
0301                RETURN
0302                END
```

```
*OPTIONS IN EFFECT*   ID,BCD,SOURCE,NOLIST,NODECK,LOAD,NOMAP
*OPTIONS IN EFFECT*   NAME = SHEAR    , LINECNT =      60
*STATISTICS*     SOURCE STATEMENTS =      302,PROGRAM SIZE =     10414
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
IEF285I   SYSOUT                                          SYSOUT
IEF285I   VOL SER NOS=      .
IEF285I   RONDATA                                         KEPT
IEF285I   VOL SER NOS= PCPLIB.
//STEPF EXEC FORTC,PARM='NAME=CELLT'
XXFORT    EXEC PGM=IEYFORT,REGION=100K
XXSYSPRINT DD  SYSOUT=A
XXSYSPUNCH DD  SYSOUT=B
//SYSLIN DD DSN=RONDATA,DISP=(MOD,KEEP,DELETE),VOL=SER=PCPLIB
X/SYSLIN DD DSN=&LOADSET,UNIT=SYSDA,DISP=(MOD,PASS,DELETE),          X
XX             SPACE=(80,(200,100)),DCB=BLKSIZE=80
//SYSIN DD *
IEF236I ALLOC. FOR WINGA    FORT    STEPF
IEF237I 191   ALLOCATED TO SYSLIN
IEF237I 00C   ALLOCATED TO SYSIN
```

```
0001            SUBROUTINE CELLT(NWEB,IARRYW,LBEG,LNO,XX,ZZ,NCELL,ITLEG,IARRY,COFT
               *,QT,AREAC,TPNT,TDISTR,WT,TORQ,YLOCAT,YM,ICOUNT,G,TE,DY)
0002            DIMENSION IARRYW(3),LBEG(13),LNO(13),XX(980),ZZ(980),IARRY(4,5),AR
               *EAC(4),CLDIVT(4),COFT(4,3),QI(4,3),QT(4),THETA(4),WLDIVT(3),TE(980
               *),QTD(4),THETAD(4),ITLEG(4),QTA(4),QTR(4),QTL(4),G(980)
          C
          C    TWISTING DEFLECTIONS ARE CALCULATED FOR EACH SECTION AS A FUNCTION OF THE
          C    SHEAR FLOW DISTRIBUTION IN THE SKIN DUE TO TORQUE LOAD.  THE SHEAR FLOW
          C    DISTRIBUTION OF A MULTI-CELL SECTION IS FOUND BY A METHOD OF SUCCESSIVE
          C                              CORRECTIONS
          C
          C
          C   CALCULATE CARRY OVER FACTORS, CELL 1-2, CELL 2-1, CELL 2-3, CELL 3-2 ETC.
          C
0003            ISW=0
0004            IF(TORQ.EQ.0.0)ISW=1
0005            DO 285 IWEB=1,NWEB
0006            WLDIVT(IWEB)=0.
0007            ILEG=IARRYW(IWEB)
0008            L=LBEG(ILEG)
0009            K=L+LNO(ILEG)-2
0010            DO 285 I=L,K
0011            J=I+1
0012            DELTAX=XX(J)-XX(I)
0013            DELTAZ=ZZ(J)-ZZ(I)
0014            DIST=SQRT(DELTAX**2+DELTAZ**2)
0015            TAVG=(TE(J)+TE(I))/2.0
0016            GAVG=(G(J)+G(I))/2.0
0017            WLDIVT(IWEB)=WLDIVT(IWEB)+DIST/(TAVG*GAVG)
0018          285 CONTINUE
0019            DO 295 IWEB=1,NWEB
0020            ICELW=IWEB+1
0021            DO 295 ICELL=IWEB,ICELW
0022            CLDIVT(ICELL)=0.
0023            IND=ITLEG(ICELL)
0024            DO 290 IORD=1,IND
0025            ILEG=IARRY(ICELL,IORD)
0026            L=LBEG(ILEG)
0027            K=L+LNO(ILEG)-2
0028            DO 290 I=L,K
0029            J=I+1
0030            DELTAX=XX(J)-XX(I)
0031            DELTAZ=ZZ(J)-ZZ(I)
0032            DIST=SQRT(DELTAX**2+DELTAZ**2)
0033            TAVG=(TE(J)+TE(I))/2.0
0034            GAVG=(G(J)+G(I))/2.0
0035            CLDIVT(ICELL)=CLDIVT(ICELL)+DIST/(TAVG*GAVG)
0036          290 CONTINUE
0037            COFT(ICELL,IWEB)=WLDIVT(IWEB)/CLDIVT(ICELL)
0038          295 CONTINUE
          C
          C     CALCULATE Q INDIVIDUALLY FOR EACH CELL ASSUMING G*THETA=1
          C
0039            DO 300 ICELL=1,NCELL
0040            QT(ICELL)=2.*AREAC(ICELL)/CLDIVT(ICELL)*0.00001
0041            QTA(ICELL)=QT(ICELL)
0042          300 CONTINUE
          C
```

```
                C     USING CARRY OVER FACTORS SUMATE Q'S CARRIED OVER FROM CELL TO CELL
                C
0043                  QTR(1)=0.0
0044                  QTL(NCELL)=0.0
0045                  QTOLR=ABS(QT(1)/100000.)
0046                  DO 315 I=1,100
0047                  DO 305 ICELL=2,NCELL
0048                  IWEB=ICELL-1
0049                  QTR(ICELL)=COFT(ICELL,IWEB)*QTA(ICELL-1)
0050                  QT(ICELL)=QT(ICELL)+QTR(ICELL)
0051               305 CONTINUE
0052                  DO 310 ICELB=2,NCELL
0053                  ICELL=NCELL-(ICELB-1)
0054                  IWEB=ICELL
0055                  QTL(ICELL)=COFT(ICELL,IWEB)*QTA(ICELL+1)
0056                  QT(ICELL)=QT(ICELL)+QTL(ICELL)
0057               310 CONTINUE
0058                  DO 311 ICELL=1,NCELL
0059                  QTA(ICELL)=QTR(ICELL)+QTL(ICELL)
0060               311 CONTINUE
0061                  IF(ABS(QTL(1)).LT.QTOLR)GO TO 320
0062               315 CONTINUE
                C
                C  CALCULATE TORQUE IN EACH CELL WHERE TWIST*G WAS ASSUMED UNITY.  THEN
                C  CALCULATE CORRECTED SHEAR FLOW IN EACH CELL AND TWIST
                C
0063               320 T2AQ=0.0
0064                  DO 335 ICELL=1,NCELL
0065                  T2AQ=T2AQ+2.*AREAC(ICELL)*QT(ICELL)
0066               335 CONTINUE
0067                  DO 340 ICELL=1,NCELL
0068                  IF(ISW.EQ.0)QT(ICELL)=TORQ*QT(ICELL)/T2AQ
0069                  IF(ISW.EQ.1)QT(ICELL)=1.0*QT(ICELL)/T2AQ
0070               340 CONTINUE
0071                  DO 341 ICELL=1,NCELL
0072                  ICELLP=ICELL+1
0073                  ICELLM=ICELL-1
0074                  IF(ICELL.EQ.NCELL)THETA(ICELL)=((QT(ICELL)-QT(ICELLM))*WLDIVT(ICEL
                     *LM)+QT(ICELL)*(CLDIVT(ICELL)-WLDIVT(ICELLM)))*DY/(2.*AREAC(ICELL))
0075                  IF(ICELL.EQ.1)THETA(ICELL)=((QT(ICELL)-QT(ICELLP))*WLDIVT(ICELL)+Q
                     *T(ICELL)*(CLDIVT(ICELL)-WLDIVT(ICELL)))*DY/(2.*AREAC(ICELL))
0076                  IF(ICELL.GT.1.AND.ICELL.LT.NCELL)THETA(ICELL)=((QT(ICELL)-QT(ICELL
                     *P))*WLDIVT(ICELL)+(QT(ICELL)-QT(ICELLM))*WLDIVT(ICELLM)+QT(ICELL)*
                     *(CLDIVT(ICELL)-WLDIVT(ICELLM)-WLDIVT(ICELL)))*DY/(2.*AREAC(ICELL))
0077               341 CONTINUE
0078                  TPNT=THETA(1)
0079                  IF(ISW.EQ.1)TPNT=0.0
0080                  IF(ISW.EQ.0)TDISTR=THETA(1)*WT*DY/(2.0*TORQ)
0081                  IF(ISW.EQ.1)TDISTR=THETA(1)*WT*DY/2.0
0082                  DIFFT=THETA(1)-THETA(2)
0083                  TOLRT=THETA(1)/1000.
0084                  IF(ABS(TOLRT).LT.ABS(DIFFT))WRITE(6,345)THETA(1),THETA(2)
0085               345 FORMAT(' THE TWIST FOR THE FIRST TWO CELLS ARE NOT EQUAL',/,' CELL
                     *1 TWIST=',E10.3,' CELL2 TWIST=',E10.3)
0086                  RETURN
0087                  END
```

```
*OPTIONS IN EFFECT*   ID,BCD,SOURCE,NOLIST,NODECK,LOAD,NOMAP
*OPTIONS IN EFFECT*   NAME = CELLT    , LINECNT =      60
*STATISTICS*     SOURCE STATEMENTS =      87,PROGRAM SIZE =    3512
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
IEF285I   SYSOUT                                          SYSOUT
IEF285I   VOL SER NOS=
IEF285I   RONDATA                                         KEPT
IEF285I   VOL SER NOS= PCPLIB.
//STEPG EXEC FORTC,PARM='NAME=OUT'
XXFORT    EXEC PGM=IEYFORT,REGION=100K
XXSYSPRINT DD  SYSOUT=A
XXSYSPUNCH DD  SYSOUT=B
//SYSLIN DD DSN=RONDATA,DISP=(MOD,KEEP,DELETE),VOL=SER=PCPLIB
X/SYSLIN DD DSN=&LOADSET,UNIT=SYSDA,DISP=(MOD,PASS,DELETE),          X
XX             SPACE=(80,(200,100)),DCB=BLKSIZE=80
//SYSIN DD *
IEF236I ALLOC. FOR WINGA    FORT    STEPG
IEF237I 191   ALLOCATED TO SYSLIN
IEF237I 00C   ALLOCATED TO SYSIN
```

```
0001            SUBROUTINE OUT(YLOCAT,NPNTS,X,Z,XP,ZP,TAND,XAC,ZAC,CHAND,ATANGD,XI
               *BAR,ZIBAR,XZIBAR,PMI,XBAR,ZBAR,VX,VZ,MZ,MX,TORQUE,TORQ,XSC,ZSC,IDR
               *XXF,IDRXZF,QXF,QZF,IDRX,Q,SIGMA,YM,QT,NCELL,T,EF,GF)
0002            DIMENSION X(100),Z(100),XP(100),ZP(100),IDRXXF(980),IDRXZF(980),QX
               *F(980),QZF(980),IDRX(980),Q(980),SIGMA(980),QT(4),T(100),EF(100),G
               *F(100)
0003            REAL MZ,MX
                C
                C  WRITE OUT VALUES CALCULATED
                C
0004              NPNT=10.0*(NPNTS-1)
0005            845 WRITE(6,965)
0006              WRITE(6,850)YLOCAT
0007            850 FORMAT(1X,'THE AIRFOIL SHAPE AT SECTION ',F9.3,'  IS DEFINED',/,'
                  *BY THE REFERENCE X,Z COORDINATES',8X,'BY THE ROTATED REFERENCE XP,
                  *ZP AXIS',14X,'THICKNESS',7X,'E MODULUS',7X,'G MODULUS')
0008              DO 855 I=1,NPNTS
0009            855 WRITE(6,860)I,X(I),I,Z(I),I,XP(I),I,ZP(I),I,T(I),I,EF(I),I,GF(I)
0010            860 FORMAT(1X,'X(',I3,')=',F7.3,5X,'Z(',I3,')=',F7.3,7X,'XP(',I3,')=',
               *F7.3,5X,'ZP(',I3,')=',F7.3,7X,'T(',I2,')=',E10.3,1X,'E(',I2,')=',E
               *10.3,1X,'G(',I2,')=',E10.3)
0011              WRITE(6,865)TAND,XAC,ZAC,CHAND,ATANGD,XIBAR,ZIBAR,XZIBAR,PMI
0012            865 FORMAT(1X,'THE ANGLE IN DEGREES BETWEEN X AND XP AXIS ',F9.3,/,' T
               *HE LOCATION OF THE AERODYNAMIC CENTER  X=',F9.3,3X,'Z=',F9.3,/,' C
               *HORD ANGLE IN DEGREES ',F9.3,5X,'ANGLE OF ATTACK IN DEGREES ',F9.3
               *,/,' MOMENT OF INERTIA ABOUT THE X  AXIS',E12.5,/,' MOMENT OF INER
               *TIA ABOUT THE Z  AXIS',E12.5,/,' PRODUCT OF INERTIA ABOUT THE  X,Z
               *  AXIS ',E12.5,/,' POLAR MOMENT OF INERTIA ABOUT THE  X,Z  AXIS',E
               *12.5)
0013              WRITE(6,870)XBAR,ZBAR,VX,VZ,MZ,MX,TORQUE,TORQ,XSC,ZSC
0014            870 FORMAT(/,' CENTROID LOCATION X=',F9.3,5X,'Z=',F9.3,/,' SHEAR IN TH
               *E X  DIRECTION',E12.5,/,' SHEAR IN THE Z  DIRECTION',E12.5,/,' MOM
               *ENT ABOUT THE Z  AXIS',E12.5,/,' MOMENT ABOUT THE X  AXIS',E12.5,/
               *,' TORQUE ABOUT THE AERODYNAMIC CENTER ',E12.5,/,' TORQUE ABOUT TH
               *E SHEAR CENTER ',E12.5,/,' SHEAR CENTER LOCATION X=',F9.3,5X,'Z=',
               *F9.3)
0015              WRITE(6,965)
0016              WRITE(6,875)
0017            875 FORMAT(1X,'SIGN CONVENTION  1=LEFT, 2=UP LEFT, 3=UP, 4=UP RIGHT, 5
               *=RIGHT, 6=DOWN RIGHT, 7=DOWN, 8=DOWN LEFT')
0018              WRITE(6,880)
0019            880 FORMAT(/,30X,'SHEAR FLOWS DUE TO FORCES ACTING ALONG THE XP AXIS')
0020              DO 885 I=1,NPNT,5
0021              J=I+1
0022              K=I+2
0023              L=I+3
0024              M=I+4
0025            885 WRITE(6,890)I,IDRXXF(I),QXF(I),J,IDRXXF(J),QXF(J),K,IDRXXF(K),QXF(
               *K),L,IDRXXF(L),QXF(L),M,IDRXXF(M),QXF(M)
0026            890 FORMAT(1X,'QXF(',I3,')=',I2,E11.4,3X,'QXF(',I3,')=',I2,F11.4,3X,'Q
               *XF(',I3,')=',I2,E11.4,3X,'QXF(',I3,')=',I2,E11.4,3X,'QXF(',I3,')='
               *,I2,E11.4)
0027              WRITE(6,965)
0028              WRITE(6,895)
0029            895 FORMAT(/,30X,'SHEAR FLOWS DUE TO FORCES ACTING ALONG THE ZP AXIS')
0030              DO 900 I=1,NPNT,5
0031              J=I+1
0032              K=I+2
```

```
0033              L=I+3
0034              M=I+4
0035            900 WRITE(6,905)I,IDRXZF(I),QZF(I),J,IDRXZF(J),QZF(J),K,IDRXZF(K),QZF(
                   *K),L,IDRXZF(L),QZF(L),M,IDRXZF(M),QZF(M)
0036            905 FORMAT(1X,'QZF(',I3,')=',I2,E11.4,3X,'QZF(',I3,')=',I2,E11.4,3X,'Q
                   *ZF(',I3,')=',I2,E11.4,3X,'QZF(',I3,')=',I2,E11.4,3X,'QZF(',I3,')='
                   *,I2,E11.4)
0037              WRITE(6,965)
0038              WRITE(6,910)(ICELL,QT(ICELL),ICELL=1,NCELL)
0039            910 FORMAT(1X,'SHEAR FLOWS DUE TO TORQUE ABOUT AERODYNAMIC CENTER',4('
                   * QT(',I1,')=',E12.5))
0040              WRITE(6,930)
0041            930 FORMAT(/,30X,'SHEAR FLOWS DUE TO TORQUE AND SHEAR LOADS APPLIED AT
                   * THE AERODYNAMIC CENTER')
0042              DO 935 I=1,NPNT,5
0043              J=I+1
0044              K=I+2
0045              L=I+3
0046              M=I+4
0047            935 WRITE(6,940)I,IDRX(I),Q(I),J,IDRX(J),Q(J),K,IDRX(K),Q(K),L,IDRX(L)
                   *,Q(L),M,IDRX(M),Q(M)
0048            940 FORMAT(1X,'Q(',I3,')=',I2,E11.4,3X,'Q(',I3,')=',I2,E11.4,3X,'Q(',I
                   *3,')=',I2,E11.4,3X,'Q(',I3,')=',I2,E11.4,3X,'Q(',I3,')=',I2,E11.4)
0049              WRITE(6,965)
0050              WRITE(6,945)
0051            945 FORMAT(1X'NORMAL SKIN STRESSES  -(COMPRESSION)  +(TENSION)',/)
0052              DO 950 I=1,NPNT,5
0053              J=I+1
0054              K=I+2
0055              L=I+3
0056              M=I+4
0057            950 WRITE(6,955)I,SIGMA(I),J,SIGMA(J),K,SIGMA(K),L,SIGMA(L),M,SIGMA(M)
0058            955 FORMAT(1X,'SIGMA(',I3,')=',E11.4,3X,'SIGMA(',I3,')=',E11.4,3X,'SIG
                   *MA(',I3,')=',E11.4,3X,'SIGMA(',I3,')=',E11.4,3X,'SIGMA(',I3,')=',E
                   *11.4)
0059              WRITE(6,965)
0060              WRITE(6,970)
0061            965 FORMAT(1H1)
0062            970 FORMAT(11X,'YLOCAT',12X,'Z',17X,'X',17X,'TWIST',7X,'ABOUT THE X,Z
                   *AXIS')
0063              RETURN
0064              END
```

```
*OPTIONS IN EFFECT*   ID,BCD,SOURCE,NOLIST,NODECK,LOAD,NOMAP
*OPTIONS IN EFFECT*   NAME = OUT      , LINECNT =      60
*STATISTICS*     SOURCE STATEMENTS =       64,PROGRAM SIZE =     4948
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
IEF285I   SYSOUT                                          SYSOUT
IEF285I   VOL SER NOS=
IEF285I   RONDATA                                         KEPT
IEF285I   VOL SER NOS= PCPLIB.
 DURATION OF JOB WAS 00 HOURS 08 MINUTES 24 SECONDS
 NUMBER OF LINES PRINTED WAS 01268
```

```
//WING     JOB    '9608 25    90   5','KRIZ R.D.          ',
//   MSGLEVEL=(1,1)
//FORT EXEC PGM=IEYFORT,PARM='NAME=INOUT'
//SYSPRINT DD SYSOUT=A
//SYSPUNCH DD SYSOUT=B
//SYSLIN DD DSN=RONDATA,DISP=(MOD,KEEP,DELETE),UNIT=2311,
//    VOL=SER=PCPLIB,SPACE=(80,(200,100)),DCB=BLKSIZE=80
//SYSIN DD *
 **** CAL POLY OS/19.6 **** KRIZ R.D. **********  22222222   5555555555  ***** DATE 74.081 **** TIME 13.06.31 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. ********** 2222222222  5555555555  ***** DATE 74.081 **** TIME 13.06.31 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. ********** 22       22  55          ***** DATE 74.081 **** TIME 13.06.31 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. **********         22  55          ***** DATE 74.081 **** TIME 13.06.31 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. **********  222222222  555555555   ***** DATE 74.081 **** TIME 13.06.31 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. ********** 222222222  5555555555  ***** DATE 74.081 **** TIME 13.06.31 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. ********** 22             55       ***** DATE 74.081 **** TIME 13.06.31 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. ********** 22          55  55       ***** DATE 74.081 **** TIME 13.06.31 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. ********** 2222222222  5555555555  ***** DATE 74.081 **** TIME 13.06.31 ***
 **** CAL POLY OS/19.6 **** KRIZ R.D. ********** 2222222222   55555555   ***** DATE 74.081 **** TIME 13.06.31 ***
IEF236I ALLOC. FOR WING     FORT
IEF237I 191    ALLOCATED TO SYSLIN
IEF237I 00C    ALLOCATED TO SYSIN
```

```
0001                  SUBROUTINE INOUT(NCELL,NPNTS,NLEG,ITLEG,IARRY,ISENSE,IARRYW,LNO,LB
                     *EG,LEND,IV,IU,RX,RZ,TX,TZ,TR,TT,YF,YL,RXAC,RZAC,TXAC,TZAC,RHOS,RHO
                     *C,DC,ATANGD,CHAND,E,G,NN,YS,NWEB,S,DY,ES)
0002                  DIMENSION ITLEG(4),IARRY(4,5),ISENSE(4,5),IARRYW(3),LNO(13),LBEG(1
                     *3),LEND(13),IV(13),IU(13),RX(100),RZ(100),TX(100),TZ(100),TR(100),
                     *TT(100),YS(10),E(100),G(100)
                C
                C                NUMBER OF CELLS
                C
0003                5 READ(5,6)NCELL
0004                6 FORMAT(16X,I1)
                C
                C                NUMBER OF POINTS DEFINING SHAPE OF CROSSECTION
                C
0005                  READ(5,10)NPNTS
0006               10 FORMAT(47X,I2)
                C
                C          POINTS IN EACH LEG DEFINED
                C
                C             NUMBER OF LEGS
                C
0007                  READ(5,15)NLEG
0008               15 FORMAT(15X,I2)
                C
                C             TOTAL NUMBER OF LEGS FOLLOWED BY THE ORDER OF
                C              LEGS ASSOCIATED WITH EACH CELL
                C
0009                  DO 30 ICELL =1,NCELL
0010                  READ(5,21)ITLEG(ICELL)
0011               21 FORMAT(22X,I1)
0012                  INO=ITLEG(ICELL)
0013                  READ(5,25)(IARRY(ICELL,IORD),IORD=1,INO)
0014               25 FORMAT(5I2)
0015               30 CONTINUE
                C
                C             THE SENSE OF EACH LEG AND EACH CELL
                C             PLUS COUNTER CLOCKWISE, MINUS CLOCKWISE
                C
0016                  DO 33 ICELL=1,NCELL
0017                  INO=ITLEG(ICELL)
0018                  READ(5,32)(ISENSE(ICELL,IORD),IORD=1,INO)
0019               32 FORMAT(5I2)
0020               33 CONTINUE
                C
                C             LEGS COMMON TO ADJACENT CELLS (SHEAR WEBS DEFINED)
                C
                C                READ IN NUMBER OF SHEAR WEBS
                C
0021                  READ(5,35)NWEB
0022               35 FORMAT(30X,I1)
0023                  READ(5,40)(IARRYW(IWEB),IWEB=1,NWEB)
0024               40 FORMAT(4X,I2)
                C
                C             NUMBER OF POINTS IN EACH LEG
                C             NUMBER BEGINING EACH LEG
                C             NUMBER ENDING EACH LEG
                C
0025                  DO 55 ILEG=1,NLEG
```

```
0026              READ(5,50)LNO(ILEG),LBEG(ILEG),LEND(ILEG)
0027           50 FORMAT(20X,I2,32X,I2,17X,I2)
0028           55 CONTINUE
                C
                C          SHEAR FLOW CALCULATED AT THE BEGINNING OF EACH LEG
                C
0029              DO 57 ILEG=1,NLEG
0030              READ(5,56)IV(ILEG),IU(ILEG)
0031           56 FORMAT(19X,I2,4X,I2)
0032           57 CONTINUE
                C
                C        POINTS LOCATIONS IN THE XZ PLANE
                C        AT THE WING ROOT AND TIP
                C
0033              DO 65 I=1,NPNTS
0034              READ(5,60)RX(I),RZ(I),TX(I),TZ(I),TR(I),TT(I),E(I),G(I)
0035           60 FORMAT(4X,F6.3,1X,F6.3,1X,F6.3,1X,F6.3,1X,F6.3,1X,F6.3,2(1X,E10.3)
                 *)
0036           65 CONTINUE
                C
                C        SEMI-SPAN LENGTH
                C
0037              READ(5,70)YF,YL
0038           70 FORMAT(5X,F10.5,5X,F10.5)
                C
                C        ROOT AND TIP AERODYNAMIC CENTERS
                C
0039              READ(5,75)RXAC,RZAC,TXAC,TZAC
0040           75 FORMAT(5X,F10.5,5X,F10.5,5X,F10.5,5X,F10.5)
                C
                C        SKIN AND CORE MATERIAL DENSITIES
                C
0041              READ(5,80)RHOS,RHOC,DC
0042           80 FORMAT(24X,E10.3,/,24X,E10.3,/,19X,E10.3)
                C
                C        INITIAL ANGLE OF ATTACK, CHORD ANGLE, BENDING AND SHEAR MODULUS
                C                NUMBER OF WRITEOUTS
                C
0043              READ(5,85)ATANGD,CHAND,ES,NN
0044           85 FORMAT(16X,F8.5,/,12X,F8.5,/,23X,E10.3,/,49X,I2)
                C
                C        SPAN LOCATION WHERE WRITEOUT OCCURS (UP TO 10 MAX)
                C
0045              DO 95 I=1,NN
0046              READ(5,90)YS(I)
0047           90 FORMAT(36X,F8.4)
0048           95 CONTINUE
                C
                C        THIS SECTION WRITES OUT ALL DATA READ IN
                C
0049              WRITE(6,100)
0050          100 FORMAT(1H1'THE INPUT DATA WAS READ AS FOLLOWS')
0051              WRITE(6,101)S,DY
0052          101 FORMAT(1X,'THE FINAL WING SECTION IS EVALUATED AT Y=',F8.4,/,' DIS
                 *TANCE BETWEEN TWO SECTIONS=',F7.4)
0053              WRITE(6,105)NCELL,NPNTS,NLEG
0054          105 FORMAT(1X,'TOTAL NUMBER OF CELLS=',I2,/,' TOTAL NUMBER OF POINTS D
                 *EFINING CROSSECTION SHAPE=',I2,/,' NUMBER OF LEGS',I2,/,' THE TOTA
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```
      *L NUMBER OF LEGS FOLLOWED BY A LIST OF LEGS ASSOCIATED WITH EACH C
      *ELL')
0055       DO 120 ICELL=1,NCELL
0056       WRITE(6,110)ICELL,ITLEG(ICELL)
0057   110 FORMAT(1X,'CELL ',I1,' HAS A TOTAL OF ',I1,'LEGS.  THE LIST OF LEG
      *S')
0058       INO=ITLEG(ICELL)
0059       WRITE(6,115)(IARRY(ICELL,IORD),IORD=1,INO)
0060   115 FORMAT(1X,5I2)
0061   120 CONTINUE
0062       WRITE(6,121)
0063   121 FORMAT(1X,'THE SENSE OF EACH LEG (PLUS COUNTER CLOCKWISE, MINUS CL
      *OCKWISE)')
0064       DO 123 ICELL=1,NCELL
0065       INO=ITLEG(ICELL)
0066       WRITE(6,122)(ISENSE(ICELL,IORD),IORD=1,INO),ICELL
0067   122 FORMAT(1X,5I2,' SENSE FOR CELL ',I1)
0068   123 CONTINUE
0069       WRITE(6,125)NWEB
0070   125 FORMAT(1X,'NUMBER OF SHEAR WEBS=',I1)
0071       DO 135 IWEB=1,NWEB
0072       WRITE(6,130)IARRYW(IWEB),IWEB
0073   130 FORMAT(1X,'LEG ',I2,' FORMS SHEAR WEB ',I1)
0074   135 CONTINUE
0075       DO 145 ILEG=1,NLEG
0076       WRITE(6,140)ILEG,LNO(ILEG),LBEG(ILEG),LEND(ILEG)
0077   140 FORMAT(1X,'IN LEG ',I2,' THERE ARE ',I2,' POINTS STARTING WITH POI
      *NT NO. ',I2,' AND ENDING WITH ',I2)
0078   145 CONTINUE
0079       DO 147 ILEG=1,NLEG
0080       WRITE(6,146)ILEG,LBEG(ILEG),IV(ILEG),IU(ILEG)
0081   146 FORMAT(1X,'IN LEG ',I2,'  Q(',I2,')=Q(',I2,')+Q(',I2,')')
0082   147 CONTINUE
0083       DO 155 I=1,NPNTS
0084       WRITE(6,150)I,RX(I),I,RZ(I),I,TX(I),I,TZ(I),I,TR(I),I,TT(I),I,E(I)
      *,I,G(I)
0085   150 FORMAT(1X,'RX(',I2,')=',F7.3,1X,'RZ(',I2,')=',F7.3,1X,'TX(',I2,')=
      *',F7.3,1X,'TZ(',I2,')=',F7.3,1X,'TR(',I2,')=',E10.3,1X,'TT(',I2,')
      *=',E10.3,1X,'E(',I2,')=',E10.3,1X,'G(',I2,')=',E10.3)
0086   155 CONTINUE
0087       WRITE(6,160)YF,YL,RXAC,RZAC,TXAC,TZAC,RHOS,RHOC,DC,ATANGD,CHAND,ES
      *,NN
0088   160 FORMAT(1X,'THE Y LOCATION OF ROOT AIRFOIL IS ',F9.5,/,' THE Y LOCA
      *TION OF THE TIP AIRFOIL IS ',F9.5,/,' THE LOCATION OF THE ROOT AER
      *ODYNAMIC CENTER IS',7X,'RXAC=',F9.5,5X,'RZAC=',F9.5,/,' THE LOCATI
      *ON OF THE TIP AERODYNAMIC CENTER IS',7X,'TXAC=',F9.5,5X,'TZAC=',F9
      *.5,/,' SKIN DENSITY LBS./IN.**3 =',E10.3,/,' CORE DENSITY LBS./IN.
      ***3 =',E10.3,/,' CORE THICKNESS IN. =',E10.3,/,' ANGLE OF ATTACK='
      *,F7.5,/,' CHORD ANGLE=',F7.5,/,' SKINS BENDING MODULUS=',E10.3,/,
      *' NUMBER OF WRITEOUTS=',I2)
0089       DO 170 I=1,NN
0090       WRITE(6,165)YS(I)
0091   165 FORMAT(1X,'  INFO.  ETC. PRINT OUT AT SECTION Y=',F9.3)
0092   170 CONTINUE
0093       RETURN
0094       END
```

```
*OPTIONS IN EFFECT*   ID,BCD,SOURCE,NOLIST,NODECK,LOAD,NOMAP
*OPTIONS IN EFFECT*   NAME = INOUT    , LINECNT =      60
*STATISTICS*     SOURCE STATEMENTS =       94,PROGRAM SIZE =     5092
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
IEF285I   SYSOUT                                          SYSOUT
IEF285I   VOL SER NOS=       ,
IEF285I   RONDATA                                         KEPT
IEF285I   VOL SER NOS= PCPLIB.
//LKED   EXEC  PGM=IEWL,PARM='LIST,LET,XREF,OVLY',COND=EVEN
//SYSLIB DD DSN=SYS1.FORTLIB,DISP=OLD,UNIT=2311,VOL=SER=PCPRES
//   DD  DSN=SYS1.USERLIB,DISP=OLD,UNIT=2311,VOL=SER=PCPRES
//SYSLMOD DD DSN=RONGO(WING),DISP=(NEW,KEEP,DELETE),UNIT=2311,
//    VOL=SER=PCPLIB,DCB=BLKSIZE=1024,
//      SPACE=(1024,(20,20,1))
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD UNIT=2311,SPACE=(1024,(100,10),RLSE),DCB=BLKSIZE=1024,
//      DSN=&SYSUT1
//SYSLIN DD DSN=RONDATA,DISP=(OLD,DELETE,DELETE),UNIT=2311,
//     VOL=SER=PCPLIB
//     DD  DDNAME=SYSIN
//LKED.SYSIN DD *
IEF236I ALLOC. FOR WING     LKED
IEF237I 192   ALLOCATED TO SYSLIB
IEF237I 192   ALLOCATED TO
IEF237I 191   ALLOCATED TO SYSLMOD
IEF237I 190   ALLOCATED TO SYSUT1
IEF237I 191   ALLOCATED TO SYSLIN
IEF237I 00C   ALLOCATED TO
```

```
 F88-LEVEL LINKAGE EDITOR OPTIONS SPECIFIED LIST,LET,XREF,OVLY
           VARIABLE OPTIONS USED -  SIZE=(102400,8192)-          DEFAULT OPTION(S) USED
IEW0000      ENTRY MAIN
IEW0000      INSERT MAIN,FCN
IEW0000      OVERLAY A
IEW0000      INSERT SECT,CELLT
IEW0000      OVERLAY B
IEW0000      INSERT CENTRD
IEW0000      OVERLAY B
IEW0000      INSERT SHEAR
IEW0000      OVERLAY B
IEW0000      INSERT OUT
IEW0000      OVERLAY B
IEW0000      INSERT INOUT
****WING       DOES NOT EXIST BUT HAS BEEN ADDED TO DATA SET
```

CROSS REFERENCE TABLE

CONTROL SECTION

NAME	ORIGIN	LENGTH	SEG. NO.
$SEGTAB	00	30	1
MAIN	30	572	1
FCN	5A8	1E0	1
IHCSATN2*	788	1C8	1
IHCSSCN *	958	1D9	1
IHCFEXIT*	B38	1C	1
IHCECOMH*	B58	F39	1
IHCCOMH2*	1A98	651	1
IHCSSQRT*	20F0	145	1
IHCFCVTH*	2238	119D	1
IHCEFNTH*	33D8	512	1
IHCEFIOS*	38F0	131C	1
IHCERRM *	4C10	5BC	1
IHCUOPT *	51D0	300	1
IHCETRCH*	54D0	28E	1
IHCUATBL*	5760	C8	1
$ENTAB	5828	18	1

ENTRY

NAME	LOCATION	NAME	LOCATION	NAME	LOCATION	NAME	LOCATION
ATAN2	788	ATAN	79C				
COS	958	SIN	970				
EXIT	B38						
IBCOM#	B58	FDICCS#	C14	INTSWTCH	1A76		
SEQDASD	1E04						
SQRT	20F0						
ADCON#	2238	FCVADUTP	22E2	FCVLOUTP	2372	FCVZOUTP	24C2
FCVICUTP	2870	FCVEOUTP	2D72	FCVCOUTP	2F8C	INT6SWCH	3273
ARITH#	33D8	ADJSWTCH	3744				
FIOCS#	38F0	FIOCSBEP	38F6				
ERRMON	4C10	IHCERRE	4C28				
IHCTRCH	54D0	ERRTRA	54D8				

LOCATION	REFERS TO SYMBOL	IN CONTROL SECTION	SEG. NO.	LOCATION	REFERS TO SYMBOL	IN CONTROL SECTION	SEG. NO.
CC	IBCOM#	IHCECOMH	1	D0	SECT	SECT	2
D4	EXIT	IHCFEXIT	1	D8	SIN	IHCSSCN	1
8C8	IBCOM#	IHCECOMH	1	914	IHCERRM	IHCERRM	1
A88	IBCOM#	IHCECOMH	1	ACC	IHCERRM	IHCERRM	1
B50	IBCOM#	IHCECOMH	1	C14	SEQDASD	IHCCOMH2	1
197C	ADCON#	IHCFCVTH	1	1974	FIOCS#	IHCEFIOS	1
1980	ARITH#	IHCEFNTH	1	19A0	ADJSWTCH	IHCEFNTH	1
1928	IHCUOPT	IHCUOPT	1	199C	IHCUOPT	IHCUOPT	1
1984	FCVEOUTP	IHCFCVTH	1	1988	FCVLOUTP	IHCFCVTH	1
198C	FCVIOUTP	IHCFCVTH	1	1990	FCVCOUTP	IHCFCVTH	1
1994	FCVAOUTP	IHCFCVTH	1	1998	FCVZOUTP	IHCFCVTH	1
1924	IHCERRE	IHCERRM	1	1954	IHCCOMH2	IHCCOMH2	1
1958	IHCERRM	IHCERRM	1	192C	IHCCOMH2	IHCCOMH2	1
1930	IHCCOMH2	IHCCOMH2	1	1934	IHCCOMH2	IHCCOMH2	1
1938	IHCCOMH2	IHCCOMH2	1	1D29	IHCECOMH	IHCECOMH	1
1D2C	IHCECOMH	IHCECOMH	1	1ADC	IHCERRM	IHCERRM	1
1AD8	IBCOM#	IHCECOMH	1	1F49	IHCECOMH	IHCECOMH	1
1F59	IHCECOMH	IHCECOMH	1	1F69	IHCECOMH	IHCECOMH	1
21C0	IBCOM#	IHCECOMH	1	21E8	IHCERRM	IHCERRM	1
3234	IBCOM#	IHCECOMH	1	3230	IHCERRM	IHCERRM	1
3794	IBCOM#	IHCECOMH	1	3798	INTSWTCH	IHCECOMH	1
3740	INT6SWCH	IHCFCVTH	1	373C	IHCUOPT	IHCUOPT	1
37A0	ADCON#	IHCFCVTH	1	379C	FIOCS#	IHCEFIOS	1
380C	IHCERRM	IHCERRM	1	3A50	IHCERRM	IHCERRM	1
4840	IHCUATBL	IHCUATBL	1	484C	IBCOM#	IHCECOMH	1
518C	IHCUOPT	IHCUOPT	1	51C0	IBCOM#	IHCECOMH	1
51C4	IHCTRCH	IHCETRCH	1	51C8	FIOCSBEP	IHCEFIOS	1
5644	IBCOM#	IHCECOMH	1	5648	ADCON#	IHCFCVTH	1
564C	FIOCSBEP	IHCEFIOS	1				

CONTROL SECTION				ENTRY							
NAME	ORIGIN	LENGTH	SEG. NO.	NAME	LOCATION	NAME	LOCATION	NAME	LOCATION	NAME	LOCATION
SECT	5840	EF92	2								
CELLT	147D8	DB8	2								
$ENTAB	15590	3C	2								

LOCATION	REFERS TO SYMBOL	IN CONTROL SECTION	SEG. NO.	LOCATION	REFERS TO SYMBOL	IN CONTROL SECTION	SEG. NO.
59E8	INOUT	INOUT	6	59EC	CENTRD	CENTRD	3
59F0	FCN	FCN	1	59F4	IBCOM#	IHCECOMH	1
59F8	SHEAR	SHEAR	4	59FC	OUT	OUT	5
5A00	CELLT	CELLT	2	5A04	SQRT	IHCSSQRT	1
5A08	COS	IHCSSCN	1	5A0C	SIN	IHCSSCN	1
14804	IBCOM#	IHCECOMH	1	148D8	SQRT	IHCSSQRT	1

```
CONTROL SECTION                         ENTRY

  NAME     ORIGIN  LENGTH  SEG. NO.      NAME   LOCATION     NAME   LOCATION     NAME   LOCATION     NAME   LOCATION

CENTRO     155D0    AB6      3

LOCATION  REFERS TO SYMBOL  IN CONTROL SECTION  SEG. NO.  LOCATION  REFERS TO SYMBOL  IN CONTROL SECTION  SEG. NO.

  156A4          SQRT          IHCSSQRT          1        156A8          ATAN2         IHCSATN2          1
  156AC          COS           IHCSSCN           1        156B0          SIN           IHCSSCN           1

CONTROL SECTION                         ENTRY

  NAME     ORIGIN  LENGTH  SEG. NO.      NAME   LOCATION     NAME   LOCATION     NAME   LOCATION     NAME   LOCATION

SHEAR      155D0   28AE      4

LOCATION  REFERS TO SYMBOL  IN CONTROL SECTION  SEG. NO.  LOCATION  REFERS TO SYMBOL  IN CONTROL SECTION  SEG. NO.

  15858          IBCOM#        IHCECOMH          1        1585C          CELLT         CELLT             2
  15860          SQRT          IHCSSQRT          1        15864          COS           IHCSSCN           1
  15868          SIN           IHCSSCN           1

CONTROL SECTION                         ENTRY

  NAME     ORIGIN  LENGTH  SEG. NO.      NAME   LOCATION     NAME   LOCATION     NAME   LOCATION     NAME   LOCATION

OUT        155D0   1354      5

LOCATION  REFERS TO SYMBOL  IN CONTROL SECTION  SEG. NO.  LOCATION  REFERS TO SYMBOL  IN CONTROL SECTION  SEG. NO.

  15678          IBCOM#        IHCECOMH          1

CONTROL SECTION                         ENTRY

  NAME     ORIGIN  LENGTH  SEG. NO.      NAME   LOCATION     NAME   LOCATION     NAME   LOCATION     NAME   LOCATION

INOUT      155D0   13E4      6

LOCATION  REFERS TO SYMBOL  IN CONTROL SECTION  SEG. NO.  LOCATION  REFERS TO SYMBOL  IN CONTROL SECTION  SEG. NO.

  156A8          IBCOM#        IHCECOMH          1
ENTRY ADDRESS    30
```

TOTAL LENGTH 17E80

```
IEF285I   SYS1.FORTLIB                                    KEPT
IEF285I   VOL SER NOS= PCPRES.
IEF285I   SYS1.USERLIB                                    KEPT
IEF285I   VOL SER NOS= PCPRES.
IEF285I   RONGO                                           KEPT
IEF285I   VOL SER NOS= PCPLIB.
IEF285I   SYSOUT                                          SYSOUT
IEF285I   VOL SER NOS=       .
IEF285I   SYS74081.T125238.RP004.WING.SYSUT1              DELETED
IEF285I   VOL SER NOS= OSWK01.
IEF285I   RONDATA                                         DELETED
IEF285I   VOL SER NOS= PCPLIB.
  DURATION OF JOB WAS 00 HOURS 02 MINUTES 33 SECONDS
  NUMBER OF LINES PRINTED WAS 00366
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